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# Zika virus: What every nurse should know

Merry-K. Moos, RN, MPH, FAAN

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**Contact hours:** 1.7 contact hours are available for this activity through 9/30/17. Continuing nursing education (CNE) contact hours may be extended past this date following content review and/or update.

**Accreditation:** March of Dimes Foundation is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

**Disclosure:** Neither the author nor any member of the planning committee has any financial, professional or personal relationships that could potentially bias the content.

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## Article purpose

Seldom have perinatal health care professionals been called upon to respond so quickly to a devastating pregnancy infection that was essentially unknown until a year ago. The magnitude of the complications of Zika infection on developing fetuses and rapidly evolving recommendations around related care require that nurses stay up to date on the latest information to best serve women of childbearing age and their families. The purpose of this article is to provide nurses with critical information on strategies to prevent Zika infection and appropriate follow-up of pregnant women and affected infants.

## Objectives

After reading this article, the learner will be able to:

1. Describe the epidemiology and transmission of the Zika virus.
2. Identify five strategies to reduce transmission on the Zika virus.
3. Explain appropriate surveillance for women infected with the virus.
4. Describe appropriate follow-up of infants exposed to Zika virus in utero.
5. Identify resources to keep knowledge about prevention and management of Zika infection up to date.

## Zika virus: Where did it come from?

The Zika virus was first isolated in Africa in a rhesus monkey in 1947; in 1952 the first human cases were reported in Uganda and Tanzania, and sporadic human infections were reported in Africa and Asia in the subsequent 60 years (World Health Organization [WHO], 2016a). In 2014, the first Zika virus infections were detected in the Western hemisphere, and in May, 2015, the infection was detected in Brazil (LaBeaud, 2016). In the United States, Zika virus infection was initially limited to men and women who had travelled to affected areas. Currently, the United States and its territories of Puerto Rico, the Virgin Islands and American Samoa have mosquito-borne Zika virus transmission, with the situation in Puerto Rico reaching epidemic proportions. In December, 2015, Puerto Rico became the first U.S. jurisdiction to report local transmission of Zika virus (Dirlikov et al., 2016). In the summer of 2016, Miami, Florida became the site of the first mosquito-borne transmission of Zika virus in the continental United States (LaBeaud, 2016).

## Why is Zika virus so important?

Zika virus has been associated with numerous neurologic complications in infected adults, including Guillain-Barre syndrome, brain ischemia and meningoencephalitis (LaBeaud, 2016). However, the most alarming problem is its effect on pregnancy outcomes. Zika infection during pregnancy can cause extreme forms of microcephaly. It also has been

linked to miscarriage, stillbirth and brain and eye abnormalities (McCabe, 2016; Oduyebo et al., 2016).

Much remains unknown about the human effects of Zika infection in the short and long term and about its influence on pregnancy outcomes. While transmission of Zika to the fetus has been documented in all trimesters, uncertainties include the incidence of Zika infection among pregnant women in endemic areas; the rate of vertical transmission; and the rate with which infected fetuses manifest complications, such as microcephaly or fetal death (American College of Obstetricians and Gynecologists [ACOG] & Society of Maternal-Fetal Medicine [SMFM], 2016). A Brazilian study reported adverse pregnancy outcomes including stillbirth, growth restriction, microcephaly and other sonographic abnormalities in 29 percent of fetuses born to women infected with Zika virus at some point in their pregnancies (Brasil et al, 2016). While the risk of vertical transmission exists throughout pregnancy, the most serious fetal sequelae appear to be associated with first- and second-trimester infections (McCabe, 2016). Zika infection during the first trimester may carry the greatest risk; up to 13 percent of babies whose mothers are infected with Zika during the first trimester may develop microcephaly (Johansson, Reefhuis, Gibloa & Hills, 2016).

