Overview

Useful For
An aid to resolve discrepant results between screening treponemal (eg, enzyme immunoassay [EIA], multiplex flow immunoassay) and non-treponemal (eg, rapid plasma regain) assays
This test is **not recommended for** general screening purposes for syphilis.
This test should **not be used** to evaluate response to therapy.
This test is **not intended for** medical-legal use.

Testing Algorithm
See [Syphilis Serology Algorithm](#) in Special Instructions.

Special Instructions
- [Syphilis Serology Algorithm](#)

Method Name
Particle Agglutination

NY State Available
Yes

Specimen

Specimen Type
Serum

Ordering Guidance
This assay is recommended by the Centers for Disease Control and Prevention for specimens testing positive by a screening treponemal assay and negative by rapid plasma reagin (RPR). The results of this assay assist in determining whether the results of a screening treponemal test are truly or falsely positive.

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.

Reject Due To
- Gross hemolysis  **Reject**
- Gross lipemia  **Reject**

Specimen Minimum Volume
Test Definition: TPPA
Syphilis Ab by TP-PA, S

0.3 mL

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</td>
<td>14 days</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(preferred)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frozen</td>
<td></td>
<td>14 days</td>
<td></td>
</tr>
</tbody>
</table>

Clinical & Interpretive

Clinical Information
Syphilis is a disease caused by infection with the spirochete Treponema pallidum. The infection is systemic and the disease is characterized by periods of latency. These features, together with the fact that T pallidum cannot be isolated in culture, mean that serologic techniques play a major role in the diagnosis and follow-up of treatment for syphilis. Syphilis is categorized by an early primary infection in which patients may have nonspecific symptoms and, potentially, genital lesions. Patients tested by serology during the primary phase may be negative for antibodies, especially if testing is performed during the first 1 to 2 weeks after symptom onset. As the disease progresses into the secondary phase, antibodies to T pallidum reach peak titers and may persist indefinitely regardless of the disease state or prior therapy. Therefore, detection of antibodies to non-treponemal antigens, such as cardiolipin (a lipoidal antigen released by host cells damaged by T pallidum) may help to differentiate between active and past syphilis infection. Non-treponemal antibodies are detected by the rapid plasma reagin (RPR) assay, which is typically positive during current infection and negative following treatment or during late/latent forms of syphilis.

For prenatal syphilis screening, the syphilis IgG test (SYPGN / Syphilis Total Antibody, Serum) is recommended. Testing for IgM-class antibodies to T pallidum should not be performed during routine pregnancy screening unless clinically indicated.

Historically, the serologic testing algorithm for syphilis included an initial non-treponemal screening test, such as the RPR or the venereal disease research laboratory (VDRL) tests. Because these tests measure the host's antibody response to non-treponemal antigens, they may lack specificity. Therefore, a positive result by RPR or VDRL requires confirmation by a treponemal-specific test, such as fluorescent treponemal antibody absorption (FTA-ABS) or T pallidum particle agglutination (TP-PA). Although the FTA-ABS and TP-PA are technically simple to perform, they are labor intensive and require subjective interpretation by testing personnel.

Due to the low prevalence of syphilis in the United States, the increased specificity of treponemal assays, and the objective interpretation of automated treponemal enzyme immunoassay (EIA) and multiplex flow immunoassay (MFI), many large clinical laboratories have switched to screening for syphilis using a reverse algorithm. Per this algorithm, serum samples are first tested by an automated treponemal assay (eg, EIA or MFI). Specimens testing positive by these assays are then reflexed to the RPR assay to provide an indication of the patient’s disease state and history of treatment. Recently, the Centers for Disease Control and Prevention recommended that specimens testing positive by a screening treponemal assay and negative by RPR be tested by a second treponemal test (eg, TP-PA). The results of TP-PA assist in determining whether the results of a screening treponemal test are truly or falsely positive.

