

KEY MESSAGES – ZIKA VIRUS DISEASE

Purpose: This document is for internal and external use. The document contains cleared key messages for use in developing other materials.

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Updated information is in blue.

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GENERAL

What is Zika virus?

Zika virus is spread to people primarily through the bite of an infected *Aedes* species mosquito (*A. aegypti* and *A. albopictus*). The most common symptoms of Zika virus disease (Zika) are fever, rash, joint pain, and conjunctivitis (red eyes). The illness is usually mild with symptoms lasting for several days to a week. There is no vaccine to prevent or medicine to treat Zika. Severe disease requiring hospitalization is uncommon and deaths are rare.

Mosquitoes that spread Zika virus are aggressive daytime biters, prefer to bite people, and live indoors and outdoors near people. [They can also bite at night.](#) The mosquitoes that spread Zika virus also spread dengue and chikungunya viruses.

Zika virus is not currently found in the continental United States, but cases have been reported in returning travelers. Outbreaks of Zika have been reported in tropical Africa, Southeast Asia, the Pacific Islands, and most recently in the Americas. Because the mosquitoes that spread Zika virus are found throughout the world, it is likely that outbreaks will continue to spread.

Where is Zika virus found?

Outbreaks of Zika previously have been reported in tropical Africa, Southeast Asia, and the Pacific Islands. Zika virus likely will continue to spread to new areas. In May 2015, the Pan American Health Organization (PAHO) issued an alert regarding the first confirmed Zika virus infection in Brazil. [Since that time, local transmission has been reported in many other countries and territories.](#)

Does CDC know how many Zika cases were confirmed worldwide before the 2007 outbreak on Yap Islands in the Federated States of Micronesia?

[Before 2007, at least 14 cases of human Zika virus disease had been documented, although other cases were likely to have occurred and were not reported. It is likely that Zika virus has occurred in many locations over time; however, the symptoms of Zika virus are similar to those of many other diseases. Because of limited availability for diagnostic testing and the challenges of cross-reactivity with other flaviviruses, like dengue virus, it is very likely that many other cases were not identified, not tested, not reported to health officials, or not published. Both the *New England Journal of Medicine* and *Emerging Infectious Diseases* published papers in 2009 that contain some historical information on Zika virus cases.](#)

What should I do if I have Zika?

Treat the symptoms:

- Get plenty of rest.
- Drink fluids to prevent dehydration.
- [Take medicine such as acetaminophen \(Tylenol®\) to reduce fever and pain.](#)
- Do not take aspirin or other non-steroidal anti-inflammatory drugs.
- If you are taking medicine for another medical condition, talk to your healthcare provider before taking additional medication.

Protect others: During the first week of infection, Zika virus can be found in the blood and [can pass](#) from an infected person to another mosquito through mosquito bites. An infected mosquito can then spread the virus to other people. To help prevent others from getting sick, avoid mosquito bites during the first week of illness by [strictly following steps to prevent mosquito bites.](#)

See your healthcare provider if you are pregnant and develop a fever, rash, joint pain, or conjunctivitis (red eyes) [during a trip](#) or within 2 weeks after traveling to [a place](#) where Zika has been reported. Be sure to tell your healthcare provider where you traveled.

Guillain-Barré Syndrome

What is Guillain-Barré syndrome (GBS)?

Guillain-Barré syndrome (GBS) is a rare disorder in which a person's own immune system damages the nerve cells, causing muscle weakness and sometimes, paralysis. These symptoms can last a few weeks or several

months. Although most people fully recover from GBS, some people have permanent damage and in rare cases, people have died.

Does Zika virus infection cause Guillain-Barré syndrome (GBS)?

We do not know. It is difficult to determine if any particular germ “causes” Guillain-Barré syndrome (GBS). The [Brazil Ministry of Health \(MOH\)](#) is reporting an increased number of people affected with GBS. CDC is collaborating with the Brazil MOH to determine if having Zika makes it more likely you will get GBS.

SYMPTOMS

What are the symptoms of Zika virus disease (Zika)?

The most common symptoms of Zika virus disease are

- Fever
- Rash
- Joint pain
- Conjunctivitis (red eyes)

Other symptoms include

- Muscle pain
- Headache

[About 1 in 5 people infected with Zika virus become sick. The sickness is usually mild with symptoms lasting for several days to a week. People usually don't get sick enough to go to the hospital, and they very rarely die of Zika.](#)

DIAGNOSIS

How is Zika diagnosed?

See your healthcare provider if you develop symptoms (fever, rash, joint pain, red eyes) and you live in or have recently traveled to [an area with Zika](#).

Your healthcare provider may order [specialized](#) blood tests to look for Zika or other similar viral diseases like dengue or chikungunya.

Can someone who returned from a [place with an outbreak of Zika](#) get tested for the virus?

See your healthcare provider if you develop symptoms (fever, rash, joint pain, red eyes) and tell him or her that you traveled to [an area with Zika](#). Your healthcare provider may order blood tests to look for Zika virus infection or other similar diseases like dengue and chikungunya viruses.

Zika virus diagnosis is based on a combination of travel history, clinical signs and symptoms, and specialized laboratory blood tests.

TREATMENT

What is the treatment for Zika?

There is no vaccine [to prevent](#), or specific medicine to treat, Zika virus infections.

Treat the symptoms

- Get plenty of rest.
- Drink fluids to prevent dehydration.
- [Take medicine such as acetaminophen \(Tylenol®\) to reduce fever and pain.](#)
- Do not take aspirin or other non-steroidal anti-inflammatory drugs.
- If you are taking medicine for another medical condition, talk to your healthcare provider before taking additional medication.

What should I do if I am sick or if a family member is sick with Zika?

During the first week of infection, Zika virus can be found in the blood. The virus can be passed from an infected person to a mosquito through mosquito bites. An infected mosquito can then spread the virus to other people.

To help prevent others from getting sick, avoid mosquito bites during the first week of illness.

- Wear long-sleeved shirts and long pants.
- Stay in places with air conditioning or that use window and door screens to keep mosquitoes outside.
- Sleep under a mosquito bed net if you are overseas or outside and are not able to protect yourself from mosquito bites.
- [Use Environmental Protection Agency \(EPA\)-registered insect repellents.](#) All EPA-registered insect repellents are evaluated for effectiveness. Pregnant and breastfeeding women can and should use EPA-registered insect repellents.
 - Always follow the product label instructions.
 - [Reapply insect repellent as directed.](#)
 - Do not spray repellent on the skin under clothing.
 - If you are also using sunscreen, apply sunscreen before applying insect repellent.
- Treat clothing and gear with permethrin or [buy](#) permethrin-treated items.
 - Treated clothing remains protective after multiple washings. See product information to learn how long the protection will last.
 - If treating items yourself, follow the product instructions carefully.
 - Do **NOT** use permethrin products directly on skin. They are intended to treat clothing.