## How is Zika virus transmitted?

Zika virus spreads to humans primarily through the bite of an infected *Aedes* (*Ae.*) species mosquito: either the *Ae. Aegypti*, which lives primarily in tropical regions, or the *Ae. Albopictus*, which lives in more temperate regions (Centers for Disease Control & Prevention [CDC], 2016a). *Aedes* mosquitoes also transmit dengue and chikungunya viruses. Other important Zika virus transmission routes include sexual contact with an infected individual and vertical transmission from mother to fetus (ACOG & SMFM, 2016). Infection through blood transfusions and laboratory exposure also has been reported (CDC, 2016d). Zika virus RNA has been detected in blood, urine, semen, saliva, female genital tract secretions, cerebrospinal fluid, amniotic fluid and breast milk (LaBeaud, 2016).

## What are clinical manifestations of Zika infection?

The incubation period between exposure and the onset of clinical signs and symptoms (Table 1) is

**Table 1. Clinical manifestations of Zika**

- Arthralgia, particularly of the small joints of the hands and feet\*
- Asthenia
- Headache
- Low-grade fever (<38.5 C)\*
- Maculopapular pruritic rash\*
- Myalgia
- Non-purulent conjunctivitis\*
- Retro-orbital pain

\* Clinical criteria leading to diagnosis of Zika infection; when coupled with residence in or visit to an affected area, 1 of 4 of these is sufficient for diagnosis.

LaBeaud, 2016; Simeone et al., 2016

usually 2 to 14 days, with resolution of the symptoms 2 to 7 days later (LaBeaud, 2016). The illness is very mild and may even go unnoticed: only 20 percent of individuals who become infected with Zika demonstrate clinical manifestations (LaBeaud, 2016), which makes epidemiologic surveillance challenging.

Health care providers suspect Zika infection in individuals with typical clinical findings when coupled with relevant epidemiologic exposure, including residence in or travel to an area where mosquito-borne transmission of Zika has been reported or unprotected sexual contact with a person who meets the epidemiologic exposure criteria (LaBeaud, 2016).

The amount of time an infected individual is a carrier of the disease is constantly being reviewed as epidemiologists gather and analyze data. Zika stays in an infected person's blood for up to a week (CDC, 2016b). Zika virus ribonucleic acid (RNA) has been detected in semen up to 188 days after symptom onset, in vaginal fluids 3 days after symptom onset and in cervical mucus up to 11 days after symptom onset (CDC, 2016a). However, Zika RNA may indicate the presence of live virus that can be infectious, or it may indicate leftover genetic material (dead virus) that isn't infectious. Therefore, the presence of Zika RNA does not necessarily mean live virus is present or that a person can spread it to others. Evolving understanding of how long the virus can live in a body requires nurses and other health care professionals to keep informed about the latest guidance from ACOG, CDC and other national organizations.

There is no specific treatment for Zika infection. Management includes comfort measures, such as rest, drinking fluids to reduce the risk of dehydration and the use of acetaminophen to relieve fever and joint and muscle pain. Aspirin and other nonsteroidal anti-inflammatory drugs should be avoided to reduce the risk of hemorrhage until dengue infection has been ruled out (McCabe, 2016). Once infected, a person probably is protected from reinfection, but the likelihood and length of immunity has not yet been established (ACOG & SMFM, 2016).

## What strategies can help prevent Zika transmission?

While work is underway to develop an effective vaccine to protect populations from the Zika virus, none currently is available. The lack of a vaccine means that individual actions are the most important prevention strategies (Table 2). Nurses and other public health professionals have an important role assuring that all members of populations they serve have information they need to protect themselves,