Reference Values
Negative

Interpretation
### Test Definition: TPPA

**Syphilis Ab by TP-PA, S**

<table>
<thead>
<tr>
<th>Patient history</th>
<th>Test and result</th>
<th>Interpretation</th>
<th>Follow-up</th>
<th>EIA/CIA/MFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPR</td>
<td>TP-PA</td>
<td>Unknown history of syphilis</td>
<td>Non-reactive</td>
<td>N/A</td>
</tr>
<tr>
<td>N/A</td>
<td>No serologic evidence of syphilis</td>
<td>None, unless clinically indicated (eg, early syphilis)</td>
<td>Unknown history of syphilis</td>
<td>Reactive</td>
</tr>
<tr>
<td>Reactive</td>
<td>N/A</td>
<td>Untreated or recently treated syphilis</td>
<td>See CDC treatment guidelines</td>
<td>Unknown history of syphilis</td>
</tr>
<tr>
<td>Reactive</td>
<td>Non-reactive</td>
<td>Non-reactive</td>
<td>Probable false-positive screening test</td>
<td>No follow-up testing, unless clinically indicated</td>
</tr>
<tr>
<td>Unknown history of syphilis</td>
<td>Reactive</td>
<td>Non-reactive</td>
<td>Reactive</td>
<td>Possible syphilis (eg, early or latent) or previously treated syphilis</td>
</tr>
<tr>
<td>Historical and clinical evaluation</td>
<td>Known history of syphilis</td>
<td>Reactive</td>
<td>Non-reactive</td>
<td>Reactive or N/A</td>
</tr>
</tbody>
</table>

### Cautions

Testing by only *Treponema pallidum* particle agglutination (TP-PA) is not recommended for general screening purposes for syphilis. TP-PA should only be requested when:

1. The results of a treponemal screening test (eg, enzyme immunoassay [EIA] or multiplex flow immunoassay; MFI) and rapid plasma reagin (RPR) are discordant (eg, syphilis IgG-positive, RPR-negative)

2. A laboratory screens for syphilis using RPR and is in need of a treponemal confirmatory test.

Interpretation of results obtained with the Serodia TP-PA syphilis antibody test must be used in conjunction with the patient’s clinical symptoms, medical history and other clinical and laboratory findings.

Serodia TP-PA assay is less sensitive than the fluorescent treponemal antibody absorption (FTA-ABS) test in untreated primary syphilis but compares favorably in all other stages of syphilis.

Serodia TP-PA assay should not be used to evaluate response to therapy since treponemal tests tend to remain reactive following treatment for syphilis.

Serodia TP-PA assay may be reactive in a small percentage (<1%) of normal or healthy persons. These false-positive results are often transient with unknown cause. False-positive results may occur in association with other underlying illnesses.

Serodia TP-PA may be reactive in persons from areas endemic for yaws or pinta.

Serodia TP-PA performs best in populations at risk for *T pallidum* infection.

False-positive or inconclusive results for this assay may be seen in patients with HIV, leprosy, toxoplasmosis, or *Helicobacter pylori*.

### Supportive Data

<table>
<thead>
<tr>
<th>BioPlex syphilis IgG MFI assay</th>
<th>Fujirebio TP-PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>No result</td>
</tr>
</tbody>
</table>
Test Definition: TPPA
Syphilis Ab by TP-PA, S

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Negative</td>
<td>11</td>
</tr>
<tr>
<td>1083</td>
<td>1</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Antibody or condition tested: Number of samples tested by TP-PA

<table>
<thead>
<tr>
<th>Antibody or condition tested</th>
<th>Number of samples tested by TP-PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epstein Barr VCA IgG</td>
<td>5</td>
</tr>
<tr>
<td>Epstein Barr VCA IgM</td>
<td>5</td>
</tr>
<tr>
<td>HSV IgG</td>
<td>5</td>
</tr>
</tbody>
</table>

Clinical Reference


Performance

Method Description
The Serodia TP-PA test is based on the agglutination of colored gelatin particle carriers sensitized with Treponema pallidum (Nichols Strain) antigen. Serum samples are serially diluted in microplate wells. Sensitized gelatin particles are added to respective wells and the contents of the plate mixed. The mixture is incubated for 2 hours at ambient temperature. Serum containing specific antibodies will react with the antigen-sensitized colored gelatin particles to form a smooth mat of agglutinated particles in the microplate well. A compact button formed by the settling of the nonagglutinated particles characterizes negative reactions. The agglutination patterns are read visually to determine interpretation.(Package insert: Serodia TP-PA. Fujirebio Diagnostics, Inc; 8/13/2017)

PDF Report
No

Specimen Retention Time
14 days

Performing Laboratory Location
Rochester

Fees & Codes

Test Classification
This test has been cleared, approved, or is exempt by the US 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
86780