MAYO CLINIC LABORATORIES

Test Definition: STFR

Soluble Transferrin Receptor (sTfR)

Overview

Useful For

Evaluation of suspected iron deficiency in patients who may have inflammation, infection, or chronic disease and other conditions in which ferritin concentration does not correlate with iron status, including:

-Cystic fibrosis patients who frequently have inflammation or infections(1-2)

-Evaluating insulin-dependent diabetics who may have iron-deficiency resulting from gastric autoimmunity and atrophic gastritis(3)

Method Name

Immunoturbidimetric Assay

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Collection Container/Tube:

Preferred: Serum gel

Acceptable: Red top

Submission Container/Tube: Plastic vial

Specimen Volume: 1 mL

Collection Instructions:

1. Serum gel tubes should be centrifuged within 2 hours of collection.

2. Red-top tubes should be centrifuged and aliquoted within 2 hours of collection.

Reject Due To

Gross hemolysis	Reject

Specimen Minimum Volume

0.25 mL

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Frozen (preferred)	90 days	
	Refrigerated	7 days	
	Ambient		

Clinical & Interpretive

Clinical Information

Iron uptake into cells is mediated through internalizing iron-transferrin complexes. The iron-transferrin complex binds to transferrin receptors present on the external face of the plasma membrane, and is internalized through endosomes with ultimate release of iron into the cytoplasm. Plasma membrane-bound transferrin receptor is released by proteolytic cleavage of the extracellular domain, resulting in the formation of a truncated soluble transferrin receptor (sTfR) that circulates freely in the blood.

The concentration of sTfR is an indicator of iron status. Iron deficiency causes overexpression of transferrin receptor and sTfR levels, while iron repletion results in decreased sTfR levels. While ferritin measurement is the accepted method for assessment of iron deficiency, ferritin is an acute-phase reactant and elevates in response to processes that do not correlate with iron status, including inflammation, chronic disease, malignancy, and infection. sTfR is not an acute-phase reactant and the interpretation of iron status using sTfR measurement is not affected by these confounding pathologies.

Reference Values

1.8-4.6 mg/L

It is reported that African Americans may have slightly higher values.

Interpretation

Soluble transferrin receptor (sTfR) concentrations are inversely related to iron status; sTfR elevates in response to iron deficiency and decreases in response to iron repletion.

Cautions

The soluble transferrin receptor (sTfR) immunoassay should not be used for the routine clinical evaluation of patients for iron status when ferritin immunoassay (FERR / Ferritin, Serum) would be appropriate, such as in the absence of confounding pathologies (inflammation, infection, chronic disease, or malignancy).

Patients with hemolysis and recent blood loss may have falsely elevated sTfR levels.

sTfR is elevated in patients with thalassemia and sickle cell disease. Caution should be exercised in managing anemia in these individuals based on the sTfR test results.

Clinical Reference

1. Cook JD, Skikne BS, Baynes RD: Serum transferrin receptor. Ann Rev Med 1993;44:63-74

2. Keevil B, Rowlands D, Burton I, Webb AK: Assessment of iron status in cystic fibrosis patients. Ann Clin Biochem 2000;37:662-665

3. De Block CEM, Van Capenhout CM, De Leeuw IH, et al: Soluble transferrin receptor level: a new marker of iron deficiency anemia, a common manifestation of gastric autoimmunity in type 1 diabetes. Diabetes Care 2000;23:

1384-1388

4. Mast AE, Blinder MA, Gronowski AM, et al: Clinical utility of the soluble transferrin receptor and comparison with serum ferritin in several populations. Clin Chem 1998;44:45-51

5. Rees DC, Williams TN, Maitland K, et al: Alpha thalassaemia is associated with increased soluble transferrin receptor levels. Br J Haematol 1998;103:365-369

6. Duits AJ, Roker RA, van Endt T, et al: Erythropoiesis and Serum sVCAM-1 levels in adults with sickle cell disease. Ann Hematol 2003;82:171-174

Performance

Method Description

Latex-bound anti-sTfR antibodies react with the antigen in the sample to form an antigen/antibody complex. Following agglutination, the complex is measured turbidimetrically on a Roche P Modular.(Package insert: The Tina-quant Soluble Transferrin Receptor Immunoturbidimetric assay for the in vitro quantitative determination of soluble transferrin receptor. Roche Corporation, Indianapolis, IN 46250, 2001)

PDF Report

No

Specimen Retention Time

Stored Serum 1 week

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

84238

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
STFR	Soluble Transferrin Receptor (sTfR)	30248-9

Result ID	Reporting Name	LOINC®
STFR	Soluble Transferrin Receptor (sTfR)	30248-9