MAYO CLINIC LABORATORIES

Test Definition: IRON

Iron, Serum

Overview

Useful For

Aiding in the evaluation of iron deficiency and iron overload diseases in combination with total iron binding capacity and percent saturation

Assessment of acute iron poisoning

Method Name

Only orderable as part of profile. For more information see SFEC / Iron and Total Iron-Binding Capacity, Serum

Colorimetric Assay

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Only orderable as part of profile. For more information see SFEC / Iron and Total Iron-Binding Capacity, Serum

Patient Preparation:

1. Fasting (12 hours)
2. For 24 hours before collection, patient **should not** take iron-containing supplements.

Supplies: Sarstedt Aliquot Tube 5 mL (T914)
Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL
Collection Instructions:

1. Draw blood before noon (preferred).
2. Within 2 hours of collection, serum gel tubes should be centrifuged.
3. Within 2 hours of collection, red-top tubes should be centrifuged, and the serum aliquoted into a plastic vial.

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	21 days	
	Frozen	365 days	

Clinical & Interpretive

Clinical Information

Iron (Fe) is involved in the function of all cells. Systemic iron homeostasis is maintained by the tight regulation of communication between cells that absorb iron from the diet (duodenal enterocytes), cells that consume iron (mainly erythroid precursors), and cells that store iron (hepatocyte and tissue macrophages). Once ingested iron is absorbed and temporarily stored in the mucosal cells within ferritin. Ferritin provides a soluble protein shell to encapsulate a complex of insoluble ferric hydroxide and ferric phosphate. Iron is released into the blood and transported as Fe (III)-transferrin.(1)

The concentration of iron varies widely, both in normal healthy persons, and in various clinical disorders. The biologic variation of iron is notable in normal healthy persons and in various clinical disorders owing to both diurnal variation and post-prandial effects. Normally, intra-individual serum iron levels undergo significant within day and day-to-day variation. The intraindividual day-to-day variation of iron is approximately 25% to 30%.(1) Serum iron concentration is frequently highest in the morning and declines progressively during the day, to reach a low point near midnight. There are no definitive studies that suggest fasting from food is required; however, serum iron is commonly drawn in the fasting state. Drawing blood three hours after consuming oral iron supplements has been shown to significantly increase serum iron concentration 3 to 5-fold and therefore should be avoided for 24 hours prior to collection.(2)

Reference Values

Only orderable as part of profile. For more information see SFEC / Iron and Total Iron-Binding Capacity, Serum

Males: 50-150 mcg/dL
Females: 35-145 mcg/dL

Interpretation

Serum iron is elevated in iron overload conditions including hemochromatosis. Additional causes include oral or parenteral intake of medicinal iron, acute hepatitis, and chronic liver failure.(1)

Serum iron is decreased in iron deficiency, iron deficiency anemia, and anemia of chronic disease.(1)

Cautions

Serum iron is unreliable as the primary test for identification of iron deficiency. The percentage iron saturation of transferrin may be helpful in conjunction with ferritin and soluble transferrin receptor, especially in patients with inflammation.

Recommendations on blood sampling for iron and iron saturation measurements are contradictory; however, minimizing influence of diurnal variation and post-prandial effects can be accomplished by collecting during the morning after an overnight fasting.

Patients should avoid taking iron supplements (oral or parenteral) for 24 hours prior to collection.

Patients treated for acute iron poisoning who are administered metal-binding drugs (eg, deferoxamine) may have falsely decreased iron values.

Clinical Reference

1. Swinkels DW. Iron metabolism. In: Rifai N, Chiu RWK, Young I, Burnham CAD, Wittwer CT. Tietz Textbook of Laboratory Medicine. 7th ed. Elsevier, 2023:chap 40
2. Silay K, Akinci S, Yalcin A, et al. The status of iron absorption in older patients with iron deficiency anemia. Eur Rev Med Pharmacol Sci. 2015;19(17):3142-3145

Performance

Method Description

Under acidic conditions, iron is liberated from transferrin. Lipemic samples are clarified by the detergent. Ascorbate reduces the released Fe(3+) ions to Fe(2+) ions which then react with FerroZine to form a colored complex. The color intensity is directly proportional to the iron concentration and can be measured photometrically.(Package insert: IRON2. Roche Diagnostics; V9.0, 09/2019)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

Same day/1 to 2 days

Specimen Retention Time

7 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

Fees & 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 account representative. For assistance, contact Customer Service.

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

83540-Iron

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
IRON	Iron	2498-4

Result ID	Test Result Name	Result LOINC® Value
IRON	Iron	2498-4