

## Component 3-Terminology in Healthcare and Public Health Settings

### Unit 4-Blood, Lymphatic and Immune Systems

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## Blood, Lymphatic and Immune Systems

- Objectives
  - Define, understand and correctly pronounce medical terms related to the blood, lymphatic and immune systems
  - Describe the following related to the blood, lymphatic and immune systems
    - common diseases and conditions
    - laboratory and diagnostic procedures
    - medical and surgical procedures
    - medications

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## Blood Overview

- Average adult has about five liters of blood
- Blood circulates through body within blood vessels
- Blood cells are produced in red bone marrow

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## Blood: Functions

- Transports substances throughout body
  - Substances are attached to **red blood cells** or dissolved in **plasma**
- **White blood cells**
  - Fight infection and disease
- **Platelets**
  - Initiate blood clotting process

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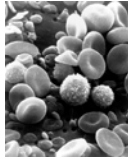
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## Blood Cells

- Erythrocytes (red blood cells)
  - Carry oxygen
  - Carry carbon dioxide
- Thrombocytes (Platelets)
  - Critical in blood clotting
- Leukocytes (white blood cells)
  - Provide protection against
    - bacteria
    - viruses
    - foreign material
- Plasma (fluid part of the blood)



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## Blood Types

- **Group A**
  - A antigen on red cells
  - B antibody in the plasma
- **Group B**
  - B antigen on red cells
  - A antibody in the plasma
- **Group AB**
  - both A and B antigens on red cells
  - neither A nor B antibodies in the plasma
- **Group O**
  - neither A nor B antigens on red cells
  - both A and B antibodies in the plasma

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## Rh Factor

- Rh - blood given to Rh- patients
- Rh- or Rh + blood given to Rh+ patients
- Universal red cell donor is O negative
- Universal plasma donor is AB positive

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## Iron deficiency Anemia

- Iron makes hemoglobin which gives the blood its red color.
- Low iron levels might be due to:
  - Heavy periods
  - Pregnancy
  - Ulcers
  - Colon polyps
  - Colon cancer
  - Inherited disorders
  - A diet that does not have enough iron
- Anemia can make you feel weak, cold, dizzy and irritable. It is confirmed with a blood test.

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## Treating Iron Deficiency Anemia

- Increase iron-rich foods
- Iron supplementation
- Takes months to correct

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## Sickle Cell Anemia

- Abnormally shaped red blood cells
  - Shaped like a crescent or sickle
  - More fragile and more easily ruptured
    - Leads to anemia
  - Get stuck in blood vessels, blocking blood flow
    - Painful
    - Organ damage

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## Sickle Cell Anemia

- Genetic
- Two sickle cell genes, one from each parent = sickle cell anemia
- One sickle cell gene – sickle cell trait
- 1 in 12 African Americans has sickle cell trait
- Diagnosed with a blood test

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## Sickle Cell Treatment

- No widely available cure
- Treatment relieves symptoms
- Goals of treatment
  - Relieve pain
  - Prevent infections, organ damage, or strokes
  - Control complications
- Researchers looking for new treatments

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## Blood Combining Forms

- chrom/o color hemochromatosis
- coagul/o clotting coagulation
- erythr/o red erythrocyte
- granul/o granules granulocyte
- hemat/o blood hematologist
- leuk/o white leukopenia
- thromb/o clot thrombosis

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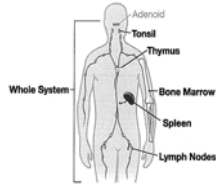
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## The Lymphatic and Immune Systems

- Organs of the Lymphatic System
  - Lymph nodes
  - Lymphatic vessels
  - Thymus gland
  - Spleen
  - Tonsils



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## The Lymphatic and Immune Systems

- Functions of the Lymphatic System
  - Network of vessels
  - Picks up excess tissue fluid, cleanses it, and returns it to circulatory system
  - Picks up fats absorbed by digestive system
- Functions of Immune System
  - Fights disease and infections

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## Immunity

- Body's ability to defend itself
- Target pathogens
  - Bacteria, viruses, fungi, protozoans, toxins, cancerous tumors
- Two forms
  - Natural immunity
  - Acquired immunity

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## Natural Immunity

- Also called **innate immunity**
- Not specific to a particular disease
- Doesn't require prior exposure to pathogen
- Example:
  - WBCs that ingest any pathogen encountered

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## Acquired Immunity

- Body's response to a specific pathogen
- May be either:
  - Passive acquired immunity
  - Active acquired immunity

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## Acquired Immunity

- **Passive acquired immunity**
  - Results when a person receives protective substances produced by
    - Another human (e.g., maternal antibodies)
    - An animal (e.g., antitoxin)
- **Active acquired immunity**
  - Develops following direct exposure to pathogen
  - Stimulates immune response – series of mechanisms designed to neutralize pathogen
  - Immunizations provide active acquired immunity

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## Lymphedema

- **Edema (swelling) develops from**
  - An increase in the amount of fluid in the body
  - A blockage in the lymphatic system
- **Causes include**
  - Infection
  - Cancer
  - Scar tissue from radiation therapy or removal of lymph nodes
  - Inherited conditions
- **Treatments**
  - Physical methods (compression stockings)
  - Medicines

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## Tonsillitis

- **Definition**
  - Inflammation of the tonsils (two oval-shaped pads of tissue at the back of the throat, one tonsil on each side)
- **Signs and symptoms**
  - Swollen tonsils
  - Sore throat
  - Difficulty swallowing
- **Causes**
  - Common virus
  - Bacterial infection
- **Treatment**
  - Tonsillectomy

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## Tell me, Detective . . .

- James complains of soaking night sweats, fatigue, shaking chills, swollen lymph nodes, weight loss, persistent white spots on his tongue and headaches. This is indicative of:
  - Tonsillitis
  - Iron deficiency anemia
  - AIDS



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- For additional information on content covered in this unit, please visit:

- <http://www.nlm.nih.gov/medlineplus/bloodheartandcirculation.html/>
- <http://www.nlm.nih.gov/medlineplus/immunesystem.html>

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