

## Iron Deficiency Anemia

Iron deficiency anemia accounts for more than half of anemia cases worldwide. It is typically caused by malnutrition (decreased ingestion of meat, eggs, iron-fortified foods and leafy greens), as well as malabsorption (IBD, parasitism, celiac disease). Hemorrhage is another reason for this type of anemia, which may be caused by heavy menstruation, parasitism, malignancy or ulceration. This is a microcytic, hypochromic anemia which is caused by decreased heme synthesis. Labs typically show decreased reticulocytes, and decreased ferritin, which is an iron-storing protein. There is also an increased red cell distribution width, which helps distinguish iron deficiency anemia from thalassemia.



PLAY PICMONIC

### Causes

#### Malnutrition/Malabsorption

##### [Nutritional-plate-mallet/Intestine-mallet](#)

The most common global cause of iron deficiency anemia is malnutrition or malabsorption. Meat, eggs and leafy-greens describe the types of foods containing iron, which are necessary to prevent anemia. Malabsorption due to parasitism, celiac disease or inflammatory bowel disease may lead to decreased iron absorption. Because dietary iron requires gastric acid to be absorbed, certain bariatric surgeries that reduce available acid may cause an iron deficiency anemia.

#### Hemorrhage

##### [Hemorrhage-hammer](#)

Hemorrhage is a cause of iron-deficient anemia, due to the amount of iron contained in the blood. Menorrhagia (increased blood loss during menstruation), colorectal cancers, and ulcers are other common causes of blood loss that may lead to iron deficiency anemia. Intestinal parasites may also contribute to hemorrhage. Patients IDE stemming from hemorrhage actually have an increased reticulocyte count.

### Signs

#### Microcytic, Hypochromic Anemia

##### [Small-cells with Hippo-chrome and Anemone](#)

Lab results in patient with iron deficiency anemia show a microcytic, hypochromic anemia. This means that the mean corpuscular volume is less than 80 (MCV <80) and that the cells are paler than usual. Typically the cells have central pallor.

#### Decreased Heme Synthesis

##### [Down-arrow He-man](#)

As the body's stores of iron are depleted, a CBC blood test will show a decreased RBC count. This occurs because there is not enough iron to properly complete the final step in heme synthesis.

### Labs

### **Decreased Reticulocytes**

[Down-arrow Rattle with Baby-cell](#)

Reticulocytes are immature blood cells, which are a small component of the blood cells that develop and mature in the bone marrow. The reticulocyte count is decreased in iron-deficient anemia as hematopoiesis is interrupted due to the lack of iron, which is essential for hemoglobin synthesis. It should be noted that with hemorrhage, reticulocyte count is actually increased.

### **Decreased Ferritin**

[Down-arrow Ferret-tin](#)

Ferritin is a protein which stores iron. For lab purposes, it is an important indicator for how much stored iron is present. Thus in iron deficient anemia, ferritin levels are decreased.

### **Increased Red Cell Distribution Width (RDW)**

[Up-arrow Red Cell Projectile Width](#)

The red cell distribution width (RDW) measures the variation of blood cell volume in an obtained sample. Varying sizes of blood cells is a hallmark of iron deficiency anemia and helps distinguish between this disease and thalassemia (as both are hypochromic and microcytic).

### **Poikilocytosis**

[Pokiball-side-toe cell](#)

Blood smears in these patients show a variation in blood cell shape (poikilocytosis).

### **Anisocytosis**

[N-ice-side-toe cell](#)

Patients with iron deficiency anemia show blood cells of differing sizes (anisocytosis).

### **Increased Central Pallor**

[Up-arrow Pail with Central Pallor](#)

Red blood cells in iron deficiency anemia show pallor on the inside of cells.