Chapter 46

Care of the Patient with a Blood or Lymphatic Disorder
Components of the Blood

- Red blood cells (erythrocytes) carry oxygen and carbon dioxide away from the cells
- White blood cells (leukocytes) fight infections within the body
- Thrombocytes assist in forming clots
- Plasma
Types of White Blood Cells

- Neutrophils—essential for phagocytosis
- Eosinophils—responsible for allergic reactions and fight certain parasitic infections
- Basophils—essential to the nonspecific immune response to inflammation
- Monocytes—engulf foreign antigens and cell debris
- Lymphocytes—determine the specificity of the immune response
Erythrocyte Formation

- Dependent on several factors
  - Healthy bone marrow
  - Dietary substances such as iron and copper
  - Essential amino acids
  - Certain vitamins, especially vitamin $B_{12}$, folic acid, riboflavin (vitamin $B_2$), and pyridoxine (vitamin $B_6$)
White Blood Cell Differential

- An examination in which the five types of WBCs are counted and reported as percentages
  - Neutrophils
  - Eosinophils
  - Basophils
  - Monocytes
  - Lymphocytes
Hemostasis

- A process in the body that arrests the flow of blood and prevents hemorrhage
- Involves three processes
  - Vessel spasms
  - Platelet plug formation
  - Clot formation
Vessel Spasm

- Smooth walls of the vessels contract
- This narrows the lumen of the vessel
Platelet Plug Formation

- Platelets rush in and attempt to seal the area
- This is effective in most small vessels
Clot Formation

- Injury
- Hemorrhage
- Grouping platelets
- Thromboplastin released (reacts along with calcium ions)
- Converts prothrombin to thrombin
- Links with fibrinogen
- Formation of fibrin
- Traps RBCs and platelets
- Forms clot
Blood Types

- Preferred system is the ABO system
- Four types
  - A
  - B
  - AB
  - O
Type A

- Contains A Antigen
- Will clump when exposed to A antibody
Type B

- Contains B antigen
- Will clump when exposed to B antibody
Type AB

- Contains neither A nor B antibodies
- The universal recipient
Type O

- Does not contain A nor B antigens
- The universal donor
Lymphatic System Structures

- Lymphatic vessels
- Lymph fluid
- Lymph tissue
Lymphatic System Function

- Maintenance of fluid balance
- Production of lymphocytes
- Absorption and transportation of lipids from the intestine to the bloodstream
Laboratory Tests and Diagnostic Exams

- CBC
- Schilling test and megaloblastic anemia profile
- Gastric analysis
- Radiologic studies
- Bone marrow aspiration or biopsy
CBC

- A CBC includes
  - Red blood cells (RBCs)
  - White blood cells (WBCs)
  - Hematocrit (Hct)
  - Hemoglobin (Hgb)
  - Erythrocyte indexes
  - Differential white cell count
Schilling Test and Megaloblastic Anemia Profile

- A laboratory blood test for diagnosing pernicious anemia
- Measures the absorption of radioactive vitamin B$_{12}$, before and after parenteral injection of the intrinsic factor
Gastric Analysis

- An older test for determining pernicious anemia
- In pernicious anemia, gastric secretions are minimal and the pH remains elevated, even after injection of histamine
Radiologic Studies

- CT
- MRI
Bone Marrow Aspiration or Biopsy

- Bone marrow aspiration or biopsy can help establish the diagnosis and assess treatment response
Anemia

- Hypovolemic anemia
- Pernicious anemia
- Aplastic anemia
- Iron deficiency anemia
- Sickle cell anemia
Hypovolemic Anemia

- Due to acute or chronic blood loss
- Signs and symptoms include restlessness; a subtle rise in respiratory rate; weakness; stupor; irritability; pale, cool, moist skin; rapid thready pulse
- Blood counts should be monitored during and after the suspected bleed
- Treatment is aimed at stopping bleeding and replacing fluid
- Hemodynamic status and signs or symptoms of bleeding should be monitored closely
Hypovolemic Shock

- Shock caused by a decrease in circulating fluid in the body
- Signs and symptoms of hypovolemic shock include
  - Irritability
  - Weakness
  - Cool, clammy skin
  - Diaphoresis
  - Weak, thready pulse
Pernicious Anemia

- Caused by impaired $\text{B}_{12}$ absorption through the small intestine
- Lack of intrinsic factor causes this malabsorption
- Characterized by fever, fatigue, glossitis, decreased Hgb
- Treatment involves replacing $\text{B}_{12}$ with injections for life
- Nursing interventions vary greatly and are dependent upon the patient’s condition
Patient Teaching for the Patient with Pernicious Anemia

- Importance of maintaining $B_{12}$ level
- Injections will need to be maintained for life
- The patient should be taught how to self-inject, or a family member should be taught
- High $B_{12}$ diet
- Importance of rest
- Ways to avoid fatigue
Aplastic Anemia

- Depression of erythrocyte production results in lowered hemoglobin and RBCs
- Leukopenia and thrombocytopenia may develop
- Patient is usually pancytopenic
- Fatigue, weakness, general malaise, dyspnea, and palpitations may characterize aplastic anemia
- Diagnosed through history, CBC, and bone marrow biopsy
- Blood transfusions must be used cautiously, steroids, prevent infection, immunosuppressive therapy, bone marrow transplant, splenectomy
Iron Deficiency Anemia