If you have a baby or child

- Do not use insect repellent on babies younger than 2 months of age.
- Dress your child in clothing that covers arms and legs.
- Cover crib, stroller, and baby carrier with mosquito netting.
- Do not apply insect repellent onto a child's hands, eyes, mouth, and cut or irritated skin.
- Adults: Spray insect repellent onto your hands and then apply to a child's face.

TRANSMISSION

How do people get infected with Zika?

Zika virus is spread to people primarily through the bite of an infected *Aedes* species mosquito. These mosquitoes also spread dengue and chikungunya viruses. Mosquitoes that spread Zika, chikungunya, and dengue are aggressive daytime biters, prefer to bite people, and live indoors and outdoors near people. [They can also bite at night.](#) Mosquitoes become infected when they bite a person already infected with the virus. Infected mosquitoes can then spread the virus to other people through bites.

Zika virus can be passed from a mother to her baby during pregnancy. [We are studying how some mothers can pass the virus to their babies.](#)

To date, there are no reports of infants getting Zika through breastfeeding. Because of the benefits of breastfeeding, mothers are encouraged to breastfeed even in areas where Zika virus is found.

Spread of the virus through blood transfusion and sexual contact have been reported and is being investigated.

Who can get Zika?

Anyone who lives in or travels to an area where Zika virus is found and has not already been infected with Zika virus can get it from mosquito bites.

Can someone who traveled from a place with an outbreak of Zika spread the virus?

During the first week of infection with Zika virus, Zika virus can be found in the blood and passed from an infected person to a mosquito through mosquito bites. An infected mosquito can then spread the virus to other people. To help prevent others from getting sick, [strictly follow steps to prevent mosquito bites during the first week of illness.](#)

Can mothers pass Zika on to their babies?

Zika virus can be passed from mother to her baby during pregnancy. [We are studying how some mothers can pass the virus to their babies.](#)

To date, there are no reports of infants getting Zika through breastfeeding. Because of the benefits of breastfeeding, mothers are encouraged to breastfeed even in areas where Zika virus is found.

Can mothers pass Zika to their babies through breastfeeding?

To date, there are no reports of [babies](#) getting Zika through breastfeeding. Because of the benefits of breastfeeding, mothers are encouraged to breastfeed even in areas where Zika virus is found.

Can Zika be sexually transmitted?

Spread of the virus through sexual contact has been reported and is being investigated.

Are you [protected](#) (immune) for life once infected?

Once a person has been infected [with Zika virus](#), he or she is likely to be protected from future infections.

Vector Information

Why are mosquitoes such effective disease spreaders – as compared, for instance, with flies?

Mosquitoes spread disease-causing agents (not the disease). Female mosquitoes bite people to consume blood. Feeding allows the mosquito to produce eggs. When feeding, a mosquito will pierce the skin (like a needle) and inject saliva into a person's skin. This allows the disease-causing agent (for example, the Zika virus) into the site.

Only a small fraction of fly species will bite people. When a fly bites, it creates a wound and laps blood up from the site (think of an animal biting and then lapping up the blood). When a fly bites, it does not directly inject saliva into the bite like a mosquito does. There are some diseases transmitted by flies, but because fly feeding habits are different from mosquito-biting habits, fewer pathogens are transmitted through fly bites.

In addition to malaria, dengue, West Nile virus, yellow fever and now Zika virus, what other disease-causing viruses are carried by mosquitoes?

The most common viruses and parasites transmitted through mosquito bites are:

- Chikungunya
- Dengue
- Eastern equine encephalitis
- Filariasis, including dirofilaria, which causes dog heartworm
- Jamestown Canyon virus disease
- Japanese encephalitis
- LaCrosse encephalitis
- Malaria
- Rift Valley fever
- Ross River virus disease
- St. Louis encephalitis
- Venezuelan equine encephalitis
- Western equine encephalitis
- Yellow fever

Does anyone know why the Zika virus is transmitted only by the *Aedes* mosquito?

Not all *Aedes* species transmit Zika virus. At this time, we don't know if there are other mosquito species that could transmit Zika virus.

PREVENTION

What can people do to prevent becoming infected with Zika?

There is no vaccine to prevent Zika virus disease. [The best way to prevent diseases spread by mosquitoes is to protect yourself and your family from mosquito bites.](#) Here's how:

- Wear long-sleeved shirts and long pants.
- Stay in places with air conditioning or that use window and door screens to keep mosquitoes outside.
- [Use Environmental Protection Agency \(EPA\)-registered insect repellents.](#) All EPA-registered insect repellents are evaluated for effectiveness. Women who are pregnant and breastfeeding can and should use EPA-registered insect repellents.
 - Always follow the product label instructions.
 - Reapply insect repellent [as directed](#).
 - Do not spray repellent on the skin under clothing.
 - If you are also using sunscreen, apply sunscreen before applying insect repellent.
- If you have a baby or child:
 - Do not use insect repellent on babies younger than 2 months of age.
 - Dress your child in clothing that covers arms and legs, or
 - Cover crib, stroller, and baby carrier with mosquito netting.
 - Do not apply insect repellent onto a child's hands, eyes, mouth, and cut or irritated skin.
 - Adults: Spray insect repellent onto your hands and then apply to a child's face.
- Treat clothing and gear with permethrin or purchase permethrin-treated items.
 - Treated clothing remains protective after multiple washings. See product information to learn how long the protection will last.
 - If treating items yourself, follow the product instructions carefully.
 - Do **NOT** use permethrin products directly on skin. They are intended to treat clothing.
- Sleep under a mosquito bed net if you are overseas or outside and are not able to protect yourself from mosquito bites.

Insect Repellent

What kind of insect repellent should I use?

Repellents containing DEET, picaridin, IR3535, and some oil of lemon eucalyptus and para-menthane-diol (PMD) products provide long-lasting protection. Choose one insect repellent and use it [as directed](#). Products with higher percentages of active ingredient will provide longer protection. Always follow the label instructions when using insect repellent. Label instructions will indicate the frequency of application.

Can I use natural insect repellents to prevent mosquito bites?

The effectiveness of non-EPA registered insect repellents, including some natural repellents, is not known. To protect yourself against Zika, CDC and EPA recommend using an [EPA-registered insect repellent](#). Always follow instructions on the label. Choosing an EPA-registered repellent ensures that EPA has evaluated the product for effectiveness.

Insect repellents should not be used in babies younger than 2 months old, products containing oil of lemon eucalyptus should not be used in children younger than 3 years old, and products containing higher than 30% DEET should not be used in children.

