

<h1>Iron Studies</h1>	
<b>Description</b>	Includes: iron, transferrin, total iron binding capacity (TIBC) and the calculation of transferrin saturation.
<b>Indication</b>	Diagnosis of iron deficiency or iron overload.
<b>Additional Info</b>	<p>Iron is an essential element. It is found in haem, a component of haemoglobin, myoglobin and cytochromes. Iron is transported in the blood bound to transferrin, which is synthesised by the liver. In tissues stores iron is bound to ferritin (soluble) or hemosiderin (insoluble). Serum iron only accounts for ~1% of the total body iron and levels fluctuate widely in healthy individuals. Therefore, it is not a good test of iron deficiency and is only of value in diagnosing iron overload.</p> <p>TIBC is the total amount of iron that can be bound by proteins in the blood. Since the primary iron-binding protein is transferrin, the TIBC is an indirect measurement of transferrin concentration.</p> <p>The transferrin saturation is calculated from the serum iron concentration and the TIBC:  <math display="block">\% \text{ Saturation} = (\text{Serum Iron} / \text{TIBC}) \times 100</math></p>
<b>Concurrent Tests</b>	Ferritin Full blood count (FBC)
<b>Dietary Requirements</b>	n/a
<b>Interpretation</b>	<p><u>Iron deficiency.</u> Raised transferrin/TIBC with a low transferrin saturation is indicative of iron deficiency. Serum ferritin is a better indicator of iron deficiency (see ferritin entry). Transferrin is also raised in pregnancy, oestrogen replacement therapy and with the oral contraceptive pill.</p> <p><u>Iron overload.</u> Raised serum iron and transferrin saturation is indicative of iron overload. Transferrin/TIBC is low in chronic iron overload (haemochromatosis, haemolytic anaemia), but may be low/normal in acute iron overload (poisoning). Transferrin is a negative acute phase response protein, so levels may also be decreased in inflammatory conditions. Levels also reflect nutritional status and synthetic capacity of the liver. Therefore levels may be decreased in liver disease, poor nutritional states and nephrotic syndrome.</p> <p>Recent blood transfusions can affect results.</p>
<b>Collection Conditions</b>	N/A

<b>Frequency of testing</b>	As required. Use FBC to monitor iron replacement. Use ferritin to monitor chelation therapy for iron overload.
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