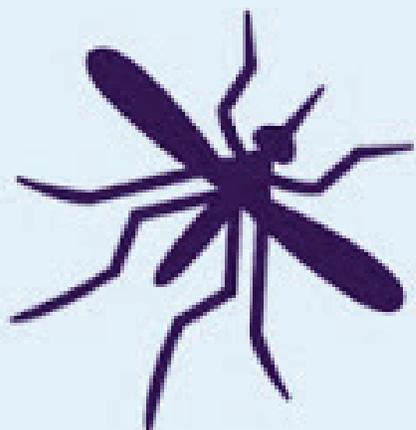


# Zika Follow-up for Infants & Children 2016



## What Pediatric Healthcare Providers Need to Know



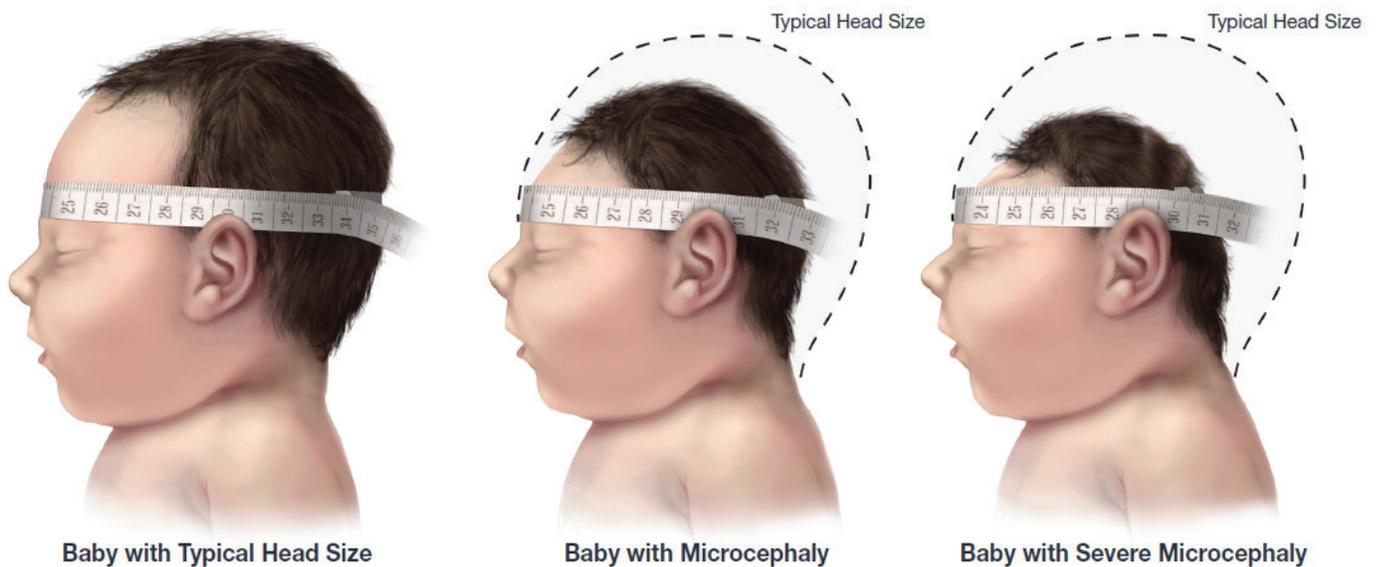


## Zika & Birth Defects: What Pediatric Providers Need to Know

Zika is a virus that can cause serious birth defects in babies born to some infected women. Zika virus can cause fetal brain damage, specifically a condition called microcephaly in which a baby's head is significantly smaller than expected when compared to babies of the same age and sex.

Infants with possible congenital Zika syndrome may suffer intellectual disability and variable degrees of growth failure, deafness, and neurological abnormalities. Some signs and symptoms may include microcephaly, seizures, developmental delays, hearing loss, vision problems, feeding problems, constant crying, and problems with movement and balance.

This manual was developed for pediatric healthcare providers in order to provide guidance for the care and follow-up of infants with congenital Zika syndrome or other possible birth defects. Information provided in this manual comes directly from the Centers for Disease Control (CDC) and Prevention.



Source: CDC - [www.cdc.gov](http://www.cdc.gov)

Microcephaly can happen for many reasons. Some babies have microcephaly because of

1. Changes in their genes
2. Certain infections during pregnancy
3. A woman being close to or touching toxins during pregnancy

There is more to learn about Zika virus and how it affects infants. Researchers are collecting data to better understand the extent Zika virus impacts mothers and their children. According to the CDC, based on the available evidence, Zika virus infection in a woman who is not pregnant would not pose a risk for birth defects in future pregnancies after the virus has cleared from her blood. Once a person has been infected with Zika virus, he or she is likely to be protected from a future Zika infection.

## CDC Clinical Guidance for Healthcare Providers Caring for Infants & Children

Infants and children can acquire Zika virus congenitally and postnatally. Guidance is available on testing, clinical management and prevention of Zika for children under the age of 18.

### Key Points on Evaluation and Management of Infants with Possible Congenital Zika Virus Infection

- Testing of infants with possible congenital Zika virus infection should be guided by
  - Whether the infant has abnormalities consistent with congenital Zika syndrome (e.g., microcephaly, intracranial calcifications, or other brain or eye abnormalities).
  - The mother's Zika virus testing results.
- Congenital Zika virus infection can be diagnosed by reverse transcription-polymerase chain reaction (RT-PCR) and through serologic testing.