Is there a vaccine to prevent infection?

- No. No vaccine is available to prevent Zika infections.
- Take medicine such as acetaminophen (Tylenol®) to reduce fever and pain.
- Do not take aspirin or other non-steroidal anti-inflammatory drugs.
- If you are taking medicine for another medical condition, talk to your healthcare provider before taking additional medication.

Can I use an insect repellent if I am pregnant or nursing?

Yes, pregnant women and women who are breastfeeding can use an [Environmental Protection Agency \(EPA\)-registered insect repellent](#). Always follow label instructions.

Is permethrin-treated clothing safe for pregnant women?

The Environmental Protection Agency (EPA) has reviewed scientific studies on the use of permethrin-treated clothing. Based on EPA's review, there is no evidence of reproductive or developmental effects to mother or child following exposure to permethrin. Always follow the instructions on the label. Learn more about permethrin-treated clothing on [EPA's website](#).

TRAVEL

If I am traveling to a country with Zika virus, should I be concerned about the transmission of Zika?

Yes. Travelers who go to places [with outbreaks of Zika](#) are at risk of being infected with Zika virus. Travelers may also be at risk of being infected with dengue or chikungunya virus. Mosquitoes that spread Zika spread other viruses and are aggressive daytime biters, prefer to bite people, and live indoors and outdoors. [They can also bite at night](#). There is no vaccine available for Zika virus. The best way to avoid Zika virus infection is to [prevent mosquito bites](#).

Some travelers become infected while traveling abroad but do not get sick until they return home. Be aware of any illness or symptoms [during your trip or after](#) you return home. Tell your healthcare provider where you have traveled and when you were there.

CDC has issued a [travel notice \(Level 2 alert, “practice enhanced precautions”\)](#) for people traveling to certain destinations where Zika virus transmission is ongoing. Specific areas where Zika virus transmission is ongoing are often difficult to determine and are likely to change over time. An up-to-date list of destinations with confirmed Zika transmission can be found on [CDC’s Zika Travel Information page](#).

This travel notice follows reports in Brazil of [microcephaly](#) and other poor pregnancy outcomes in babies of mothers who were infected with Zika virus while pregnant. More studies are planned to learn more about the risks of Zika virus infection during pregnancy.

Until more is known, CDC recommends the following:

- Pregnant women should consider postponing travel to the areas where Zika virus is spreading. Pregnant women who must travel to one of these areas should talk to their healthcare provider first and strictly follow [steps to avoid mosquito bites](#) during the trip.
- Women trying to get pregnant should talk to their healthcare provider before traveling to these areas and strictly follow [steps to prevent mosquito bites during the trip](#).

What places have outbreaks of Zika virus?

Specific areas where Zika virus transmission is ongoing are often difficult to determine and are likely to change over time. Please visit [CDC’s Zika Travel Information page](#) for the most up-to-date information about travel recommendations.

What countries and territories have travel notices because of Zika?

For a complete listing of travel notices, see [CDC’s Zika Travel Information webpage](#).

How does CDC determine which places to include in this travel notice?

Countries and territories with confirmed cases of local transmission are included in the travel notice. Local transmission means that mosquitoes in affected areas have been infected with Zika virus and are spreading it to people. Countries and territories with imported cases are not included in the travel notice. Imported cases occur when people get Zika during travel to an affected areas and then return to their home countries.

Are there US travel restrictions for people infected with Zika virus?

There are no restrictions for travelers coming back to the United States who have contracted Zika virus.

Why are other places where Zika has been reported not included in this travel notice?

Only places with ongoing transmission are included in current travel notices. Countries with past transmission are not included. CDC has had Zika travel notices in the past for several other countries, but those were removed as outbreaks ended.

How unusual is the type of travel notice that CDC has issued?

CDC regularly issues level 2 alert travel notices when recommending special precautions for travelers because of a specific outbreak or situation. Special precautions might mean getting a certain vaccine or taking a certain medicine that would not usually be recommended for that destination. Sometimes the special precaution is that a certain group should avoid travel. In the case of destinations with Zika outbreaks, CDC is advising that pregnant women consider delaying travel because of the link between Zika infection in mothers and serious birth defects and other poor pregnancy outcomes. To learn more about CDC travel notices, please see [Travel Notice Definitions](#).

Will more places be added to the travel notice?

Specific areas where Zika virus transmission is ongoing are often difficult to determine and are likely to change over time. As more information becomes available, CDC's [Zika travel notices](#) will be updated. Please check back frequently for the most up-to-date recommendations.

What can travelers do to prevent Zika?

Currently, there is no vaccine to prevent or medicine to treat Zika. Travelers can protect themselves by [preventing mosquito bites](#).

Is it possible that airport screening could be established to monitor travelers coming into the United States from places with Zika?

CDC is not conducting enhanced entry screening of arriving travelers for Zika at this time. CDC and Customs and Border Protection are working together to assess the situation and determine necessary measures.

CDC has routine procedures to detect sick travelers entering the United States, including requirements for ships and airplanes arriving in the United States to report certain illnesses to CDC. State and local health departments notify CDC when communicable diseases of public health concern are diagnosed in people who traveled while contagious.

Are there any special recommendations in advance of the Olympics this summer?

The Zika epidemic in Brazil and the rest of the Americas is fast moving and rapidly evolving. CDC will post more specific guidance for the 2016 Summer Olympics as the timeframe gets closer.

IN THE CONTINENTAL UNITED STATES

Are there cases of Zika in the United States?

In December 2015, the Commonwealth of Puerto Rico, a United States territory, reported its first confirmed locally transmitted Zika virus case. Cases of local transmission have recently been confirmed in two other US territories, the United States Virgin Islands and American Samoa. Locally transmitted Zika virus has not been reported in the continental United States, but cases of Zika have been reported in returning travelers. With the recent outbreaks in the Americas, the number of Zika cases among travelers visiting or returning to the United States will likely increase. These imported cases may result in local spread of the virus in some areas of the United States.

Should we be concerned about Zika in the United States?

The US mainland does have the *Aedes* species mosquitoes that could become infected with and spread Zika virus. US travelers who visit a country where Zika is found could become infected if bitten by a mosquito. With the recent outbreaks, the number of Zika virus disease cases among travelers visiting or returning to the United States will likely increase. These imported cases might result in local spread of the virus in some areas of the United States. [CDC has been monitoring these outbreaks closely and is prepared to address cases imported into the United States and cases transmitted locally.](#)

- **US imported case:** A person with Zika virus disease who became infected outside the United States and then visited or returned to the United States.
- **Local transmission:** Local transmission means that mosquitoes in the area have been infected with Zika virus and can transmit it to humans.

