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	A common nutrient disorder common in younger people who do not get enough iron in their diet.	A group of diseases that involved inadequate Hgb production resulting in decreased RBC.	Most common cause is pernicious anemia. It is caused by a lack of intrinsic factor secretion which is needed for cobalamin absorption. Cobalamin deficiency also occurs with excess alcohol or hot tea ingestion, smoking, long-term users of H2-histamine receptor blockers and proton pump inhibitors, and those who are strict vegetarian	Folic acid deficiency can cause megaloblastic anemia.
Clinical Manifestations	Early on they may not show symptoms, but further along patients may show pallor, glossitis, chelitis, headache, paresthesia, and burning sensation of the tongue.	Often asymptomatic May have mild to moderate anemia with microcytosis, hypochromia, mild splenomegaly, bronzed skin color, and bone marrow hyperplasia	Can occur is patient who recently had a GI surgery. Develop due to tissue hypoxia. GI: sore, red, beefy, and shiny tongue; anorexia, nausea, and vomiting; and abdominal pain Neuro: weakness, paresthesias of the feet and hands, reduced vibratory and position senses, ataxia, muscle weakness, and impaired cognition May take years to develop	Develops over a long period of time. Has similar symptoms as cobalamin deficiency. GI: tomatitis, cheilosis, dysphagia, flatulence, and diarrhea Often, Thiamine deficiency is present and can cause neurological symptoms.
	Occult stool	Hcg and HCT	Blood draws	Blood draws

Diagnostic Studies	test, endoscopy, colonoscopy, bone marrow biopsy.	CBC Iron metabolism Blood typing Peripheral smear	Endoscopy Colonoscopy Biopsies	Endoscopy Colonoscopy Biopsies
Drug Therapy	Iron supplements Parenteral iron	Oral deferasirox Deferiprone IV or subcutaneous deferoxamine luspaterceptaamt	Parenteral vitamin B12 1000 mcg/day of cobalamin IM for 2 weeks	Folic acid supplements
Nursing Management	Treat the underlying cause and direct towards replacing the iron the body needs. Teach the patient good ways to improve their iron intake.	Not much treatment as the body will adapt. Common treatment includes blood transfusions.	Administer m medicine regimen and monitor for signs of adverse effects. Protect patient from falls, burns, and traumas due to decreased sensitivity to pain and heat.	This is treated with replacement therapy. Treatment duration depends on factors causing low folic acid and educate patients on what foods to increase in their diet to keep folic acid levels up.

Table 2	**Anemia of Chronic Disease**	**Aplastic Anemia**	**Acute Anemia due to Blood Loss**	**Chronic Anemia due to Blood Loss**
Etiology	Usually develops after 1 to 2 months of disease activity. Causes: cancer, autoimmune and infectious disorders (human immunodeficiency virus [HIV], hepatitis, malaria), HF, or chronic inflammation bleeding disorders can	Roughly 70% of aplastic anemia's are due to autoimmune activity by auto-reactive T lymphocytes, and this causes them to destroy patient's own hematopoietic stem cells. Toxic injury to bone marrow stem cells Inherited stem cell defect.	This type of anemia is caused when there is a dramatic decrease in their blood levels. This can then lead to hypovolemic shock	Sources of chronic blood loss are similar to those of iron deficiency anemia such as low iron intake, bleeding ulcer, hemorrhoids, menstrual and postmenopausal blood loss.