### Key Points on Evaluation and Management of Infants with Possible Postnatal Zika Virus Infection

- Guidance for testing and clinical management of infants and children with postnatal Zika virus infection is in line with testing and clinical management recommendations for adults.
- Postnatal Zika virus disease should be suspected in an infant or child <18 years old who
  - Has traveled to or lived in an area with active Zika virus transmission in the last 2 weeks
  - Has two or more symptoms of Zika: fever, rash, conjunctivitis, or arthralgia
  - Has another possible exposure to Zika
- Perinatal Zika virus disease should also be suspected in an infant in the first 2 weeks of life if
  - The mother traveled to or resided in an affected area within 2 weeks of delivery
  - The infant has two or more of the following manifestations: fever, rash, conjunctivitis, or arthralgia.
- For diagnostic postnatal Zika virus infection, RT-PCR is recommended during the first two weeks after symptom onset, serologic testing is recommended 2-12 weeks after symptom onset.
- Symptomatic treatment and supportive care are appropriate and usually sufficient to treat Zika. Special considerations to treat children with Zika include
  - Aspirin should **never** be used to treat children with symptoms of acute viral illness because of the risk of Reye's syndrome.
  - All non-steroidal anti-inflammatory drugs (NSAIDs) should be avoided in children <6 months.
- No cases of Zika virus infection associated with breastfeeding have been reported. Current evidence suggests that the benefits of breastfeeding outweigh the theoretical risks of Zika virus transmission through breast milk. CDC and the World Health Organization recommend that infants born to women with suspected, probable, or confirmed Zika virus infection, or who live in or have traveled to areas with Zika, should be fed according to established infant feeding guidelines.
- Protecting children from mosquito bites is the primary way to prevent Zika virus infection. Adolescents that live in or traveled to an area with active Zika transmission should be counseled on the risks of sexual transmission and prevention methods.

More information may be viewed at <http://www.cdc.gov/zika/hc-providers/infants-children.html>



## Guidance for Zika Virus Specimens for Fetal Loss or At Time of Birth Collection, Shipping, and Testing



The Alabama Department of Public Health (ADPH) Zika Pregnancy Registry Coordinator will contact the healthcare provider with further instructions for collecting specimens after the healthcare provider has received confirmation of test results. If you have not been contacted by ADPH within 48 hours please call 334-206-6403.

**DO NOT DISCARD ANY SPECIMENS OR TISSUE! (Place all specimens or products of conception in formalin)**

### Specimen Collection & Storage

- ✓ Serum
  - Collect infant blood specimen in a tiger top (serum separator) tube, centrifuge, and extract serum and place in a sterile tube. Approximately 1-2 mL of serum is needed to test for Zika. Serum should be kept refrigerated (2 – 8°C) until ready to be shipped. Ship in an insulated container with frozen ice packs.
- ✓ Tissue
  - Collect all products of conception.
  - Label all specimens to identify location of sample. Use a volume 10X the mass of the tissue to fix specimens in 10% neutral buffered formalin for a minimum of 3 days. Ship and store at room temperature. Collect 3 full thickness pieces (0.5-1 cm x 3-4 cm in depth) from middle third of placental disk and at least 1 from the placental disk margin. Sample both the maternal and fetal side of placenta.
  - Collect 5 x 12 cm strip of fetal membranes.
  - Collect at least 4 segments of umbilical cord at 2.5 cm in length. Segments should be obtained at proximal, middle, and distal to umbilical cord insertion site on the placenta.
  - Collect 5 or more brain and spinal cord specimens from different sections at 0.5-1.0 cm<sup>3</sup> each.
  - Collect 1 representative 0.5-1.0 cm<sup>3</sup> specimen of each solid organ (heart, lung, eyes, kidneys, liver, skeletal muscle, and bone marrow).

### Specimen Shipping

- ✓ **Do not** ship tissue samples together with the serum specimen.
  - ✓ Complete one (1) BCL Requisition Form for **each specimen** and submit with the specimens to BCL. Select Arboviral testing and indicate Zika as the agent suspected. Include specimen collection date and the source of specimen. Please use the comments area for details.
  - ✓ Complete one (1) CDC's Specimen Submission Form (CDC DASH 50.34) for **each specimen** and submit with the specimen to BCL.
    - Specimen origin (top left corner): HUMAN
    - Test order name: Arbovirus Special Study
    - **Note:** Zika virus testing is not an option in the *suspected* -down menu (located on 1st page, top left); therefore, type "Zika virus testing" in the Brief Clinical Summary field located at the top of the second page of the form.
    - **Fully complete** the Specimen Information section with as much details as possible.
  - ✓ The specimen may be taken to your local county health department to be couriered to BCL overnight (at no cost). Please contact your local county health department to coordinate courier pick up time.
- OR**
- ✓ Ship specimen directly to BCL-EID at 8140 AUM Drive, Montgomery, AL 36117 (**at your expense**).
  - ✓ If you have a question about specimen collection and shipping, call BCL at 334-260-3400 or email [clab@adph.state.al.us](mailto:clab@adph.state.al.us)