How widespread would an outbreak of Zika virus be in the United States?

For Zika to cause an outbreak in the [continental](#) United States

- People infected with the virus need to enter the United States.
- An *Aedes* mosquito must bite the infected person during the relatively short time that the virus can be found in the person's blood.
- The infected mosquito must live long enough for the virus to multiply and for the mosquito to bite another person.

CDC is not able to predict how much Zika virus would spread in the [continental](#) United States. Many areas in the United States have [the type of](#) mosquitoes that can become infected with and transmit Zika virus. However, recent chikungunya and dengue outbreaks in the [continental](#) United States suggest that Zika outbreaks in the [continental](#) United States may be relatively small and focal. Given this, it is important that we maintain and improve our ability to identify and test for Zika and other mosquito-borne diseases. We would not be surprised to see additional imported cases here in the US from travelers who return from areas where Zika virus is circulating. It is also possible, as a result of imported cases, that we may see some limited local transmission of Zika virus in some parts of the [continental](#) United States, similar to what occurred with chikungunya and dengue viruses.

Have travel-associated cases of Zika been diagnosed in the United States?

CDC continues to work with states to monitor the United States for mosquito-borne diseases, including Zika. In 2016, Zika became a nationally notifiable condition. Healthcare providers are encouraged to report suspected cases to their state or local health departments to facilitate diagnosis and mitigate the risk of local transmission. To date, local transmission of Zika virus has **not** been identified in the continental United States. Limited local transmission may occur in the [continental](#) United States but it's unlikely that we will see widespread transmission of Zika in the [continental](#) United States.

How many state health departments have informed CDC of confirmed cases of Zika?

Zika virus disease is now a nationally notifiable condition in the United States. This means that healthcare providers are required to report suspected cases to their state or local health departments to facilitate diagnosis and mitigate the risk of local transmission. State health departments are encouraged to report laboratory-confirmed cases to CDC through ArboNET, the national surveillance system for arboviral disease.

Currently, only a few state health departments have the capacity to test for Zika virus. CDC is working with public health partners to increase the number of states with capacity to test for Zika virus. Because several state health departments have testing capacity, CDC will not always know about the number of cases being tested at the state level.

CDC and the Council of State and Territorial Epidemiologists worked together to make Zika virus infection nationally notifiable. This means that any case of Zika virus infection would have to be reported through Arbonet, a national electronic surveillance system for arboviral diseases, by the state health departments to CDC.

CDC is concerned about both imported and locally acquired cases of Zika virus infection in the United States. However, given the number of countries reporting Zika virus outbreaks, we expect that the number of imported Zika cases will increase. Locally acquired cases are of greater concern to CDC because this means that local mosquitoes are infected and could further spread the virus to people.

Is Zika a nationally notifiable disease?

Because of the seriousness of Zika virus disease to pregnant women and in response to the largest reported Zika outbreak, CDC and the Council of State and Territorial Epidemiologists have worked together to confirm that Zika virus disease is now a notifiable condition in the United States.

WHAT CDC IS DOING

What is CDC doing about Zika?

CDC has been aware of Zika for some time and has been preparing for its possible introduction into the United States. Laboratories in many countries, [including the United States](#), have been trained to test for chikungunya and dengue. These skills have prepared these laboratories for Zika testing.

CDC is working with international public health partners and with state health departments to

- Alert healthcare providers and the public about Zika.
- [Post travel notices and other travel-related guidance](#).
- Provide state health laboratories with diagnostic tests.
- Detect and report cases, which will help prevent further spread.

The arrival of Zika in the Americas demonstrates the risks posed by this and other exotic viruses. CDC's health security plans are designed to effectively monitor for disease, equip diagnostic laboratories, and support mosquito control programs both in the United States and around the world.

ZIKA AND PREGNANCY

Does Zika virus infection in pregnant women cause birth defects, such as microcephaly?

Brazil has been having a significant outbreak of Zika virus since May 2015. Officials in Brazil have also noted an increase in the number of babies with congenital [microcephaly](#) (a birth defect in which the size of a baby's head is smaller than expected for age and sex) during that time. Congenital microcephaly is often a sign of the brain not developing normally during pregnancy. Health authorities in Brazil, with assistance from the Pan American Health Organization, CDC, and other agencies, have been investigating the possible association between Zika virus infection and microcephaly.

Additional studies are needed to determine the degree to which Zika might be linked with microcephaly. More lab testing and other studies are planned to learn more about the risks of Zika virus infection during pregnancy.

Because of the possible association between Zika infection and microcephaly, pregnant women should take [steps to prevent mosquito bites](#).

Should pregnant women travel to [places with Zika outbreaks](#)?

Zika virus can be spread from a pregnant woman to her unborn baby. There have been reports of a serious birth defect of the brain called microcephaly in babies of mothers who were infected with Zika virus while pregnant. Knowledge of the link between Zika and birth defects such as microcephaly is evolving, but until more is known, CDC recommends special precautions for the following groups:

- Women who are pregnant
 - Consider postponing travel to any area where Zika virus is spreading.
 - If you must travel to one of these areas, talk to your doctor first and strictly follow [steps to prevent mosquito bites](#) during your trip.

- Women who are trying to get pregnant
 - Before you travel, talk to your doctor about your plans to get pregnant and the risk of Zika virus infection.
 - Strictly follow [steps to prevent mosquito bites](#) during your trip.

Specific areas where Zika virus is spreading are hard to determine and are likely to change. As more information becomes available, [travel notices](#) will be updated. Please check back frequently for the most up-to-date recommendations.

What should a pregnant woman who has previously traveled to a place with a Zika outbreak do?

Pregnant women who have recently traveled to an area with Zika should talk to their healthcare provider about travel even if they don't feel sick. CDC has issued guidance to help doctors decide what tests are needed for pregnant women who may have been exposed to Zika and what tests are needed for unborn babies. CDC recommends that all pregnant women who have traveled to an area with Zika talk to their healthcare provider. It is especially important to see a doctor if you are pregnant and develop a fever, rash, joint pain, or red eyes during your trip or within 2 weeks after traveling to a country where Zika has been reported. Be sure to tell your doctor where you traveled.

Can a previous Zika virus infection cause someone who later becomes pregnant to have an infant with microcephaly?

Currently, there is no evidence to suggest that Zika virus infection poses a risk of birth defects for future pregnancies. Zika virus usually remains in the blood of an infected person for about a week. The virus will not cause infections in a baby that is conceived after the virus is cleared from the blood.

If a woman who is not pregnant is bitten by a mosquito and infected with Zika virus, will her future pregnancies be at risk?