**Table 2. Zika prevention strategies**

<b>Travel</b>	If your patient is pregnant or trying to get pregnant, recommend that she and her partner not travel to a Zika-affected area unless absolutely necessary. If they do plan to visit one of these areas, encourage them to take steps to prevent mosquito bites during the trip. They also can check CDC travel alerts at <a href="http://cdc.gov/travel/notices">cdc.gov/travel/notices</a> .
<b>Mosquito transmission</b>	<p><b>If your patient lives in or travels to an area where Zika is spreading, recommend that she:</b></p> <ul style="list-style-type: none"> <li>• Use EPA-approved insect repellent (spray or lotion). If the product contains DEET, it should have at least 20 percent DEET.</li> <li>• Follow instructions on the product label, especially about how often to reapply</li> <li>• Not use repellent under clothes. If she’s using sunscreen, she should put it on before she applies repellent.</li> <li>• Use insect repellent during the day and night; the <i>Aedes aegypti</i> mosquito bites primarily during the day and at dusk and dawn.</li> <li>• Use insect repellent for 3 weeks after leaving a Zika-affected area to help prevent transmission to others</li> <li>• Wear a hat, a long-sleeved shirt, long pants, shoes and socks. Treat clothes, shoes and outdoor gear with an insecticide called permethrin*.</li> <li>• Protect interior spaces. <i>Aedes</i> mosquitoes are active both inside and outside. She should ensure that all windows are covered with intact screens and that doors to the outside can be tightly closed. Air conditioning, while not available to everyone, is a good comfort measure in hot, humid areas and may reduce the need to open doors and windows.</li> <li>• Use bed nets if she’s sleeping outside or in a room that doesn’t have air conditioning or screens on doors and windows. She can purchase bed nets at outdoor stores, and she should look for nets approved by the WHO Pesticide Evaluation Scheme and treated with permethrin*. If the net is treated with permethrin, she shouldn’t wash it or leave it in the sun.</li> <li>• Remove all still water from inside and outside the home and workplace. The smallest receptacle, as small as a discarded bottle cap, contains sufficient water for the <i>Aedes aegypti</i> mosquito to reproduce. In tropical and semi-tropical areas, watching for standing water requires considerable effort because of frequent rain showers; without this attentiveness, the likelihood of infection increases greatly.</li> </ul> <p>* For general mosquito prevention, the CDC (2016c) recommends the use of permethrin, an insecticide used to treat clothing and outdoor gear. However, mosquitoes in Puerto Rico, other Caribbean islands and parts of Mexico have developed resistance to it (Branswell, 2016).</p> <p style="text-align: right;"><i>(Continued on next page)</i></p>

**Table 2. Zika prevention strategies (continued)**

<b>Sexual transmission</b>	<p>If your patient is sexually active, recommend that she not have sex with a male or female partner who may be infected with Zika. If she does have sex, she should use a barrier method of birth control every time. Appropriate barrier methods include:</p> <ul style="list-style-type: none"> <li>• For vaginal sex, male and female condoms</li> <li>• For oral sex, male condoms, male condoms cut to create a flat barrier and dental dams</li> </ul> <p>If your patient is planning pregnancy, see Table 3 for preconception recommendations.</p>
<b>Workplace exposure</b>	If your patient works in a laboratory or health care setting, recommend that she follow workplace safety rules about handling body fluids, lab samples and patients who may be infected with Zika.
<b>Blood donation</b>	If your patient has or may have Zika, recommend that she wait at least 4 weeks before donating blood. She should not donate umbilical cord blood.
Brooks et al., 2016; CDC, 2016c	

their families and their communities. Undoubtedly, the greatest prevention energies are needed for women who are pregnant or likely to become pregnant because of the devastating birth outcomes associated with Zika infection.

Clinicians, including nurses, should communicate to women that EPA-registered insect repellents, particularly those with DEET, can be used safely before and during pregnancy when used as directed on the product label.

Clinicians should discuss pregnancy intention and timing with all women and couples of reproductive age (Moos, 2013; National Preconception Health and Health Care Initiative Clinical Work Group, no date). Because of the devastating pregnancy complications associated with Zika infection in pregnancy, this emphasis is especially important for women who live in areas where transmission had been recorded. Table 3 identifies preconception recommendations for Zika prevention.

