Reporting Title: Zika Virus IgM

Test Definition: 30294
Testing Location: Lee’s Summit, MO
Reporting Location: Melville, NY

Description:
Zika infection during pregnancy can cause a serious birth defect called microcephaly that is a sign of incomplete brain development. Microcephaly is a condition where a baby’s head is much smaller than expected. During pregnancy, a baby’s head grows because the baby’s brain grows. Microcephaly can occur because a baby’s brain has not developed properly during pregnancy or has stopped growing after birth, which results in a smaller head size. Microcephaly can be an isolated condition, meaning that it can occur with no other major birth defects, or it can occur in combination with other major birth defects. Doctors have also found other problems in pregnancies and among fetuses and infants infected with Zika virus before birth.

The ZIKV Detect™ IgM Capture ELISA is intended for the presumptive detection of Zika virus IgM antibodies in human sera collected from individuals meeting CDC Zika virus clinical criteria (e.g., a history of clinical signs and symptoms associated with Zika virus infection) and/or CDC Zika virus epidemiological criteria (e.g., history of residence in or travel to a geographic region with active Zika transmission at the time of travel, or other epidemiological criteria for which Zika virus testing may be indicated). The assay is intended for use in laboratories in the United States that are certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA), 42 U.S.C. §263a, to perform high complexity tests, or by similarly qualified non-U.S. laboratories, consistent with the latest CDC guideline for the diagnosis of Zika virus infection.

Analytical Method(s):

The ZIKV Detect™ IgM Capture ELISA is an enzyme linked capture immunoassay for the detection of human IgM antibodies targeting the ZIKV envelope glycoproteins. The ZIKV Detect™ IgM Capture ELISA is only for use under the FDA's Emergency Use Authorization.

Patient Preparation:
Counsel patient on their risk of Zika infection.

Specimen Requirements:

Specimen Type: Serum

Container/Tube: Red-top Vacutainer® tube or Serum Separator Tube (Red/Grey or Gold top SST).

Specimen Volume: 1.0 ml of spun serum or 5 ml of unspun whole blood.

Specimen Stability: Serum samples are stable at ambient temperature for 6 days.

Specimen Rejection Criteria: hemolysis, lipemia, incorrect tube type, insufficient volume

Additional Information:

CPT Code: 87790
Reference Values:

Presumptive Zika Positive:
Presence of detectable Zika IgM antibody, possible recent infection with ZIKV. The result should be confirmed by the latest CDC guideline for the diagnosis of Zika virus infection.

Possible Zika Positive:
Specimens that fall in this category may still have levels of Zika IgM antibody present in serum and follow-up testing is required; however, other confounding IgM antibodies from related flaviviruses may be present that cause this level of reactivity.

Presumptive Other Flavivirus Positive:
The result should be confirmed with FDA-cleared Dengue and West Nile virus IgM devices.

Negative:
Negative results do not preclude the possibility of Zika virus infection, past or present. Negative results may be seen in specimens collected before day four post onset of symptoms or after the window of detectable IgM closes.

An Interpretive Report will be provided.

Supplemental Report:
No

Testing Algorithm:

For up to date testing algorithms see: https://www.cdc.gov/zika/hc-providers/testing-guidance.html

Consents/Authorizations: N/A

Disclaimer:
The Zika Virus Real-time RT-PCR test is a laboratory test designed to detect Zika virus. The U.S. Food and Drug Administration (FDA) has not cleared or approved this test. No FDA-cleared or approved tests exist that can tell whether you have Zika virus infection. However, FDA has authorized the use of this test under an Emergency Use Authorization (EUA). Like all other EUA authorizations, this test has been authorized by FDA under an EUA for use by authorized laboratories. This test has been authorized only for the detection of RNA from Zika virus and diagnosis of Zika virus infection, not for any other viruses or pathogens. This test is only authorized for the duration of the declaration that circumstances exist justifying the authorization of the emergency use of in vitro diagnostic tests for detection of Zika virus and/or diagnosis of Zika virus infection under section 564(b)(1) of the Act, 21 U.S. C. § 360bbb-3(b)(1 ), unless the authorization is terminated or revoked sooner. Information regarding the Zika virus is changing regularly, the information in this brochure was accurate as of the date of publication. For the most current Zika news and updates, please visit www.cdc.gov/zika.
Test Requisition Instructions

Complete Physician Information and Patient Information sections. Be sure to check off the specific Test Request.

