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Chapter 47

Care of the Patient With a Blood or Lymphatic Disorder

Lesson 47.1

1. Describe the components of blood.
2. Discuss factors necessary for the formation of erythrocytes.
3. Differentiate between the functions of erythrocytes, leukocytes, and thrombocytes.
4. Define the white blood cell differential.
5. Describe the blood-clotting process.
6. List the basic blood groups.
7. Describe the generalized functions of the lymphatic system and list the primary lymphatic structures.

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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

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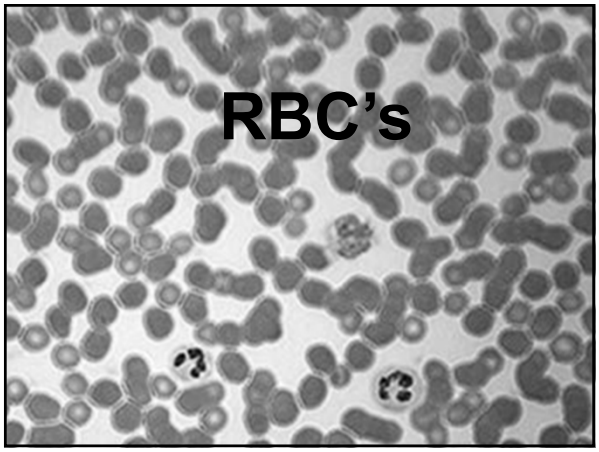
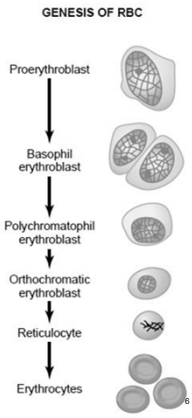


Erythrocyte Formation

- 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)



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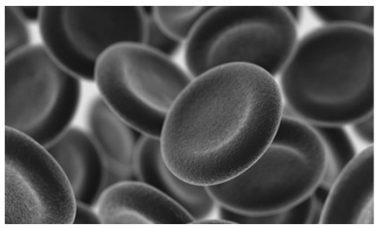
Red Blood Cells

- Hemoglobin (Hgb) contained in erythrocytes carries oxygen from the lungs to the cells and carbon dioxide away from the cells to the lungs



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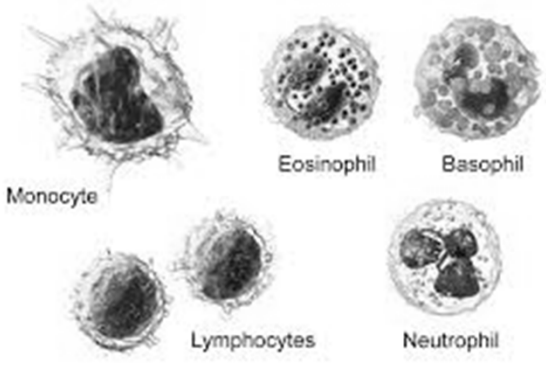
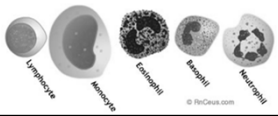


White Blood Cells

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



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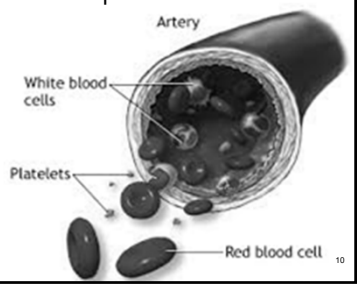
White Blood Cell Differential

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



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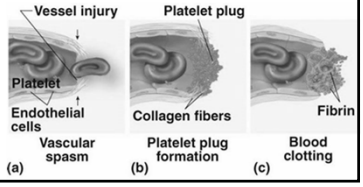
CBC
Adult Reference Ranges

Parameter	Adult Reference Range
WBC	4.5-11.0 X 10^3/μL
RBC	Male: 4.5-5.5 X 10^6 /μL Female: 4.0-5.0 X 10^6 /μL
HGB	Male: 14-17.4 g/dL Female: 12.0-16.0 g/dL
HCT	Male: 42-52% Female: 36-46%
MCV	80-100 fl
MCH	28-34 pg
MCHC	32-36 g/dL or %
RDW	12.0-14.6%
PLT	150-450 X 10^3 /μL
MPV	6.8-10.2 fl

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



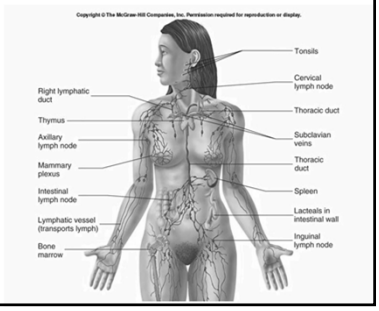
Blood Types

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

TYPE	YOU CAN GIVE BLOOD TO	YOU CAN RECEIVE BLOOD FROM
A+	A+, AB+	A+, A-, O+, O-
O+	O+, A+, B+, AB+	O+, O-
B+	B+, AB+	B+, B-, O+,O-
AB+	AB+	EVERYONE
A-	A+, A-, AB+, AB-	A-, O-
O-	EVERYONE	O-
B-	B+, B-, AB+, AB-	B-, O-
AB-	AB+, AB-	AB-, A-, B-, O-