## How is Zika infection diagnosed?

Table 4 identifies case definitions of Zika infections. Laboratory testing for Zika infection is performed by the Pan American Health Organization/WHO, the CDC Arboviral Diagnostic Laboratory and some state health departments (LaBeaud, 2016). Every clinic and hospital needs clear guidance for its employees regarding whom to test, what to order and where to send specimens. Routine testing for Zika is not recommended for men or nonpregnant women with

possible Zika virus exposure without clinical illness (ACOG & SMFM, 2016). However, because of the potential for severe fetal consequences of this infection in pregnancy, testing for pregnant women is more liberal. Providers should educate all women who could become pregnant to contact their health care provider as soon as they think they are pregnant so that appropriate screening and surveillance can be initiated (March of Dimes, 2016; Oduyebo et al., 2016).

## What is appropriate surveillance of and care for women infected with Zika virus?

According to ACOG and SMFM (2016), providers should assess all pregnant woman in the United States and U.S. territories for Zika virus exposure at each prenatal visit to determine if Zika testing is indicated. Assessment includes inquiries about signs and symptoms associated with Zika and travel history for both the woman and her partner. Clinicians should clearly document findings from each of these assessments in the prenatal record to inform newborn assessment and testing at birth.

In the absence of positive findings for either assessment, routine serologic testing is not recommended except for asymptomatic women with an ongoing risk for virus exposure; for these women, CDC recommends that IgM testing be a component of routine obstetric care during the first and second trimesters (Oduyebo et al, 2016). ACOG and SMFM (2016) have developed and disseminated algorithms to

Table 3. Preconception recommendations for Zika prevention	
<b>If pregnancy is desired</b>	<ul style="list-style-type: none"> <li>• Women diagnosed with Zika should wait at least 8 weeks from symptom onset or exposure to attempt pregnancy.</li> <li>• Men diagnosed with Zika should wait at least 6 months from symptom onset to attempt pregnancy.</li> <li>• Men and women with possible Zika exposure without clinical illness consistent with Zika infection should wait at least 8 weeks after possible exposure to attempt pregnancy.</li> </ul> <p>These prevention strategies become difficult for women and couples who live in areas where the infection is epidemic, such as Brazil and Puerto Rico. In these areas, providers counsel couples to see a health care provider before attempting pregnancy so that every opportunity for a healthy pregnancy and baby can be put in place early enough to make a difference.</p>
<b>If pregnancy is not desired</b>	<p>Providers recommend the most effective strategies to prevent unintended pregnancy and consider safety, effectiveness, availability and acceptability when helping a woman/couple select a contraceptive method. A tool to help women, men and couples explore contraception options is available at <a href="http://bedsider.org">bedsider.org</a>. This site is useful in helping health care providers assist patients in finding the best match for their contraceptive needs.</p>
ACOG & SMFM, 2016	

guide who and how to test pregnant women in the United States and U.S. territories. Because of rapidly evolving understanding of how to identify and manage Zika infection, all health care providers, including nurses, should routinely revisit national recommendations and guidelines.

Table 4. Case definitions of Zika infection	
<b>Suspected case</b>	A person with a maculopapular rash and/or fever (37.8 to 38.5 C) with at least one of the following symptoms not explained by other medical conditions: arthralgia, arthritis, conjunctivitis. A suspected case has relevant epidemiologic exposure (residence in or travel to an area where mosquito-borne transmission of Zika virus infection has been reported or unprotected sexual contact with a person who meets the same criteria).
<b>Probable case</b>	A person with immunoglobulin (IgM antibody) against Zika virus (with no evidence of infection with other flaviviruses, such as West Nile, dengue, tick-borne encephalitis, yellow fever and other viruses associated with encephalitis) and relevant epidemiologic exposure.
<b>Confirmed case</b>	Requires laboratory confirmation of Zika virus infection, either by detection of RNA or antigen in serum or other samples or by detection of Zika IgM antibody and a positive Zika virus plaque-reduction neutralization test (PRNT), which helps avoid false positive tests
LaBeaud, 2016	

