

**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>	Due to inadequate dairy intake, malabsorption, blood loss, hemolysis	Inadequate production of normal hemoglobin, which decreases RBC production Due to an absent or reduced globulin protein Found in Southeastern Asia, the Middle East, India, Pakistan, China, Southern Russia, and Africa	Absence of intrinsic factor Most common cause= pernicious anemia The gastric mucosa isn't secreting IF due to gastric mucosal atrophy or autoimmune destruction of parietal cells Can occur with chronic alcoholism, gastric bypass, Crohn's disease, ileitis, celiac disease	Causes megaloblastic anemia RBCs are large and abnormal
<b>Clinical Manifestations</b>	Pallor Glossitis Cheilitis Headache Paresthesia Burning sensation of the tongue Palpitations Fatigue Dyspnea Sensitivity to cold	Often asymptomatic Microcytosis, hypochromia Splenomegaly Bronzed skin Bone marrow hyperplasia Physical and mental growth is slow Anemia Pale Jaundice Diabetes Osteoporosis Pulmonary HTN	Sore, red, beefy shiny tongue Anorexia Nausea Vomiting Abdominal pain Weakness Paresthesias of the feet and hands Reduced vibratory and position senses Ataxia Muscle weakness Confusion to dementia	Stomatitis Cheilosis Dysphagia Flatulence Diarrhea Thiamine deficiency can cause neuro symptoms
<b>Diagnostic Studies</b>	CBC Stool occult blood test Endoscopy Colonoscopy Bone marrow biopsy	CBC	CBC Serum test for anti-IF antibodies Upper GI endoscopy Biopsy of the gastric mucosa Test of serum MMA and homocysteine	CBC
<b>Drug Therapy</b>	Oral iron (150-200 mg/day)  Parenteral (IM, IV) iron	Blood transfusions Chelating agents Deferasirox Deferiprone Deferoxamine Ascorbic acid supplements Zinc supplements	Parenteral vitamin B <sub>12</sub> or intranasal cyanocobalamin	Folic acid replacement (1-5 mg/day)
<b>Nursing Management</b>	Treat underlying problem Replace iron Educate about foods high in iron Possible transfusion of packed RBCs Reassess Hgb and RNC count throughout therapy	Splenectomy post op care Cure= HSCT Keep hgb above 10 Monitor labs	Assess for neurologic difficulties Reduce risk for injury related to sensory impairment Physical therapy	Educate about 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
<b>Etiology</b>	<p>Caused by cancer, HIV, hepatitis, malaria, HF or chronic inflammation</p> <p>Underproduction of RBCs and mild shortening of RBC survival</p>	<p>Peripheral blood pancytopenia (decrease in RBCs, WBCs, and platelets) and hypocellular bone marrow</p> <p>RARE</p> <p>Most commonly due to autoimmune activity by T lymphocytes- destroy the hematopoietic stem cells</p>	<p>Occurs from a sudden hemorrhage such as trauma, complications of surgery, or disease that causes disrupt vascular integrity</p> <p>Can lead to hypovolemic shock and decreased RBCs</p>	<p>Due to bleeding ulcer, hemorrhoids, menstrual and postmenopausal blood loss</p> <p>Depletion of iron stores</p>
<b>Clinical Manifestations</b>	CBC	<p>Fatigue</p> <p>Dyspnea</p> <p>Tachycardia</p> <p>Palpitations</p> <p>Headache</p> <p>Irritability</p> <p>At risk for infection</p> <p>Petechia, bruising, nosebleeds</p>	<p>Depends on the volume lost</p> <p>500 ml: none</p> <p>1000 ml: tachycardia with exercise and slight postural hypotension</p> <p>1500 ml: Postural hypotension and tachycardia with exercise</p> <p>2000 ml: BP, CVP, and CO below normal at rest. Air hunger, rapid thready pulse, cold clammy skin</p> <p>2500 ml: shock, lactic acidosis, potential death</p>	<p>Pallor</p> <p>Glossitis</p> <p>Cheilitis</p> <p>Headache</p> <p>Paresthesia</p> <p>Burning sensation of the tongue</p> <p>Palpitations</p> <p>Fatigue</p> <p>Dyspnea</p> <p>Sensitivity to cold</p>
