

**Unit 7: Hematology**  
**Chapter 29 & 30: Hall**  
**ONLINE CONTENT (1.5 H)**

**Complete the worksheet and submit in the Unit 7: Hematology dropbox by March 20, 2023 at 0800. Please be sure to bring a copy to class on March 20, 2023.**

Table 1	<b>Iron Deficiency Anemia</b>	<b>Thalassemia</b>	<b>Cobalamin (Vitamin B<sub>12</sub>) Deficiency</b>	<b>Folic Acid Deficiency</b>
<b>Etiology</b>	Inadequate dietary intake, malabsorption, blood loss or hemolysis Inadequate amount for menstruating or pregnant women	Group of disease involving ↓ production of normal Hbg Absent or ↓ globulin protein. A-globin → α-thalassemia B-globin → β-thalassemia Genetic link: autosomal	Most common cause: pernicious anemia Absence of IF Begins middle age or later (after 40) with 60 years most common. Northern European & African Americans Body is either not getting enough or not absorbing enough vitamin B12	Inadequate folic acid Causes megaloblastic anemia
<b>Clinical Manifestations</b>	Early: no symptoms Chronic: Pallor (most common), Glossitis (inflammation of the tongue), cheilitis (inflammation of the lips), headache, parathesis, burning sensation of the tongue	Minor asymptomatic Major: Life-threatening disease: growth, physical & mental slowed; pale, symptoms of anemia. Develop in kids 2 years old Jaundice Splenomegaly Hepatomegaly Cardiomyopathy	GI: sore, red, beefy, shiny tongue, anorexia, N/V, abdominal pain Neuromuscular: weakness, paresthesia hands & feet, ataxia, impaired thought process	Attributed to coexisting problems (cirrhosis & esophageal varices) GI: Stomatitis, cheilosis, dysphagia, flatulence & diarrhea Thiamine deficiency Neurologic symptoms
<b>Diagnostic Studies</b>	Stool occult blood Endoscopy Colonoscopy Bone marrow biopsy Hgb, Hct, Bilirubin, RBC, serum iron, serum ferritin, serum transferrin, TIBC	Labs: Hgb, Hct, Bilirubin, RBC, serum iron, serum ferritin, serum transferrin, TIBC, folate	Labs: Hgb, Hct, Bilirubin, RBC, serum iron, serum ferritin, serum transferrin, TIBC, folate Endoscopy Biopsy	Labs: Hgb, Hct, Bilirubin, RBC, serum iron, serum ferritin, serum transferrin, TIBC, folate Low folate level & normal serum cobalamin level
<b>Drug Therapy</b>	Oral: Ferrous sulfate or ferrous gluconate IM or IV: Iron dextran, sodium ferrous gluconate & iron sucrose	No specific drugs are effective in treating. Major: Oral deferasiroz, deferiprone IV: Deferoxamine	Parenteral Vitamin b12 or intranasal cyanocobalamin Cobalamin IM or oral	Folic acid: 1 mg/day oral Malabsorption & chronic alcoholism: 5 mg/day
<b>Nursing Management</b>	Treat underlying cause Nutritional therapy Iron supplements Transfusion packed RBC's	Minor: No treatment Major: Blood transfusions	Assess neurologic difficulties. Fall risk	Teach foods high in folic acid

