Introduction to the Human Body

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Anatomy

Anatomy: the study of body structure A.K.A. morphology of the body.

"What it looks like"

Example: anatomy describes what the lung looks like.

Physiology

- Physiology: the study of the body's function.
- How the body works

Example: Physiology of the lung describes the process of gas exchange.

- Pathophysiology: the study of improper functioning of the body.
- What happens in the body when something is wrong.

Example: Pathophysiology would describe how gas exchange is altered with a patient suffering from emphysema.

Human Body

- The body has levels of organization.
- Simple to complex
- From microscopic atoms to complex human organisms.
- Progression:
  - Atoms→ molecules →cells → tissues →organs→ organ systems→organism.

- Cells are the smallest living unit.
- Tissues are specialized groups of cells with similar structure and function.
- Organs are arranged from tissues and are a group of tissues that accomplish a function. Ex. Lung has organized tissue to aid in gas exchange.
- Organ systems are comprised of organs. Ex. Respiratory system is made of lungs.
- Organ systems form the human organism.

Major Organ Systems

- Integumentary: Skin-Hair-Nails
  - Protective covering & regulates body temp.
- Skeletal: Bones-joints-cartilage
  - Body's framework
- Muscular: Muscles
  - Enables the body to move

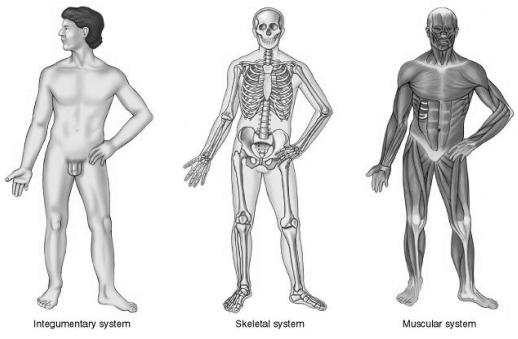
Major Organ Systems

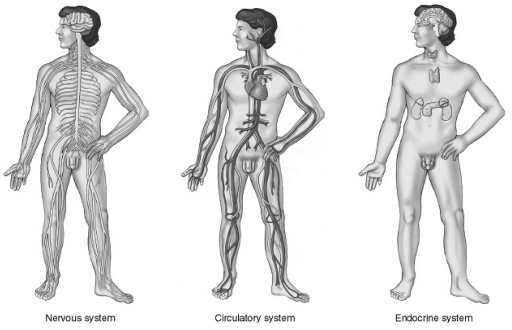
- Nervous: Brain-spinal cord-nerves-sense organs
  - Sensory & Motor processing
- Endocrine: Glands that secrete hormones and chemical substances.
  - Secretes hormones that regulate body activities
- Circulatory: Heart-Blood Vessels
  - Transports nutrients & O2 to cells & rid of waste

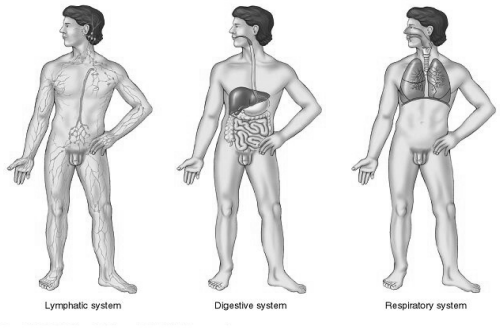
Major Organ Systems

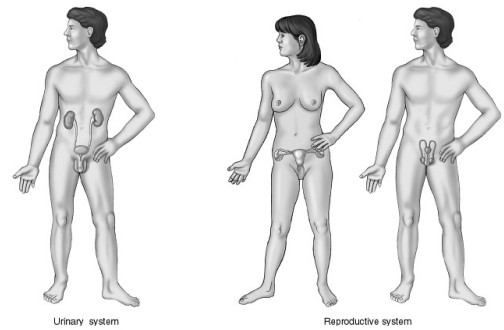
- Lymphatic: Lymph nodes-lymphatic vessels
  - Defend body against pathogens
- Respiratory: Lungs-Trachea-Bronchi
  - Provide O2 & rid of CO2
- Digestive: Stomach-intestines-liver-gallbladder
  - Digestion & Elimination

- Major Organ Systems
  - Urinary: Kidneys-Ureters-Bladder
    - Rid body of nitrogenious waste
  - Reprodutive: Ovaries-Testes
    - Reproduction & Secretion of hormones









Homestasis

- Homestasis: Body's ability to maintain a stable internal environment in response to changing external environment.
- Condition of body stays the same even with changes outside the body.

Ex. Your body temperature will stay at 98.6 regardless of outside temperature. Homeostatic mechanisms for temperature control are activated.

- Imbalance occurs when the mechanisms that keep the body in balance don't work.
- This results is Disease.
- Various disorders are related to Homeostatic Imbalance.

Anatomical Position

Anatomical position:

- Body is standing erect
- Face is forward
- Arms at at sides
- Palms and toes directed forward

Anatomical Terms: describes the location, position and regions of body parts.

