Introduction to the Human Body

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Human Body

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.

Human Body

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

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

Human Body

- 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.

Human Body

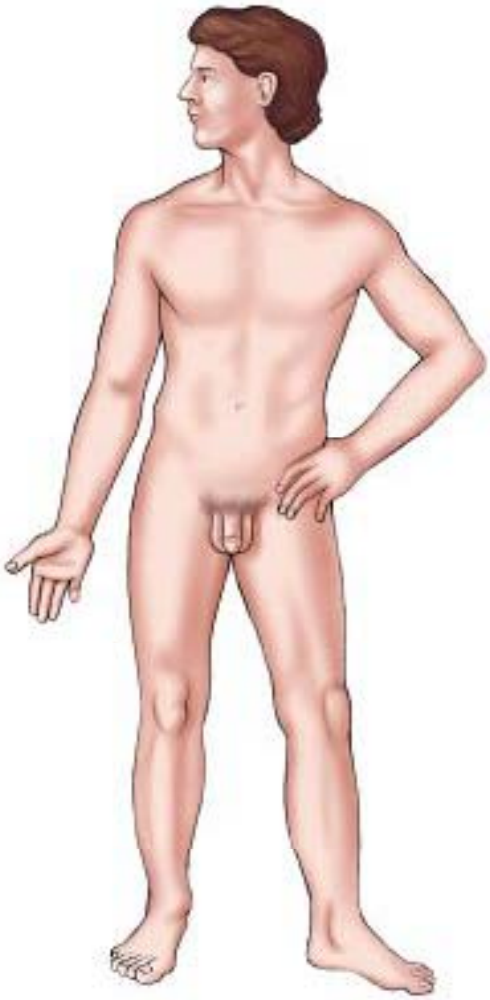
- Cells are the basic unit of life.
- Tissues are specialized groups of cells with similar structure and function.
- Organs are arranged from tissues and are a group of tissues that accomplish a function. Ex. Lung has organized tissue to aid in gas exchange.
- Organ systems are comprised of organs. Ex.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

Human Body

- Major Organ Systems:
  - Integumentary: Skin-Hair-Nails
  - Skeletal: Bones-joints-cartilage
  - Muscular: Muscles
  - Nervous: Brain-spinal cord-nerves-sense organs
  - Endocrine: Glands that secrete hormones and chemical substances.

Human Body

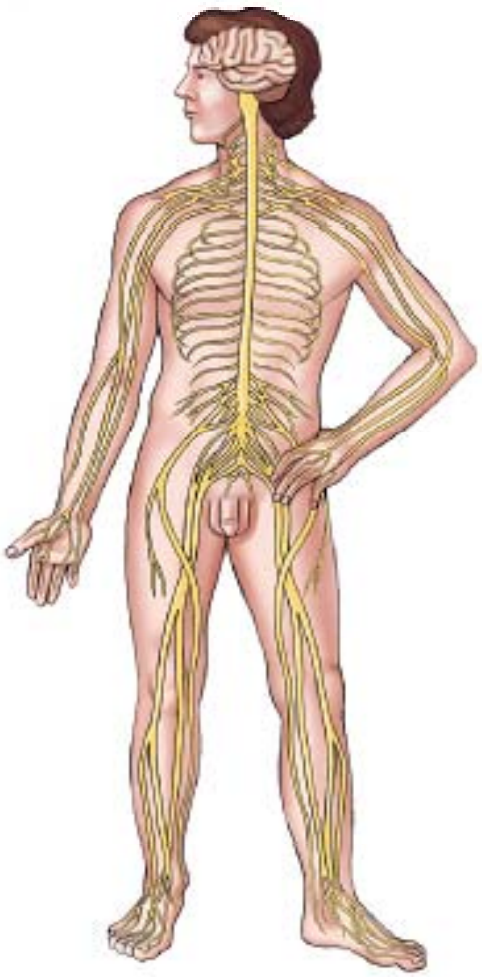
- Circulatory: Heart-Blood Vessels
- Lymphatic: Lymph nodes-lymphatic vessels
- Respiratory: Lungs-Trachea-Bronchi
- Digestive: Stomach-intestines-liver-gallbladder
- Urinary: Kidneys-Ureters-Bladder
- Reprodutive: Ovaries-testes