Table 2	<b>Anemia of Chronic Disease</b>	<b>Aplastic Anemia</b>	<b>Acute Anemia due to blood loss</b>	<b>Chronic Anemia due to blood loss</b>
<b>Etiology</b>	Caused by cancer, autoimmune & infectious disorders, HF or chronic inflammation. Underproduction of RBC & mild shortening of RBC survival Diversion of iron from circulation	Peripheral blood pancytopenia (↓ of all blood cell types) Hypocellular bone marrow 70% due to autoimmune activity by autoreactive T lymphocytes Body attacks its own stem cells	Sudden hemorrhage Trauma, complications of surgery & conditions that disrupt vascular integrity	Bleeding ulcer, hemorrhoids, menstrual & postmenopausal blood loss Related to the depletion of iron stores
<b>Clinical Manifestations</b>	High serum ferritin & increase iron stores. Normal folate & cobalamin blood levels	Abruptly over days or insidiously over weeks to months Mild to severe Fatigue, dyspnea, cardiovascular & cerebral response	Hypovolemic shock Lactic acidosis Rapid thready pulse Cool clammy skin	Pallor, Glossitis (inflammation of the tongue), cheilitis (inflammation of the lips), headache, parathesis, burning sensation of the tongue
<b>Diagnostic Studies</b>	Labs: Hgb, Hct, Bilirubin, RBC, serum iron, serum ferritin, serum transferrin, TIBC, folate	Labs: RBC, WBC, platelets, reticulocyte, Hgb, Hct, Bilirubin, serum iron, serum ferritin, serum transferrin, TIBC, folate Bone marrow biopsy	Labs: RBC, WBC, platelets, Hgb & Hct	Stool occult blood Endoscopy Colonoscopy Bone marrow biopsy Labs: Hgb, Hct, Bilirubin, RBC, serum iron, serum ferritin, serum transferrin, TIBC
<b>Drug Therapy</b>	Erythropoietin for anemia r/t renal disease	Erythropoietin for anemia r/t renal disease Steroids Immunosupportive therapy	IV fluids: Dextran, hetastarch, albumin, crystalloids electrolyte solutions (LR),	Iron supplement
<b>Nursing Management</b>	Severe anemia: Blood transfusions Correct underlying cause.	Blood transfusions Removing causative agent & providing supportive care	Replace blood volume. Find source of hemorrhage Monitor blood loss	Identify the source & stop the bleeding

Table 3	Acquired Hemolytic Anemia	Hemochromatosis	Polycythemia
<b>Etiology</b>	Physical destruction Antibody reactions Infectious agents & toxins	Iron overload disorder Genetic defect most common Can be caused by liver disease & chronic blood transfusions. May exceed total iron concentration of 50 g normal range is 40 mg/kg in women	Production & presence of ↑ RBC's 2 types; Primary polycythemia & secondary polycythemia Primary: Chronic myeloproliferative disorder, involves RBC, Wbc & platelets with an ↑ production in all, associated with genetic link: Janus Kinase 2 gene Secondary: Hypoxia driven or hypoxia independent
<b>Clinical Manifestations</b>	Weakness, paleness, jaundice, dark-colored urine, fever, and inability to do physical activity.	Don't develop until after 40 men & 50 in women. Early: Nonspecific; fatigue, arthralgia, impotence, abdominal pain & weight loss Later: Liver enlargement & eventually liver cirrhosis, diabetes, skin pigment changes (bronzing), heart problems (cardiomyopathy), arthritis & testicular atrophy	1 <sup>st</sup> : Headache, vertigo, dizziness, tinnitus & visual changes, generalized pruritus. Later: Parathesis, erythromelalgia, angina, HF, intermittent claudication, petechiae, bruising, nosebleed, GI bleed & thrombosis
<b>Diagnostic Studies</b>	Labs: Hgb, Hct, Bilirubin, RBC, serum iron, serum ferritin, serum transferrin, TIBC, folate	Labs: Hgb, Hct, Bilirubin, RBC, serum iron (high), serum ferritin (high), serum transferrin, TIBC (high) & folate Liver biopsy	Primary: High hgb, & RBC with microcytosis, low to normal EPO level, high WBC with basophilia & neutrophilia, high platelet count & platelet dysfunction, high leukocyte alkaline phosphatase, uric acid & cobalamin levels, high histamine levels; Bone marrow exam Secondary: High level of EPO
<b>Drug Therapy</b>	Corticosteroids Folate replacement Glucocorticoids Rituximab	Deferoxamine IV or SQ Deferasirox & deferiprone oral	Low dose aspirin Allopurinol Myelosuppressive agents such as hydroxyurea, busulfan & chlorambucil. Ruxolitinib
<b>Nursing Management</b>	General support until causative agent can be eliminated or at least made less injurious. Aggressive hydration Electrolyte replacement Blood products	Goal: Remove excess iron from body & minimize symptoms Iron removal: 500 ml of blood each week for 2 to 3 years Dietary changes: avoiding vitamin C and iron supplements, uncooked seafood & iron rich foods	Treatment geared toward reducing blood volume & viscosity & bone marrow activity. Phlebotomy to reduce hct Assess I & O's & nutritional status. Teach about medication side effects