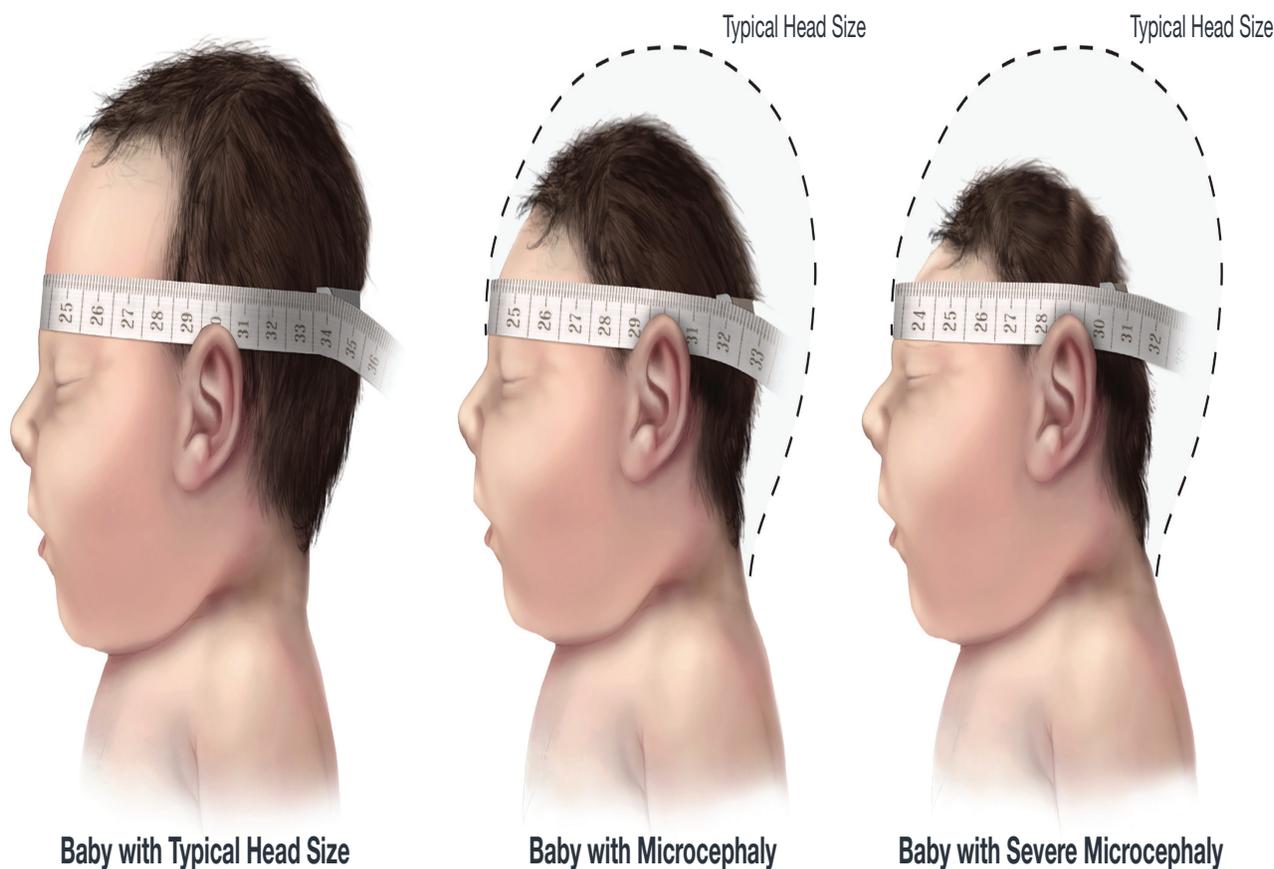
### Resources

- ✓ For more information about Zika virus, visit <http://adph.org/mosquito/>

# CDC Resources for Healthcare Providers

CDC's Response to **Zika**

## MEASURING HEAD CIRCUMFERENCE



**Baby with Typical Head Size**

**Baby with Microcephaly**

**Baby with Severe Microcephaly**

- 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 eyebrow
  - » Above the ears
  - » Most prominent part of the back of the head
- Take the measurement three times and select the largest measurement to the nearest 0.1 cm
- Head circumference measurements should be taken on the first day of life because commonly-used birth head circumference reference charts by age and sex are based on measurements taken before 24 hours of age

For more information: [www.cdc.gov/zika](http://www.cdc.gov/zika)

