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Unit 7: Hematology
Chapter 29 & 30
ONLINE CONTENT (1.5 H)

Table 1	**Iron Deficiency Anemia**	**Thalassemia**	**Cobalamin (Vitamin B_{12}) Deficiency**	**Folic Acid Deficiency**
Etiology	May develop because of inadequate dietary intake, malabsorption, blood loss, or hemolysis.	A group of diseases involving inadequate production of normal hemoglobin which decreases RBC production.	It is caused by an absence of intrinsic factor which is lacking due to pernicious anemia.	Caused by chronic alcoholism, lose due to dialysis, dietary deficiency, or malabsorption symptoms.
Clinical Manifestations	In early stages there may be no symptoms. As this because chronic, the most common symptom is pallor, glossitis, cheilitis, headache, paresthesia, and burning sensation of the tongue.	Typically, patients are asymptomatic, but can have mild anemia with microcytosis and hypochromia, mild splenomegaly, bronze colored skin, and bone marrow hyperplasia.	Sore red beefy and shiny tongue, anorexia, nausea/vomiting, abdominal pain, weakness, ataxia, and paresthesia	Stomatitis, cheilosis, dysphagia, flatulence, and diarrhea.
Diagnostic Studies	Stool occult blood, laboratory abnormalities, endoscopy and colonoscopy may detect bleeding, and a bone marrow biopsy may be done if other tests are inconclusive.	Laboratory abnormalities and cardiac complications.	Laboratory abnormalities (low serum cobalamin levels), low serum folate levels, blood tests for pernicious anemia, and serum MMA test.	Low serum folate and other laboratory abnormalities.
Drug Therapy	Oral iron, enteric coated or sustained release capsules. Medications should be taken within an hour before meals and taking with vitamin c will help increase absorption. Sodium ferrous gluconate and Iron sucrose could be given IV or IM.	Oral deferasirox or IV deferoxamine. *Can also be managed with blood transfusions.	Lifelong cyanocobalamin or nascobal which cannot be taken oral, it needs to be given IV or IM directly into the blood stream since it can't be absorbed in the GI tract.	Oral folic acid.
Nursing Management	Treat underlying cause of iron loss and teach the patient about good sources of iron.	Careful monitoring of cardiac abnormalities and vitals. Also educated on the importance of transfusions.	Assess neurologic difficulties, implement measures to reduce risk of injury and protect patients from any falls.	Teach the patient about foods high in folic acid, and appropriate care for anemia patients.

Table 2	Anemia of Chronic Disease	Aplastic Anemia	Acute Anemia due to blood loss	Chronic Anemia due to blood loss
Etiology	Can be caused by cancer, autoimmune disorders, infectious disorders, and chronic inflammation due to underproduction of RBCs.	Characterized by pancytopenia and hypocellular bone marrow due to autoimmune activity by T-lymphocytes and is very Rare.	Caused by sudden hemorrhage which can be the result of trauma, surgery complications, and vascular diseases. Low RBCs are the main characteristic.	Like iron deficiency anemia (bleeding ulcers, hemorrhoids, menstrual and postmenopausal), this is related to the depletion of iron stores and considered iron deficiency anemia.
Clinical Manifestations	Clubbing of the fingers, laboratory abnormalities and impaired renal function.	Fatigue, dyspnea, thrombocytopenia, neutropenia, and are at high risk for septic shock and death	Possible signs and symptoms related to blood loss are syncope, tachycardia, postural hypotension, Cold/clammy skin, shock, and potentially death.	Signs and symptoms are related to the cause of blood loss.
Diagnostic Studies	Diagnosed by exclusion.	Low hemoglobin, white blood cells and platelets, and reticulocyte count. Bone marrow biopsy, aspiration, or pathology	Initially there is no laboratory abnormalities, but once plasma levels increase there will be low RBC, Hgb, and Hct levels which reflect the blood loss.	Diagnosis is symptom based and laboratory abnormalities.
Drug Therapy	Best treatment is to correct the underlying disorder, if severe blood transfusions can be done or erythropoietin therapy.	Immunosuppressive therapy, ATG, steroids, cyclosporine, or cyclophosphamide.	Best treatment is to treat the underlying cause of bleeding, but in emergencies IV fluids, dextran, albumin, packed RBC infusion can be used. Also, oral iron during recovery may be used.	Supplemental Iron may be needed.
Nursing Management	Monitor patient closely due to increased risk for thromboembolism and death with treatment.	Nursing management is aimed at prevention of infection and hemorrhage.	Carefully monitor blood loss via drainage tubes or dressings. Administration of blood products.	Identify the source and stop the bleeding, also supplemental iron may be needed.

Table 3	Acquired Hemolytic Anemia	Hemochromatosis	Polycythemia
Etiology	RBCs are normal but external factors are causing damage. It is a condition caused by the destruction or hemolysis of RBCs, at a rate that exceeds production. Caused by infectious diseases, cancer, DIC, HELP syndrome etc.	An iron overload disorder, this can be caused by a genetic defect, sideroblastic anemia, liver disease, or chronic blood transfusions.	Is the production and presence of an increased number of RBCs. This increase can be so great that the circulation of blood is impaired because of the increased blood viscosity and volume.
Clinical Manifestations	Jaundice, enlarged spleen, enlarged liver, acute tubular necrosis, and general manifestations of anemia.	Symptoms do not develop into after 40 in men or 50 in women. Early symptoms: fatigue, arthralgia, impotence, abdominal pain, and weight loss Later symptoms: enlarged liver, liver cirrhosis, diabetes, bronzing of the skin, cardiomyopathy, arthritis, and testicular atrophy	Headache, vertigo, dizziness, tinnitus, and visual changes generalized pruritus and paresthesia.
Diagnostic Studies	Bilirubin, LDH, and laboratory abnormalities.	Lab values will show, high serum iron, TIBC, and serum ferritin Testing will be done for known genetic mutations and a liver biopsy.	High hemoglobin and RBC count with microcytosis, low to normal EPO levels, high WBC with basophilia and neutrophils, high platelet count and dysfunction and high levels of leukocyte alkaline phosphate, uric acid, and cobalamin levels.
Drug Therapy	May need folate replacement, Treatment of underlying cause, blood transfusions and possibly corticosteroids General supportive care, aggressive hydration, and electrolyte replacement.	Iron chelating agents such as deferoxamine given IV or SUBQ, or defrasirox/ deferiprone which are given orally.	Phlebotomy is the mainstay of treatment to reduce the hematocrit below 45%. Avoid iron supplements and increase hydration therapy to reduce bloods viscosity. Low dose of aspirin, Allopurinol, hydroxyurea, busulfan, and chlorambucil may be given.
Nursing Management	Patients should be educated on the importance of blood transfusions, monitor IV fluids, and assess for any signs of fluid overload, and assess vital signs frequently.	Educate the patient on dietary changes such as avoiding vitamin C, iron supplements, uncooked seafood, and iron rich foods. Assist in managing organ involvement.	Assisting with phlebotomy, assess fluid intake and output during hydration therapy, and avoid fluid overload. Assess nutritional status, educate on passive leg exercises, and educate on the importance of medications to decrease risk for clots.