

Nutritional anemia	Etiology	Presentation	Lab evaluation	Treatment
Iron deficiency	<i>Blood loss</i> , physio stress (growth, preg, lactation), dietary	Asymp, gi or bleeding (underlying), glossitis, angular cheilitis, esophag webs, koilonychia, blue sclera, pica	CBC: micro, hypochrom, hi RDW Serum Fe/TIBC < 10% Serum ferritin < 12 Marrow aspirate (gold standard)	Oral/parenteral replacement Treat underlying condition
B-12 deficiency	Dietary, gastric acid/pepsin, IF (pernicious anemia), ileal receptors, bacterial/parasitic competition for B-12, B-12 inactiv by NO	Glossitis, neuropsych, peripheral neuropathy, dorsal column involv	Serum homocysteine & methylmalonic acid Schilling test: < 8% (IF, abx, pancreatic extract) CBC: anisocyt, poikilocyt, poly hyperseg, mild leuko/thrombopenia Marrow hyperplasia	Parenteral replacement Do not treat w/ folic acid alone
Folic acid deficiency	<i>Dietary</i> , intestinal malabsorption, drugs (ethanol, sulfa)	Glossitis	Serum homocysteine Folic acid level highly sensitive to intake	Oral replacement Prophylaxis (preg, chronic hemolysis)

Congenital hemolytic anemia	Genetics	Defect	Features	Presentation	RBC	Treatment
Hereditary spherocytosis & elliptocytosis	Auto dom	Sphero: vertical interactions Ellipto: horizontal interactions (spectrin only)	Intrinsic Extravascular	Mild anemia, jaundice, pigment gallstones, splenomeg, leg ulcers	Polychrom, rigid spherocytes Osmotic frag test (not diagnostic)	Splenectomy (severe)
G6PD deficiency	X-linked	Unable to produce reduced glutathione	Intrinsic & extrinsic Primarily extravascular Malaria hyp	Self-limited Measurement of G6PD after attack may yield false neg	Heinz bodies, bite cells X lization	Avoid oxidative stress
PK deficiency	Auto rec	Glycolytic pathway	Intrinsic Extravascular	Chronic hemolysis	Poikilocytosis, no spherocytes, cell dehydration, incr 2,3-DPG	Splenectomy (severe)
Thal trait		Alpha/beta chain imbalance	No hemolysis Malaria hyp	Asymptomatic	Microcytic	
Beta-thal		Ineffective erythropoiesis	HbA2, HbF Malaria hyp	Profound, transfusion-dependent anemia	Micro, hypochr, poikilocytosis Destruction of alpha tetramers in marrow	Allo stem cell transplant, hydroxyurea (reactivation of HbF)
Alpha-thal		Impairment of ¾ alpha globin genes	HbH Malaria hyp		Heinz bodies	Splenectomy
Hemoglobin bart's		Impairment of ¾ alpha globin genes	Gamma-globin tetramers Malaria hyp	Hydrops fetalis, intrauterine death		
Sickle cell	SS	Impaired beta globin gene	Intravascular Malaria hyp	Painful crisis, organ dysfunction, bone infarct, stroke, acute chest syndrome, cutaneous ulcers, autosplenectomy	Howell-jolly bodies	Abx prophyl, hydration, exchange transfusion, allo stem cell transplant, hydroxyurea
	SC	Same	Same	Retinopathy, splenic sequestration crisis	Cell dehydration	