Ultrasound is the primary screening tool for fetal Zika infection. Ultrasound assessment requires careful evaluation of the skull, eyes, brain structures and joints for contractions (arthrogryposis) (ACOG & SMFM, 2016). The minimum time between maternal Zika infection and development of sonographic signs of fetal infection is not known. In women who are infected at the time of conception or early in pregnancy, abnormal findings may be detected as early as 18 to 20 weeks gestation but usually are detected in the late second and early third trimester. Therefore, providers should rescan later in pregnancy at-risk women who have reassuring ultrasound findings early in pregnancy (McCabe, 2016).

ACOG and SMFM (2016) recommend that providers consider ultrasounds every 3 to 4 weeks for women with recent or presumptive Zika infection. This surveillance helps identify indications of developing or worsening anomalies and poor growth in utero. All ultrasound evidence of microcephaly and related brain disorders cannot be assigned to the Zika virus as there are numerous causes. Where resources exist, providers should refer pregnant women whose fetuses have suspected microcephaly or other related brain abnormalities for specialized care to investigate the underlying cause (WHO, 2016b).

The CDC recommends that providers offer fetal tissue testing to women with laboratory evidence of confirmed or possible Zika infection who experience a fetal loss or stillbirth to provide insight into the cause of the loss (Oduyebo et al., 2016a). Understanding contributors to the loss may help parents process the death as well as provide them with information about opportunities for a better pregnancy outcome in the future. Zika infection may have had nothing to do with the loss.

Great attention has been paid to congenital anomalies associated with fetal Zika infection, but relatively little consideration has been directed to the anxiety, grief and guilt likely to overwhelm expectant parents confronted with the possibility or reality of an affected fetus. WHO (2016c) offers a handbook that gives clear guidance for health care providers on how to provide support for women and families whose pregnancies have been impacted by Zika (Table 5). The publication is available in English, Spanish and Portuguese. WHO prefaces its recommendations by noting that provision of accurate information about a largely unknown communicable disease and its suspected effects is important not only for public health reasons but also because it can reduce anxiety in people and their communities. It also notes that “unverified but plausible sounding rumors communicated through social media can cause serious distress” (p 5). WHO (2016c) also provides a summary of important strategies to enhance supportive communication in the face of a personal crisis (Table 7). Nurses who read this guidance are likely to find ways to improve their approaches to supporting patients during difficult conversations. Women and their support persons need accurate and evidence-based information on the prognosis of risks for their infants as well as the significance and prognosis of any abnormalities identified by prenatal ultrasound. Provision of understandable patient education and psychosocial support are foundations of nursing practice. Nurses should take leadership in

**Table 5. Guidance for professionals on providing support for women and families whose pregnancies are affected by Zika**

- Respect and enforce a woman’s privacy. A breach of confidentiality is not only unethical but it may result in significant stigma for the woman and her family.
- Encourage women to involve and invite a trusted person (partner, friend, family) to prenatal care visits, especially when discussing testing or test results. Ask the woman and her support team what they already know about Zika, microcephaly and other related complications. Listen to the woman and her support team’s thoughts, feelings and questions.
- Provide accurate and understandable information on all assessments and investigations before they occur and on all test results.
- Educate women on what is known about the prognosis of Zika and/or microcephaly and other complications. Provide realistic hope. Emphasize that many babies with microcephaly do not develop developmental disorders or other severe neurologic complications. Explain the need for regular follow-up care to monitor neurodevelopment and assess for possible complications. Table 6 summarizes what we know and what we still don’t know about Zika virus and its effect on pregnancy.
- Assess the woman’s understanding of information you’ve shared. Ask her to summarize what you’ve told her. Gently correct any misunderstandings. Encourage her to take notes and to call or return to the clinic if she has questions later.
- Share information about and refer her to services to address social, psychological and physical health needs, as appropriate.
- Educate women about appropriate measures to control spread of the virus.
- Before ending each visit, restate and confirm what the woman’s next action step is, such as attending another appointment or contacting a service.