	also be a cause.			
Clinical Manifestations	Associated with an underproduction of RBC. Cytokines released in these problems cause an increased uptake and retention of iron within macrophages. High serum ferritin and increased iron stores distinguish this from iron deficiency anemia.	Can manifest over weeks to months and can vary from mild to severe. Fatigue Dyspnea Cardiovascular/ cerebral responses Infection in those who are neutropenic Septic shock Death	This can be due to trauma, injury, surgery complications, etc. Signs and symptoms are more important than lab values. Pain Low BP Numbness or tingling	Effects are usually due to depleted iron in the body such as hypoxia, lethargy, pallor, weakness, etc.
Diagnostic Studies	CBC BMP Colonoscopy /Endoscopy Biopsy Blood Type and screen	CBC TIBC Bone marrow biopsy, aspiration, and pathological examination	When blood volume loss is sudden, plasma volume has not yet had a chance to increase. Laboratory data do not reflect the RBC loss. May utilize once accurate.	CBC TIBC Blood type and screen
Drug Therapy	Dependent on cause of anemia.	Antithymocyte globulin (ATG) Cyclosporine Eltrombopag Cyclophosphamide Alemtuzumab Androgens Iron-binding agent	IV fluids Transfusions (Packed RBC's, whole blood, platelets, plasma, and cryoprecipitate) Clotting factors	Therapy is dependent on reason for anemia Transfusions Supplementing
Nursing Management	Best way to treat is to treat the underlying problem. May need a blood transfusion depending on anemia severity. Treatment in general depends on what is causing it.	Prognosis if untreated is poor. HSCT is best but not all are candidates for this. May receive immunosuppressant therapy. Blood transfusions and monitor iron levels to prevent iron overload.	Replace blood volume Promote coagulation to prevent further bleeding. Find the source of bleeding and act appropriately. Blood transfusions (Packed RBC's, whole blood, platelets, plasma, and cryoprecipitate) Should be no need for long-term treatment.	This involved identifying the source of the bleeding and taking proper action to stop it. These patient require long-term therapy as their condition in chronic, so ensuring proper education about diet and medications is very important.

Table 3	**Acquired Hemolytic**	**Hemochromatosis**	**Polycythemia**

	Anemia		
Etiology	Caused by hemolysis of RBCs from extrinsic factors such as physical destruction, antibody reactions, and infectious agents and toxins.	An iron overload disorder characterized by increased intestinal iron absorption. Genetic defect is the most common cause. May occur with diseases such as sideroblastic anemia and liver disease, and the chronic blood transfusions used to treat thalassemia and SCD.	The production and presence of increased numbers of RBCs. The increase in RBCs can be so great that blood circulation is impaired because of the increased blood viscosity and volume. Primary and secondary types.
Clinical Manifestations	Dehydration Fatigue and weakness Hypoxia (SOB) Pallor	Early symptoms are nonspecific (fatigue, arthralgia, impotence, abdominal pain, and weight loss) Excess iron accumulates in the liver and causes liver enlargement and cirrhosis causing diabetes, skin pigment changes (bronzing of the skin), heart problems, arthritis, and testicular atrophy.	Primary: Includes increase production in WBC and platelets too. Splenomegaly and hepatomegaly are common. Patients are predisposed to clotting. Symptoms develop slowly over time and symptoms do not always show right away. Secondary: Either hypoxia driven or hypoxia independent. Low SpO2 requiring oxygen. Both: HTN, headache, vertigo, dizziness, tinnitus, visual changes, itching, paresthesias, erythromelalgia. Stroke is the most common mortality.
Diagnostic Studies	CBC BMP Hgb and HCT UA	TIBC Serum ferritin MRI Liver biopsy	CBC INR PT PTT TIBC Bone marrow biopsy UA
Drug Therapy	Folate replacement therapy Immunosuppressive agents Plasma exchange and Eculizumab, Monoclonal antibody to complement protein C5	Iron-chelating drugs Deferoxamine Deferasirox Deferiprone NO iron supplements	Low dose ASA Myelosuppressive agents Ruxolitinib α-Interferon Pegylated IFN alfa-2a
Nursing	General supportive care	Treatment is managed through organ involvement.	Patients may have blood removed to keep their

Management	until the causative agent can be eliminated or at least made less injurious to the RBCs. Always be prepared for emergency treatment	most common causes of death are cirrhosis, liver failure, liver cancer, and HF Early diagnosis and treatment can allow the patient to live to normal expectancy.	blood levels within therapeutic range. Continuously monitor patient lab values as well as GI symptoms and neurological symptoms to monitor for signs of stroke.

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.