Macy Schafer
Online unit 7
Anemias

**Unit 7: Hematology**
**Chapter 29 & 30**
**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 | **Iron Deficiency Anemia** | **Thalassemia** | **Cobalamin (Vitamin $B_{12}$) Deficiency** | **Folic Acid Deficiency** |
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| **Etiology** | May develop due to inadequate dietary intake, malabsorption, blood loss, or hemolysis<br><br>Menstruating Women<br><br>GI surgery<br><br>Blood loss most commonly in the GI (Peptic ulcer, gastritis, esophagitis, diverticula, hemorrhoids, and cancer) | Group of diseases involving inadequate production of normal hgb resulting in decreased RBC production<br><br>Due to an absent or reduced globulin production<br><br>Found in ethnic groups who origin is near the Mediterranean Sea and equatorial regions of Southeastern Asia, the Middle East, India, Pakistan, China, Southern Russia, and Africa<br><br>Genetic Link | Pernicious anemia caused by a sense of intrinsic factor as disease of insidious onset<br><br>Middle age or later (40-60)<br><br>Northern European ancestry<br><br>GI Surgery<br><br>Excess Alcohol, hot tea ingestion, smoking, H2 histamine receptor blockers and protein pump inhibitors | Develops insidiously<br><br>Needed for DNA synthesis |
| **Clinical Manifestations** | May not have any symptoms early on<br><br>Pallor<br><br>Glossitis (Inflammation of the tongue)<br><br>Cheilitis (inflammation of the lips)<br><br>Headache | Minor is often asymptomatic<br><br>Mild to moderate anemia microcytosis and hypochromia, mild splenomegaly, bronzed skin color and bone marrow hyperplasia<br><br>Life threating in | Tissue Hypoxia<br><br>GI- sore, red, beefy, shiny tongue, anorexia, nausea, and vomiting<br><br>Neuro- weakness, paresthesia's of hands and feet, reduced vibratory and position senses, ataxia, confusion to | Cirrhosis<br><br>Esophageal varices<br><br>GI- stomatitis, cheilosis, dysphagia, flatulence, and diarrhea |

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| | Parathesis<br><br>Burning sensation of the tongue | which growth physical and mental is often slowed Major is pale and displays other general symptoms of anemia<br><br>Start to develop by 2 years of age causing both growth and developmental deficiencies. Jaundice, splenomegaly, hepatomegaly, cardiomyopathy<br><br>Bone marrow insufficiencies<br><br>Cardiac Complications<br><br>Lung disease and hypertension<br><br>Endocrine problems<br><br>Osteoporosis | dementia<br><br>May take several months to developed | |
| **Diagnostic Studies** | Lab abnormalities<br>L- RBC, Hgb/Hct, MCV, Folate, Serum Iron, Ferritin, transferrin<br>H-TIBC<br>Stool Occult blood test<br><br>Endo/Colonoscopy<br><br>Bone marrow biopsy | Laboratory abnormalities | Lab Studies<br><br>Large and abnormal RBC<br><br>Serum Methylmalonic and homocysteine | Serum folate is low<br><br>Normal Cobalamin |
| **Drug Therapy** | Oral Iron- enteric coated or sustained released<br><br>150-200 mg daily (3-4 doses) | No diet or drug therapies that effectively treat<br><br>Major is managed | Vitamin b12 or intranasal cyanocobalamin<br><br>High dose or | Folate 1-5 mg PO daily |