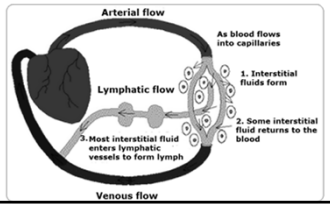
Lymphatic System Structures

- 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



Lesson 47.2

8. List common diagnostic tests for evaluation of blood and lymph disorders, and discuss the significance of the results.
9. Compare and contrast the various types of anemia in terms of etiology and pathophysiology, clinical manifestations, assessment, diagnostic tests, medical management, nursing interventions, patient teaching, and prognosis.
10. List six signs and symptoms associated with hypovolemic shock.
11. Discuss important issues to cover in patient teaching and home care planning for the patient with pernicious anemia.
12. Discuss the etiology and pathophysiology, clinical manifestations, assessment, diagnostic tests, medical management, nursing interventions, patient teaching, and prognosis for patients with acute and chronic leukemia.

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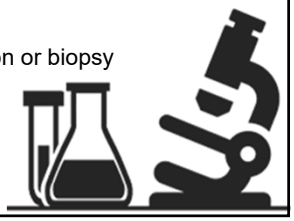
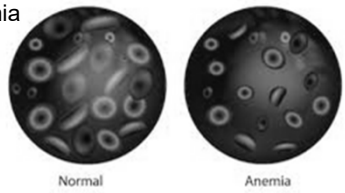
Laboratory Tests and Diagnostic Exams

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



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

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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 B_{12} absorption through the small intestine
- Lack of intrinsic factor causes this malabsorption
- Characterized by fever, fatigue, glossitis, decreased Hgb
- Treatment involves replacing B_{12} with injections for life
- Nursing interventions vary greatly and are dependent upon the patient's condition

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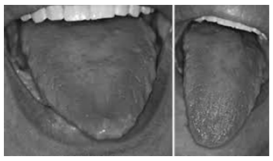
Patient Teaching for the Patient with Pernicious Anemia

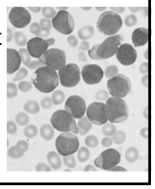
- Importance of maintaining B_{12} level
- Injections will need to be maintained for life
- The patient should be taught how to self-inject, or a family member should be taught
- High B_{12} diet
- Importance of rest
- Ways to avoid fatigue



Leukemia

(Slide 1 of 2)

- 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

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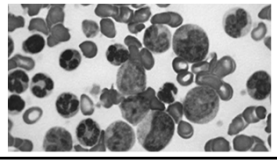
- Treatment options include medications, bone marrow transplant, stem cell transplant, radiation
- Nursing interventions should be directed at preventing complications, preventing infection, preventing fatigue, and providing patient education



Lesson 47.3

13. Compare and contrast the disorders of coagulation (thrombocytopenia, hemophilia, disseminated intravascular coagulation) in terms of etiology and pathophysiology, clinical manifestations, assessment, diagnostic tests, medical management, nursing interventions, and prognosis.
14. Discuss the primary goal of nursing interventions for the patient with lymphedema.
15. Discuss the etiology and pathophysiology, clinical manifestations, assessment, diagnostic tests, medical management, nursing interventions, patient teaching, and prognosis for the patient with multiple myeloma, malignant lymphoma, and Hodgkin's lymphoma.
16. Apply the nursing process to the care of the patient with disorders of the hematologic and lymphatic systems.

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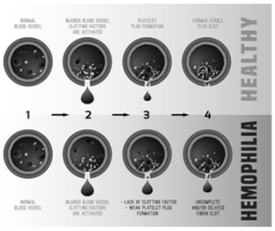
Disorders of Coagulation

- Thrombocytopenia
- Hemophilia
- Disseminated intravascular coagulation



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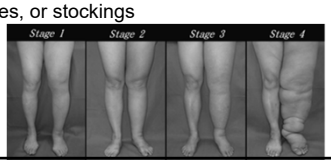
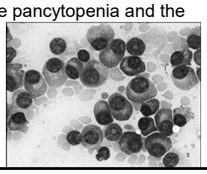
Lymphedema

- 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



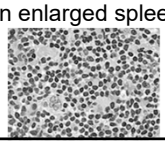
Multiple Myeloma

- 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



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



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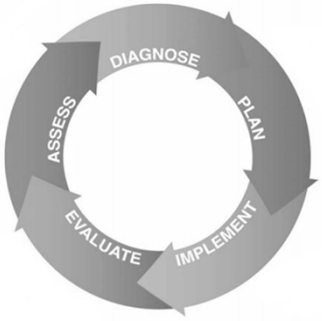
Nursing Process for the Patient with a Blood or Lymphatic Disorder

- Assessment
- Planning
- Diagnosis
- Implementation
- Evaluation



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