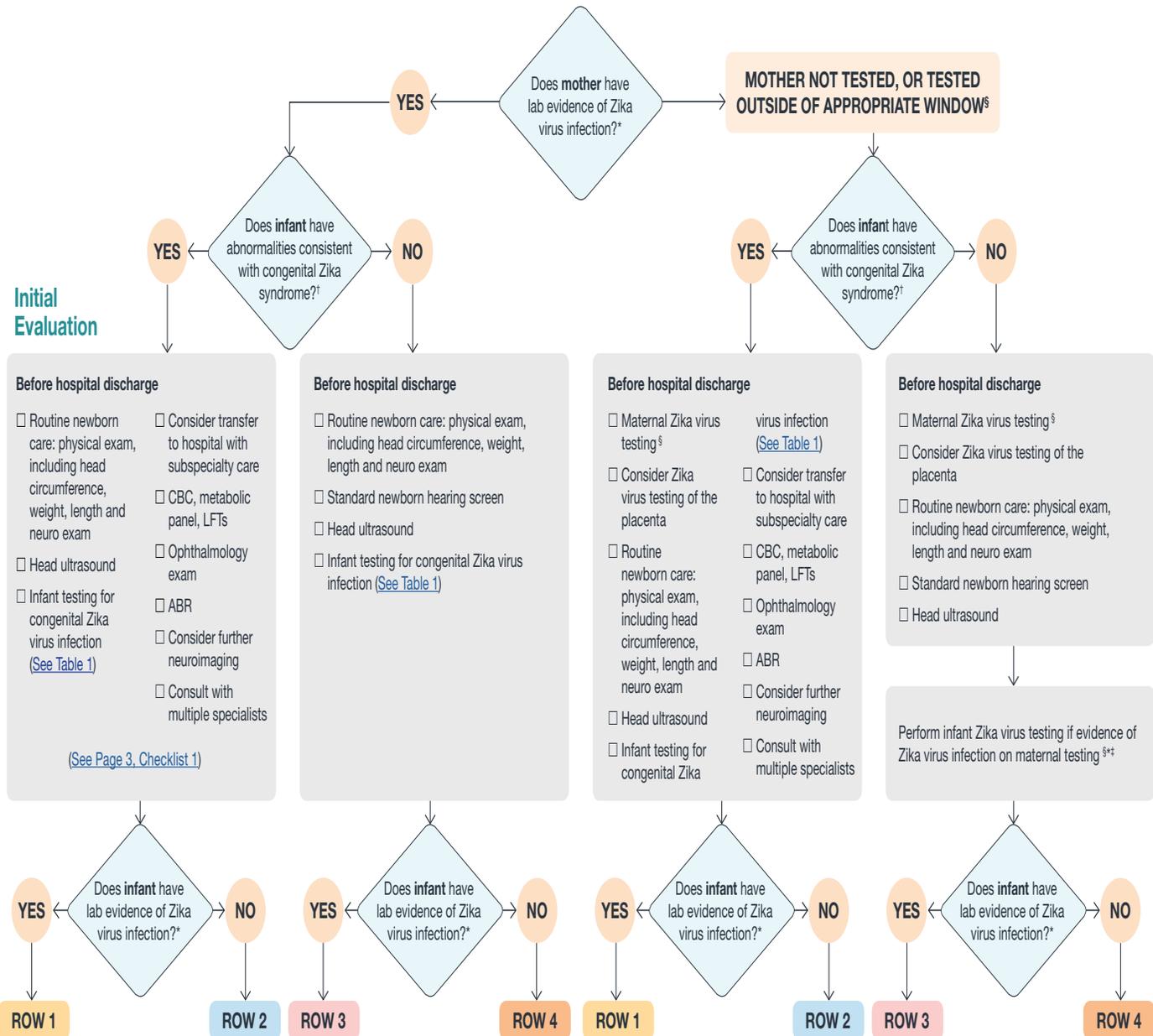


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# CDC Resources for Healthcare Providers

CDC's Response to Zika

## INITIAL EVALUATION AND OUTPATIENT MANAGEMENT DURING THE FIRST 12 MONTHS OF LIFE FOR INFANTS WITH POSSIBLE CONGENITAL ZIKA VIRUS INFECTION



Follow management and follow-up recommendations indicated in Outpatient Management Checklist

# CDC Resources for Healthcare Providers

## CDC's Response to Zika

### Outpatient Management Checklist\*\*

	2 weeks	1 month	2 months	3 months	4-6 months	9 months	12 months
<b>ROW 1</b> Infant with abnormalities consistent with congenital Zika syndrome† and laboratory evidence of Zika virus infection*	<input type="checkbox"/> Thyroid screen (TSH & T4)	<input type="checkbox"/> Neuro exam	<input type="checkbox"/> Neuro exam	<input type="checkbox"/> Thyroid screen (TSH & T4) <input type="checkbox"/> Ophthalmology exam	<input type="checkbox"/> Repeat audiology evaluation (ABR)		
	<input type="checkbox"/> Routine preventive health care including monitoring of feeding and growth <input type="checkbox"/> Routine and congenital infection-specific anticipatory guidance <input type="checkbox"/> Referral to specialists, including evaluation of other causes of congenital anomalies as needed <input type="checkbox"/> Referral to early intervention services (See Page 3, Checklist 2)						
<b>ROW 2</b> Infant with abnormalities consistent with congenital Zika syndrome† and negative for Zika virus infection	<input type="checkbox"/> Continue to evaluate for other causes of congenital anomalies <input type="checkbox"/> Further management as clinically indicated						
<b>ROW 3</b> Infant with no abnormalities consistent with congenital Zika syndrome† and laboratory evidence of Zika virus infection*	<input type="checkbox"/> Ophthalmology exam <input type="checkbox"/> ABR				<input type="checkbox"/> Consider repeat ABR	<input type="checkbox"/> Behavioral audiology evaluation if ABR not done at 4-6 months	
	<input type="checkbox"/> Monitoring of growth parameters (HC, weight, and height), developmental monitoring by caregivers and health care providers, and age-appropriate developmental screening at well-child visits (See Page 3, Checklist 3)						
<b>ROW 4</b> Infant with no abnormalities consistent with congenital Zika syndrome† and negative for Zika virus infection	<input type="checkbox"/> Monitoring of growth parameters (HC, weight, and height), developmental monitoring by caregivers and health care providers, and age-appropriate developmental screening at well-child visits						

**Abbreviations:** rRT-PCR = real-time reverse transcription-polymerase chain reaction; IgM = immunoglobulin M; CBC = complete blood count; LFTs = liver function tests, PE = physical examination; US = ultrasound; ABR = auditory brainstem response; CT = computed tomography; MRI = magnetic resonance imaging; neuro = neurologic; HC = Head (occipitofrontal) circumference

\* Laboratory evidence of Zika virus infection includes: (1) Zika virus RNA detected by real-time reverse transcription-polymerase chain reaction (rRT-PCR) in any clinical specimen; or (2) positive Zika virus IgM. Confirmatory neutralizing antibody titers are needed in addition to IgM for maternal Zika virus infection. Cord blood and testing of the placenta not recommended for infant testing for Zika virus.