Specimen Labels – Preprinted with the requisition number. Please enter the patients last and first names EXACTLY as they appear on the requisition form. Affix the label to the patient specimen. Please complete the date and time collected fields.

Billing Information – Provide a photocopy of the front and back of insurance card or print the information in the required fields. Please provide credit card information to cover tests ordered requiring additional charges.
Test Requisition Form

NTD | Eurofins Clinical Diagnostics
---|---

Physician Information
Name (Last, First, MI)
Address
City State Zip
Phone

Patient Information
Name (Last, First, MI)
Date of Birth
SSN #
Gender: ☐ Male ☐ Female
Address
City State Zip

Test Request (Please check all that apply)
- Urine
- Serum
- 4800 Zika Virus RT-PCR (Urine and/or Serum)
- 3024H Zika IgM (Serum Only)

Specimen Labeling

Client Accession Number
NTD Labs Use Only

Patient Billing Information
Name (as it appears on credit card)
Address 1
Address 2
City State Zip Social Security
Credit Card No.
Expiration DV

Authorized Amount $ ☐ MasterCard ☐ Visa ☐ American Express ☐ Other: ___________________________

This shall confirm that the undersigned has agreed to pay the discounted amount listed above using the credit card information, check or money order provided and that such payment shall be deemed payment in full and the undersigned shall not be charged or responsible for any amounts for the procedure, except as provided below. The undersigned confirms that he/she is not enrolled in any state Medicaid program, is not currently applying for Medicaid benefits and is not entitled to any state Medicaid benefits or any Medicaid Managed Care coverage. The undersigned further agrees that because most patients at the present time do not or will not reimburse for Zika virus testing, and because he/she is therefore being treated as uninsured for these purposes and being given the discounted fee identified above, he/she represents and agrees that neither he/she nor anyone else on his/her behalf will submit a claim for reimbursement for such Zika virus testing to any insurance company or other third-party payer, including but not limited to any federal and/or state reimbursement programs, auto/property/compensation programs, commercial insurance, self-insured programs, MDS, PHS, etc. The undersigned agrees that should he/she submit a claim for reimbursement to any such insurance company or third-party payer, NTD Labs will invoice pricing for this test to the full list price and the undersigned will be responsible for any additional amounts required to collect payment in full as stated from either he/she or the insurance company or other third-party payer. The undersigned has been provided information about Zika virus testing and consents to have the specimen he/she has supplied tested for the Zika virus.

Patient Signature (required) ___________________________ Signature of Credit Card Holder (if different than patient) ___________________________ Date ______/____/____

© This document is copyright of Eurofins
During the actual use of this form, cover page need not be printed.
Specimen Collection Instructions (see also Blood Specimen Collection from Venipuncture Instruction Manual.)

**Zika Virus Specimen Collection**

**Test Name:** Zika Virus Rq-PCR (Qual)  
**Test Code:** 4809  
**Test Name:** Zika Virus IgM  
**Test Code:** 30294

### Urine collection procedure:
1. Peel back sticker  
   - Once patient’s urine sample is collected, peel back protective sticker to expose rubber-covered cannula
2. Insert urinal tube  
3. Cover and label  
   - Place protective sticker back over the integrated transfer port  
   - Affix the requisition label to the tube, and write in patient’s first and last name exactly as they appear on the requisition
4. Dispose and transport  
   - Remove lid from cup and dispose in a sharps collector  
   - Dispose of urine according to your policy  
   - Dispose of collection cup as a biohazard  
   - Immediately transport labeled urine tube to the laboratory