No. Zika virus usually remains in the blood of an infected person for about a week. The virus will not cause infections in a baby that is conceived after the virus is cleared from the blood. [There is currently no evidence that Zika virus infection poses a risk of birth defects in future pregnancies.](#) The virus will not cause infections in a baby that is conceived after the virus is cleared from the blood. A woman thinking about pregnancy, who has recently recovered from Zika infection, should consult her healthcare provider after recovery.

Is it safe to get pregnant after traveling to a [place with a Zika outbreak](#)?

Zika virus usually remains in the blood of an infected person for about a week. Zika virus has been found in semen for up to two weeks. There is no evidence that the virus will cause infections in a baby that is conceived after the virus is cleared from the blood.

I was in a [place with Zika](#) recently—how long do I need to wait after returning to get pregnant?

We do not know the risk to a baby if a woman is infected with Zika virus while she is pregnant. Zika virus usually remains in the blood of an infected person about one week. Zika virus has been found in semen for up to two weeks. The virus will not cause infections in an infant that is conceived after the virus is cleared from the blood. [There is currently no evidence to suggest that Zika virus infection poses a risk of birth defects in future pregnancies.](#) A woman who is planning a pregnancy, who has recently traveled to an area with local Zika transmission, should talk to her healthcare provider after returning.

I am pregnant and got sick while I was in a [place with Zika](#) recently. How do I know if I might have had Zika virus?

If you are pregnant and worried that you might have had Zika, talk to your healthcare provider. Tell your healthcare provider about your recent travel and any symptoms of Zika you experienced. The most common symptoms of Zika are fever, rash, joint pain, and conjunctivitis (red eyes). Your healthcare provider may order specialized blood tests to look for Zika or other similar viral diseases, like dengue or chikungunya.

Information for healthcare providers can be found on the Zika virus [Information for Health Care Providers](#) website. [Information for women is available on the CDC website.](#)

What is being done to investigate the association between Zika virus infection and birth defects?

- In an effort to better understand what might be responsible for the rise in microcephaly cases, the Brazilian Ministry of Health (MOH) and the Pan American Health Organization (PAHO) are performing a thorough investigation.
- CDC has been invited by PAHO to provide technical assistance to the Brazil MOH for its investigation of microcephaly and the possible association with Zika virus infection by collaborating on studies.
- CDC has been regularly communicating with representatives from PAHO and the Brazil MOH to discuss the investigation and laboratory testing options.
- CDC has offered to test samples from the microcephaly cases for serologic evidence of Zika virus infection until in-country capacity can be established.
- CDC will continue to provide guidance to people considering travel to places where Zika is present.
- [CDC has developed interim guidelines for pregnant women during a Zika virus outbreak and interim guidelines for the testing and evaluation of an infant with possible congenital Zika virus infection](#)

If a woman has traveled to an area with Zika virus transmission, should she wait to get pregnant?

We do not know the risk to a baby if a woman is infected with Zika virus while she is pregnant. Zika virus usually remains in the blood of an infected person for up to a week. The virus will not cause infections in an infant that is conceived after the virus is cleared from the blood. There is currently no evidence that Zika virus infection poses a risk of birth defects in future pregnancies. A woman thinking about pregnancy, who has recently traveled to an area with local Zika transmission, should talk to her healthcare provider after returning.

What should a pregnant woman do if she has symptoms of Zika?

Pregnant women who develop a fever, rash, muscle or joint pain, or conjunctivitis (red eye), and have recently traveled to an area with Zika, should contact their healthcare provider as soon as possible. Pregnant women who have a fever should take acetaminophen (Tylenol®) for fever control. They should be sure to tell their healthcare provider where they have traveled. CDC has developed [interim guidelines for pregnant women for Zika](#). Your healthcare provider may order specialized blood tests to look for Zika or other similar viral diseases like dengue or chikungunya.

Does every woman who has Zika virus get symptoms?

About one in five people infected with Zika will develop symptoms, and we don't know if there is a different risk of symptoms for pregnant women. Symptoms typically begin 2 to 7 days after being bitten by an infected mosquito. For people who get sick, the illness is usually mild.

Can a blood test or ultrasound detect birth defects? How early or late in pregnancy?

CDC's National Center on Birth Defects and Developmental Disabilities (NCBDDD) has an existing webpage that provides information on the diagnosis of birth defects both during pregnancy and after birth:

<http://www.cdc.gov/ncbddd/birthdefects/diagnosis.html>. Some tests need to be done during a particular time in pregnancy, but others such as an ultrasound can be done at many points in pregnancy.

The reports from Brazil indicate a marked increase in reported microcephaly following the time of year with high levels of Zika virus transmission. During pregnancy, microcephaly can sometimes be diagnosed during an ultrasound (which creates pictures of the baby). However, microcephaly might not be able to be diagnosed until late in the second or early in the third trimester of pregnancy. [CDC has developed interim guidelines for the testing and evaluation of an infant with possible congenital Zika virus infection.](#)

How accurate are the tests?

The accuracy of the test varies depending on the type of test, the timing of the test during pregnancy, the specific equipment used for the test, and the person conducting the test.

Microcephaly can develop at different points in time during pregnancy. Therefore, the ability to detect microcephaly on a prenatal test is also dependent on the test being conducted after the condition has occurred.

Can babies with microcephaly live a normal life or life span? What are the chances?

Babies with microcephaly can have a range of other health problems, depending on the severity of their microcephaly. [Some children with microcephaly might have other problems:](#)

- Seizures
- Developmental delay, such as problems with speech or other developmental milestones (like sitting, standing, and walking)
- Intellectual disability (decreased ability to learn and function in daily life)
- Problems with movement and balance
- Feeding problems, such as difficulty swallowing
- Hearing loss
- Vision problems

These problems can range from mild to severe and are often lifelong. In some cases, these problems can be life-threatening. Because it is difficult to predict at birth what problems a baby will have from microcephaly, babies with microcephaly often need close follow-up through regular check-ups with a healthcare provider to monitor their growth and development.

Who could advise a woman who is pregnant and concerned about Zika?

Women should consult with their healthcare providers about any concerns regarding Zika infection and the potential effects on the unborn baby.

[CDC has developed interim guidelines for pregnant women during a Zika virus outbreak and interim guidelines for the testing and evaluation of an infant with possible congenital Zika virus infection.](#)

What advice is CDC providing to obstetric providers?

The [American Congress of Obstetricians and Gynecologists](#) and the Society for Maternal-Fetal Medicine (SMFM) have issued a Practice Advisory directed to obstetric providers about prevention strategies and clinical management of pregnant women.