- RBCs contain decreased levels of hemoglobin
- Most common cause is excessive iron loss
- In adults, the most common cause is chronic intestinal or uterine bleeding
- The most common symptoms of iron deficiency anemia are pallor, glossitis, fatigue, weakness, and sometimes shortness of breath
- RBC, hemoglobin levels, and hematocrit are decreased; serum iron levels are low
- Treatment is aimed at iron replacement and stopping bleeding
Leukemia

- A malignant disorder of the hematopoietic system in which an excess of leukocytes accumulates in the bone marrow and lymph nodes
- Classified by the type of cell involved
- Diagnosed through careful assessment, labs, CT, and lumbar puncture
- Patient may initially complain of joint pain and fatigue
- Symptoms may progress to skin abnormalities, infection, and abnormal lab findings
Leukemia cont’d

- Treatment options include medications, bone marrow transplant, stem cell transplant, radiation
- Nursing interventions should be directed at preventing complications, preventing infection, preventing fatigue, and providing patient education
Disorders of Coagulation

- Thrombocytopenia
- Hemophilia
- Disseminated intravascular coagulation
Thrombocytopenia

- A deficiency in the number of circulating platelets
- Occurs in aplastic anemia, leukemia, tumors, and chemotherapy
- Major signs include petechiae and ecchymoses under the skin
- Patient may also vomit blood, have black tarry stools, and passage of red blood from the anus
- Diagnosed through lab testing and careful assessment
Thrombocytopenia cont’d

- Treatment is aimed at the underlying cause
- Frequently includes administration of immunoglobulins
- Nursing interventions
  - Prevent infection
  - Prevent bleeding
Hemophilia

- Hemophilia is an X-linked hereditary trait that affects mainly males
- Females are carriers
- The patient is missing clotting factors that prevent bleeding, therefore the patient has increased risk for bleeding
- Clinical manifestations include abnormal bleeding, bleeding in the joint space, fever, pain, edema, and redness
Hemophilia cont’d

- Diagnosed by examining factor VIII and IX, which will be deficient
- Care focuses on preventing and treating bleeding and relieving pain
- Nursing interventions are aimed at preventing hemorrhage and controlling hemorrhages that occur
Disseminated Intravascular Coagulation (DIC)

- Plasma clots are formed during this coagulopathy
- This leads to thrombosis and eventually bleeding
- HELLP
- This is a grave diagnosis and the prognosis is poor
Disseminated Intravascular Coagulation (DIC) cont’d

- Bleeding is the most common sign associated with DIC
- D-dimer and FDP will be elevated
- Platelets are decreased
- Medical management—the underlying condition may be treated
- Nursing interventions are aimed at bleeding prevention and careful assessment
Lymphedema

- Nursing interventions are aimed at increasing lymphatic drainage and avoiding trauma

- Nursing interventions include
  - Massage
  - Encouraging active exercise
  - Advise patients to avoid constrictive clothing, shoes, or stockings
Multiple Myeloma

- A malignant neoplastic immunodeficiency disease of the bone marrow
- Neoplastic cells invade the bone marrow, which destroys osseous tissue
- The disease process shows a proliferation of malignant plasma cells and development of single or multiple bone marrow tumors
- This is followed by bone destruction with dissemination into lymph nodes, liver, spleen, and kidneys
- The patient may also experience pancytopenia and the complications that occur with it
Multiple Myeloma cont’d

- Diagnosis of multiple myeloma is made with radiographic skeletal studies, bone marrow biopsy, and laboratory examination of blood and urine
- Treatment is symptomatic
- Radiation and chemotherapy are initiated to reduce tumor size, impede tumor growth, and produce remission
- Nursing interventions for multiple myeloma focus on relieving pain, preventing infection and bone injury, administering chemotherapy and radiation, and maintaining hydration
Hodgkin’s Lymphoma

- Characterized by painless, progressive enlargement of lymphoid tissue
- Painless enlargement of the cervical, axillary, or inguinal lymph nodes is most often the initial development
- Blood studies show anemia
- Chest X-ray may show a mediastinal mass
- CT scan may show an enlarged spleen or liver
- Reed-Sternberg cells
Hodgkin’s Lymphoma cont’d

- Treatment varies widely depending on the stage of the disease
- Nursing interventions
  - Prevent infection
  - Control itching
  - Prevent skin breakdown
  - Work to alleviate fear and anxiety
Nursing Process for the Patient with a Blood or Lymphatic Disorder

- Assessment
- Planning
- Diagnosis
- Implementation
- Evaluation
Assessment

- Collect data from various sources
- Remain aware of vague signs and symptoms that may be produced
- Assess for signs and symptoms that occur as a result of low RBCs, WBCs, platelets
- Assess for signs of bleeding
- Assess for abnormal clotting
Diagnosis

- Risk for infection
- Injury (trauma)
- Risk for (bleeding, falls)
- Fatigue
- Deficient knowledge
- Acute pain
- Chronic pain

- Ineffective tissue perfusion
- Impaired gas exchange
- Activity intolerance
- Ineffective coping
- Impaired skin integrity
Planning and Implementation

- Goals should be realistic and measurable
- Use Maslow’s hierarchy of needs
Evaluation

- Outcomes and interventions should be evaluated to determine appropriateness and effectiveness