

**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 <sub>12</sub> ) Deficiency	Folic Acid Deficiency
<b>Etiology</b>	<ul style="list-style-type: none"> <li>- Inadequate Dietary Intake</li> <li>- Malabsorption</li> <li>- Blood Loss</li> <li>- Hemolysis</li> </ul>	<ul style="list-style-type: none"> <li>- Inadequate Production of Normal Hemoglobin</li> <li>- Absent or Reduced Globulin Protein</li> </ul>	<ul style="list-style-type: none"> <li>- Pernicious Anemia</li> <li>- Lack of IF Protein</li> <li>- Chronic Alcoholism</li> <li>- Dietary Deficiency</li> <li>- Pregnant</li> <li>- Intestinal Malabsorption</li> </ul>	<ul style="list-style-type: none"> <li>- Chronic Alcoholism</li> <li>- Chronic Hemodialysis</li> <li>- Dietary Deficiency</li> <li>- Pregnant</li> <li>- Drugs that interfere with folic acid absorption</li> </ul>
<b>Clinical Manifestations</b>	<ul style="list-style-type: none"> <li>- Pallor</li> <li>- Glossitis</li> <li>- Cheilitis</li> <li>- Headache</li> <li>- Paresthesia</li> <li>- Burning Sensation on Tongue</li> </ul>	<ul style="list-style-type: none"> <li>- Microcytosis</li> <li>- Hypochromia</li> <li>- Mild Splenomegaly</li> <li>- Bronzed Skin</li> <li>- Bone Marrow Hyperplasia</li> <li>- Physical and Mental Growth Slowed</li> <li>- Pale</li> <li>- Jaundice</li> <li>- Hepatomegaly</li> <li>- Cardiomyopathy</li> </ul>	<ul style="list-style-type: none"> <li>- Sore, Red, Beefy, Shiny Tongue</li> <li>- Anorexia</li> <li>- Nausea</li> <li>- Vomiting</li> <li>- Abdominal Pain</li> <li>- Weakness</li> <li>- Paraneesthesia of the Feet and Hands</li> <li>- Ataxia</li> <li>- Confusion</li> </ul>	<ul style="list-style-type: none"> <li>- Stomatitis</li> <li>- Cheilosis</li> <li>- Dysphagia</li> <li>- Flatulence</li> <li>- Diarrhea</li> <li>- Confusion</li> </ul>
<b>Diagnostic Studies</b>	<ul style="list-style-type: none"> <li>- CBC</li> <li>- Reticulocyte count</li> <li>- Peripheral Blood Smear</li> <li>- Stool Occult Blood Test</li> <li>- Endoscopy</li> <li>- Colonoscopy</li> <li>- Bone Marrow Biopsy</li> </ul>	<ul style="list-style-type: none"> <li>- CBC</li> <li>- Reticulocyte count</li> <li>- Peripheral Blood Smear</li> </ul>	<ul style="list-style-type: none"> <li>- CBC</li> <li>- Reticulocyte count</li> <li>- Peripheral Blood Smear</li> <li>- Endoscopy</li> <li>- Serum Methylmalonic Acid</li> <li>- Serum Homocysteine</li> </ul>	<ul style="list-style-type: none"> <li>- CBC</li> <li>- Reticulocyte count</li> <li>- Peripheral Blood Smear</li> </ul>
<b>Drug Therapy</b>	<ul style="list-style-type: none"> <li>- Oral Iron Supplement</li> </ul>	<ul style="list-style-type: none"> <li>- No Treatment</li> </ul>	<ul style="list-style-type: none"> <li>- IM or Oral Cobalamin Supplement</li> </ul>	<ul style="list-style-type: none"> <li>- Oral Folic Acid Supplement</li> </ul>
<b>Nursing Management</b>	<ul style="list-style-type: none"> <li>- Identify and treat underlying cause</li> <li>- Drug Therapy</li> <li>- Nutritional Therapy</li> <li>- Transfusion of packed RBCs</li> </ul>	<ul style="list-style-type: none"> <li>- Transfusion of packed RBCs</li> <li>- Chelation Therapy</li> <li>- Monitor Hepatic, Heart, and Lung Functions</li> <li>- Hematopoietic Stem Cell Transplantation</li> </ul>	<ul style="list-style-type: none"> <li>- Assess neurologic difficulties</li> <li>- Provide temperature control</li> <li>- Fall Precautions</li> <li>- Physical Therapy</li> <li>- Drug Therapy</li> </ul>	<ul style="list-style-type: none"> <li>- Drug Therapy</li> <li>- Nutritional Therapy</li> </ul>