\*\* Outpatient management checklist for infants born to a woman with laboratory evidence of confirmed or possible Zika virus infection.

† Findings consistent with congenital Zika virus syndrome can include microcephaly, intracranial calcifications, or other brain or eye abnormalities.

§ Mothers who travelled to or reside in an area of active Zika transmission or who had unprotected sex with a partner who had traveled to or resided in an area with active transmission should be tested by rRT-PCR within 2 weeks of exposure or symptom onset, or IgM within 2-12 weeks of exposure or symptom onset. Because of the decline in IgM antibody and viral RNA levels over time, negative maternal testing 12 weeks after exposure or symptom onset does not rule out maternal infection.

‡ Infant testing is recommended within the first two days after birth; if testing is performed later, it can be difficult to distinguish congenital infection from perinatally or postnatally acquired infection.

# CDC Resources for Healthcare Providers

## CDC's Response to Zika

TABLE 1

### Interpretation of results of laboratory testing of infant's blood, urine and/or cerebrospinal fluid for evidence of congenital Zika virus infection

Infant test results*		Interpretation
rRT-PCR	IgM	
Positive	Positive or Negative	Confirmed congenital Zika virus infection
Negative	Positive	Probable congenital Zika virus infection <sup>†</sup>
Negative	Negative	Negative for congenital Zika virus infection <sup>†</sup>

**Abbreviations:** rRT-PCR = real-time reverse transcription-polymerase chain reaction; IgM = Immunoglobulin M

\* Infant serum, urine or cerebrospinal fluid.

<sup>†</sup> Laboratory results should be interpreted in the context of timing of infection during pregnancy, maternal serology results, clinical findings consistent with congenital Zika syndrome, and any confirmatory testing with plaque reduction neutralization testing (PRNT).

#### CHECKLIST 1

### Initial clinical evaluation & management of infants with laboratory evidence of Zika virus infection and abnormalities consistent with congenital Zika syndrome<sup>†</sup>

#### Consultation with:

- Neurologist for determination of appropriate neuroimaging and additional evaluation.
- Infectious disease specialist for diagnostic evaluation of other congenital infections (e.g. syphilis, toxoplasmosis, rubella, cytomegalovirus infection, lymphocytic choriomeningitis virus infection, and herpes simplex virus infection).
- Ophthalmologist for comprehensive eye exam and evaluation for possible cortical visual impairment prior to discharge from hospital or within 1 month of birth.
- Endocrinologist for evaluation for hypothalamic or pituitary dysfunction.
- Clinical geneticist to evaluate for other causes of microcephaly or other anomalies if present.

#### Consider consultation with:

- Orthopedist, physiatrist and physical therapist for the management of hypertonia, club foot or arthrogrypic-like conditions.
- Pulmonologist or otolaryngologist for concerns about aspiration.
- Lactation specialist, nutritionist, gastroenterologist, or speech or occupational therapist for the management of feeding issues.
- Perform ABR to assess hearing.
- Perform complete blood count and metabolic panel, including liver function tests.
- Provide family and supportive services.

#### CHECKLIST 2

### Outpatient management of infants with laboratory evidence of Zika virus infection and abnormalities consistent with congenital Zika syndrome<sup>†</sup>

- A medical home should be established, and visits with primary care provider should occur monthly for at least the first 6 months of life.
- Follow growth parameters, monitor development, encourage parents and other caregivers to monitor child's development, provide routine immunizations and anticipatory guidance, psychosocial support, and to ensure infants receive necessary testing and consultations.
- Neurologic examination by the primary care provider at 1 and 2 months of age. Refer to neurology for any abnormalities, or for any parental or provider concerns.
- Refer to developmental specialist and early intervention services.
- Repeat a comprehensive ophthalmologic exam at 3 months of age, and refer to ophthalmology for any abnormal findings, or for any parental or provider concerns.
- Repeat ABR testing at 4-6 months of age, and follow up on any abnormal findings, or for any parental or provider concerns.
- Repeat testing for hypothyroidism (i.e. TSH, total T4 and estimated free T4) at 2 weeks and 3 months of age, even if the initial testing was normal. Refer to endocrinology for any abnormal findings.
- Provide family and supportive services.

