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 Dietary Intake, Increased Iron Needs, Blood Loss, Impaired Iron Absorption, Gastrointestinal Disorders, and Chronic Diseases	Thalassemia is a genetic disorder caused by mutations in the genes responsible for producing hemoglobin. These mutations result in abnormal hemoglobin production, leading to ineffective red blood cell formation, chronic anemia, and other complications	Deficiency can occur due to various causes related to impaired absorption, dietary insufficiency, or increased demand.	an insufficient amount of folate in the body. Folic acid is the synthetic form of folate found in supplements and fortified foods. Folate is essential for various bodily functions, including DNA synthesis, red blood cell formation, and proper fetal development during pregnancy.
Clinical Manifestations	Fatigue, weakness, shortness of breath, dizziness, pallor, cold intolerance, rapid heartbeat, exercise intolerance.	primarily related to the degree of anemia, ineffective erythropoiesis, and hemolysis	Deficiency can lead to hematologic, neurological, and psychiatric manifestations.	Fatigue, weakness, pallor, tachycardia, shortness of breath, and macrocytic anemia. mouth ulcers, nausea, vomiting, diarrhea, or constipation.

				Cognitive impairment, memory loss, fatigue, paresthesia, and irritability. Neural tube defects, preterm labor, low birth weight.
Diagnostic Studies	a combination of blood tests to confirm low iron levels, assess red blood cell function, and identify the underlying cause. CBC, serum iron, occult blood test, urinalysis	CBC, peripheral blood smear, hemoglobin electrophoresis, iron studies, genetic testing, and liver function tests	Serum Vitamin B12, Methylmalonic Acid (MMA), Homocysteine, CBC, Peripheral Blood Smear, Intrinsic Factor Antibodies, and Serum Folate Level	Serum Folate Level, Red Blood Cell, Folate Level, C (CBC), Homocysteine Level, MMA Level, Bone Marrow Aspiration, Stool Studies, Vitamin B12 Levels, Liver Function Tests, Pregnancy Tests, and Iron Studies
Drug Therapy	Oral Iron Therapy, IV Iron therapy, Erythropoies is-Stimulating Agents, and blood transfusions	Iron Chelation Therapy, Folic Acid Supplements, Transfusions, Luspatercept, Hydroxyurea, Splenectomy, Bone Marrow, and Transplantation	Oral Vitamin B12, Sublingual Vitamin B12 Intramuscular or Subcutaneous Injections, High-Dose Oral Vitamin B12, Folic Acid Supplementatio n, and Treatment of Underlying Causes	Oral Folic Acid, Intravenous or Intramuscular Folic Acid, Treatment of Underlying Conditions, Iron SupplementationDietary Recommendati on

Nursing Management	Management of iron deficiency anemia involves assessment, implementation of interventions to correct the anemia, education to prevent recurrence, and monitoring for complications. Focus areas are symptom management, patient education, and promoting treatment adherence.	Providing supportive care, preventing complications, educating patients and families, and helping them maintain an optimal quality of life. Monitoring for signs of anemia, managing transfusions, preventing iron overload, and providing education on medication and lifestyle adaptations.	Perform thorough assessments, including dietary habits, medical history, and physical examination. Administer vitamin B12 supplements or injections as prescribed. Provide education on B12-rich foods, supplementation, and the importance of ongoing treatment. Address fatigue, weakness, and neuropathy, and encourage a gradual return to activity. Work with the healthcare team to manage underlying causes and complications. Regularly monitor lab results, symptoms, and treatment adherence.	Evaluate health history, symptoms, and laboratory results. Administer folic acid as prescribed and monitor for effectiveness. Encourage dietary changes, including folate-rich foods. Monitor for side effects and complications. Counsel on dietary changes, the impact of alcohol, and avoiding medications that interfere with folate absorption. Monitor for improvement in symptoms, lab results, and dietary adherence.

Table 2	**Anemia of Chronic Disease**	**Aplastic Anemia**	**Acute Anemia due to Blood Loss**	**Chronic Anemia due to Blood Loss**
Etiology	typically develops in response to long-term inflammation or infection, and is characterized by the body's impaired ability to use iron for red blood cell production despite normal or elevated iron stores.	a rare and serious condition where the bone marrow fails to produce enough new blood cells. The condition can result from the destruction or suppression of hematopoietic stem cells in the bone marrow.	a rapid and significant loss of blood, leading to a decrease in the number of circulating red blood cells and a resultant decrease in oxygen-carrying capacity. Blood loss can be classified into external and internal causes, and it can be due to a variety of conditions or events that lead to hemorrhage.	A slow, persistent loss of blood over a prolonged period, which gradually depletes the body's red blood cell reserves. This type of anemia is often associated with a variety of underlying conditions, including gastrointestinal, gynecological, and urinary causes, as well as certain medical conditions that lead to ongoing blood loss.
Clinical Manifestations	Joint pain, stiffness, Weight loss or fever, abdominal pain, diarrhea, or bloody stools, frequent infections, headaches, and tachycardia.	Weakness, fatigue, malaise, pale or sallow complexion, mouth ulcers, tachycardia. Jaundice, skin rashes, joint pain (depending on the cause). Hypotension, organ dysfunction, splenomegaly.	Confusion or altered mental status, Shortness of breath, Fatigue, Chest pain, Oliguria, Nausea, and vomiting. Tachycardia, pallor, weakness, dizziness, tachypnea, and thirst.	Fatigue, paleness, shortness of breath, dizziness, and headaches are the most common symptoms. Tachycardia, chest pain, weakness, and cold extremities may occur as the condition worsens.