### Serum collection procedure:
- Invert 5 times  
- Clot 30 minutes  
- Spin 10 minutes

- Gently invert 5 times to mix clot activator with blood  
- Allow blood to clot for a minimum of 30 minutes, but no longer than 2 hours, in a vertical position  
- Observe a dense clot
- Centrifuge at FULL SPEED (between 1100 and 1300g) for 10 minutes for swing-head units or for 15 minutes for fixed-angle units (balance tube in centrifuge)
- Barrier will form, separating serum specimen from clot
- Transfer serum to the plastic transfer tube  
- Affix the requisition label to the transfer tube  
- Immediately transport labeled transfer tube to laboratory on ice (see reverse side)
Zika Virus Specimen Packaging and Shipping

Specimens must be immediately refrigerated and received at NTD Labs within 48 hours of collection. Transit time may not exceed 24 hours.

**Specimen packaging:**

1. Place the spun serum and/or urine vacuainer tube in absorbent pouch inside biohazard bag
2. Place completed requisition in outside pouch of biohazard bag

**Specimen rejection criteria:**

- Gously hemolyzed
- No Pos-ID (full name + requisition # or date of birth)
- No test requisition included with sample
- Not received next day*
- Not shipped with ice packs

**Specimen shipping:**

1. Place biohazard bag containing specimens inside flexible ice pouch
2. Place flexible ice pouch at bottom of shipping box
3. Add all 3 Cryo-Gel™ refrigerant packs on top of the flexible ice pouch with sample(s)
4. Place cover lid on top, and seal shipping box
5. Call FedEx for same-day pickup
6. Retain FedEx ticket with tracking number for your records

**Shipping:**

Ship Monday through Friday, labeled for FedEx Priority Overnight with Saturday delivery. Specimens may not be in transit more than 24 hours.

**Ship specimen to:**

NTD Labs
80 Ruland Road, Suite 1
Melville, NY 11747

*If FedEx is missed on day of collection, keep sample(s) refrigerated and send the following day with FRESH ice packs.

© This document is copyright of Eurofins
During the actual use of this form, cover page need not be printed.
Example Report

Zika Virus Testing

Patient Name: REPORT, SAMPLE
Patient ID #: 509999
Date of Birth: 01/01/93
Date Collected: 01/04/17
Date Received: 01/05/17
Date Reported: 01/05/17

Physician: 9999
Dr. OB/Specialist
100 Main Street
Melville, NY 11747

Specimen Type(s) Received: Serum
Test(s) ordered: Zika Virus IgM

Testing was performed at:
Vincor-IBT Laboratories - 1001 NW Technology Dr., Lee's Summit, MO | CLIA# 26D-0983643

See Attached Report

If you have any questions regarding this report, please contact NTD Labs at 855-754-5221. Thank you.

Jonathan B. Carmichael, Ph.D.,
Laboratory Director

Terence W. Hallahan, Ph.D.,
Laboratory Director
LABORATORY REPORT

**Patient Name:** REPORT, SAMPLE
**Sex:** M  **DOB:** 01/01/1993  **Age:** 24y
**Viracor Eurofins Patient ID:** 7096605
**Physician:** Undefined.
**Received:** 01/05/2017 9:14  **Report Delivered:** 01/05/2017 9:43

**RESULTS**

<table>
<thead>
<tr>
<th>TEST</th>
<th>RESULT</th>
<th>FLAG</th>
<th>REF RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zika Virus IgM</td>
<td>Presumptive Zika Positive</td>
<td>Ab</td>
<td>Negative</td>
</tr>
</tbody>
</table>

**Interpretive Comment:**

Presumptive Zika Positive: Presence of detectable Zika IgM antibody, possible recent infection with ZIKV. The result should be confirmed by the latest CDC guideline for the diagnosis of Zika virus infection.

Possible Zika Positive: Specimens that fall in this category may still have levels of Zika IgM antibody present in serum and follow-up testing is required; however, other confounding IgM antibodies from related flaviviruses may be present that cause this level of reactivity.

Presumptive Other Flavivirus Positive: The result should be confirmed with FDA-cleared Dengue and West Nile virus IgM devices.

