

## Anemia

### Types of Anemia:

- Iron deficient (most common)
- B12 deficient (primarily geriatric patients)
- Folic Acid Deficient (common in alcoholics)
- Sickle cell (genetic)
- Chronic disease (Chronic Kidney Disease, HIV/AIDS)

### Signs/Symptoms of Anemia

- Acute: tachycardia (rapid heart beat), light headedness, shortness of breath, lethargy
- Chronic: headache, weakness, vertigo, faintness, pale skin

### Bloodwork and Iron Labs:

**HGB** – a value less than the normal range is considered anemia

- Male range 13.5 – 17.5 g/dL
- Female range 12 – 15.5 g/dL

**HCT** – a measure of the percentage of blood volume made up by RBCs

- Male range 38 – 50%
- Female range 35 – 46%

**Serum Iron** – amount of circulating iron bound to transferrin

- Male range 55 – 160 mcg/dL
- Female range 40 – 155 mcg/dL

**Total iron binding capacity (TIBC)**

- Normal range is 20 – 40%

**Transferring saturation (Tsat)**- serum iron/TIBC x 100%

- 25 – 35%

**Ferritin** – measurement of iron stored in the body

- Male range 20 – 500ng/mL
- Female range 20 – 200ng/mL

**Mean corpuscular volume (MCV)** – the average volume of red blood cells

- Adult range 80 – 96 fL/cell









**Mean corpuscular hemoglobin (MCH)** – the average amount of hemoglobin inside a RBC

- Adult range 27 – 33pg/cell

**Mean corpuscular hemoglobin concentration (MCHC)** – the average concentration of hemoglobin inside a RBC

- Adult range 33 – 36g/dL

## Type Identification

	Iron Deficiency	B12 Deficiency Pernicious Anaemia	Anaemia of Chronic Disease
RBC Size	 Microcytic	Macrocytic	Normocytic
MCV (82-99)	 Decreased ↓	Increased ↑	Normal
MCH (27-32)	 Low ↓	Normal or High ↑	Normal
TIBC	 High ↑	Normal	Normal or Low
Ferritin (10-291)	 Low ↓	High ↑	Normal or High ↑
B12 (130-700)	Normal	 Low ↓	Normal
Folate (200-650)	Normal	Normal	Normal
RBC (4-5)	 Low	Low	Low
Hb (12-16)	 Low	Low	Low

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## REFERENCES

<https://www.clinicalkey.com/pharmacology/search/tov>

<http://www.hematology.org/Patients/>

<https://www.kidney.org/atoz/content/about-chronic-kidney-disease>

<https://www.mayoclinic.org/diseases-conditions/anemia/symptoms-causes/syc-20351360>

<http://www.nationalkidneycenter.org/chronic-kidney-disease/stages/>

## Treatment

Treatments can range depending on type and severity

- Iron supplementation
- B12 supplementation
- Folate supplementation
- Blood transfusion
- Treat underlying cause
- Be sure to separate iron supplements from antacids and calcium by 4 hours
- Take iron on an empty stomach if possible
- Take iron with Vitamin C to increase absorption

# Show What You Know

## Anemia Quiz

1) True or False

A within normal hemoglobin (Hgb) range for women is a range of 12 to 15.5 g/dL?

2) True or False

Vitamin C helps with the absorption of iron supplementation.

3) True or False

An elevated MVC (Mean Corpuscular Volume) could indicate a B12 deficiency

4) True or False

Folate deficiency is a type of anemia?

## Quiz Answers- How Did You Do?

1. True
2. True
3. True
4. True