Diagnostic Studies	CBC, Serum Iron, Serum Hepcidin Levels, Erythropoietin Levels, Inflammatory Markers, Bone Marrow Biopsy, and tests for underlying disease	CBC, Peripheral Blood Smear, Bone Marrow Biopsy, Reticulocyte Count, Serum Erythropoietin Level, Flow Cytometry, HLA Typing and T-Cell Assay, Cytogenetic Testing, Viral Testing, Hepatitis, HIV, CMV, EBV Autoimmune Testing, Serum Iron Studies, and Genetic Testing	CBC, peripheral blood smear, coagulation studies, and blood type/crossmatch. Chest X-ray, abdominal ultrasound, CT scan, and endoscopic procedure. stool occult blood test, and endoscopic ultrasound. Urinalysis, ABGs, and pregnancy tests.	(CBC), iron studies, peripheral blood smear. Reticulocyte count and reticulocyte hemoglobin content. Fecal occult blood test and stool culture. Urinalysis, Abdominal ultrasound, or CT scan.
Drug Therapy	Treat the underlying disease, Iron supplementation Erythropoiesis-stimulating agents, Iron chelation therapy, Blood transfusions, Vitamin B12 or folate supplementation, Corticosteroids, and Immunosuppressive therapy	Immunosuppressive Therapy, Hematopoietic Growth Factors, Granulocyte Colony-Stimulating Factor, Androgens Oxymetholone, Danazol, Blood Transfusions: Underlying Causes, and Bone Marrow Transplant	Blood Transfusions, Hemostatic agents, Vasopressors, Iron Supplements, Erythropoiesis-Stimulating Agents, Antibiotics, Prophylactic Medications, Vitamin K, and Anti-diarrheal medications	Iron Supplements, Erythropoiesis-Stimulating Agents, Folic Acid, Vitamin B12, Medications for Specific Causes, Blood Transfusions

Nursing Management	Alleviating symptoms, improving patient comfort, supporting treatment of the underlying chronic condition, and monitoring for complications. Helping to manage both the anemia and the underlying disease.	Monitor vital signs, CBC, signs of infection, and bleeding. Implement isolation precautions, monitor for infection, and educate on infection prevention. Monitor for bleeding, provide platelet transfusions. Encourage a balanced diet, and hydration, and provide education on iron and folate intake.	Focuses on stabilizing the patient, monitoring for complications, addressing the underlying cause of the blood loss, and providing supportive care to ensure optimal recovery. Provide information about transfusion, iron supplementation, and signs of complications. Work with the healthcare team to manage the underlying cause.	Regularly check vital signs, lab values, and physical symptoms to assess the severity of anemia. Administer iron, ESAs, folic acid, vitamin B12, and blood transfusions as ordered. Managing Underlying Causes, Educating the patient about iron-rich foods, proper supplementation, and recognizing symptoms of worsening anemia.

Table 3	**Acquired Hemolytic Anemia**	**Hemochromatosis**	**Polycythemia**
Etiology	Acquired hemolytic anemia occurs when the body destroys RBCs faster than they can be produced. Unlike inherited hemolytic anemia,	excessive absorption and storage of iron in various organs, leading to iron overload. The excess iron is deposited in organs like the liver, heart, pancreas, and joints, potentially causing damage.	an increased number of RBCs in the bloodstream, leading to thickened blood and a higher risk of clotting.

	acquired hemolytic anemia develops due to external factors that lead to the premature destruction of RBCs.		
Clinical Manifestations	Fatigue, weakness, and pallor. Jaundice and dark urine. Splenomegaly and hepatomegaly due to increased RBC destruction. Hemoglobinuria, Gallstones, Fever, and Malaise	Fatigue, weakness, joint pain, abdominal pain, weight loss. Bronze or gray skin pigmentation. Hepatomegaly, cirrhosis, increased liver cancer risk. Diabetes mellitus Cardiomyopathy, arrhythmias, heart failure. Hypogonadism, irregular periods, early menopause. Arthritis, particularly in hands, knees, hips, and ankles. Splenomegaly, increased infection risk.	Fatigue, Headaches, Dizziness, or Lightheadedness. Weakness, Pruritus, Splenomegaly, Hepatomegaly, Erythromelalgia, Plethora, Gout, and Visual Disturbances
Diagnostic Studies	CBC, Peripheral Blood Smear, Serum Bilirubin, LDH, Haptoglobin, Coombs Test, Urinalysis, G6PD Assay, Cold Agglutinin Titer, Flow Cytometry	Blood tests, genetic testing, liver biopsy, imaging, and ultrasound are used to assess liver size and structure. Liver Fibrosis, Cardiac and Endocrine Evaluation.	CBC, Erythropoietin Levels, JAK2 Mutation Testing, Arterial Blood Gases, Chest X-ray or Pulmonary Function Tests, Abdominal Ultrasound/CT Scan, Bone Marrow Biopsy, Serum Uric

	Imaging		Acid, and Coagulation Studies
Drug Therapy	Corticosteroids, Immunosuppressants, IVIG, Folic acid, Blood transfusions, Erythropoiesis-stimulating agents, Splenectomy, Avoidance of trigger medications	Phlebotomy, Iron Chelation Therapy, Symptomatic Management, and Dietary Modifications	Phlebotomy, Low-dose Aspirin, Hydroxyurea: Interferon-alpha, Ruxolitinib, and Anagrelide
Nursing Management	Monitor vital signs, Track laboratory values, Administer medications, Educate the patient, Encourage rest, and Monitor for complications, Provide emotional support	Assessment and Monitoring, Education, Managing Phlebotomy, Chelation Therapy, Symptom Management Psychosocial Support, and Preventing Complications	Assessment and Monitoring, Medication Administration, Symptom Management, Prevention of Complications, Patient Education, Psychosocial Support.

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.