

Anaemia Investigations

Complete Blood Examination

- **Haemoglobin:** The amount of haemoglobin present is the basis for anaemia diagnosis.
- **Mean Cell Volume (MCV):** The size of the cells. May be micro-, normo- or macrocytic
- **Mean Cell Haemoglobin (MCHC):** The amount of haemoglobin in each cell.
- **Red Cell Distribution Width (RDW):** The range of sizes of erythrocytes in the circulation. This increases if large numbers of reticulocytes are being released into the blood stream.

Mean Cell Volume In Anaemia

Microcytic	Normocytic	Macrocytic
Iron Deficiency	Haemolysis	Megaloblastic
Anaemia of Chronic Disease		Alcohol Abuse
Thalassaemia	Acute blood loss	Liver Disease
Sickle Cell Disease	Renal Failure	Marrow Infiltrate
Sideroblastic	Bone Marrow failure	Antifolate Drugs
Hypothyroidism		
Pregnancy		

Iron Studies

When a patient has low Haemoglobin, and their MCV shows a microcytic picture, Iron Studies can assist in distinguishing the different causes.

- **Serum Iron:** The amount of Iron present
- **Serum Ferritin:** Ferritin is a storage complex for iron, and indicates the levels of stored iron.
- **Serum Transferrin:** A transporter protein for iron, transferrin increases when iron levels drop.
- **Transferrin Saturation %:** How much iron the transferrin is actually transporting.

Condition	Serum Iron	Serum Ferritin	Serum Transferrin	Transferrin Sat. %
Normal	N	N	N	N
Iron Deficiency	Low	Low	N/Elevated	Low
Anaemia of Chronic Disease	Low	N/Elevated	N/Low	Low
Thalassaemia	N/Elevated	N/Elevated	N	N/Elevated

Iron Studies are most useful for microcytic anaemias. If the patient is normocytic or macrocytic, the clinical picture is often helpful in guiding further investigation (LFTs, TFTs, Vitamin B12 and Folate levels, etc.).