

## Iron deficiency anemia

**Iron deficiency anemia** is a common type of anemia, a condition in which blood lacks adequate healthy red blood cells. Red blood cells carry oxygen to the body's tissues.

As the name implies, iron deficiency anemia is due to insufficient iron. Without enough iron, body can't produce enough hemoglobin in red blood cells that enables them to carry oxygen.

You can usually correct iron deficiency anemia with iron supplementation. Sometimes additional tests or treatments for iron deficiency anemia are necessary, especially if your doctor suspects that you're bleeding internally.

People with mild or moderate iron-deficiency anemia may not have any symptoms. More serious iron-deficiency anemia may cause common symptoms of anemia, such as tiredness, shortness of breath, or chest pain. Other symptoms include:

- Fatigue
- Dizziness or lightheadedness
- Cold hands and feet
- Pale skin

### Diagnosis

#### Complete blood count (CBC) test

A complete blood count (CBC) is usually the first test a doctor will use. A CBC measures the amount of cellular or cell-related components in the blood, including:

- red blood cells (RBCs)
- white blood cells (WBCs)
- hemoglobin
- hematocrit
- platelets

A CBC provides information about blood that's helpful in diagnosing iron-deficiency anemia. This information includes:

- the hematocrit level
- the hemoglobin level
- the size of your RBCs

Normal hematocrit range	Normal hemoglobin range	
Adult women	34.9 to 44.5 percent	12.0 to 15.5 grams per deciliter
Adult men	38.8 to 50 percent	13.5 to 17.5 grams per deciliter

In iron-deficiency anemia, the hematocrit and hemoglobin levels are low. Also, RBCs are usually smaller in size than normal.

A CBC test is often performed as part of a routine physical examination. It's a good indicator of a person's overall health. It may also be performed routinely before a surgery. This test is useful to diagnose this type of anemia because most people who have an iron deficiency don't realize it.

### Other tests

Anemia can usually be confirmed with a CBC test. The doctor might order additional blood tests to determine how severe the anemia is and help determine treatments. We may also examine the blood through a microscope (Blood picture). These blood tests will provide information, including:

- Iron level in the blood
- RBC size and color (RBCs are pale if they're deficient in iron)
- Ferritin level
- Total iron-binding capacity (TIBC)

**Ferritin** is a protein that helps with iron storage in the body. Low levels of ferritin indicate low iron storage. A TIBC test is used to reflect the amount of transferrin that's carrying iron. Transferrin is a protein that transports iron.

## Healthy and Low Iron Studies in Adults

<b>Iron, <math>\mu\text{mol/L}</math></b>	Normal	10 to 30
	Iron-deficiency anemia	Less than 10
<b>Ferritin, <math>\mu\text{g/L}</math></b>	Normal	Men 40 to 300 Women 20 to 200
	Iron-deficiency anemia	Less than 10

**TABLE 1. Laboratory findings in ACD and combined iron deficiency anemia and anaemia of chronic disease (IDA and ACD)<sup>[3]</sup>**

Laboratory test	IDA	ACD	IDA and ACD
<b>Haematology</b>			
MCV	↓	↓ or normal	↓ or normal
MCH	↓	↓ or normal	↓ or normal
Bone marrow iron stores	↓	↑	↓ or normal
CHr (pg)	<28	≥28	<28
Hypochromic red blood cells (%)	>5	<5	>5
<b>Biochemistry</b>			
Iron	↓	↓	↓
Transferrin	↑	↓ or normal	↓
Transferrin saturation	↓	↓	↓
Ferritin	↓	↑	↓ or normal
sTfR	↑	Normal	Normal or ↑
sTfR-ferritin index	High (>2)	↓	High (>2)
Zinc protoporphyrin	↑	Normal	Normal or ↑
CRP	Normal	↑	↑
Hepcidin	↓	↑	↑

MCV = mean cell volume; MCH = mean cell haemoglobin; sTfR = soluble transferrin receptor; CRP = C-reactive protein.

