Unit 7: Hematology
Chapter 33 & 34
ONLINE CONTENT (2H)

Complete the worksheet and submit in the Unit 7: Hematology dropbox by March 17, 2025 at 0800. Please be sure to bring a copy to class on March 17, 2025.

Table 1	**Iron Deficiency Anemia**	**Thalassemia**	**Cobalamin (Vitamin B_{12}) Deficiency**	**Folic Acid Deficiency**
Etiology	Inadequate diet intake, malabsorption blood loss, or hemolysis	Group of diseases involving inadequate production of normal Hgb, which decreases normal RBC production Due to an absent or reduced globulin protein Alpha-Globin chains are absent or reduced in alpha-Thalassemia Beta-Globin chains are absent or reduced in Beta-Thalassemia	Pernicious anemia Caused by an absence of intrinsic factor	Chronic alcohol use, chronic hemodialysis (folic acid loss during this), diet deficiency (leafy green veggies, citrus fruits), drugs interfering with absorption or use of folic acid (metformin, phenytoin), pregnancy, Celiac disease, Crohn disease, small bowel resection
Clinical Manifestations	Early phases: may not have any symptoms Chronic: pallor, glossitis (inflammation of the tongue), cheilitis (inflammation of the lips), may report headache, paresthesia, and burning sensation of the tongue	Often asymptomatic Have mild to moderate anemia with microcytosis (small cells) and hypochromia (pale cells, mild splenomegaly, bronzed skin color, and bone marrow hyperplasia Life-threatening Symptoms develop in childhood by age 2 and can cause growth and development deficits Pallor, jaundice, splenomegaly, hepatomegaly, and cardiomyopathy Thickening of the cranium and maxillary cavity due to expansion of the marrow space Thrombocytosis after spleen dysfunction and/or removal may occur	GI manifestations: sore, red, beefy and shiny tongue; anorexia, nausea, vomiting, and abdominal pain Neuromuscular manifestations: weakness, paresthesia of the feet and hands, reduced vibratory and position senses, ataxia, muscle weakness, and impaired cognition	GI problems: stomatitis, cheilosis, dysphagia, flatulence, and diarrhea Thiamine deficiency can cause neurologic symptoms

Diagnostic Studies	History & Physical assessment, Hbg and Hct levels, RBC count including morphology, reticulocyte count, serum iron, serum ferritin, serum transferrin, total iron-binding capacity (TIBC), stool examination for occult blood Endoscopy and colonoscopy may detect GI bleeding Bone marrow biopsy may be done if other tests are inconclusive	Lab values	Serum cobalamin and serum folate levels Serum test for anti-IF antibodies Serum methylmalonic acid (MMA) and serum homocysteine help determine the cause of the anemia	Serum folate and cobalamin levels
Drug Therapy	Oral: ferrous sulfate IM or IV: iron dextran, sodium ferrous gluconate, iron sucrose Packed RBC transfusion	Blood transfusions in conjunction with chelating agents Oral: deferasirox (Exjade, JadeNu) or deferiprone (Ferriprox) IV or SC: deferoxamine (Desferal) SC: luspatercept-aamt (Reblozyl)	Cobalamin administration Parenteral vitamin B12 (cyanocobalamin, hydroxocobalamin) or intranasal cyanocobalamin (Nascobal)	Replacement therapy 1 to 5 mg/day by mouth
Nursing Management	Treat underlying problem that is causing iron loss, reduced intake (malnutrition, alcohol use), or poor iron absorption Teach patient about food sources rich in iron IV iron supplements If from acute blood loss, then may need a packed RBC transfusion	Splenectomy Monitor liver, heart, and lung function and provide treatment as needed	Assess for neurologic problems not corrected by replacement therapy, implement measures to reduce risk for injury from decreased sensitivity to heat and pain, protect patient from falling, burns, and trauma	Teach patient to eat foods high in folic acid

Table 2	**Anemia of Chronic Disease**	**Aplastic Anemia**	**Acute Anemia due to Blood Loss**	**Chronic Anemia due to Blood Loss**
Etiology	Cancer, HIV, hepatitis malaria, HF, or chronic inflammation	Chemical agents (benzene, insecticides), drugs (alkylating agents, antiseizure drugs, antimetabolites, antimicrobials, gold, NSAIDs, antithyroid medications,	Trauma, surgery complications, and problems that disrupt vascular integrity	Bleeding ulcer, hemorrhoids, menstrual and post-menopausal blood loss