#### CHECKLIST 3

### Outpatient management of infants with laboratory evidence of Zika virus infection, but without abnormalities consistent with congenital Zika syndrome<sup>†</sup>

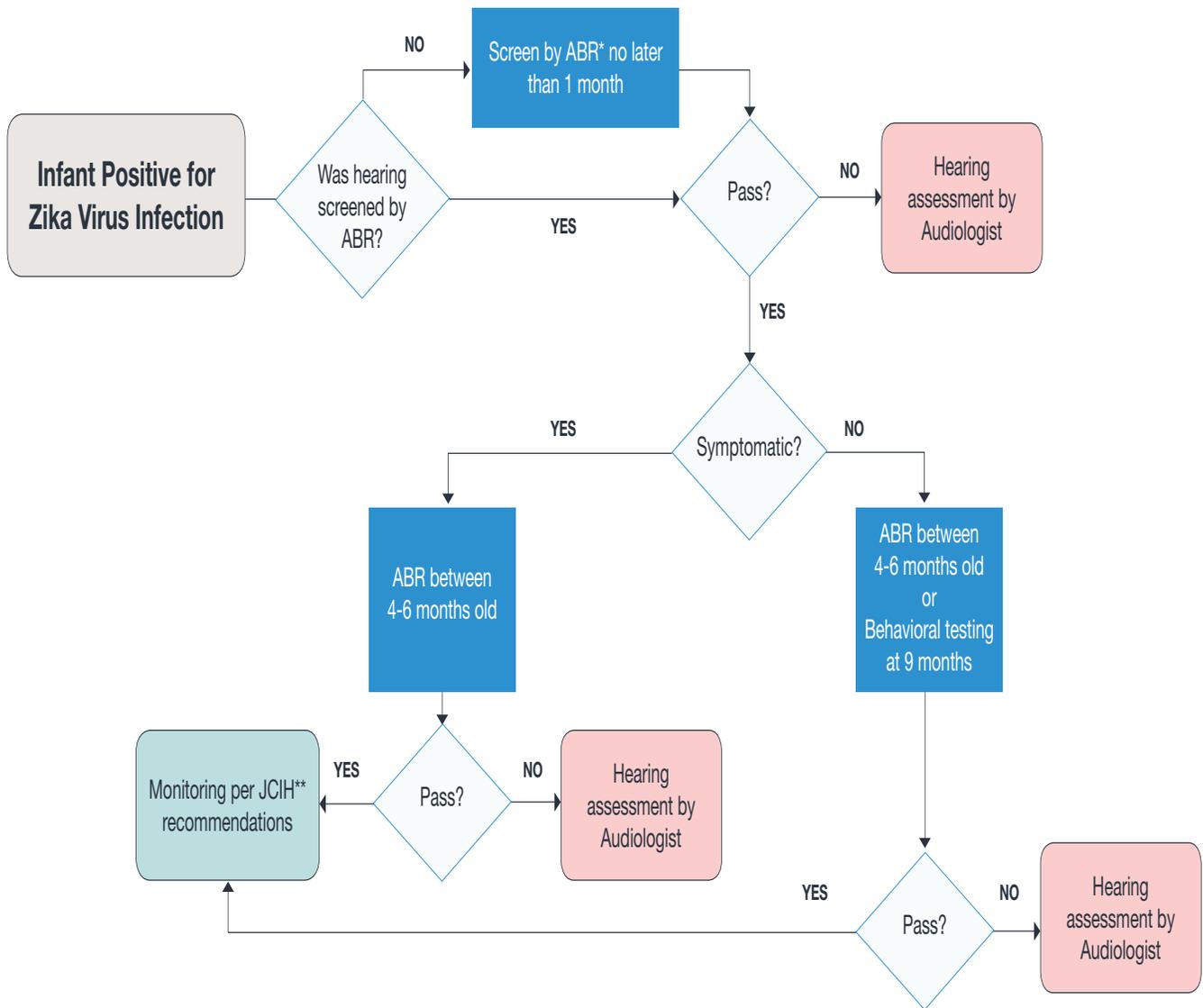
- A medical home should be established.
- Follow growth parameters, perform developmental monitoring at each well child visit and encourage parents and other caregivers to monitor child's development.
- Emphasize anticipatory guidance for families regarding developmental milestones, feeding and growth, sleep and irritability, and abnormal movements.
- Use a standardized, validated developmental screening tool at 9 months as currently recommended, or earlier for any parental or provider concerns.
- Referral to ophthalmology for comprehensive eye exam within one month of birth. Perform vision screening and assess visual regard at every well child visit, and refer to ophthalmology for any abnormal findings, or for any parental or provider concerns.
- Perform ABR within one month of birth. Perform behavioral diagnostic testing at 9 months of age, or consider repeat ABR at 4-6 months. Refer to audiology for any abnormal findings, or for any parental or provider concerns.
- Provide family and supportive services.

# CDC Resources for Healthcare Providers

CDC's Response to **Zika**

## ASSESSMENT OF INFANT HEARING

For Infants Testing Positive for Zika Virus Infection



\*ABR - Auditory Brainstem Response    \*\*JCIH - Joint Committee on Infant Hearing



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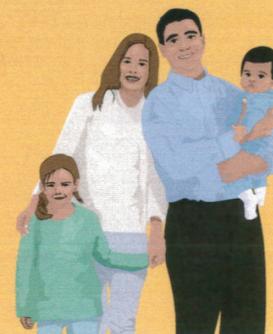
# CDC Resources for Families

CDC's Response to **Zika**

## For Parents: A Positive Zika Virus Test

### What does it mean for my child?

You've just learned from your pediatrician or healthcare provider that your child has a positive Zika test result, which means your child has a Zika virus infection. During the first week of infection, Zika virus is in a person's blood. Prevent your child from getting bitten by mosquitoes. While the virus is in your child's blood, a mosquito can bite the child, get infected with the Zika virus, and spread the virus to other people.



Everyone who has Zika should take steps to protect themselves and others. This fact sheet explains what to do.