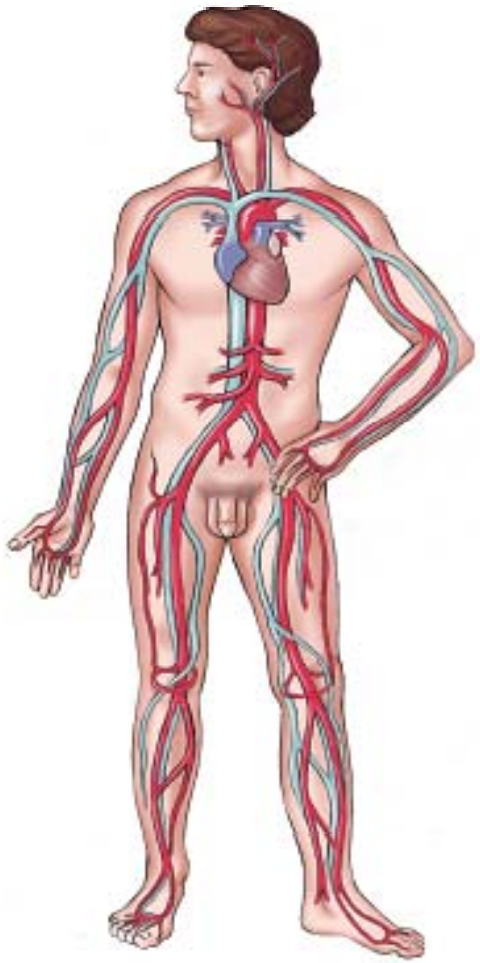
Integumentary system

Skeletal system

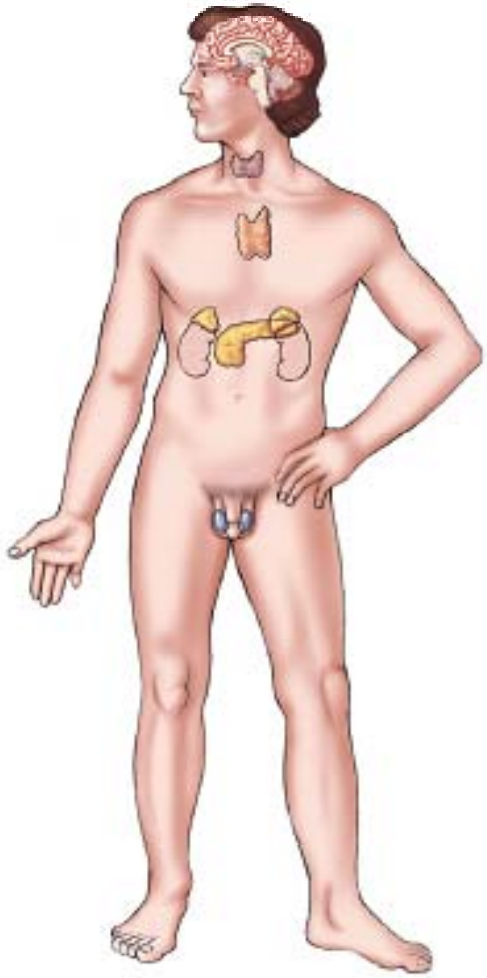
Muscular system



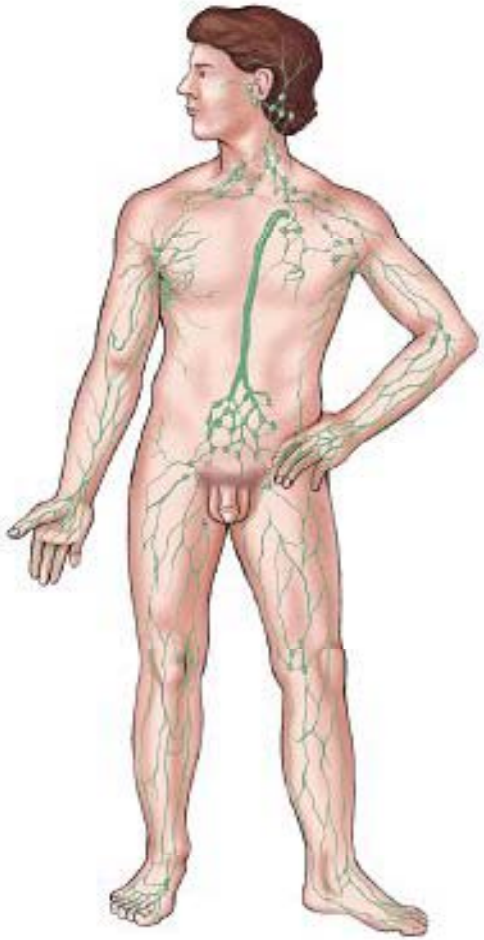
Nervous system



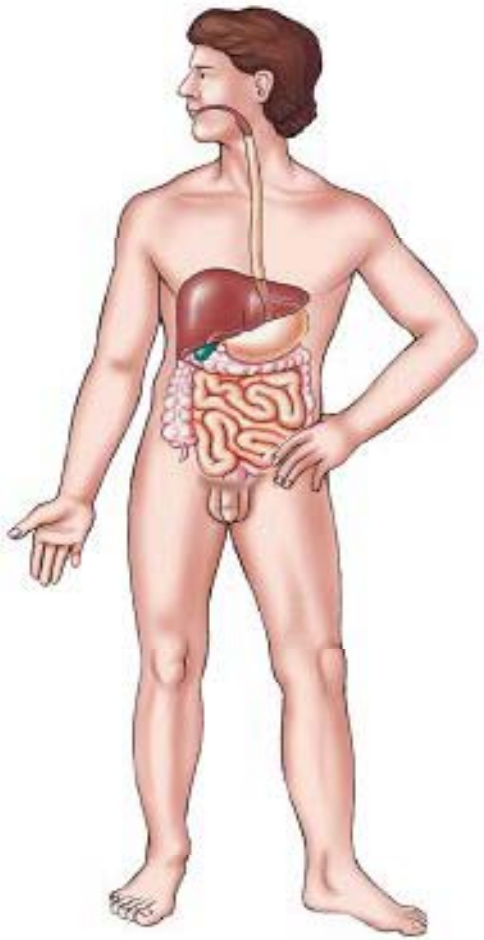
Circulatory system



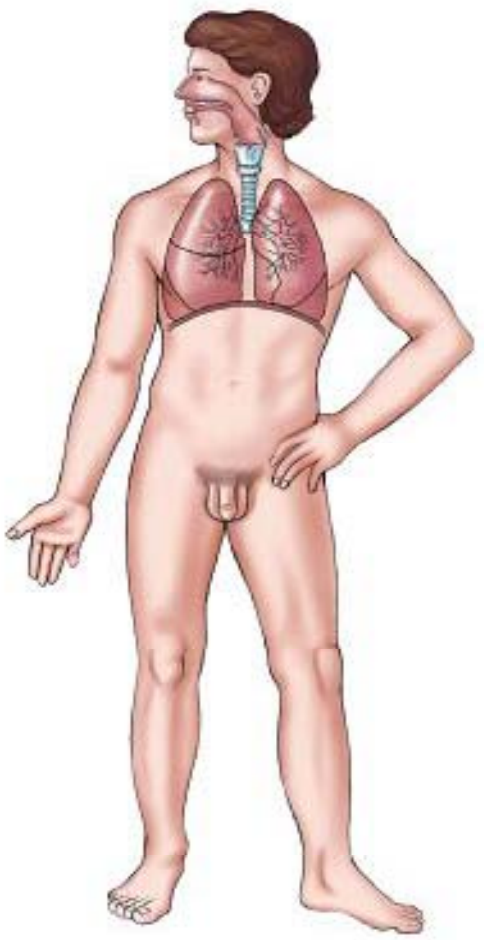