<b>Diagnostic Studies</b>	CBC	<p>CBC</p> <p>Iron studies</p> <p>Bone marrow biopsy</p>	CBC	CBC
<b>Drug Therapy</b>		<p>HSCT and immunosuppressive therapy with ATG</p> <p>Steroids</p> <p>Cyclosporine</p> <p>Cyclophosphamide</p> <p>Eltrombopag</p> <p>Blood transfusions</p>	<p>Dextran, hetastarch, albumin, LR</p> <p>Blood transfusions</p> <p>Supplemental iron</p>	Supplemental iron
<b>Nursing Management</b>	<p>Correct underlying cause</p> <p>Blood transfusions</p> <p>Erythropoietin therapy</p>	<p>Identify and remove causative agent</p> <p>Prevent complications from infection and hemorrhage</p> <p>Bleeding precautions</p> <p>Education about disease</p>	<p>Replace blood volume to prevent shock</p> <p>Find the source of bleeding and stop the loss</p> <p>Monitor chest tubes and dressings for post-op patients</p> <p>Blood administration</p>	<p>Identify course and stop the bleeding</p> <p>Recommend rest periods</p>

Table 3	Acquired Hemolytic Anemia	Hemochromatosis	Polycythemia
<b>Etiology</b>	<p>Cause by the destruction of hemolysis of RBC at a rate that exceeds production</p> <p>RBCs are normal but external factors are causing damage</p> <p>DIC, HELLP, TTP, cancer</p>	<p>Iron overload disorder</p> <p>The genetic defect is the most common cause</p> <p>May occur with sideroblastic anemia, liver disease, and chronic blood transfusions</p>	<p>The production and presence of increased numbers of RBCs</p> <p>Causes impaired blood circulation because of hyperviscosity and hypervolemia</p> <p>Primary: involves RBCs, WBCs, and platelets</p> <p>Secondary: hypoxia driven, stimulates erythropoietin production in kidneys</p>
<b>Clinical Manifestations</b>	<p>Fatigue</p> <p>Dyspnea</p> <p>Palpitations</p> <p>Headache</p> <p>Irritability</p> <p>Jaundice</p> <p>Spleen and liver enlargement</p>	<p>Exceed 50 g concentration</p> <p>Fatigue</p> <p>Arthralgia</p> <p>Impotence</p> <p>Abdominal pain</p> <p>Weight loss</p> <p>Liver enlargement, cirrhosis</p> <p>Diabetes, skin pigment changes, cardiomyopathy, arthritis, testicular atrophy</p>	<p>Hypertension</p> <p>Headache</p> <p>Vertigo</p> <p>Dizziness</p> <p>Tinnitus</p> <p>Visual changes</p> <p>Pruritus</p> <p>Paresthesias and erythromelalgia</p> <p>Angina</p> <p>HF</p> <p>Intermittent claudication</p> <p>Thrombophlebitis</p> <p>Stroke</p> <p>Plethora</p>
<b>Diagnostic Studies</b>	CBC	<p>CBC</p> <p>TIBC, ferritin levels</p> <p>Test for genetic mutations</p> <p>Liver biopsy</p>	<p>CBC</p> <p>Bone marrow examination</p>
<b>Drug Therapy</b>	Corticosteroids (predisone)	<p>Removing 500 mL of blood each week for 2 to 3 years, then less often</p> <p>Iron chelating agents: Deferoxamine, Deferasirox, deferiprone</p>	<p>Phlebotomy</p> <p>Myelosuppressive agents (hydroxyurea, busulfan, chlorambucil)</p> <p>Roxolitinib</p> <p>Anagrelide</p> <p>Aspirin</p> <p>a-Interferon</p> <p>allopurinol</p>
<b>Nursing Management</b>	Maintain renal function	<p>Minimize symptoms</p> <p>Educate to avoid vitamin C and iron supplements, uncooked seafood, iron rich foods</p> <p>Manage diabetes and HF</p>	<p>Avoid iron supplementation</p> <p>Hydration therapy</p> <p>Assist or perform phlebotomy</p> <p>Assess I and Os</p> <p>Give ordered drugs</p> <p>Educate about side effects</p> <p>Assess nutritional status</p> <p>Prevent thrombus formation-active or passive exercise and ambulation</p> <p>Assess for complications</p>