

# Anemia

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**Suspected Anemia - First rule out acute bleeding.**

## Complete Blood Count (CBC)

**Isolated**

**Other Cytopenias**

•Separate differential

### Mean Corpuscular Vol (MCV)

**Microcytic**  
<80

Compromised production of hemoglobin.

**Normocytic**  
80 - 100

Global Issue: Either dysfunctional signal to produce RBCs, or issues with the bone marrow.

**Macrocytic**  
>100

Interference with cell division.

### Reticulocyte Count

normal = 0.5-2.0%

**Low Reticulocytes <2%**

Inadequate bone marrow response

•Also consider with: 'Abnormally Normal' reticulocyte count

**High reticulocytes >3%**

Increased loss or destruction of red blood cells

### Rate of Onset

e.g.: B12 deficiency develops over a long time course, (years).

### ALSO CONSIDER:

### Age of Patient

e.g.: Myeloma is low on differential in a 25-year-old. Heavy menses as a cause of iron deficiency anemia is low on differential in a post-menopausal woman.

### Microcytic: Iron Deficiency Anemia

Most common cause of anemia worldwide!

Other Causes:Thalassemias, Lead poisoning, and Isoniazid

### Labs

Iron

Iron Binding

Ferritin

### Causes:

- Chronic Bleeding
- GI: peptic ulcers, colon cancer, diverticulosis, IBD, Celiac Disease, bariatric surgery
- GU: heavy menstrual or uterine bleeding
- Malabsorption: IBD, Celiac Disease, Bariatric surgery

### Treatment:

- Determined by the acuity:
  - Malabsorption or acute Iron Deficiency:
    - IV iron supplementation
  - Otherwise:
    - PO iron supplementation
    - QD or BID. If no improvement, begin IV iron

\*PO TID iron is not recommended due to increased side effects: constipation, diarrhea, abdominal pain.

### Macrocytic Anemia Differential:

- Nutritional deficiencies: B12 or folate
  - Common causes: Crohn's Disease and Pernicious Anemia
- Alcohol use (rare)
- Medication toxicities (e.g. methotrexate)
- Myelodysplastic syndromes (MDS)

### Nutritional deficiencies: B12 or Folate:

#### Low B12:

Low intake due to diet (i.e. vegan diet)  
PMHx: Celiac Disease or Crohn's Disease  
PE: Neurologic symptoms only with B12

- B12 Levels
  - B12 levels can be misinterpreted.
  - The normal range overlaps with true deficiency
- Interpretation:

- **>350:** unlikely B12 deficiency.
- **200-350:** get methylmalonic acid (MMA)
  - If elevated = B12 deficiency.
- **<200:** no MMA levels are needed.

#### Low Folate:

- In the USA, deficiency is rare.
- Causes:
  - EtOH
  - anti-epileptic drugs
  - bariatric surgery

### Clinical Pearls



- Women's Health: Quantify menses directly
  - Ask: How many days of menses? How many pads or tampons? How frequently are pads/tampons needing to be changed?
- Blood smear can be helpful to visually confirm the diagnosis.