Endocrine system



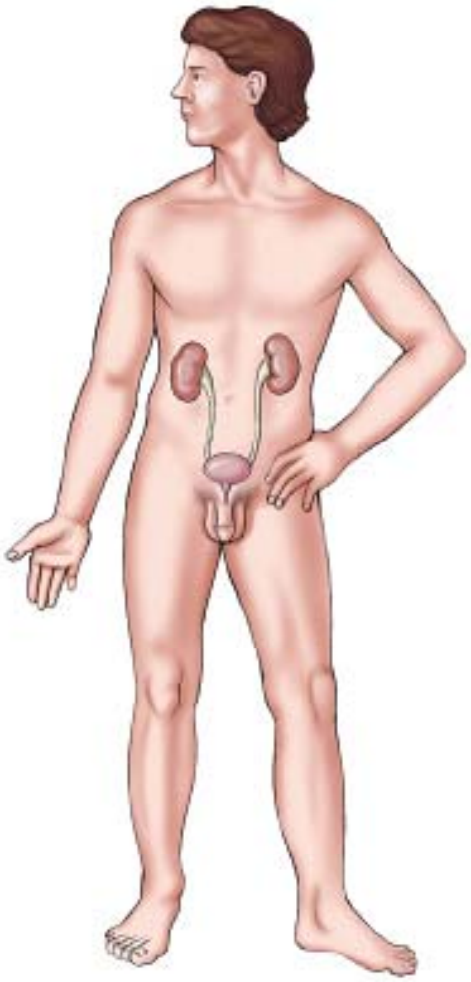
Lymphatic system



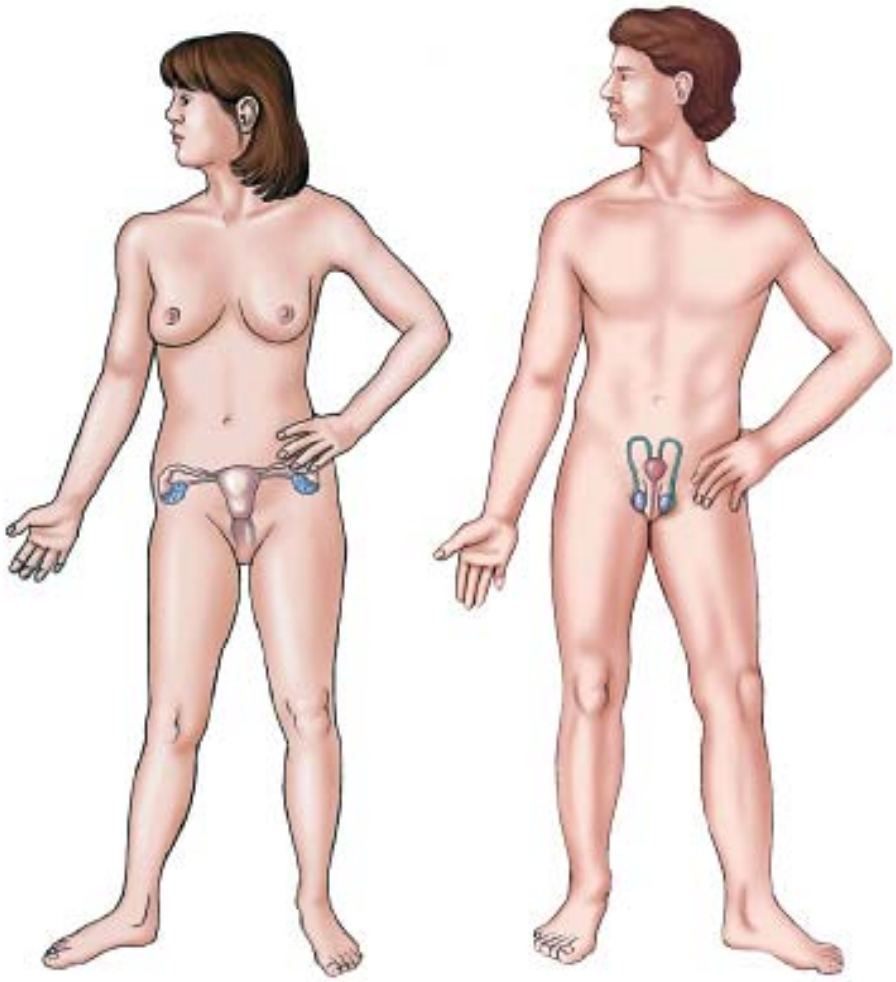
Digestive system



Respiratory system



Urinary system



Reproductive system

Human Body

- 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.

Human Body

- 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.

Human Body

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

Anatomical position:

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

Human Body

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.

