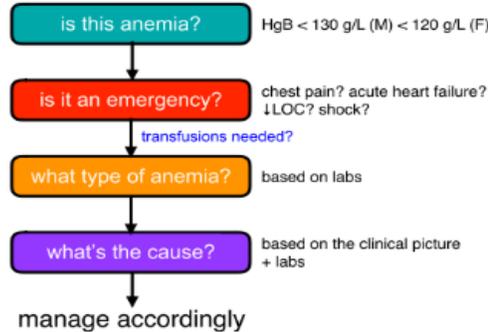


Anemia: primarily defined by having low Hb or hct
 → classified mainly based on RBC size (indicated by MCV)

Why anemia matters:

- S/S of anemia
- CHF, CV events, atrial fibrillation
- Falls: 22% ↑ fall risk for every 10 g/L in ↓ in Hb in hospitalized pts
- Mortality

Approach to anemia



Drug-related causes:

- RBC synthesis inhibition: myelosuppressives
- Vitamin/mineral absorption/metabolism interference
 - Iron: Al/Mg antacids, quinolones, tetracyclines, PPIs/H2RAs
 - B12: PPIs, metformin
 - Folate: MTX, TMP, PHT, EtOH
- Hemolysis: β-lactams, HCTZ, rifampin, quinidine, sulfonamides, APAP, insulin, NSAIDs, isoniazid

Transfusions:

- Transfuse when pt needs a transfusion (case by case)
 → Misconception to transfuse when Hb < a certain level
- Transfusions are not for volume replacement, only for acute/chronic anemia
- One unit of RBC LR SAGM added increases Hb by 10 g/L

Iron Deficiency Anemia

Parameter	Finding	
HgB	↓	low = anemia
MCV	↓	low = microcytic
RDW	↑ / --	
Ferritin	↓	<40 = most sensitive & specific test for IDA
TIBC/transferrin	↑	
Serum Fe	-- / ↓	mostly normal
"% saturation" / "transferrin index" / "transferrin saturation"	↓	

Therapy:

- Transfusion?
- Replace deficiency: 150-200 mg/d
 → PO therapy almost always preferred to parenteral
- Address underlying cause
- Maintenance: 1-2 mg/kg/d if needed
- Pregnancy: 30 mg/d supplement beginning at first prenatal visit

Fe dosing tips:

- Absorbed from duodenum & proximal jejunum, so EC or SR caps (release iron further down GIT) are not useful
- Don't give w/ food: phosphates, phytates & tannates in food bind Fe and ↓absorption
- Give 2 h before or 4 h after antacids
- Think about PPIs, H2RAs
- N/V/dyspepsia: ↓dose, split doses, take w/ food
- Constipation: ↑ fluids, add docusate/fiber, ↓ Fe dose
- Add ascorbic acid?
- AEs correlated with dose of elemental Fe (not salt)
- Heme-bound iron absorbed better but very expensive way to treat iron deficiency anemia

When to use parenteral iron:

- Non-response or intolerance to PO Fe
- Severe Fe deficiency and hospitalized
- Severe ongoing bleeding
- TPN
- Some dialysis patients on EPO

Monitoring:

- Hb & retics: 1-2 wk after starting PO Fe
- Hb: monthly until normalized
- Duration:
 - a. Stop Fe when Hb normal
 - b. Continue Fe x 6 mo after normal Hb
 - c. Continue Fe indefinitely if underlying cause irreversible

Folate deficiency anemia

Parameter	Finding
HgB	↓
MCV	↑
RDW	↑
Ferritin	--
TIBC/transferrin	--
Serum Fe	--
"% saturation" / "transferrin index" / "transferrin saturation"	--

macrocytic

SERUM FOLATE and/or RBC Folate ↓ RBC folate =
serum folate fluctuates by more sensitive
day, meals, etc

Therapy:

- Transfusion?
- Give folic acid (RDI = 100 mcg/d)
 - 1-5 mg PO daily x 1-4 mo, or until Hb normal
- Correct underlying cause or continue supplementing
 - Folate-rich foods: green, OJ, cereals, flour, milk, bananas, strawberries
- NEVER INITIATE FOLATE WITHOUT KNOWING B12
 - May correct anemia, but won't prevent irreversible neurological complications of B12 deficiency

Causes:

- Diet: overcooked, lack of veggies, alcoholism
- Drugs
- Malabsorption: IBD, Sprue (celiac), short bowel

Monitoring:

- Hb & retics: 1-2 weeks after starting folate
 - Monthly thereafter until Hb plateaus
- q2 monthly after stopping folate, until Hb stable

B12 deficiency anemia

Parameter	Finding
HgB	↓
MCV	↑
RDW	↑
Ferritin	--
TIBC/transferrin	--
Serum Fe	--
"% saturation" / "transferrin index" / "transferrin saturation"	--

SERUM B12 ↓, Schilling's test +, anti-IF antibody +

- Schilling's: specific test for pernicious anemia (uncommon cause of B12 deficiency)
- anti-IF antibody (causes pernicious anemia) also tests for this

Causes:

- Diet: strict vegan, alcoholism
- Drugs: metformin, chronic PPIs
- Malabsorption: gastritis, pancreatic insufficiency, IBD, short bowel, pernicious anemia, H. pylori

Therapy:

- Transfusion?
- B12 (cyanocobalamin) – RDI = 3 mcg/d
 - IM: B12 1 mg daily x 7 days, 1 mg weekly x 4 wk, then 1 mg monthly
 - PO: immediately or after initial parenteral replacement
 - 2 mg B12 PO indefinitely
 - 1 mg B12 PO daily x 10 days, then weekly x 4 weeks, then monthly indefinitely

Monitoring:

- Hb & retics: 1-2 wk after starting B12
 - Monthly thereafter until Hb plateaus
- q2 monthly after stopping B12, until Hb stable
 - In PA, once on stable regimen & stable Hb, only infrequent monitoring required (Hb q6 monthly)

Consequences:

- Neurologic: spinal degeneration → leg neuropathy → weakness, spasticity, paraplegia
- Neuropsych: memory loss, irritability, dementia

Anemia of chronic disease:

Hb: ↓
MCV: -- / ↓
TIBC/transferrin: ↓
Serum Fe: ↓ related to pathophys

Blood loss anemia:

Hb ↓
MCV ↑ retics after trauma (huge)
RDW ↑ mix of RBCs before trauma + retics
retics ↑ retic'ing because of blood loss