Overview

Useful For
Monitoring Cryptococcus antigen titers in cerebrospinal fluid

Aiding in the diagnosis of cryptococcosis

Method Name
Lateral Flow Assay (LFA)

NY State Available
Yes

Specimen

Specimen Type
CSF

Specimen Required

Container/Tube: Sterile vial

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
0.3 mL

Reject Due To

<table>
<thead>
<tr>
<th>Reject Due To</th>
<th>Acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemolysis</td>
<td>Mild OK; Gross reject</td>
</tr>
<tr>
<td>Lipemia</td>
<td>NA</td>
</tr>
<tr>
<td>Icterus</td>
<td>NA</td>
</tr>
<tr>
<td>Other</td>
<td>NA</td>
</tr>
</tbody>
</table>

Specimen Stability Information

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSF</td>
<td>Refrigerated (preferred)</td>
<td>14 days</td>
</tr>
<tr>
<td></td>
<td>Frozen</td>
<td>14 days</td>
</tr>
</tbody>
</table>

Clinical and Interpretive
**Clinical Information**

Cryptococcosis is an invasive fungal infection caused by *Cryptococcus neoformans* or *C. gattii*. *C neoformans* has been isolated from several sites in nature, particularly weathered pigeon droppings. *C. gattii* was previously only associated with tropical and subtropical regions, however, more recently this organism has also been found to be endemic in British Columbia and among the Pacific Northwest United States, and is associated with several different trees species.

Infection is usually acquired via the pulmonary route. Patients are often unaware of any exposure history. Approximately half of the patients with symptomatic disease have a predisposing immunosuppressive condition such as AIDS, steroid therapy, lymphoma, or sarcoidosis. Symptoms may include fever, headache, dizziness, ataxia, somnolence, and cough. While the majority of *C neoformans* infections occur in immunocompromised patient populations, *C. gattii* is has a higher predilection for infection of healthy hosts.\(^1,2\)

In addition to the lungs, cryptococcal infections frequently involve the central nervous system (CNS), particularly in patients infected with HIV. Mortality among patients with CNS cryptococcosis may approach 25% despite antibiotic therapy. Untreated CNS cryptococcosis is invariably fatal. Disseminated disease may affect any organ system and usually occurs in immunosuppressed individuals.

Note: According to the College of American Pathologists (CAP, IMM.41840), cerebrospinal fluid (CSF) samples submitted for initial diagnosis that test positive by the lateral flow assay should also be submitted for routine fungal culture. Fungal cultures are not required for CSF samples that are submitted to monitor *Cryptococcus* antigen titers during treatment.

**Reference Values**

Negative

**Interpretation**

The presence of cryptococcal antigen in any body fluid (serum or cerebrospinal fluid: CSF) is indicative of cryptococcosis.

Disseminated infection is usually accompanied by a positive serum test.

Declining titers may indicate regression of infection. However, monitoring titers to cryptococcal antigen should not be used as a test of cure or to guide treatment decisions. Low-level titers may persist for extended periods of time following appropriate therapy and resolution of infection.\(^3,4\)

CSF specimens submitted for initial diagnosis that test positive by the lateral flow assay, should also be submitted for routine fungal culture. Culture can aid to differentiate between the 2 common *Cryptococcus* species causing disease (*C neoformans* and *C. gattii*) and can be used for antifungal susceptibility testing, if necessary. CSF specimens submitted to monitor antigen levels during treatment do not need to be cultured.

**Cautions**

A traumatic lumbar puncture and contamination of the cerebrospinal fluid (CSF) specimen with serum may lead to a positive *Cryptococcus* antigen result from CSF in patients without neuroinvasive cryptococcosis.

*Cryptococcus* antigen titers acquired by the lateral flow assay may be higher than titers achieved by other
Cryptococcus antigen assays. Titers acquired by different assay methods are not interchangeable.

Cryptococcus antigen titers should be followed using the same assay.

A positive result is indicative of cryptococcosis, however, all test results should be reviewed in light of other clinical findings.

A negative result does not preclude diagnosis of cryptococcosis, particularly if only a single specimen has been tested and the patient shows symptoms consistent with cryptococcosis.

Testing should not be performed as a screening procedure for the general populations and should only be performed when clinical evidence suggests the diagnosis of cryptococcal disease.

Although rare, extremely high concentrations of cryptococcal antigen can result in weak test lines and in extreme instances, yield negative test results.

This assay has not been evaluated for cross-reactivity in patients with trichosporonosis.

Supportive Data

Endpoint titers between the IMMY LFA and the Meridian latex agglutination test were compared for 18 cerebrospinal fluid (CSF) samples positive for Cryptococcus antigen. While the overall qualitative correlation was good, these data indicate that the endpoint titer achieved by the IMMY LFA was at least 2-fold higher than that achieved by the Meridian latex agglutination assay in 15 of 17 (88%) serum samples. (Table 1) Therefore, Cryptococcus antigen titers should be monitored by using the same method on serially-collected samples; titers acquired by different methods are not interchangeable.

<table>
<thead>
<tr>
<th>CSF Sample</th>
<th>Meridian Latex Agglutination</th>
<th>IMMY LFA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&gt;256</td>
<td>5,120</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>80</td>
</tr>
<tr>
<td>3</td>
<td>128</td>
<td>40</td>
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<tr>
<td>4</td>
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<td>&gt;256</td>
<td>5,120</td>
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<tr>
<td>7</td>
<td>128</td>
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</tr>
<tr>
<td>8</td>
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<tr>
<td>11</td>
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<tr>
<td>14</td>
<td>&gt;256</td>
<td>10,240</td>
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</table>
Clinical Reference


Performance

Method Description

The *Cryptococcus* antigen (CrAg) lateral flow assay is a sandwich immunochromatographic assay. Specimens and diluent are added to a test tube and the lateral flow device is added. The test uses specimen wicking to capture gold-conjugated, anticytrococcal antigen monoclonal antibodies and gold-conjugated control antibodies deposited on the test membrane. If cryptococcal antigen is present in the specimen, it binds to the gold-conjugated, anticytrococcal antigen antibodies. This complex wicks up the membrane and interacts with the test line, which has immobilized anticytrococcal antigen monoclonal antibodies. The antigen-antibody complex forms a sandwich at the test line causing a visible line to form. A valid test shows a visible line at the control line. Positive test results create 2 lines (control and specimen), while negative results form only the control line. (Package insert: CrAg Lateral Flow Assay, IMMY, Norman, OK, Rev 2012)

PDF Report

No

Day(s) and Time(s) Test Performed

Monday through Friday; 1 p.m. and 8 p.m., Saturday, Sunday; 2 p.m.

Analytic Time

Same day/1 day

Maximum Laboratory Time

2 days

Specimen Retention Time
Test Definition: CLFAT
Cryptococcus Ag Titer, LFA, CSF

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
87899

LOINC® Information

<table>
<thead>
<tr>
<th>Test ID</th>
<th>Test Order Name</th>
<th>Order LOINC Value</th>
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<tbody>
<tr>
<td>CLFAT</td>
<td>Cryptococcus Ag Titer, LFA, CSF</td>
<td>9817-8</td>
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>62076</td>
<td>Cryptococcus Ag Titer, LFA, CSF</td>
<td>9817-8</td>
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