Human Body

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

Human Body

Relative Positions:

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

Human Body

Relative Positions:

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

Human Body

Relative Terms:

Superficial: Nearer to surface of body.

Ex. Skin, Veins

Deep: Away from surface of body.

Ex. Bones

Human Body

Relative Position:

Central: located in the center

Ex. Heart

Peripheral: away from the center

Ex. Brain

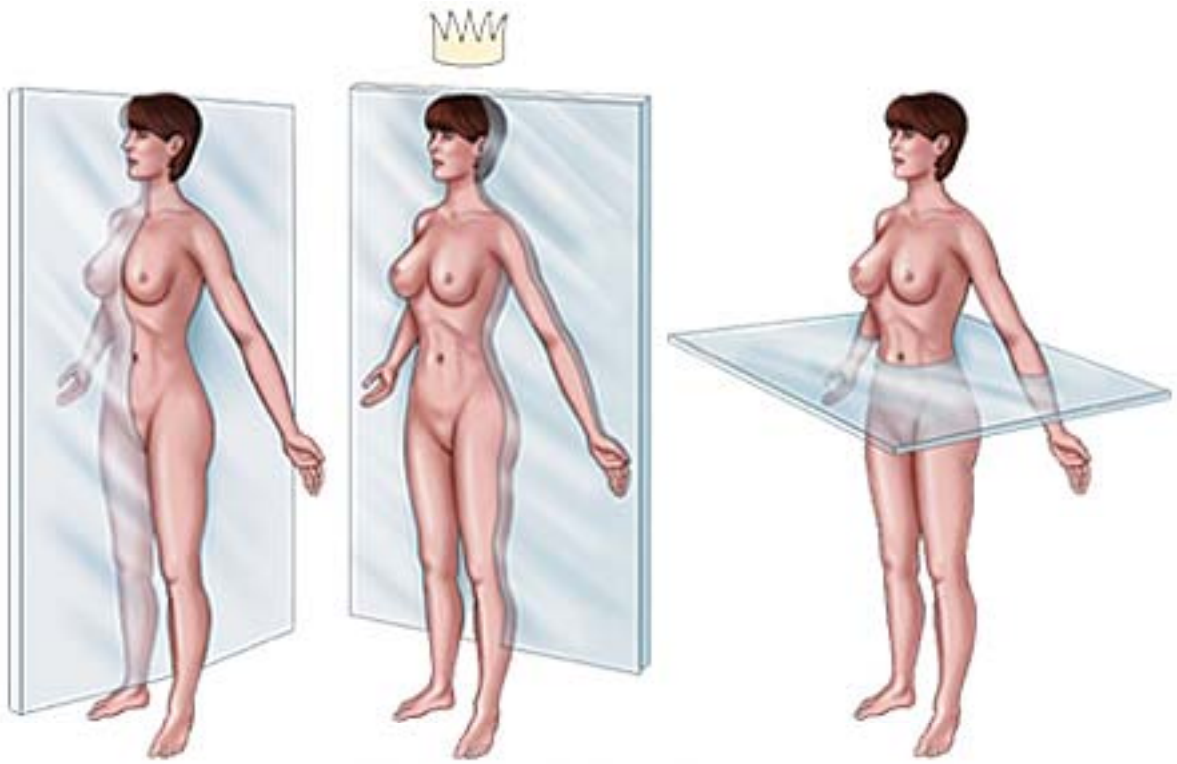
Human Body

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


Sagittal plane
Frontal (coronal) plane
Transverse plane

Human Body

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

Human Body

Regional Terms:

Cranial: nearer to the head

Digital: fingers, toes

Femoral: thigh area

Inguinal: area thigh meet trunk

Oral: mouth

Orbital: area around eye

Human Body

Regional Terms:

Patellar: front of knee

Pedal: foot

Pubic: genital area

Sternal:middle of chest

Umbilical: navel

Human Body

Regional Terms related to posterior surface:

