

ANATOMY AND PHYSIOLOGY

BSN - 1L

1ST SEMESTER | S.Y. '26-27

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1 INTRODUCTION TO ANATOMY AND PHYSIOLOGY

- Anatomy and physiology are the twin pillars of the biological sciences. While they are often studied together, their focuses are distinct yet inextricably linked.

ANATOMY

- The build up of electric charge on the surface of an object. These charges stay in one place (they are "static") until they are discharged.

PHYSIOLOGY

- is the study of the function of the body's structural machinery—how the parts work and carry out their life-sustaining activities.

2 LEVELS OF STRUCTURAL ORGANIZATION

- The body is organized into a hierarchical structure, where each level builds upon the previous one, increasing in complexity.

NOTES DURING ROUND-ROBIN ACTIVITY

1. CHEMICAL LEVEL

- The simplest level, involving atoms combining to form molecules (e.g., water, proteins, carbohydrates). These molecules associate in specific ways to form organelles.

2. CELLULAR LEVEL

- Cells are the basic structural and functional units of an organism. They are composed of organelles and represent the smallest units of life.

3. TISSUE LEVEL

- Tissues are groups of similar cells that have a common function. The four primary tissue types are epithelial, connective, muscle, and nervous tissue.

4. ORGAN LEVEL

- An organ is a discrete structure composed of at least two (and usually four) tissue types that performs a specific complex function for the body.

5. ORGAN SYSTEM LEVEL

- Organs that work together to accomplish a common purpose (e.g., the cardiovascular system pumping blood).

6. ORGANISMAL LEVEL

- The highest level of organization; the sum total of all structural levels working in concert to promote life.

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3 NECESSARY LIFE FUNCTIONS AND SURVIVAL NEEDS

- To maintain life, an organism must perform specific physiological processes and maintain a stable internal environment.

RESPONSIVENESS

- The ability to sense changes (stimuli) in the environment and respond to them.

MOVEMENT

- Includes not only the motion of the body as a whole but also the movement of substances within the body (e.g., blood flow, peristalsis).

METABOLISM

- All chemical reactions that occur within body cells, including **catabolism** (breaking down substances) and **anabolism** (synthesizing complex structures).

EXCRETION

- The process of removing wastes (excreta) from the body.

4 ANATOMICAL TERMINOLOGY AND ORIENTATION

- To ensure precision in clinical and research settings, anatomists use a standardized language.

THE ANATOMICAL POSITION

- All anatomical descriptions assume the body is in the **anatomical position**: standing erect, facing forward, arms at the sides, and palms facing anteriorly (forward).

DIRECTIONAL SYSTEM

- These terms allow for the precise localization of body structures relative to one another:

- **Superior (Cranial) vs. Inferior (Caudal)**: Toward the head vs. toward the feet.
- **Anterior (Ventral) vs. Posterior (Dorsal)**: Toward the front vs. toward the back.
- **Medial vs. Lateral**: Toward the midline of the body vs. away from the midline.
- **Proximal vs. Distal**: Closer to the point of attachment (of a limb) vs. further from the point of attachment.
- **Superficial vs. Deep**: Toward the body surface vs. away from the body surface.

5 BODY PLANES AND SECTIONS

- Anatomical imaging and surgical procedures require viewing the body in slices or planes.

SAGITTAL PLANE

- A vertical plane that divides the body into right and left parts. A **midsagittal** plane divides the body into exactly equal halves.

FRONTAL (CORONAL) PLANE

- A vertical plane that divides the body into anterior and posterior (front and back) portions.

TRANSVERSE (HORIZONTAL) PLANE

- A horizontal plane that divides the body into superior and inferior (top and bottom) portions. Sections made through this plane are often called **cross-sections**.

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