CDC has released interim guidelines for [pregnant women](#) during a Zika virus outbreak. Because there are limited data and experience with Zika virus in pregnancy, CDC continually evaluates any new or emerging data that may inform future recommendations. As more information becomes available, we will update the [CDC Zika website](#).

CDC has [additional Q&As](#) about Zika virus and for healthcare providers.

Is there guidance for fetal screening? How early and how often?

CDC has developed [interim guidelines for evaluating pregnant women](#) during a Zika virus outbreak and [interim guidelines](#) for the testing and evaluation of an infant with possible congenital Zika virus infection.

LABORATORY

What biosafety precautions should a lab take when working with Zika virus?

Labs should take BSL2 precautions for Zika virus.

INFORMATION FOR OBSTETRICAL HEALTHCARE PROVIDERS

Laboratory Testing

What types of testing for Zika virus are available to test pregnant women?

During the first week of illness, Zika virus disease can often be diagnosed by performing reverse transcriptase-polymerase chain reaction (RT-PCR) on serum. [Serology](#) assays can also be used to detect Zika virus-specific IgM and neutralizing antibodies, which typically develop toward the end of the first week of illness. Plaque-reduction neutralization testing (PRNT) can be performed to measure virus-specific neutralizing antibodies to confirm primary flavivirus infections and differentiate from other viral illnesses.

How can I order a Zika virus test for a patient that has traveled to an area with Zika virus transmission?

There are no commercially available tests for Zika virus. Zika virus testing is performed at the CDC Arbovirus Diagnostic Laboratory and a few state health departments. Healthcare providers should contact their state and local health department to facilitate testing. See the [Diagnostic Testing](#) webpage for information on how to obtain Zika testing.

How is maternal Zika virus infection diagnosed?

Laboratory evidence of maternal Zika virus infection can include Zika virus RNA detected by RT-PCR in any clinical specimen; or positive Zika virus IgM with confirmatory neutralizing antibody titers that are ≥ 4 -fold higher than dengue virus neutralizing antibody titers in serum [by PRNT](#). Testing would be considered inconclusive if Zika virus neutralizing antibody titers are < 4 -fold higher than dengue virus neutralizing antibody titers.

What are the challenges in interpreting Zika virus testing?

RT-PCR test may not demonstrate Zika virus RNA in a woman with Zika virus infection if the period of viremia has passed. Serum serologic testing can be performed. However, cross-reactivity with related flaviviruses (e.g., dengue, and yellow fever viruses) is common. Plaque-reduction neutralization testing (PRNT) can be performed to measure virus-specific neutralizing antibodies to Zika virus, but neutralizing antibodies may still yield cross-reactive results in persons who were previously infected with another flavivirus, such as dengue, or has been vaccinated against yellow fever or Japanese encephalitis. It is important to work closely with your state or local health department to ensure the appropriate test is ordered and interpreted correctly.

How can Zika virus infection be prevented?

There is no vaccine to prevent Zika virus infection. Travelers can protect themselves [by taking steps to prevent mosquito bites](#). Use insect repellent; wear long-sleeved shirts and long pants; and stay in places with air

conditioning or with window and door screens. Pregnant women can and should choose an [EPA-registered insect repellent](#) and use it according to the product label.

Zika and Pregnancy

What is known about the effects of Zika virus on pregnant women?

We expect that the course of Zika virus disease is similar to that in the general population. No evidence exists to suggest that pregnant women are more susceptible or experience more severe disease during pregnancy. It is not known if pregnant women are more susceptible to Guillain-Barré syndrome.

Is there any association between Zika virus infection and congenital microcephaly?

There have been reports of congenital microcephaly in babies of mothers who were infected with Zika virus while pregnant. Zika virus infections have been confirmed in several infants with microcephaly; it is not known how many of the microcephaly cases are associated with Zika virus infection. Studies are under way to investigate the association of Zika virus infection and microcephaly, including the role of other contributory factors (e.g., prior or concurrent infection with other organisms, nutrition, and environment).

Is there any known association between maternal Zika virus infection and other adverse pregnancy outcomes?

The full spectrum outcomes that might be associated with Zika virus infections during pregnancy is not known and requires further investigation.

How should pregnant patients who are considering travel to an area with Zika virus transmission be counseled?

Until more is known, CDC recommends that pregnant women consider delaying travel to an area where Zika virus is spreading. If a pregnant woman must travel, she should be counseled to strictly follow [steps to prevent mosquito bites](#). She should also be counseled to see her obstetrician after returning home even if she does not become sick and to report any [symptoms of Zika virus](#) infection that develop during or within two weeks of travel to affected areas.

Which pregnant women should be tested for Zika virus infection?

Providers who care for pregnant women should obtain a travel history from all pregnant women and use recent travel history to guide decisions about testing. Testing is not indicated for pregnant women without a travel history to an area with Zika virus transmission.

Pregnant women with a history of travel to an area with Zika virus transmission and who report two or more symptoms consistent with Zika virus disease (including acute onset of fever, maculopapular rash, arthralgia or conjunctivitis) during or within two weeks of travel should be tested. In addition, pregnant women with a history of travel to an area with Zika virus transmission and who have ultrasound findings of fetal microcephaly or intracranial calcifications should also be tested for Zika virus infection. Testing should be performed in consultation with state or local health departments.

What specimens can be tested for Zika virus?

Zika virus RT-PCR and serology assays can be performed on maternal serum or plasma. Zika virus RT-PCR can also be performed on amniotic fluid. Other testing that can be performed includes: 1) histopathologic examination and immunohistochemical staining of the placenta and umbilical cord, 2) Zika virus testing of frozen placental tissue and cord tissue, and 3) IgM and neutralizing antibody testing of cord blood.

Who should be offered amniocentesis?

Amniocentesis should be offered to pregnant women with recent travel to an area with Zika virus transmission, reporting 2 or more symptoms within 2 weeks of travel, and a positive or inconclusive maternal serum test. For pregnant women with recent travel to an area with Zika virus transmission and ultrasound findings of microcephaly or intracranial calcifications, amniocentesis may also be considered. Consultation with a maternal-fetal medicine specialist should be considered.

Why is amniocentesis offered?

While amniocentesis is a relatively safe test, risk and benefits of amniocentesis should always be considered. An amniocentesis can be used to provide additional clinical information. For example, a positive RT-PCR result on amniotic fluid would be suggestive of intrauterine infection and potentially useful to pregnant women and their healthcare providers to guide decisions about timing of delivery and the level of neonatal care at delivery sites.

When should amniocentesis be performed?