### Is Zika a more serious illness for children than it is for adults?

Zika affects children the same way it affects adults. Many children and adults infected with Zika won't have symptoms, and those who do may have only mild symptoms lasting a few days to a week. The common symptoms are fever, rash, joint pain, and red eyes.

### Will a Zika infection affect my child's growth and development, or his or her reproductive health?

For babies and children, Zika virus only remains in the blood for the first week of illness. After that, the virus has left the blood and is no longer in the body. Based on what we know now, Zika hasn't been linked to any developmental or growth issues in infants and young children who become infected after birth, and there is no evidence that it affects children's future ability to have healthy children of their own.

### How can I treat my child's symptoms of Zika?

There is no specific medicine or vaccine for Zika. To treat the symptoms of Zika, make sure your child gets plenty of rest, drinks fluids to prevent dehydration, and takes medicine such as acetaminophen (Tylenol®) to reduce fever and pain, following product instructions for children based on age and size. To reduce the risk of bleeding, do not give your child aspirin or other non-steroidal anti-inflammatory drugs (NSAIDs; such as like ibuprofen or naproxen) until dengue can be ruled out.

If your child is taking medicine for another medical condition, talk to your pediatrician or other healthcare provider before giving additional medicine. If your child gets sicker, get medical treatment right away because Zika has caused severe illness in rare cases.

[www.cdc.gov/zika](http://www.cdc.gov/zika)

CS266324-A June 1, 2016



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## CDC Resources for Families

### How can I prevent my child from spreading Zika to others?

#### Protect them from mosquito bites.

Zika virus is spread to people primarily through mosquito bites. During the first week of infection, Zika virus is in a person's 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, strictly follow steps to prevent mosquito bites during the first week of your child's illness.

- ◆ Apply insect repellent on your child using [Environmental Protection Agency \(EPA\)-registered](#) insect repellent with one of the following active ingredients: DEET, picaridin, IR3535, oil of lemon eucalyptus, or para-menthane-diol.
- ◆ Do not use insect repellent on children younger than 2 months old.
- ◆ Do not use oil of lemon eucalyptus on children younger than 3 years old.
- ◆ Dress your child in long-sleeved shirts and long pants and stay indoors with air conditioning as much as possible.
- ◆ You can cover the stroller with netting when taking infants outside.

### Is my child protected from future infections?

Once your child has been infected with Zika virus, he or she is likely to be protected from future infections.



# CDC Resources for Families

## Respuesta de los CDC al zika Para padres: Resultado positivo en la prueba de detección del virus del Zika ¿Qué implica esto para mi hijo?

Acaba de enterarse por su pediatra o proveedor de atención médica que el resultado de la prueba de detección del virus del Zika de su hijo es positivo, lo que significa que su hijo tiene el virus del Zika. Durante la primera semana de la infección el virus del Zika está presente en la sangre de una persona. Evite que a su hijo lo piquen los mosquitos. Mientras el virus esté en la sangre de su hijo, si un mosquito lo pica puede infectarse con el virus del Zika y diseminarlo a otras personas.



Todas las personas con zika deben tomar medidas para protegerse y proteger a los demás.

Esta hoja informativa explica qué hacer.

### ¿El zika es más grave en los niños que en los adultos?

El zika afecta a los niños de la misma manera que a los adultos. Muchos niños y adultos infectados con zika no tienen síntomas, y quienes sí lo tienen suelen tener síntomas leves que duran entre unos pocos días y una semana. Los síntomas comunes son fiebre, sarpullido, dolor en las articulaciones y ojos enrojecidos.

### ¿Una infección por el virus del Zika puede afectar el crecimiento y el desarrollo de mi hijo o su salud reproductiva?

En el caso de los bebés y niños, el virus del Zika solo permanece en la sangre durante la primera semana de la enfermedad. Después de ese período el virus desaparece de la sangre y del cuerpo. Según lo que sabemos hoy, el zika no se ha asociado a ningún problema de desarrollo ni de crecimiento en bebés y niños pequeños que se infectan después del nacimiento, y no existe evidencia de que afecte la capacidad futura de los niños de tener a sus propios hijos sanos.

### ¿Cómo trato los síntomas del zika de mi hijo?

No existe un medicamento específico ni una vacuna contra el virus del Zika. Para tratar los síntomas del zika procure que su hijo descanse mucho, beba abundante líquido para no deshidratarse y tome medicamentos como acetaminofeno (Tylenol®) para bajar la fiebre y calmar el dolor, según las indicaciones del producto para niños, según su edad y talla. Para reducir el riesgo de hemorragia, no le dé a su niño aspirina ni ningún otro medicamento antiinflamatorio no esteroideo (AINE, como ibuprofeno o naproxeno) hasta que se pueda descartar dengue.

Si su hijo está tomando medicamentos para otra afección, hable con su médico o proveedor de atención médica antes de darle otros medicamentos. Si su hijo se enferma más gravemente, recurra de inmediato a un médico para que lo atiendan porque se han conocido algunos casos en los que la enfermedad por el virus del Zika causó un cuadro de gravedad.

