



## Complete Summary

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### GUIDELINE TITLE

Interim guidelines for the evaluation of infants born to mothers infected with West Nile virus during pregnancy.

### BIBLIOGRAPHIC SOURCE(S)

Interim guidelines for the evaluation of infants born to mothers infected with West Nile virus during pregnancy. MMWR Morb Mortal Wkly Rep 2004 Feb 27;53(7):154-7. [6 references] [PubMed](#)

### GUIDELINE STATUS

This is the current release of the guideline.

## COMPLETE SUMMARY CONTENT

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## SCOPE

### DISEASE/CONDITION(S)

- West Nile virus infection
- Pregnancy

### GUIDELINE CATEGORY

Evaluation  
Prevention

### CLINICAL SPECIALTY

Family Practice  
Infectious Diseases

Obstetrics and Gynecology  
Pediatrics

## **INTENDED USERS**

Advanced Practice Nurses  
Nurses  
Physician Assistants  
Physicians

## **GUIDELINE OBJECTIVE(S)**

To develop recommendations for evaluating infants born to mothers who acquire West Nile virus infection during pregnancy

## **TARGET POPULATION**

Infants born to mothers who acquire West Nile virus infection during pregnancy

## **INTERVENTIONS AND PRACTICES CONSIDERED**

### **Evaluation**

#### **Fetus**

1. Ultrasound
2. Amniotic fluid, chorionic villi, or fetal serum

#### **Infants Born to Mothers Who Were Infected During Pregnancy**

1. Physical examination, including measurement of head circumference, length, weight, and assessment of gestational age
2. Assessment for neurological abnormalities, dysmorphic features, splenomegaly, hepatomegaly, and rash or other skin lesion. Abnormalities photographed and specialist referral, if indicated
3. Initial serum immunoglobulin M (IgM) and immunoglobulin G (IgG) testing from either the umbilical cord or directly from the infant within 2 days of birth
4. Evaluation of hearing by evoked otoacoustic emissions testing or auditory brainstem response testing
5. Referral to audiologist for infants with abnormal hearing screens
6. Examination of the placenta by a pathologist

#### **Infants with Possible Congenital West Nile Virus (WNV) Infection**

1. Computerized tomography (CT) scan of the head and brain and referral to a pediatric neurologist if indicated
2. Pediatric ophthalmologic evaluation, including examination of the retina
3. Complete blood count, platelet count, and liver function tests, including alanine aminotransferase and aspartate aminotransferase
4. Examination of cerebrospinal fluid (CSF) and should include testing of CSF for IgM antibody to WNV

5. Evaluation by a dysmorphologist or clinical geneticist
6. Further evaluation of any congenital abnormalities to determine alternative causes, including genetic, infectious, or other teratogenic causes
7. Additional hearing screen at age 6 months
8. Careful evaluation of head circumference, physical characteristics, and developmental milestones throughout the first year of life
9. Additional examination of infant serum for IgG and IgM antibody to WNV at age 6 months
10. Histopathologic examination of the placenta and umbilical cord, testing of frozen placental tissue and cord tissue for WNV nucleic acid, and testing of cord serum for IgM and IgG antibody to WNV

### **Prevention**

1. Insect repellent
2. Protective clothing
3. Educate pregnant women to avoid outside at peak-mosquito time

### **MAJOR OUTCOMES CONSIDERED**

Not stated

## **METHODOLOGY**

### **METHODS USED TO COLLECT/SELECT EVIDENCE**

Searches of Electronic Databases

### **DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE**

Not stated

### **NUMBER OF SOURCE DOCUMENTS**

Not stated

### **METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE**

Not stated

### **RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE**

Not applicable

### **METHODS USED TO ANALYZE THE EVIDENCE**

Review

### **DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE**

Not stated

## **METHODS USED TO FORMULATE THE RECOMMENDATIONS**

Not stated

## **RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS**

Not applicable

## **COST ANALYSIS**

A formal cost analysis was not performed and published cost analyses were not reviewed.

## **METHOD OF GUIDELINE VALIDATION**

Peer Review

## **DESCRIPTION OF METHOD OF GUIDELINE VALIDATION**

Not stated

# **RECOMMENDATIONS**

## **MAJOR RECOMMENDATIONS**

### **Screening for West Nile Virus During Pregnancy**

No specific treatment for West Nile virus (WNV) infection exists, and the consequences of WNV infection during pregnancy have not been well defined. For these reasons, screening of asymptomatic pregnant women for WNV infection is not recommended.

### **Diagnosis of WNV Infection During Pregnancy**

Pregnant women who have meningitis, encephalitis, acute flaccid paralysis, or unexplained fever in an area of ongoing WNV transmission should have serum (and cerebrospinal fluid [CSF], if clinically indicated) tested for antibody to WNV. If serologic or other laboratory tests indicate recent infection with WNV, these infections should be reported to the local or state health department, and the women should be followed to determine the outcomes of their pregnancies.

### **Evaluation of the Fetus in Pregnant Women with WNV Infection**

If WNV illness is diagnosed during pregnancy, a detailed ultrasound examination of the fetus to evaluate for structural abnormalities should be considered no sooner than 2 to 4 weeks after onset of WNV illness in the mother, unless earlier examination is otherwise indicated. Amniotic fluid, chorionic villi, or fetal serum can be tested for evidence of WNV infection. However, the sensitivity, specificity,

and predictive value of tests that might be used to evaluate fetal WNV infection are not known, and the clinical consequences of fetal infection have not been determined. In case of miscarriage or induced abortion, testing of all products of conception (e.g., the placenta and umbilical cord) for evidence of WNV infection is advised to document the effects of WNV infection on pregnancy outcome.