Negative: Negative results do not preclude the possibility of Zika virus infection, past or present. Negative results may be seen in specimens collected before day four post onset of symptoms or after the window of detectable IgM closes.

The presence of RF (rheumatoid factor) may result in reduced reactivity in the ELISA and should be considered as a potentially interfering substance.

The ZIKV Detect IgM Capture ELISA is only for use under the FDA’s Emergency Use Authorization. Results of this test cannot be used as the sole basis of patient management decisions and must be combined with clinical observations, patient history, epidemiological information, and other laboratory evidences. Zika IgM levels over the course of illness are not well characterized. IgM levels are variable, may be detectable near day four post onset of symptoms and persist up to approximately 12 weeks following initial infection.
EMR Ask at Order Entry (AOE) Questions: None

EMR Result Codes:

<table>
<thead>
<tr>
<th>Data Type</th>
<th>Code</th>
<th>LOINC</th>
<th>Name</th>
<th>Contains Result</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE</td>
<td>4800S</td>
<td>85622-9</td>
<td>Zika Virus RT-PCR Serum</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>CE</td>
<td>4800U</td>
<td>85623-7</td>
<td>Zika Virus RT-PCR Urine</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>CE</td>
<td>30294</td>
<td>80824-6</td>
<td>Zika Virus IGM</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>
Detect Zika Virus with Testing from NTD

Zika Virus Testing from NTD Labs: Zika RT-PCR and Zika IgM

Eurofins NTD and Viracor have partnered to provide custom Zika virus testing to meet your patients’ Zika virus screening needs.

Zika Virus Real-time RT-PCR is intended for the qualitative detection of RNA from Zika virus in human plasma, serum, or urine. Healthcare providers are strongly encouraged to collect serum specimens alongside other specimen types to provide additional opportunities for diagnosing Zika virus infection in cases when PCR tests are negative.

ZIKV Detect™ IgM Capture ELISA is intended for the presumptive detection of Zika virus IgM antibodies in serum samples. Both tests are intended for individuals meeting Zika virus clinical criteria and/or Zika virus epidemiological criteria. No FDA-cleared or approved tests exist for Zika virus infection. However, the FDA has authorized the use of these tests under an Emergency Use Authorization (EUA).

Current CDC Recommendations for Testing

<table>
<thead>
<tr>
<th>Days Since Exposure to Symptom Onset</th>
<th>Asymptomatic</th>
<th>Symptomatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;14 days</td>
<td>- Zika Virus RT-PCR (urine + serum)</td>
<td>- Zika Virus RT-PCR (urine + serum)</td>
</tr>
<tr>
<td></td>
<td>- Reflex negative RT-PCR results w/Zika IgM (serum) drawn &gt; 14 days</td>
<td>- Reflex negative RT-PCR results to Zika IgM (serum)</td>
</tr>
<tr>
<td>&gt;14 days</td>
<td>- Zika IgM (serum)</td>
<td>- Zika IgM (serum)</td>
</tr>
<tr>
<td></td>
<td>- Reflex positive IgM results w/RT-PCR (serum + urine); reflex negative RT-PCR results w/PRINT</td>
<td>- Reflex positive IgM results to RT-PCR (serum + urine)</td>
</tr>
</tbody>
</table>

*Current Zika virus testing algorithms available at www.cdc.gov/zikalaboratories/lab-guidance.html.

Additional Criteria and Testing Strategies for Pregnant Women

- If a positive anti-Zika IgM result is obtained, testing by Zika RT-PCR, on all appropriate specimen types available, should be performed.
- If the Zika RT-PCR test results are negative, testing should proceed to PRINT to test for the presence of neutralizing anti-Zika antibodies.
  - When indicated, Viracor’s Notifiable Disease Reporting (NSR) group will contact the state health department where the patient is from and arrange for the confirmatory PRINT testing.
- Anti-dengue IgM testing is recommended for symptomatic pregnant women.
Sample Requirements

Paired samples (serum and urine) are the preferred sample type for Zika RT-PCR. While Zika RNA is typically detected within the first 2 weeks following symptom onset or possible exposure, Zika RNA may be detected for prolonged periods in some pregnant women. Serum is the only sample type currently authorized for Zika IgM.