Timing of amniocentesis should be individualized based on the patient's clinical circumstances. Amniocentesis is not recommended until after 15 weeks of gestation. Amniocentesis performed ≥ 15 weeks of gestation is associated with lower rates of complications than those performed at earlier gestational ages (≤ 14 weeks of gestation). However, the exact timing of amniocentesis should be individualized based on the patient's clinical circumstances. Referral to maternal-fetal medicine or infectious disease specialist with expertise in pregnancy management may be warranted. Risk and benefits of performing the amniocentesis should be discussed with the patient.

How would results of Zika virus RT-PCR amniotic fluid test results inform clinical management of pregnant women?

A positive Zika virus RT-PCR result from amniotic fluid would be suggestive of intrauterine infection. This information would be useful for pregnant women and their healthcare providers to assist in determining clinical management (e.g., antepartum testing, delivery planning). A negative Zika virus RT-PCR result from amniotic fluid may prompt a work up for other causes of microcephaly (e.g., other infections, genetic disorders).

Prenatal Diagnosis of Microcephaly

Why is fetal ultrasound recommended?

Fetal ultrasound is generally performed in pregnancies between 18-20 weeks of gestation to assess fetal anatomy as part of routine obstetrical care. Although microcephaly and intracranial calcifications are typically detected during ultrasounds later in pregnancy, these findings might be detected as early as 18-20 weeks gestation. Microcephaly and intracranial abnormalities have been demonstrated in pregnancies with known Zika virus disease. Therefore, additional ultrasounds might provide an opportunity to identify findings consistent with fetal Zika virus infection and offer pregnant women the option of amniocentesis to test for Zika virus RNA.

What prenatal ultrasound findings have been observed among infants with confirmed Zika virus infection?

Brain abnormalities reported in infants with laboratory-confirmed congenital Zika infection include microcephaly and disrupted brain growth. Some infants with possible Zika virus infection have been found to have intracranial calcifications and abnormal eye findings. It is not known if Zika virus infection caused any of these abnormalities.

In one report of two infants with Zika virus RNA detected by RT-PCR, brain anomalies detected on ultrasound included corpus callosal and vermian dysgenesis, enlarged cisterna magna, severe unilateral ventriculomegaly, agenesis of the thalami, cataracts, intracranial and intraocular calcifications.

Is ultrasound safe in pregnancy?

Ultrasound is performed during pregnancy when medical information is needed. It has been used during pregnancy for many years and has not been associated with adverse maternal, fetal, or neonatal outcomes. Ultrasound operators are trained to use the lowest power for the minimum duration of time to obtain the needed information. There is consensus among various national and international medical organizations (American College of Radiology, American College of Obstetricians and Gynecologists, and the Society of Maternal and Fetal Medicine) that ultrasound is safe for the fetus when used appropriately.

How is microcephaly diagnosed prenatally?

Microcephaly can be diagnosed during pregnancy with ultrasound. Microcephaly is most easily diagnosed by ultrasound late in the 2nd trimester or early in the third trimester of pregnancy.

How early can microcephaly be diagnosed during pregnancy?

Microcephaly might be detected as early as 18-20 weeks of gestation. However, detection by prenatal ultrasound can be challenging at this gestational age due to fetal position and fetal motion artifact. The optimal time to perform ultrasound screening for fetal microcephaly is not known. In the absence of microcephaly, the presence of intracranial calcifications before 22 weeks gestation might suggest a risk for the future development of microcephaly.

How accurately can ultrasound detect microcephaly with maternal Zika virus?

The accuracy of ultrasound to detect microcephaly in the setting of maternal Zika virus is not known and will depend on many factors such as the timing of maternal infection relative to the timing of screening, severity of microcephaly, patient factors (e.g., obesity), gestational age, the equipment used, and the expertise of the person performing the ultrasound. Because the absence of fetal microcephaly and intracranial calcifications on ultrasound at one point in pregnancy does not exclude future microcephaly, serial ultrasounds may be considered. As we get more information specifically related to Zika virus infection and microcephaly, we expect that more specific guidance for women and their healthcare providers will be developed.

If a prenatal ultrasound demonstrates microcephaly, how well does it predict microcephaly in the infant?

The sensitivity of prenatal ultrasound for detection of microcephaly depends on a range of factors (e.g., timing of screening, severity of microcephaly, patient factors). In a study of microcephaly not caused by Zika virus infection, prenatally diagnosed microcephaly correlated with neonatal microcephaly approximately 57% of the time.

Can fetal MRI be used to detect microcephaly?

Fetal MRI is not a screening tool and should be used only to answer specific questions raised by ultrasound or used in occasional specific high-risk situations. Interpretation of fetal MRI requires specialized expertise and has limited availability in the United States.

INFORMATION FOR PEDIATRIC HEALTHCARE PROVIDERS**What is the link between Zika virus in Brazil and the high numbers of infants born there with microcephaly?**

Zika virus infections have been confirmed in several infants with microcephaly from Brazil. The time frame and geographic location of reports of infants with microcephaly coincides with the outbreak of Zika virus infections in Brazil. The baseline prevalence of congenital microcephaly is difficult to determine because of underreporting, and the inconsistency of clinical criteria used to define microcephaly. Although population-based estimates of congenital microcephaly in Brazil vary, the number of infants with microcephaly currently being reported in Brazil is greater than would be expected.

What birth defects have been reported in infants with confirmed Zika virus infection?

Brain abnormalities reported in infants with microcephaly and laboratory-confirmed congenital Zika infection include microcephaly and disrupted brain growth. Some infants with possible Zika virus infection have been found to have intracranial calcifications and abnormal eye findings. It is not known if Zika virus infection caused any of these abnormalities.

What birth defects have been reported in infants with suspected Zika virus infection?

A report of 35 infants with microcephaly who were born during an outbreak of Zika virus infection in Brazil in 2015 described the following brain abnormalities: intracranial calcifications, ventriculomegaly, and neuronal migration disorders (lissencephaly and pachygyria). Other anomalies included congenital contractures and clubfoot. An important distinction is that neither these infants nor their mothers had laboratory-confirmed Zika virus. However, most of the mothers (~75%) reported symptoms consistent with Zika virus disease. (<http://www.cdc.gov/mmwr/volumes/65/wr/mm6503e2er.htm>)

How is microcephaly diagnosed after birth?

Microcephaly is diagnosed when an infant's head is smaller than expected as compared to infants of the same age (or gestational age) and sex. Although a universally accepted definition of microcephaly does not exist, microcephaly is most often defined as head circumference (occipitofrontal circumference) greater than 2 standard deviations below the mean, or less than the 3rd percentile based on standard growth charts (e.g., Fenton, Olsen, CDC, or WHO growth curves).

(http://www.who.int/childgrowth/publications/technical_report_pub/en/)

What are the potential sequelae of microcephaly?