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| | One hour before meals<br><br>Take with vitamin C or orange juice to enhance absorption<br><br>IV/IM- IM main stain skin<br><br>Reassess Hbg and RBC on Iron | with blood transfusions<br><br>Drugs for iron overloading (deferasirox or deferiprone or IV/SubQ deferoxamine<br><br>Ascorbic acid supplements to increase urine excretion of iron. Given with folic acid<br><br>Zinc | cobalamin and sublingual cobalamin for GI intact | |
| **Nursing Management** | Identify and treat underlying cause<br><br>Drug therapy<br><br>Oral: ferrous sulfate or ferrous gluconate<br><br>IM/IV- iron dextran, sodium ferrous, gluconate, iron sucrose<br><br>Nutritional therapy<br><br>Transfusion of packed RBC | Educate on the importance of rest periods<br><br>Assist in planning ADL<br><br>Supplemental therapy | Assess for neuro difficulties<br><br>Implement measures to reduce the risk for injury from decreased sensitivity to heat and pain<br><br>Falling, burns, and trauma precaution<br><br>Neuromuscular complications may not be reversable | Replacement therapy |

| Table 2 | Anemia of Chronic Disease | Aplastic Anemia | Acute Anemia due to blood loss | Chronic Anemia due to blood loss |
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| **Etiology** | Underproduction RBCs and Mild shortening of RBC survival<br><br>Can become more sever if not treated | Disease in which the patient has peripheral pancytopenia (decrease of all blood types) and hypocellular bone marrow | Due to sudden hemorrhage<br><br>Trauma, complications of surgery, and conditions or diseases that disrupt | Source of blood loss similar to iron deficiency (Peptic ulcer, gastritis, esophagitis, diverticula, hemorrhoids, and cancer) |

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| | | Autoimmune activity by autoreactive T lymphocytes<br><br>T cells target and destroy own hemopoietic stem cells | vascular integrity<br><br>Sudden loos can lead to hypovolemic shock<br><br>Gradual loss the body maintains it blood volume by slowly increasing the plasma volume | |
| **Clinical Manifestations** | High serum ferritin<br><br>Increased Iron stores | Abrupt onset over days or insidiously over months to weeks<br><br>Mild to severe<br><br>Bone marrow suppression<br><br>Anemia<br><br>Fatigue, dyspnea, cardio, cerebral responses<br><br>Neutropenia (Infection)<br><br>Thrombocytopenia related to predisposition of bleeding | Caused by the body's response to maintain adequate blood volume and meet O2 requirements<br><br>Assess expression of pain<br><br>Tissue distention, organ replacement, and nerve compression<br><br>Localized or referred<br><br>Numbness and pain in a lower extremity from compression of the lateral cutaneous nerve<br><br>SHOCK | Fatigue, weakness, pale skin, headache, cold hands and feet, brittle nails<br><br>Gastritis<br><br>Menstrual flow<br><br>Hemorrhoids |
| **Diagnostic Studies** | Lab Abnormalities | Lab Studies<br><br>Hgb<br><br>WBC<br><br>Serum/Total Iron<br><br>Bone marrow Biopsy, aspiration, and pathologic examination (increased yellow fatty marrow) | Rapid loss of RBC does not give plasma enough time to increase, labs may be normal or high for 2 to 3 days<br><br>Once plasma is replaced the RBC is less concentrated decreasing the RBC, Hgb, and Hct levels | Depletion of iron stores and considered an iron deficiency anemia |

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| **Drug Therapy** | Erythropoietin therpay for renal disease | Immunosuppressive Therapy<br><br>Older adults<br>Cyclosporin<br>Steroids<br>Eltrombopag<br>Prior transfusion increase risk for graft rejection | IV fluids<br>Dextran, hetastarch, albumin, and crystalloid electrolyte solution such as LR<br><br>Blood transfusions<br><br>Supplemental Iron as it effects marrow production | Blood transfusions |
| **Nursing Management** | Correct underlying disorder<br><br>Blood transfusions | Identifying and removing the causing agent<br>Supportive care<br><br>Thrombocytopenia<br><br>Preventive complications from infection and hemorrhage | Replace blood volume to prevent shock<br><br>Finding the source of hemorrhage and stopping the blood loss<br><br>Monitor blood loss through drainage tubes or dressings | Source of blood loss and stopping the bleed |