Please refer to NTD’s Zika Specimen Collection Guide for details on sample collection and shipping.

Why Use NTD for Your Zika Testing?

Ease of use
- Fast turnaround time (3 days from sample receipt at NTD)
- Sample collection and shipping supplies provided, with clear and simple instructions
- The NTD Client Services team you have come to trust

Quality and experience
- For more than 40 years, NTD Labs has been an innovative leader in prenatal screening, providing accurate and timely information to healthcare providers and expectant parents.
- Viacor has more than 30 years of specialized expertise in infectious disease, immunology and allergy testing for immunocompromised and critical patients.

Multiple sample types and test options
- Blood (plasma/serum) and urine
- Zika virus RT-PCR and IgM, with reflex test options to meet CDC/ACOG recommendations

Billing information
- Cash pay® or client bill only
- Reduced pricing available with up-front payment
- Credit card, check or money order accepted

*Not available for patients with or applying for Medicare/Managed Medical.

For more information about NTD’s Zika virus testing, or to order test kits, please contact your local Genetics Account Executive or call our Client Services department at 1-888-NTD-LABS (683-5227).

NTD | Eurofins Clinical Diagnostics
80 Rutland Road, Suite 1, Melville, NY 11747
www.ntdlabs.com 1-888-NTD-LABS (683-5227)
Dear Patient,

If you are pregnant, please ask your doctor for the Fact Sheet for Pregnant Women: Understanding Results from the ZIKV Detect IgM Capture ELISA.

You are being given this Fact Sheet because your blood has been tested for evidence of Zikv virus infection. This testing was done because your healthcare provider believes you may have been exposed to the virus. The test used on your specimen is the ZIKV Detect IgM Capture ELISA, which is a laboratory test designed to help determine if you have recently been infected with Zikv virus.

This Fact Sheet contains information to help you understand the risks and benefits of using the ZIKV Detect IgM Capture ELISA. If possible, you may want to discuss your healthcare provider the risks and benefits described in this Fact Sheet and any additional questions you may have.

What is Zikv virus infection?

Zikv virus infection is caused by the Zikv virus, which is most often spread to people through mosquito bites. A woman infected with Zikv virus during pregnancy can pass the virus to her developing fetus. Zikv virus can also be passed by an infected individual to his or her partner during sex. Since 2015, a large number of Zikv virus cases have been reported in many South and Central American as well as Caribbean countries.

Most people who are infected with Zikv virus do not have any symptoms; those who do usually have mild illness with symptoms that may include fever, rash, joint pain, and/minor of the eye, these symptoms often resolve on their own within a week.

Infection with Zikv virus during pregnancy can cause microcephaly (shrink the baby's head is smaller than expected), a sign of incomplete brain development, and other severe brain defects in infants. However, detection of Zikv virus infection in the mother does not mean there is definite harm to the developing fetus. Some women who had Zikv virus infection during pregnancy have delivered apparently healthy babies. Women who are infected with Zikv virus while pregnant should be monitored closely by their healthcare providers throughout their pregnancy.

There have also been recent reports of a possible link between Zikv virus infection and an illness that can cause temporary paralysis (Guillain-Barré syndrome).

What is an Emergency Use Authorization (EUA)?

An EUA is a tool that FDA can use to allow certain medical products to be used for emergencies based on scientific data. The U.S. Secretary of Health and Human Services (HHS) has declared that circumstances exist to allow the emergency use of authorized diagnostic tests for Zikv virus infection, such as the ZIKV Detect IgM Capture ELISA.

At this time, there are no FDA-approved/reviewed alternative tests available that detect Zikv virus infection. FDA has authorized the emergency use of the ZIKV Detect IgM Capture ELISA to test for antibodies to Zikv virus in blood. Use of this test is authorized only for the duration of the threat of the emergency unless the EUA is terminated or revoked by FDA sooner.

How can I learn more?