WHO, 2016c

assuring that these characteristics of care are provided to women and families by all members of the health care team and that care is coordinated between members of the care team.

**Table 6. What we know and don't know about Zika virus and pregnancy**

<b>What we know</b>	<ul style="list-style-type: none"> <li>• Zika virus can be passed from a pregnant woman to her fetus.</li> <li>• Infection during pregnancy can cause certain birth defects.</li> <li>• Zika primarily spreads through infected mosquitoes. It also spreads through sex.</li> <li>• There is no vaccine to prevent or medicine to treat Zika.</li> </ul>
<b>What we don't know</b>	<ul style="list-style-type: none"> <li>• If there's a safe time during pregnancy to travel to an area with Zika</li> <li>• How likely it is that Zika infection will affect a pregnancy</li> <li>• If a baby will have birth defects if his mother is infected during pregnancy</li> </ul>
CDC, 2016b	

**Table 7. Do's and don'ts of supportive communication**

<b>Do's</b>	<ul style="list-style-type: none"> <li>• Try to find a quiet place to talk, and minimize outside distractions.</li> <li>• Provide actual information, if you have it. Be honest about things you know and don't know. "I do not know, but I will try to find out about that for you and will let you know as new information on this becomes available."</li> <li>• Let them know you are listening; for example, nod your head or say: "hmmmm....."</li> <li>• Be patient and calm.</li> <li>• Give information in a way that people can understand — keep it simple.</li> <li>• Respect people's right to make their own decisions.</li> <li>• Be aware of and set aside your own biases and prejudices.</li> <li>• Make it clear to people that even if they refuse help now, they can still access help in the future.</li> <li>• Respect privacy and keep the person's story confidential, if appropriate.</li> <li>• Acknowledge the person's strengths and how they have helped themselves.</li> <li>• Allow for silence.</li> <li>• Make sure you understand what people say by repeating what you understood to them, and asking them if you understood them correctly.</li> <li>• Behave appropriately by considering the person's culture, age and gender</li> <li>• Be sensitive. Acknowledge how they are feeling about things: "I am so sorry. I can imagine this is very sad for you."</li> </ul>
<b>Dont's</b>	<ul style="list-style-type: none"> <li>• Don't pressure someone to tell their story.</li> <li>• Don't take away the person's strength and sense of being able to care for themselves.</li> <li>• Do not blame the person for becoming pregnant.</li> <li>• Do not blame the person for not using insect repellent.</li> <li>• Don't interrupt or rush someone's story (like looking at your watch or speaking too rapidly)</li> <li>• Don't make up things you do not know.</li> <li>• Don't feel, think and act as if you must solve all the person's problems for them.</li> <li>• Don't use overly technical terms.</li> <li>• Don't give false promises or false reassurances.</li> <li>• Don't feel you have to try to solve all the person's problems for them.</li> <li>• Don't tell them someone else's story.</li> <li>• Don't judge what the person has done or has not done, or how they are feeling. Don't say... "You shouldn't feel that way."</li> <li>• Don't talk about your own troubles.</li> </ul>
WHO, 2016c	

## What follow-up should infants exposed to the Zika virus in utero receive?

The CDC recommends newborn laboratory testing for Zika infection in all neonates with clinical or neuroimaging findings suggestive of congenital Zika infection, including microcephaly or intracranial calcifications, born to women with possible Zika virus exposure; neonates without signs of infection but whose mothers have positive or inconclusive laboratory test results for Zika infection also should be tested for Zika infection (Oduyebo et al., 2016).

Infant serum should be tested with the initial sample collected within 2 days of birth; testing infant serum is more accurate than testing cord blood, which can result in both false positive and false negative findings (Oduyebo et al., 2016). Providers also should initiate maternal serum testing for infants born with unexpected findings (McCabe, 2016).