<http://espanol.cdc.gov/zika/>

1 de junio del 2016



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## CDC Resources for Families

### ¿Cómo evito que mi hijo contagie la enfermedad por el virus del Zika a los demás?

#### Protéjalo de las picaduras de mosquitos

El virus del Zika se disemina entre personas, principalmente, a través de las picaduras de mosquitos. Durante la primera semana de la infección el virus del Zika está presente en la sangre de una persona. Una persona infectada puede pasar el virus a un mosquito a través de la picadura. Un mosquito infectado puede diseminar el virus entre otra gente. Para ayudar a evitar que otros se enfermen, siga estrictamente las medidas para prevenir las picaduras de mosquitos durante la primera semana de la enfermedad de su hijo.

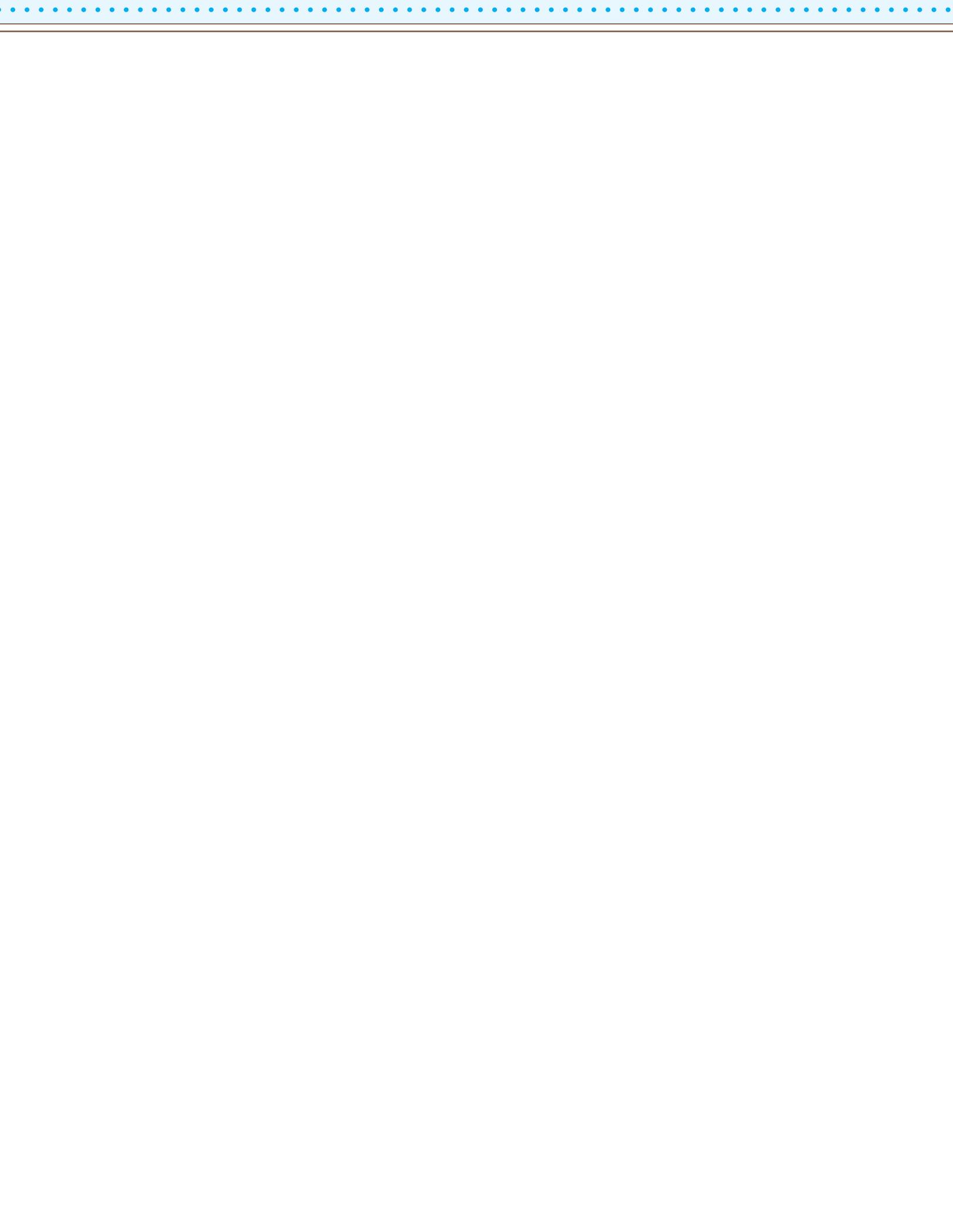
- ◆ Aplíquelo un repelente de insectos [certificado por la Agencia de Protección Ambiental \(EPA\)](#) que contenga uno de los siguientes ingredientes activos: DEET, picaridina, IR3535, aceite de eucalipto de limón o para-mentano-diol.
- ◆ No aplique repelentes de insectos a bebés menores de 2 meses.
- ◆ No utilice repelentes que contengan aceite de eucalipto limón en niños menores de 3 años.
- ◆ Vista a su hijo con camisas de mangas largas y pantalones largos y procure que permanezca en lugares cerrados con aire acondicionado tanto como resulte posible.
- ◆ Puede cubrir el cochecito con una malla cuando lleva a su bebé a pasear.

### ¿Mi hijo tiene protección contra infecciones futuras?

Una vez que su hijo se infectó con el virus del Zika, es muy probable que sea inmune a futuras infecciones.



<http://espanol.cdc.gov/zika/>



Alabama Department of Public Health  
Newborn Screening & Birth Defects Program  
[www.adph.org/newbornscreening](http://www.adph.org/newbornscreening)  
1-866-928-6755