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>	<ul style="list-style-type: none"> <li>- Cancer</li> <li>- Autoimmune and Infectious Disorders (HIV, hepatitis, malaria)</li> <li>- HF</li> <li>- Chronic Inflammation</li> </ul>	<ul style="list-style-type: none"> <li>- Chemical agents and toxins</li> <li>- Drugs</li> <li>- Immune suppression</li> <li>- Inherited stem cell defect</li> <li>- Radiation</li> <li>- Toxic injury to bone marrow stem cells</li> <li>- Viral and bacterial infections</li> </ul>	<ul style="list-style-type: none"> <li>- Sudden Hemorrhage</li> <li>- Trauma</li> <li>- Complications of Surgery</li> <li>- Conditions that disrupt vascular integrity</li> </ul>	<ul style="list-style-type: none"> <li>- Bleeding</li> <li>- Ulcer</li> <li>- Hemorrhoids</li> <li>- Menstrual and postmenopausal blood loss</li> <li>- Inadequate dietary intake</li> <li>- Hemolysis</li> </ul>
<b>Clinical Manifestations</b>	<ul style="list-style-type: none"> <li>- Fatigue</li> <li>- Pallor</li> <li>- Lightheaded</li> <li>- SOB</li> <li>- Tachycardia</li> <li>- Irritability</li> <li>- Chest Pain</li> </ul>	<ul style="list-style-type: none"> <li>- Fatigue</li> <li>- Dyspnea</li> <li>- Palpitations</li> <li>- Tachycardia</li> <li>- Headache</li> <li>- Irritability</li> <li>- Thrombocytopenia</li> <li>- Petechiae</li> <li>- Bruising</li> <li>- Nose Bleeds</li> </ul>	<ul style="list-style-type: none"> <li>- Tachycardia</li> <li>- Hypotension</li> <li>- Cold, Clammy Skin</li> <li>- Shock</li> <li>- Lactic Acidosis</li> <li>- Organ Displacement</li> <li>- Numbness</li> </ul>	<ul style="list-style-type: none"> <li>- Fatigue</li> <li>- Weakness</li> <li>- Pallor</li> <li>- Chest Pain</li> <li>- SOB</li> <li>- Headache</li> <li>- Dizzy</li> <li>- Lightheaded</li> <li>- Cold hands and feet</li> </ul>
<b>Diagnostic Studies</b>	<ul style="list-style-type: none"> <li>- CBC</li> <li>- Ferritin Blood Test (High Serum ferritin and increased iron (Fe))</li> <li>- Folate Blood Test</li> <li>- Vitamin B12 Test (Cobalamin)</li> </ul>	<ul style="list-style-type: none"> <li>- CBC (WBC and platelets decreased)</li> <li>- Ferritin Blood Test (Elevated serum iron and total iron-binding capacity)</li> <li>- Bone Marrow Biopsy (Hypocellular w/Increased Yellow Marrow)</li> </ul>	<ul style="list-style-type: none"> <li>- CBC (RBC, Hgb, Hct low)</li> <li>- Ferritin Blood Test</li> </ul>	<ul style="list-style-type: none"> <li>- CBC (RBC, Hgb, Hct low)</li> <li>- Ferritin Blood Test</li> </ul>
<b>Drug Therapy</b>	<ul style="list-style-type: none"> <li>- Ferrous sulfate</li> <li>- Vitamin B12</li> </ul>	<ul style="list-style-type: none"> <li>- Epoetin alfa</li> <li>- Sargramostim</li> <li>- Antithymocyte globulin and Cyclosporine A</li> </ul>	<ul style="list-style-type: none"> <li>- Dextran</li> <li>- Hetastarch</li> <li>- Albumin</li> <li>- Lactated Ringer's</li> <li>- Ferrous Sulfate</li> </ul>	<ul style="list-style-type: none"> <li>- Ferrous Sulfate</li> </ul>
<b>Nursing Management</b>	<ul style="list-style-type: none"> <li>- Blood transfusion</li> <li>- Erythropoietin therapy</li> <li>- Drug Therapy</li> <li>- Treat underlying cause</li> </ul>	<ul style="list-style-type: none"> <li>- Identify and remove causative agent</li> <li>- Providing supportive care until the pancytopenia reverses</li> <li>- Infection prevention</li> <li>- Bleeding management</li> <li>- HSCT therapy</li> <li>- Immunosuppressive therapy w/antithymocyte globulin, steroids, cyclosporine</li> </ul>	<ul style="list-style-type: none"> <li>- Replace blood volume to prevent shock</li> <li>- Find source of hemorrhage and stop blood loss</li> <li>- IV therapy</li> <li>- Blood Transfusion</li> <li>- Iron Supplement</li> <li>- Monitor VS</li> </ul>	<ul style="list-style-type: none"> <li>- Identify source and stop the bleed</li> <li>- Iron Supplement</li> </ul>

Table 3	Acquired Hemolytic Anemia	Hemochromatosis	Polycythemia