| Table 3 | **Acquired Hemolytic Anemia** | **Hemochromatosis** | **Polycythemia** |
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| **Etiology** | Acquired- RBC are normal but external factors are causing damage<br><br>Antibodies against RBC<br><br>Infectious agents<br><br>Physical destruction<br><br>Extracoreal circulation<br><br>HELLP syndrome<br><br>Prosthetic heart valves<br><br>Thrombocytopenic purpura<br><br>Widespread cancer | Iron overload disorder<br><br>Genetic defect most commonly<br><br>Sideroblastic anemia<br><br>Liver disease<br><br>Chronic blood transfusions<br><br>40mg/kg women<br><br>50mg/kg men | Production and presence of increased RBC<br><br>Blood circulation impaired viscosity and volume<br><br>Primary- “Vera”, involves RBC, WBC, and platelets, spleen/hepatomegaly, insidiously and follows a chronic vacillating course, 60 predominant in males<br><br>Genetic link<br><br>Secondary- EPO production in the kidneys, hypoxia driven or independent leading to increased RBC production, |

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| | | | response to try and compensate |
| **Clinical Manifestations** | Jaundice<br><br>Spleen and liver enlargement | Symptoms normally develop at or after the age of 40 in men and 50 in women<br><br>Early- fatigue, arthralgia, impotence, abdominal pain, weight loss<br><br>Later- excess iron accumulates in the liver and causes liver enlargement and eventually cirrhosis<br><br>Depostited in the liver, pancreas, heart, joints, and endocrine glands resulting in diabetes, skin pigment (bronzing), heart problems myopathy, arthritis, testicular atrophy<br><br>Enlarged liver and spleen | Primary- HTN from hypervolemia and hyper viscosity, headache, vertigo, dizziness, tinnitus and visual changes, pruritis, erythromelalgia, parasthesias, angina, HF, intermittent claudication, thrombophlebitis,<br><br>Hemorrhagic phenomena- acute or catastrophic<br><br>Hepatomegaly and splenomegaly<br><br>Myelofibrosis and leukemia<br><br>Most common is stroke |
| **Diagnostic Studies** | General supportive care | High serum iron, TIBC, serum ferritin<br><br>Testing for genetic mutations<br><br>Liver biopsy | High hgb and RBC<br><br>Low to normal EPO, secondary has high<br><br>High WBC<br><br>High platelet count and dysfunction<br><br>High leucocyte alkaline, uric acid, cobalamin<br><br>High histamine levels<br><br>Bone marrow examination shows hypercellularity in RBC, WBC, and platelets |
| **Drug Therapy** | Possible aggressive hydration and electrolyte replacement to reduce | Removing 500 ml of blood each week for 2-3 years until | Phlebotomy- 300-500 ml removed every few days |

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| | kidney injury<br>Corticosteroids<br><br>Blood Products<br><br>Removing the spleen<br><br>Folate<br><br>Immunosuppressive agents | iron restores in the body or depleted<br><br>Defromaine Iv, SubQ<br><br>Deferasirox and Deferiprone<br><br>Promote excretion of iron<br><br>Avoiding vitamin C, uncooked seafood, iron supplements and iron rich food | until reduced to acceptable levels<br><br>Myelosuppressive agents- hydroxyurea, busulfan, chlorambucil<br><br>Ruxolitinib<br><br>Anagrelide to reduce platelet count<br><br>Low dose aspirin |
| **Nursing Management** | Maintain renal function<br><br>Provide supportive therapy and monitor for appropriate therapy | Remove access iron and minimize symptoms<br><br>Management of diabetes, cirrhosis, cancer, and HF<br><br>Early diagnosis and treatment is key | Reduce Blood volume and viscosity<br><br>Primary- assist/perform phlebotomy, assess fluid intake and output during hydration, give drugs as ordered, observe the pt, educate the pt on side effects<br><br>Nutritional status<br><br>Decrease thrombus formation<br><br>Assess for complications |