		allopurinol), immune suppression of stem cells by autoreactive T lymphocytes, inherited stem cell deficit (Fanconi anemia), radiation, toxic injury to bone marrow stem cells, viral and bacterial infections		
Clinical Manifestations	Does not say in book	Fatigue, dyspnea, as well as cardiovascular and cerebral responses	10%: none or rare vasovagal response 20%: no detectable signs and symptoms at rest, increased HR with exercise, and slight postural hypotension 30%: normal supine BP and pulse at rest, postural hypotension and increased HR with exercise 40%: BP, central venous pressure, and CO below normal at rest; air hunger; rapid, thready pulse and cold, clammy skin 50%: shock, lactic acidosis, and potential death	Pallor, glossitis (inflammation of the tongue), cheilitis (inflammation of the lips), may report headache, paresthesia, and burning sensation of the tongue
Diagnostic Studies	High serum ferritin and iron store levels	Hgb, WBC, platelet values, reticulocyte count, serum iron and total iron-binding capacity, bone marrow biopsy, aspiration, and pathologic examination	RBC, Hgb, and Hct levels	NA
Drug Therapy	Replacement therapy Blood transfusions, EPO therapy	Immunosuppressive therapy with antithymocyte therapy globulin (ATG) and cyclosporine, Eltrombopag (Promacta), high-dose cyclophosphamide, alemtuzumab, or androgens, iron binding agent	Blood transfusions, whole blood, platelets, plasma, and cryoprecipitate, IV fluids (0.9% NaCl, Lactated Ringer) or colloids that pull fluid into vascular space (dextran, hetastarch, albumin), iron supplements	Iron supplements
Nursing Management	Does not say in book	Identifying and removing the causative agent and providing supporting care until the pancytopenia resolves	Replace blood volume, promote coagulation to prevent further bleeding, find the source of the bleeding and stopping the blood	Identifying the source and stopping the bleeding

			loss	

Table 3	**Acquired Hemolytic Anemia**	**Hemochromatosis**	**Polycythemia**
Etiology	Antibodies against RBCs, Cancer, DIC, extracorporeal circulation, HELLP syndrome, infectious agents (malaria) and toxins, physical destruction, prosthetic heart valves, thrombotic thrombocytopenic purpura (TTP)	Genetic defect Diseases: sideroblastic anemia, liver disease Chronic blood transfusions used to treat thalassemia and SCD	Increase in RBC number
Clinical Manifestations	Skin manifestations: pallor, jaundice, itching Cardiopulmonary manifestations: increased HR, systolic murmurs or bruits, angina pectoris and MI HF, cardiomegaly, pulmonary and systemic congestion, ascites, and peripheral edema may develop if the heart is overworked for an extended period of time Spleen and liver may enlarge	Symptoms don't develop until after age 40 in men and after age 50 in women Early symptoms: fatigue, impotence, abdominal pain, and weight loss Later symptoms: liver enlargement, cirrhosis, diabetes, skin pigment changes (bronzing), cardiomyopathy, arthritism and testicular atrophy	Circulatory manifestations: headache, vertigo, dizziness, tinnitus, and visual changes Generalized itching (often exaggerated by a hot bath) Paresthesia and erythromelalgia (painful burning and redness of the hands and feet Angina, HF, intermittent claudication, and thrombophlebitis Hemorrhagic phenomena may result in petechiae, bruising, nosebleeds, or GI bleeding Hepatomegaly and splenomegaly Patient may have pain from peptic ulcers or increased gastric secretions or liver and spleen engorgement Plethora (ruddy complexion)
Diagnostic Studies	Does not say in book	Lab values: high serum iron, TIBC, serum ferritin Testing for genetic mutations confirms diagnosis MRI can measure liver and cardiac iron Liver biopsy can determine amount of iron and degree of organ damage	Lab values: high Hgb, Hct, and RBC mass Bone marrow examination showing hypercellularity of RBCs, WBCs, and platelets Presence of JAK2 V617F or JAK2 exon 12 mutation Low EPO levels High WBC count with basophilia and neutrophilia High platelet count and platelet dysfunction Normal or high leukocyte alkaline phosphatase, uric acid, or cobalamin levels
Drug Therapy	Does not say in book	IV or SC: deferoxamine Oral: deferasirox and deferiprone Vitamin C and iron supplements	Myelosuppressive agents (hydroxyurea, busulfan (Myelran), Ruxolitinib (Jakafi), alfa-interferon and pegylated IFN alfa-2a are options for childbearing

			women of age or those with intractable itching
Nursing Management	Maintain renal perfusion	Remove excess iron from body and minimize any symptoms the patient may have	Phlebotomy: reduce Hct and keep below 45% Assess I&O to avoid fluid overload or fluid deficit, assist or perform phlebotomy based on agency policy, give myelosuppressive agents as ordered, observe patient and teach them about drug side effects, assess patient's nutrition status, assess patient for complications with each encounter since this is ongoing

In order to receive full credit (2H class time) for this assignment, it must be completed in its entirety by the due date/time assigned. Any assignment not completed in its entirety by the due date and time will result in missed class time and must be completed by the end of the semester to pass the course.