For infants diagnosed with microcephaly, head size correlates with underlying brain size. However, these measurements do not consistently predict long term sequelae. Neurologic sequelae may include seizures, vision or hearing problems, and developmental disabilities. Sequelae vary with the extent of brain disruption.

Additional information about microcephaly is available at:

<http://www.cdc.gov/ncbddd/birthdefects/microcephaly.html>.

What causes congenital microcephaly?

Causes of congenital microcephaly may include genetic conditions such as chromosomal abnormalities or maternal exposures (e.g., alcohol, mercury, or radiation) during pregnancy. Maternal infections that have been associated with microcephaly include cytomegalovirus (CMV), herpes simplex virus, rubella virus, lymphocytic choriomeningitis virus (LCMV), *Treponema pallidum* (i.e., syphilis), and *Toxoplasma gondii*.

What treatment exists for infants with congenital Zika virus infection?

No treatment is currently available for Zika virus infection. Care for these infants is focused on diagnosing and managing conditions that are present, monitoring the child's development over time, and addressing problems as they arise.

What is the prognosis for a newborn with congenital Zika virus infection?

The prognosis for infants with congenital Zika virus infection is not known. Zika virus infections have been confirmed in some infants with severe microcephaly from Brazil. [From what we know about severe microcephaly, a range of neurologic sequelae have been reported \(e.g., intellectual disability, hearing loss, vision](#)

loss, and seizures). These problems can range from mild to severe, are often life-long, and in some cases can be life-threatening.

Which newborns should be tested for Zika virus infection?

Testing for Zika virus infection is recommended for infants born to women who traveled to or resided in an area with ongoing Zika virus transmission during pregnancy who were 1) diagnosed with microcephaly or intracranial calcifications detected prenatally or at birth, or 2) who have mothers with positive or inconclusive test results for Zika virus infection.

How are infants diagnosed with Zika virus infection?

Zika virus infection can be diagnosed by performing reverse transcriptase-polymerase chain reaction (RT-PCR) on infant serum. Serology assays can also be used to detect Zika virus-specific IgM and neutralizing antibodies. However, since it has not been established which test is most reliable for a diagnosis in infants, RT-PCR and IgM tests should both be performed. Plaque-reduction neutralization testing (PRNT) can also be performed to measure virus-specific neutralizing antibodies and differentiate from other flaviviruses.

If Zika virus testing of a newborn is indicated, how is the test ordered?

There are no commercially available tests for Zika virus. Zika virus testing is performed at the CDC Arbovirus Diagnostic Laboratory and at some state and territorial health departments. Healthcare providers should contact their state and local health department to facilitate testing. See the Diagnostic Testing webpage for information on how to obtain Zika testing (<http://www.cdc.gov/zika/hc-providers/diagnostic.html>).

If Zika virus testing of a newborn is indicated, what specimens are recommended?

Zika virus RT-PCR and serology assays can be performed on infant serum or serum or plasma collected from the umbilical cord. If cerebrospinal fluid (CSF) specimens are available, Zika virus RT-PCR should be performed; however, CSF specimens should not be collected for the sole purpose of Zika virus testing. Other specimens that can be tested include the placenta and the umbilical cord. Histopathologic examination and immunohistochemical staining can be performed. Zika virus RT-PCR on fixed and frozen tissue should also be considered.

When is a newborn considered to have congenital Zika virus infection?

A newborn is considered to be congenitally infected if 1) Zika virus RNA is detected in any newborn specimen or during testing of amniotic fluid or the placenta, or 2) Zika virus IgM antibodies are detected along with confirmatory neutralizing antibody tiers that are ≥ 4 -fold higher than dengue virus neutralizing antibody titers in the infant serum or cerebrospinal fluid (CSF). Testing for congenital infection is considered inconclusive if Zika virus IgM antibodies are detected but Zika virus neutralizing antibody titers are < 4 -fold higher than dengue virus neutralizing antibody titers.

What are the challenges in interpreting Zika virus testing in a newborn?

Zika virus testing in newborns has several challenges. RT-PCR tests may not detect Zika virus RNA in a newborn who had Zika virus infection *in utero* if the period of viremia has passed. Serologic tests for Zika virus can often be falsely positive because of cross-reacting antibodies against related flaviviruses (e.g., dengue and yellow fever viruses). Plaque-reduction neutralization testing (PRNT) can be performed to measure virus-specific neutralizing antibodies to Zika virus, but neutralizing antibodies may still yield cross-reactive results in newborns due to

maternal antibodies that were transferred to the infant. It is important to work closely with state or territorial health departments to ensure the appropriate test is ordered and interpreted correctly.

Should healthcare providers report infants with positive or inconclusive Zika virus test results?

Health care providers should report positive or inconclusive results to their state or territorial health department. As an arboviral disease, Zika virus disease is a nationally notifiable condition.

What should healthcare providers do to evaluate infants with positive or inconclusive Zika virus test results?

A thorough physical examination should be performed, including careful measurement of the head circumference, length, weight, and assessment of gestational age. Cranial ultrasound is recommended unless it was performed as part of prenatal screening in the third trimester and clearly showed no abnormalities of the brain. Ophthalmologic evaluation is recommended as well as repeat hearing screen at six months of age. Continued evaluation of developmental characteristics and milestones, including head circumference, is recommended through the first year of life.

What additional evaluation is recommended for infants with positive or inconclusive Zika virus test results who have microcephaly or intracranial calcifications?

Consultations are recommended with a clinical geneticist or dysmorphologist, a pediatric neurologist, and a pediatric infectious disease specialist. A complete blood count, platelet count, and liver function tests should also be conducted. If any additional congenital anomalies are identified through clinical examination and imaging studies, genetic and other teratogenic causes should be considered.

What should healthcare providers do for an infant with negative test results for Zika virus infection?

For infant without suspected abnormalities, healthcare providers should continue with routine pediatric care. If the infant has microcephaly or intracranial calcifications, healthcare providers should continue to evaluate and treat for other possible etiologies.

If a mother had Zika virus infection during pregnancy but the newborn tests negative for Zika virus, what is recommended for additional follow-up?

If the newborn does not have abnormal findings on examination, the infant should receive routine pediatric care including measurement of growth and development, and appropriate evaluation and follow-up for any clinical findings that arise. If the newborn has abnormal findings on examination, diagnostic testing for other causes of the newborn's conditions should be performed including testing for other congenital viral infections if indicated.

If a mother had Zika virus infection during pregnancy, should she breastfeed her infant?

Although Zika virus RNA has been detected in breast milk, transmission of Zika infection through breastfeeding has not been documented. Based on available evidence, the benefits of breastfeeding infants outweigh any theoretical risk related to Zika virus infection.