Overview

Useful For
Trough level quantitation for evaluation of patients with loss of response to infliximab and infliximab-dyyb

Profile Information

<table>
<thead>
<tr>
<th>Test ID</th>
<th>Reporting Name</th>
<th>Available Separately</th>
<th>Always Performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFX</td>
<td>Infliximab, S</td>
<td>No</td>
<td>Yes</td>
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Reflex Tests

<table>
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<th>Reporting Name</th>
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<tbody>
<tr>
<td>INXAB</td>
<td>Infliximab Ab, S</td>
<td>No</td>
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</tr>
</tbody>
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Testing Algorithm
Infliximab will be performed by liquid chromatography-tandem mass spectrometry (LC-MS/MS) on all samples. When Infliximab results are below 5.1 mcg/mL, testing for antibodies to infliximab will be performed at an additional charge.

Method Name
INFXR, INFX: Selective Reaction Monitoring Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS)
INXAB: Electrochemiluminescent Bridging Immunoassay

NY State Available
Yes

Specimen

Specimen Type
Serum Red

Specimen Required

Patient Preparation: For 12 hours before this test do not take multivitamins or dietary supplements containing biotin (vitamin B7), which is commonly found in hair, skin, and nail supplements and multivitamins.

Container/Tube: Red top

Specimen Volume: 1 mL

Collection Instructions:

1. Draw blood immediately before next scheduled dose (trough specimen).
2. Centrifuge within 2 hours of draw.

Forms
If not ordering electronically, complete, print, and send a Gastroenterology and Hepatology Client Test Request (T728) with the specimen.

Specimen Minimum Volume
0.5 mL

Reject Due To

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<table>
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<tbody>
<tr>
<td>Hemolysis</td>
<td>Mild OK; Gross reject</td>
</tr>
<tr>
<td>Lipemia</td>
<td>Mild OK; Gross OK</td>
</tr>
<tr>
<td>Icterus</td>
<td>Mild OK; Gross reject</td>
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<tr>
<td>Other</td>
<td>Plasma, whole blood, SST tubes</td>
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Specimen Stability Information

<table>
<thead>
<tr>
<th>Specimen Type</th>
<th>Temperature</th>
<th>Time</th>
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<tr>
<td>Serum Red</td>
<td>Frozen (preferred)</td>
<td>28 days</td>
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<tr>
<td></td>
<td>Refrigerated</td>
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Clinical and Interpretive

Clinical Information

Infliximab (Remicade, Renflexis, Inflectra) is a chimeric immunoglobulin (IgG1 kappa) targeting tumor necrosis factor-alpha (TNF-a), and is currently FDA-approved for the treatment of multiple inflammatory conditions. Infliximab binds to soluble TNF-a and transmembrane homotrimers.

Infliximab pharmacokinetic properties may vary with disease and clearance is affected by concomitant use of immunosuppressants, high concentrations of TNF-a and C-reactive proteins,(1,2) low albumin concentrations, high body mass index, and presence of antibodies to infliximab, also known as human antichimeric antibodies (HACA).(3) Males seem to clear infliximab faster than females.(3)

Several studies have demonstrated that infliximab quantitation in the setting of loss of response to therapy can aid in patient management, as trough concentrations defined as therapeutic have been associated with superior clinical response and improved prognosis.(4-6)

Evaluation of infliximab concentrations may be of value for all inflammatory diseases for which it is prescribed. Primary indications for testing of infliximab include loss of response, partial response on initiation of therapy, autoimmune or hypersensitivity reactions, primary nonresponse, reintroduction after drug holiday, endoscopic/computed tomography enterography recurrence (in inflammatory bowel disease), and acute infusion reactions.

Measurement of infliximab concentrations is indicated at trough, immediately prior to the next scheduled infusion. Low trough concentrations may be correlated with loss of response to infliximab. Assessment of antibodies to infliximab is suggested when infliximab quantitation at trough is 5.0 mcg/mL or less.
The infliximab assay has been verified to analyze infliximab and infliximab-dyyb (Inflectra, Pfizer Inc) with no analytical differences between the 2 drugs quantitation. Inflectra has the same primary amino acid sequence as Remicade and Renflexis. Inflectra was approved by the FDA for use in April 2016 and became available in December 2016 in the US market. Therefore, *infliximab* will be used to refer to both the reference product and the biosimilar interchangeably.

A biosimilar product is a biological product that is approved based on showing that it is highly similar to an FDA-approved biological product, known as the reference product. No clinically meaningful differences in terms of safety and effectiveness from the reference product are present. Only minor differences in clinically inactive components are allowable in biosimilar products. In contrast to generic medications, a prescription of biosimilars needs to come from the ordering physician and not the dispensing pharmacy (pharmacies cannot substitute a biosimilar for another medication; a separate prescription is required).

**Reference Values**

**INFLIXIMAB QUANTITATION:**

Limit of quantitation is 1.0 mcg/mL. Therapeutic ranges are disease specific.

Pediatric reference ranges are not established.

**INFLIXIMAB ANTIBODIES**

Absence of antibodies to infliximab (ATI) is defined as <50 U/mL

Presence of ATI is reported as positive when concentrations are > or ≥50 U/mL

**Interpretation**

Low trough concentrations may be correlated with loss of response to infliximab. For infliximab trough concentrations 5.0 mcg/mL or less, testing for antibodies to infliximab (ATI) is suggested.

For infliximab trough concentrations above 5.0 mcg/mL, the presence of ATI is unlikely; patients experiencing loss of response to infliximab may benefit from an increased dose or a shorter infusion interval.

Results above 35 mcg/mL are suggestive of a blood draw at a time-point in treatment other than trough.

**Cautions**

Toxicity effects other than acute hypersensitivity infusion reactions have not been described nor correlated with infliximab concentrations.

During the initial induction phase of treatment (weeks 0, 2, and 6), steady-state has not been achieved and concentrations of infliximab may vary significantly between infusions.(3)

Therapeutic concentrations of infliximab may vary according to the disease (eg, Crohn disease versus ulcerative colitis versus rheumatoid arthritis).

Samples containing more than 12.5 ng/mL biotin (vitamin B7) may interfere (in the form of depressed signal) with INXAB / Infliximab Antibodies, Serum.

**Clinical Reference**


Performance

Method Description

Infliximab Quantitation:

This test is performed using liquid-chromatography and tandem mass spectrometry on an API 5000 triple-quadrupole instrument (AB Sciex). Preanalytical sample preparation includes a trypsin digestion; 2 unique clonotypic peptides from the heavy and light chains of the infliximab chimeric structure (IgG1 kappa) are monitored. (Willrich MA, Murray DL, Barnidge DR, et al: Quantitation of infliximab using clonotypic peptides and selective reaction monitoring by LC-MS/MS. Int Immunopharmacol 2015;28:513-520)

Infliximab Antibodies:


PDF Report

No

Analytic Time

3 days

Maximum Laboratory Time

6 days

SpecimenRetention Time

2 weeks

Performing Laboratory Location

Rochester

Fees and Codes
Test Definition: INFXR
Infliximab QN with Reflex to Ab, S

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 was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Code Information
80299

LOINC® Information

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<td>Infliximab QN with Reflex to Ab, S</td>
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