A careful prenatal history and review of maternal test results are important to avoid missing identification and follow-up of affected infants (McCabe, 2016). For example, if an infant is born to a woman with positive or inconclusive laboratory results for Zika virus but without evidence of microcephaly or intracranial calcifications on prenatal ultrasound, providers should consider developmental monitoring because long-term outcomes in such circumstances are unknown.

Beyond laboratory testing, clinical evaluation is needed. As is standard care for every neonatal assessment, clinicians measure a newborn's head circumference. This routine takes on special significance in areas where Zika virus is present because developing or worsening abnormalities in head circumference are potential indicators of fetal infection. Table 8 provides guidance on measuring every neonate's head. CDC (no date) offers a visual to standardize best practices at [cdc.gov/zika/pdfs/microcephaly\\_measuring.pdf](http://cdc.gov/zika/pdfs/microcephaly_measuring.pdf).

The extent of evaluation should be matched to the infant's risk status: no known exposure to Zika virus, possible exposure to Zika virus and findings suggestive of infection. The American Academy of Pediatrics offers a free, 30-minute online course called Zika virus: What pediatricians need to know.

**Table 8. Measuring head circumference**

- Use a measuring tape that cannot be stretched.
- Securely wrap the tape around the widest possible circumference of the head.
  - Broadest part of the forehead above the eyebrows
  - Above the ears
  - Most prominent part of the back of the head
- Take the measurement three times and use the largest measurement to the nearest 0.1 cm.
- Take the measurement 24 to 36 hours after birth (optimal time) when molding of the head has subsided.

CDC, no date

The program includes clear information on clinical manifestations of Zika infection and current guidance regarding screening, testing and caring for pediatric patients exposed to and infected with the virus. The course is available at <http://shop.aap.org/Zika-Virus-What-Pediatricians-Need-to-Know>.

## Are there special precautions about breastfeeding?

Although Zika virus has been detected in breast milk, transmission of Zika virus through breastfeeding has not been reported (McCabe, 2016). Because of the benefits of breastfeeding, providers can encourage mothers to breastfeed even in areas where Zika virus is found (CDC, 2016d).

## Conclusion

Nurses play a critical role in prevention and management of Zika infection, particularly for women who are pregnant. Clinical responsibilities and skill sets require nurses to be knowledgeable of current scientific information on the Zika virus, prevention methods and birth outcomes to provide accurate and accessible patient education, anticipatory guidance and patient-centered counseling.

## Resources

### March of Dimes

- [marchofdimes.org/zika](http://marchofdimes.org/zika)
- [marchofdimes.org/microcephaly](http://marchofdimes.org/microcephaly)
- [nacersano.org/zika](http://nacersano.org/zika)
- [nacersano.org/microcefalia](http://nacersano.org/microcefalia)

### American College of Nurse-Midwives

*Zika virus: An emerging infectious disease*  
[midwife.org/Zika-Virus-An-Emerging-Infectious-Disease](http://midwife.org/Zika-Virus-An-Emerging-Infectious-Disease)

### American College of Obstetricians and Gynecologists

[acog.org/zika](http://acog.org/zika)

### Association of Women's Health, Obstetric and Neonatal Nurses

*What you need to know about the Zika virus*  
[awhonn.org/?page=ZikaVirus&hhSearchTerms=%2Zika%22](http://awhonn.org/?page=ZikaVirus&hhSearchTerms=%2Zika%22)

### Centers for Disease Control and Prevention

- [cdc.gov/zika](http://cdc.gov/zika)
- [espanol.cdc.gov/zika](http://espanol.cdc.gov/zika)

### National Association of Neonatal Nurses

[nann.org/5-zika](http://nann.org/5-zika)

### Pan American Health Organization

- [paho.org](http://paho.org)
- [paho.org/hq/index.php?lang=es](http://paho.org/hq/index.php?lang=es)

### World Health Organization

- [who.int/en/](http://who.int/en/)
- [who.int/es/](http://who.int/es/)

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