### **Evaluation of Infants Born to Mothers Infected with WNV During Pregnancy**

When an infant is born to a mother who was known or suspected to have WNV infection during pregnancy, clinical evaluation is recommended.

- Thorough physical examination, including careful measurement of the head circumference, length, weight, and assessment of gestational age
- Evaluation for neurologic abnormalities, dysmorphic features, splenomegaly, hepatomegaly, and rash or other skin lesions. Any rash, skin lesions, or dysmorphic features should be photographed. If an abnormality is noted, consultation with an appropriate specialist is recommended.
- Testing of infant serum for immunoglobulin M (IgM) and immunoglobulin G (IgG) antibody to WNV. The initial sample should be collected either from the umbilical cord or directly from the infant within 2 days of birth. If maternal WNV illness occurred  $\leq 8$  days before delivery and the initial infant serum sample is negative for WNV IgM antibody, a second infant serum sample should be obtained  $\geq 2$  weeks after the first sample. Free testing of samples by the Centers for Disease Control and Prevention (CDC) can be arranged by contacting state public health laboratories.
- Evaluation of hearing by evoked otoacoustic emissions testing or auditory brainstem response testing, either before discharge from the hospital or within 1 month after birth. Infants with abnormal initial hearing screens should be referred to an audiologist for further evaluation.
- Initial examination of the placenta by a pathologist is encouraged. Regardless of whether this is completed, the entire placenta, a sample of umbilical cord tissue, and a sample of serum from the umbilical cord should be retained for further evaluation if congenital WNV infection is identified or strongly suspected. A section of the placenta and umbilical cord should be frozen, and the remainder of the placenta should be preserved in formalin; a sample of umbilical cord blood should be centrifuged, and the serum should be refrigerated or frozen.

Further evaluation should be considered if any clinical abnormality is identified or if laboratory testing indicates that an infant might have congenital WNV infection\*.

- Computerized tomography (CT) scan of the head and brain. If CT is abnormal, a pediatric neurologist should be consulted.
- Pediatric ophthalmologic evaluation, including examination of the retina
- Complete blood count, platelet count, and liver function tests, including alanine aminotransferase and aspartate aminotransferase. Examination of CSF should be considered and, if performed, should include testing of CSF for IgM antibody to WNV.
- Evaluation by a dysmorphologist or clinical geneticist

- Further evaluation of any congenital abnormalities to determine alternative causes, including genetic, infectious, or other teratogenic causes
- Additional hearing screen at age 6 months
- Careful evaluation of head circumference, physical characteristics, and developmental milestones throughout the first year of life
- Additional examination of infant serum for IgG and IgM antibody to WNV at age 6 months
- Histopathologic examination of the placenta and umbilical cord, testing of frozen placental tissue and cord tissue for WNV nucleic acid, and testing of cord serum for IgM and IgG antibody to WNV

\* The following laboratory results indicate possible congenital WNV infection: 1) positive IgM to WNV in infant serum or cerebrospinal fluid; 2) stable or increasing IgG to WNV in infant serum samples obtained at delivery and at age 6 months; or 3) detectable WNV, WNV nucleic acid, or WNV antigen in any infant clinical sample.

### **Prevention of WNV Infection During Pregnancy**

Pregnant women who live in areas with WNV-infected mosquitoes should apply insect repellent to skin and clothes when exposed to mosquitoes and wear clothing that will help protect against mosquito bites. In addition, whenever possible, pregnant women should avoid being outdoors during peak mosquito-feeding times (i.e., usually dawn and dusk).

### **CLINICAL ALGORITHM(S)**

None provided

## **EVIDENCE SUPPORTING THE RECOMMENDATIONS**

### **TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS**

The type of supporting evidence is not specifically stated for each recommendation.

## **BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS**

### **POTENTIAL BENEFITS**

Effective evaluation of infants born to mothers infected with West Nile virus during pregnancy

### **POTENTIAL HARMS**

Not stated

## QUALIFYING STATEMENTS

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Use of trade names and commercial sources is for identification only and does not imply endorsement by the United States Department of Health and Human Services.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Getting Better  
Staying Healthy

### IOM DOMAIN

Effectiveness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

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### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

2004 Feb 27

### GUIDELINE DEVELOPER(S)

Centers for Disease Control and Prevention - Federal Government Agency [U.S.]

### SOURCE(S) OF FUNDING

United States Government

## **GUIDELINE COMMITTEE**

Not stated

## **COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE**

Not stated

## **FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST**

Not stated

## **GUIDELINE STATUS**

This is the current release of the guideline.

## **GUIDELINE AVAILABILITY**

Electronic copies: Available from the Centers for Disease Control and Prevention (CDC) Web site:

- [HTML Format](#)
- [Portable Document Format \(PDF\)](#)

Print copies: Available from the Centers for Disease Control and Prevention, MMWR, Atlanta, GA 30333. Additional copies can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9325; (202) 783-3238.

## **AVAILABILITY OF COMPANION DOCUMENTS**

None available

## **PATIENT RESOURCES**

None available

## **NGC STATUS**

This NGC summary was completed by ECRI on June 4, 2004.

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