Overview

Useful For
Determining whether a patient (especially transplant recipients, organ and blood donors) has had a recent infection or previous exposure to cytomegalovirus

Method Name
Multiplex Flow Immunoassay (MFI)

NY State Available
Yes

Specimen

Specimen Type
Serum

Specimen Required
Container/Tube:
Preferred: Serum gel
Acceptable: Red top

Specimen Volume: 0.5 mL

Forms
If not ordering electronically, complete, print, and send a Microbiology Test Request (T244) with the specimen.

Specimen Minimum Volume
0.4 mL

Reject Due To

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross hemolysis</td>
<td>Reject</td>
</tr>
<tr>
<td>Gross lipemia</td>
<td>Reject</td>
</tr>
<tr>
<td>Gross icterus</td>
<td>Reject</td>
</tr>
<tr>
<td>Other</td>
<td>Heat-inactivated specimen</td>
</tr>
</tbody>
</table>

Specimen Stability Information

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
<th>Special Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum</td>
<td>Refrigerated (preferred)</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
<td>14 days</td>
<td></td>
</tr>
</tbody>
</table>
Clinical and Interpretive

Clinical Information

Cytomegalovirus (CMV) is a member of the Herpesviridae family of viruses and usually causes asymptomatic infection after which it remains latent in patients, primarily within bone marrow derived cells.(1) Primary CMV infection in immunocompetent individuals may also manifest as a mononucleosis-type syndrome, similar to primary Epstein-Barr virus infection, with fever, malaise, and lymphadenopathy.

CMV is a significant cause of morbidity and mortality among bone marrow or solid organ transplant recipients, individuals with AIDS and other immunosuppressed patients due to virus reactivation or from a newly acquired infection.(2,3) Infection in these patient populations can affect almost any organ and lead to multiorgan failure. CMV is also responsible for congenital disease among newborns and is one of the TORCH infections (toxoplasmosis, other infections including syphilis, rubella, CMV, and herpes simplex virus).

CMV seroprevalence increases with age. In the United States the prevalence of CMV specific antibodies increases from approximately 36% to over 91% in adolescents between the ages of 6 to 11 and adults over 80 years old, respectively.(4)

Reference Values

Negative (reported as positive, negative, or equivocal)

Interpretation

Positive cytomegalovirus (CMV) IgG results indicate past or recent CMV infection. These individuals may transmit CMV to susceptible individuals through blood and tissue products.

Equivocal CMV IgG results may occur during acute infection or may be due to nonspecific binding reactions. Submit an additional sample for testing if clinically indicated.

Individuals with negative CMV IgG results are presumed to not have had prior exposure or infection with CMV and are, therefore, considered susceptible to primary infection.

Cautions

Sera drawn very early during the acute stage of infection may have undetectable levels of cytomegalovirus (CMV) IgG. The CMV IgG assay should not be used alone to diagnose CMV infection. Results should be considered in conjunction with clinical presentation, patient history, and other laboratory findings. In cases of suspected disease, submit a second sample for testing in 10 to 14 days.

The performance characteristics of this assay have not been evaluated in immunosuppressed or organ transplant recipients and have not been established for cord blood or for testing of neonates.

Immune complexes or other immunoglobulin aggregates present in patient samples may cause increased nonspecific binding and produce false-positive results.

Potential cross-reactivity for CMV with human chorionic gonadotropin, HIV IgG, multiple myeloma IgG, rheumatoid factor IgM, and Toxoplasma gondii IgG have not be ruled out.

Supportive Data

To evaluate the accuracy of the BioPlex cytomegalovirus (CMV) IgG multiplex flow immunoassay, 598 prospective
serum samples submitted for routine CMV IgG testing by the VIDAS enzyme-linked fluorescence immunoassay (ELFA; bioMerieux, Durham, NC) were also analyzed in a blinded fashion by the BioPlex assay within a 24-hour period. Samples with discordant results after initial testing were repeated by both assays during the same freeze/thaw cycle. Further resolution of discrepant results was performed by using the Diamedix CMV IgG enzyme immunoassay. The results are summarized below:

<table>
<thead>
<tr>
<th>CMV IgG (VIDAS ELFA)</th>
<th>BioPlex CMV IgG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive</td>
</tr>
<tr>
<td>Positive</td>
<td>336</td>
</tr>
<tr>
<td>Negative</td>
<td>3(b)</td>
</tr>
<tr>
<td>Equivocal</td>
<td>0</td>
</tr>
</tbody>
</table>

a) Both of these serum samples were negative by the Diamedix CMV IgG EIA

b) All three of these serum samples were negative by the Diamedix CMV IgG EIA

Sensitivity: 99.1% (336/339); 95% Confidence Interval (95% CI): 97.3%-99.8%

Specificity: 99.2% (254/256); 95% CI: 97.0%-100%

Overall Percent Agreement: 98.7% (590/598); 95% CI: 97.3%-99.4%

Clinical Reference


Performance

Method Description
The BioPlex 2200 cytomegalovirus (CMV) IgG assay uses multiplex flow immunoassay technology. Briefly, CMV antigen-coated fluorescent beads are mixed with an aliquot of patient sample and sample diluted and incubated at 37 degrees C. During this time IgG anti-CMV antibodies in the specimen will bind to the CMV antigen on the beads. After a wash cycle, a fluorescently labeled antihuman IgG-antibody conjugate is added to the mixture and incubated at 37 degrees C. Following a wash step to remove unbound conjugate, the bead mixture is passed through a detector that identifies the bead based on dye fluorescence and determines the amount of antibody captured by the antigen based on fluorescence of the antihuman IgG conjugate. Raw data are calculated in relative fluorescence intensity and is converted to an antibody index for interpretation. Antibody index (AI) values < or =0.8 are considered negative. AI values of 0.9 and 1.0 are equivocal. AI values > or =1.1 are considered positive. Three additional dyed beads, an internal standard bead, a serum verification bead, and a reagent black bead are present in each reaction
mixture to verify detector response, the addition of serum to the reaction vessel and the absence of significant nonspecific binding in serum, respectively. (Package insert: BioPlex 2200 System, ToRC IgG, Bio-Rad Laboratories, Clinical Diagnostics Group, Hercules, CA)

**Test Definition: CMVG**

Cytomegalovirus Ab, IgG, S

**PDF Report**

No

**Day(s) and Time(s) Test Performed**

Monday through Saturday; 9 a.m.

**Analytic Time**

Same day/1 day

**Maximum Laboratory Time**

3 days

**Specimen Retention Time**

14 days

**Performing Laboratory Location**

Rochester

**Fees and Codes**

**Fees**

- Authorized users can sign in to [Test Prices](#) for detailed fee information.
- Clients without access to Test Prices can contact [Customer Service](#) 24 hours a day, seven days a week.
- Prospective clients should contact their Regional Manager. For assistance, contact [Customer Service](#).

**Test Classification**

This test has been cleared or approved by the U.S. Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

**CPT Code Information**

86644

**LOINC® Information**

<table>
<thead>
<tr>
<th>Test ID</th>
<th>Test Order Name</th>
<th>Order LOINC Value</th>
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</thead>
<tbody>
<tr>
<td>CMVG</td>
<td>Cytomegalovirus Ab, IgG, S</td>
<td>13949-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Result ID</th>
<th>Test Result Name</th>
<th>Result LOINC Value</th>
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