Any significant new findings that negatively impact the performance of the test and that are observed during the course of the emergency use of the ZIKV Detect IgM Capture ELISA will be made available at the CDC's website: www.cdc.gov.

Please also contact your healthcare provider if you have any questions.
What is the ZIKV Detect IgM Capture ELISA?

The ZIKV Detect IgM Capture ELISA is a laboratory test designed to detect proteins in the human body that may fight Zika virus infection. These proteins, called antibodies, appear in the blood soon after the start of Zika illness and last for up to 12 weeks. In some people, they are present for longer than 12 weeks. If the ZIKV Detect IgM Capture ELISA detects these antibodies, the test is positive. If the ZIKV Detect IgM Capture ELISA does not detect these antibodies, the test is negative.

The U.S. Food and Drug Administration (FDA) has not cleared or approved this test. No FDA-approved cleared tests exist that can tell whether you have or have had Zika virus infection. However, based on the available evidence, FDA has authorized the use of this test under an Emergency Use Authorization (EUA).

Why was my sample tested using the ZIKV Detect IgM Capture ELISA?

If your sample was tested because you have symptoms of Zika virus infection, because you live in or have recently traveled to a place where Zika virus infection is known to occur, and/or because you have another possible exposure to Zika virus (e.g., sexual transmission). The test results, along with other information, could help your healthcare provider make decisions about how to take care of you and may help limit the spread of Zika virus in your community.

If you live in an area with Zika virus, the CDC (Centers for Disease Control and Prevention) recommends testing when you start prenatal care and again during your second trimester.*


What are the known risks and benefits of InBios ZIKV Detect IgM Capture ELISA?

Besides possible discomfort or other complications that can happen when your specimen is collected, there is a risk that the test result will be incorrect (see the paragraphs below for more information). The benefit of having this test is that its results, along with other information, can help your healthcare provider make decisions about how to take care of you. Also, knowing your test results may help keep you from giving Zika virus to others, e.g., by allowing you to take measures to avoid sexual transmission of the virus to someone else.

If this test is positive for Zika virus, does it mean that I have Zika virus infection?

If you have a positive ZIKV Detect IgM Capture ELISA test result, it is likely that you were recently infected with the Zika virus.

There is a chance that this test will give a positive result that is wrong; this is called a "false positive" result. There are some other very closely related viruses (e.g., dengue virus and West Nile virus, which, like Zika virus, are called "flaviviruses") that can cause the human body to produce antibodies that may cause the test to be positive.

If your result from this test is positive, your healthcare provider or health department will determine if your results should be evaluated with additional testing. It is important that you work with your healthcare provider or health department so you can understand the next steps you should take for yourself.

If you are male and have a positive test result for Zika virus and you have a pregnant partner or a partner who might become pregnant, you should either use a condom the right way every time while your partner is pregnant or not have sex with your partner during pregnancy, to lessen the risk of passing Zika virus infection. If you are female and have a positive test result and you are considering becoming pregnant, you should discuss the risks with your healthcare provider.

More information about Zika virus infection, steps to take if you are diagnosed with Zika virus infection, including how to prevent sexual transmission of Zika virus, and information for women and their partners who are thinking about pregnancy are available at www.cdc.gov/zika/index.html.

If this test is positive for "other flaviviruses" (e.g., dengue virus or West Nile virus), does it mean that I have dengue virus infection or West Nile virus infection?

If you have a positive test result for "other flaviviruses," it is likely you have dengue virus infection or West Nile virus infection. If your result from this test is positive for other flaviviruses, additional testing may be required, and your healthcare provider or health department will work with you so you can understand the steps you should take for yourself.

If this test is negative, does it mean that I do not have Zika virus infection?

Even if you have a negative test result, you may have been infected with Zika virus. If your sample was collected just after you became ill, it is possible that your body had not yet had enough time to make the antibodies that are measured by the test. If the sample was collected more than 10 weeks after your illness, it is possible that your body has already fought off the virus and the amount of antibody is so low that it cannot be measured. Your healthcare provider will help you to interpret your test results and work with you to continue to monitor your health.