<b>Etiology</b>	<ul style="list-style-type: none"> <li>- Hemolysis (Physical Destruction, Antibody Reactions, Infectious Agents and Toxins)</li> <li>- Hemodialysis</li> <li>- Cardiopulmonary Bypass</li> <li>- Prosthetic Heart Valves</li> <li>- Autoimmune Antibody Reactions</li> </ul>	<ul style="list-style-type: none"> <li>- Genetic Defect</li> <li>- Liver disease</li> <li>- Chronic Blood Transfusions (Thalassemia and SCD)</li> </ul>	<p>Primary Polycythemia:</p> <ul style="list-style-type: none"> <li>- Somatic Genetic Mutations (JAK2 Gene)</li> </ul> <p>Secondary Polycythemia:</p> <ul style="list-style-type: none"> <li>- Obstructive Sleep Apnea</li> <li>- Obesity</li> <li>- Chronic Obstructive Pulmonary Disease</li> </ul>
<b>Clinical Manifestations</b>	<ul style="list-style-type: none"> <li>- Spider bites and bee stings</li> <li>- Pallor</li> <li>- Weakness</li> <li>- Jaundice</li> <li>- Dark Urine</li> <li>- Fever</li> </ul>	<ul style="list-style-type: none"> <li>- Fatigue</li> <li>- Arthralgia (Joint Stiffness)</li> <li>- Impotence</li> <li>- Abdominal Pain</li> <li>- Weight Loss</li> <li>- Liver Enlargement</li> <li>- Diabetes</li> <li>- Arthritis</li> <li>- Bronze Skin</li> </ul>	<p>Primary Polycythemia:</p> <ul style="list-style-type: none"> <li>- Splenomegaly</li> <li>- Hepatomegaly</li> <li>- Headache</li> <li>- Dizziness</li> <li>- Thrombosis and Stroke</li> </ul> <p>Secondary Polycythemia:</p> <ul style="list-style-type: none"> <li>- SOB</li> <li>- Fatigue</li> <li>- Headache</li> <li>- Dizziness</li> <li>- Nosebleeds</li> <li>- Bruising</li> </ul>
<b>Diagnostic Studies</b>	<ul style="list-style-type: none"> <li>- CBC</li> <li>- Ferritin Blood Test</li> </ul>	<ul style="list-style-type: none"> <li>- CBC</li> <li>- DNA Testing</li> <li>- Ferritin Blood Test</li> <li>- Serum Iron Test</li> <li>- Total-Iron Binding Capacity Test</li> <li>- Liver Biopsy</li> </ul>	<p>Primary Polycythemia:</p> <ul style="list-style-type: none"> <li>- CBC (Elevated Hgb, WBC, platelets and RBC)</li> <li>- EPO level (Low to normal)</li> <li>- Uric Acid Blood Test (Elevated)</li> <li>- Vitamin B 12 Test (Elevated)</li> <li>- Bone Marrow Biopsy (Hypercellularity of RBC, WBC and platelets)</li> </ul> <p>Secondary Polycythemia:</p> <ul style="list-style-type: none"> <li>- EPO Level (HIGH)</li> <li>- Uric Acid Blood Test (Elevated)</li> <li>- Vitamin B 12 Test (Elevated)</li> </ul>
<b>Drug Therapy</b>	<ul style="list-style-type: none"> <li>- Vitamin B9 Supplement</li> <li>- Glucocorticoids</li> <li>- rituximab</li> </ul>	<ul style="list-style-type: none"> <li>- Deferoxamine</li> <li>- Deferasirox</li> <li>- Deferiprone</li> </ul>	<ul style="list-style-type: none"> <li>- Hydroxyurea</li> <li>- Busulfan</li> <li>- Ruxolitinib</li> <li>- Low-dose Aspirin</li> <li>- Allopurinol</li> </ul>
<b>Nursing Management</b>	<ul style="list-style-type: none"> <li>- General Supportive Care</li> <li>- Elimination of causative agent</li> <li>- Emergency hydration and</li> </ul>	<ul style="list-style-type: none"> <li>- Early diagnosis</li> <li>- Remove Access iron from the body and minimize any symptoms</li> <li>- Administering Iron Chelating Agents</li> </ul>	<ul style="list-style-type: none"> <li>- Assess nutritional status</li> <li>- Frequent ambulation and activities</li> <li>- Active or passive leg exercises</li> <li>- Assess pt. for complications</li> <li>- Phlebotomy to reduce Hct.</li> <li>- Drug Therapy</li> </ul>

	<p>electrolyte replacement</p> <ul style="list-style-type: none"><li>- Providing corticosteroids and blood products or removal of spleen</li><li>- Vitamin Supplements</li><li>- Administering Immunosuppressants</li><li>- Plasma exchange and eculizumab</li></ul>	<ul style="list-style-type: none"><li>- Reduce Vitamin C intake</li><li>- Avoid uncooked seafood and foods high in iron</li></ul>	<ul style="list-style-type: none"><li>- Assess fluid intake and output</li><li>- Avoid fluid deficit or overload</li></ul>
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