

HIGH-YIELD HEMATOLOGY- ONCOLOGY NOTES

FOR USMLE STEP 1 AND STEP 2

By
Dr. Yesheswani Illuri



High-Yield Notes for USMLE Step 1 & Step 2 CK

STEP 1 - PATHOPHYSIOLOGY & BASIC SCIENCE

ANEMIAS - MICROCYTIC (MCV <80)

- Fatigue + Pica (ice craving) + Koilonychia (spoon nails) + ↓ Iron + ↓ Ferritin + ↑ TIBC → Iron deficiency anemia
- Causes: Chronic GI bleed (most common in men/elderly), Menorrhagia (most common in premenopausal women), Pregnancy, Celiac disease

DEAR IMG

- Labs: ↓ Iron, ↓ Ferritin, ↑ TIBC, ↓ % saturation, Microcytic hypochromic RBCs with ↑ central pallor
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- Chronic disease + Normal/↑ Ferritin + ↓ TIBC → Anemia of chronic disease
- Inflammation → ↑ Hepcidin → ↓ Iron release from macrophages → Can be microcytic or normocytic
- Labs: ↓ Iron, Normal/↑ Ferritin, ↓ TIBC, ↓ % saturation
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- Ringed sideroblasts in bone marrow + ↑ Iron + ↑ Ferritin → Sideroblastic anemia

- Causes: Lead poisoning (also basophilic stippling), Alcohol, Isoniazid, Pyridoxine (B6) deficiency, Copper deficiency, Congenital (X-linked)
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- Mediterranean descent + Target cells + \uparrow HbA2 on electrophoresis \rightarrow β -Thalassemia minor
- β -Thalassemia major \rightarrow Severe anemia at 6 months (when HbF declines) + Bone deformities + Hepatosplenomegaly + Transfusion-dependent
- α -Thalassemia \rightarrow 4 gene deletions (Hydrops fetalis, fatal) vs 3 deletions

(HbH disease) vs 1-2 deletions
(asymptomatic/mild)

ANEMIAS - MACROCYTIC (MCV >100)

- Fatigue + Glossitis + Neurologic symptoms (paresthesias, ataxia) + \uparrow MCV + Hypersegmented neutrophils \rightarrow B12 deficiency
- B12 deficiency causes: Pernicious anemia (anti-IF antibodies), Gastric bypass, Crohn disease (terminal ileum), *Diphyllobothrium latum* (fish tapeworm), Strict vegan

- Labs: ↓ B12, ↑ Homocysteine, ↑ Methylmalonic acid (MMA)
- Treatment: IM or high-dose oral B12
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- Alcoholic + Poor diet + ↑ MCV + Hypersegmented neutrophils + NO neurologic symptoms → Folate deficiency
- Folate deficiency causes: Alcoholism (most common), Pregnancy, Phenytoin, Methotrexate, Trimethoprim
- Labs: ↓ Folate, ↑ Homocysteine, Normal MMA (differentiates from B12 deficiency)

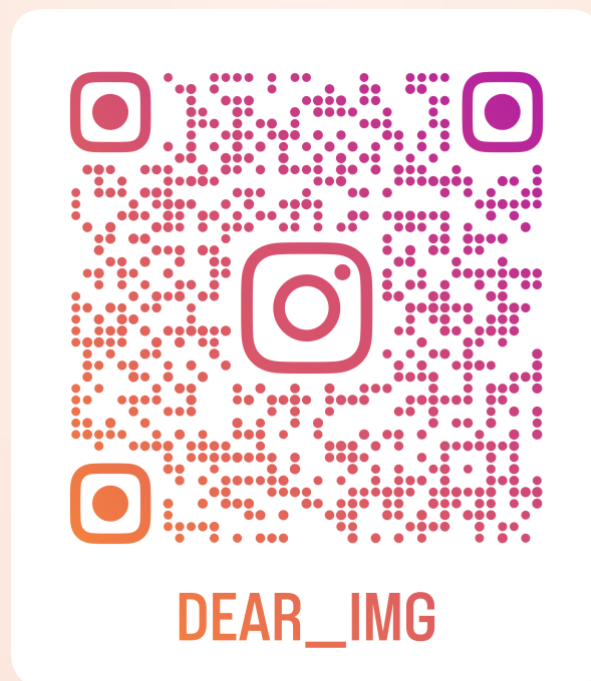
- NEVER give folate alone if B12 deficiency possible → Can worsen neurologic symptoms
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- Child + Fatigue + Recurrent infections + Bleeding + Pancytopenia + Hypocellular bone marrow → Aplastic anemia
- Causes: Fanconi anemia (DNA repair defect), Drugs (Chloramphenicol, Benzene, NSAIDs), Radiation, Viral (Parvovirus B19, EBV, HIV, Hepatitis), Idiopathic

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