Relative Position

Superior: above another part or closer to the head. Ex. Heart is superior to the liver

Inferior: below another part or closer to the feet. Ex. Liver is inferior to Lungs.

Relative Position

Anterior: front surface of body, a.k.a. Ventral
Example: Nose

Posterior: back surface of body, a.k.a Dorsal
Ex. Shoulder blades

Relative Position

Medial: toward the midline of the body
Ex. The heart is medial to the lungs

Lateral: away from the midline of the body
Ex. The shoulders are lateral to the neck

Relative Position

Proximal: nearer to trunk of body
Ex. The knee is proximal to the foot

Distal: Farther away from the trunk.
Ex. The palm is distal to the elbow

Relative Position

Superficial: Nearer to surface of body.
Ex. Skin, Veins

Deep: Away from surface of body.
Ex. Bones

Relative Position

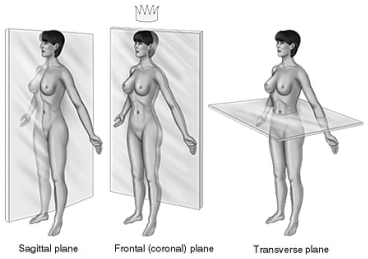
Central: located in the center
Ex. Heart

Peripheral: away from the center
Ex. Brain

Planes of Body

Planes: the body is divided into sections or planes by imaginary lines

- ***Sagittal plane***: divides the body lengthwise into right and left sections.
- ***Frontal plane***: divides the body into anterior and posterior sections. ***a.k.a coronal***
- ***Transverse plane***: divides the body horizontally creating upper and lower portions



Regional Terms

Regional Terms related to anterior surface:
Abdominal: anterior trunk just below ribs
Antecubital: area in front of elbow
Axillary: arm pit
Brachial:arm
Buccal: cheek
Cephalic: head
Cervical: neck region

Regional Terms

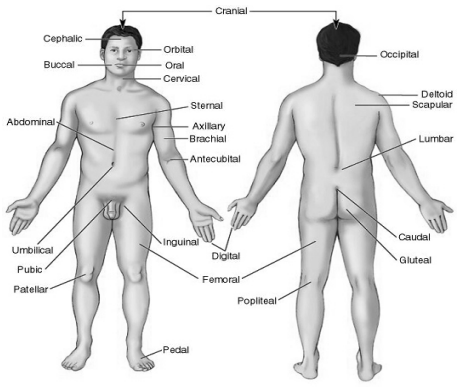
Cranial: nearer to the head
Digital: fingers, toes
Femoral: thigh area
Inguinal: area thigh meet trunk
Oral: mouth
Orbital: area around eye

Regional Terms

Patellar: front of knee
Pedal: foot
Pubic: genital area
Sternal: middle of chest
Umbilical: navel

Regional Terms

Regional Terms related to posterior surface:
Caudal: near tailbone
Deltoid: rounded area of shoulder
Gluteal: buttocks
Lumbar: area of back between ribs and hips
Occipital: back of head
Popliteal: behind the knee
Scapular: shoulder blade



Body Cavities

The organs, called viscera, are located in cavities of the body.

Two major cavities:

- Dorsal cavity: located at the back of the body.
  - Two divisions: Cranial: contains the brain
    Vetebral: contains spinal cord

Body Cavities

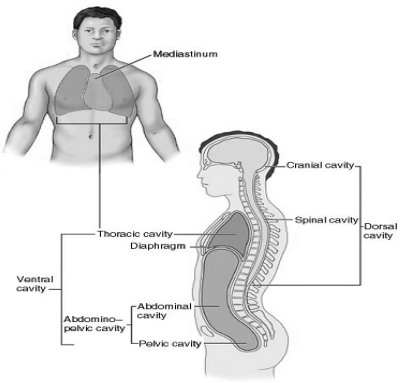
- The head has four smaller cavities:
  - Oral cavity
  - Nasal cavities
  - Orbital cavities
  - Middle ear cavities

Body Cavities

- Ventral Cavitiy: located toward the front of the body and has two divisions.
  - Thoracic cavity: located above the diaphragm and contains lungs, mediastinum, heart, esophagus, trachea, thymus gland, great vessels
    - Mediastinum: located in thoracic cavity & contains the heart, esophagus, trachea, thymus, blood vessels

Body Cavities

- Abdominopelvic Cavity: located below the diaphragm.
  - Abdominal cavity is upper portion and contains stomach, intestines, liver, gallbladder, pancreas, spleen, kidneys.
  - Pelvic cavity: lower portion containing rectum, urinary bladder, internal parts of reproductive system



Division into Quadrants

- The abdominopelvic cavity is divided into four quadrants:
  - Right upper quadrant
  - Left upper quadrant
  - Right lower quadrant
  - Left lower quadrant

Division into Regions

- Another system to divide the abdominopelvic cavity is into nine regions:
  - Three central regions: epigastric, umbilical, hypogastric
  - Six regions on either side of central region: right or left hypochondriac region, right or left lumbar region, right or left iliac region.