Caudal: near tailbone

Deltoid: rounded area of shoulder

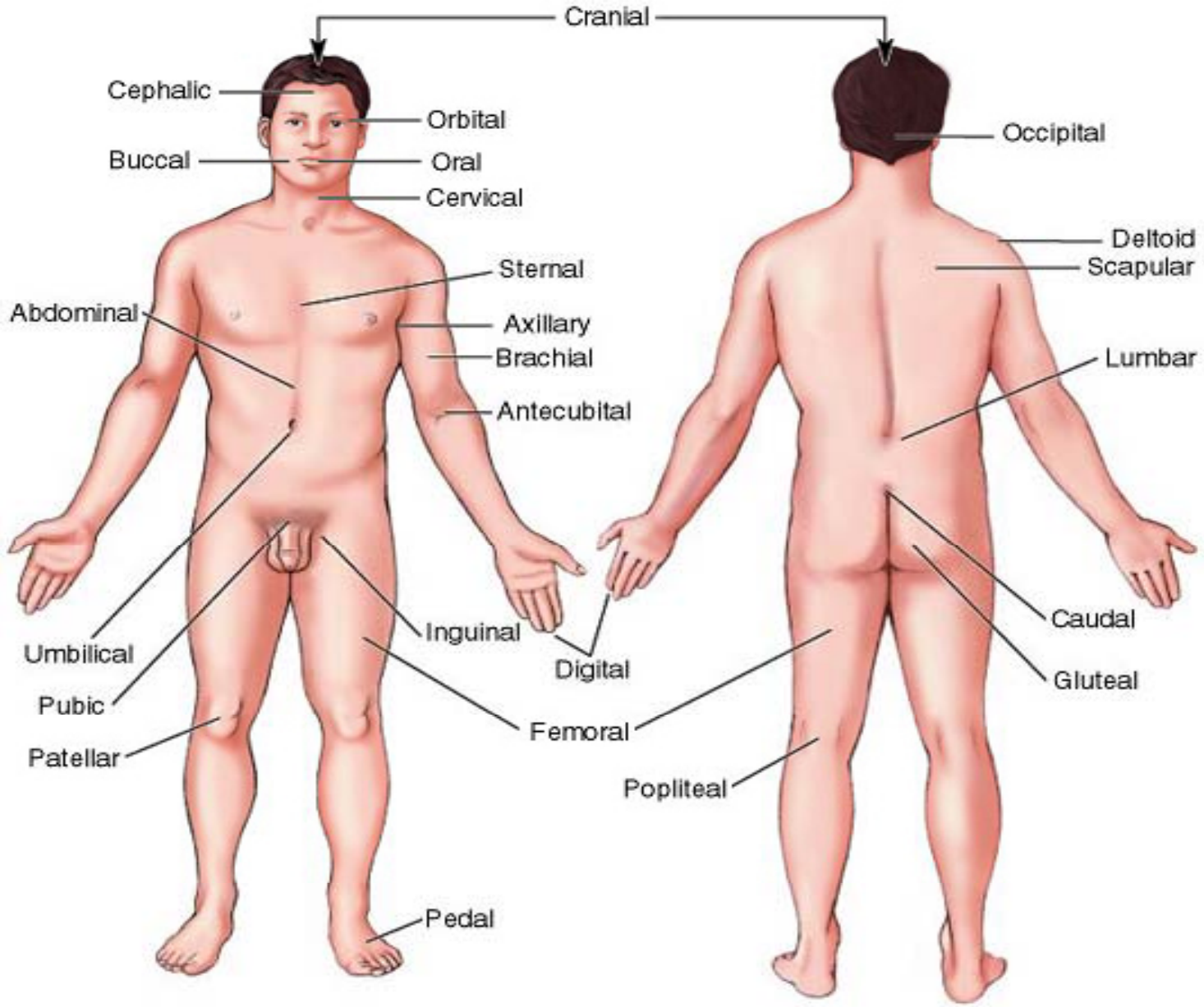
Gluteal: buttocks

Lumbar: area of back between ribs and hips

Occipital: back of head

Popliteal: behind the knee

Scapular: shoulder blade


Cranial
Cephalic
Orbital
Buccal
Oral
Cervical
Sternal
Abdominal
Axillary
Brachial
Antecubital
Umbilical
Inguinal
Digital
Pubic
Femoral
Patellar
Pedal
Occipital
Deltoid
Scapular
Lumbar
Caudal
Gluteal
Popliteal

Human Body

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

Human Body

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

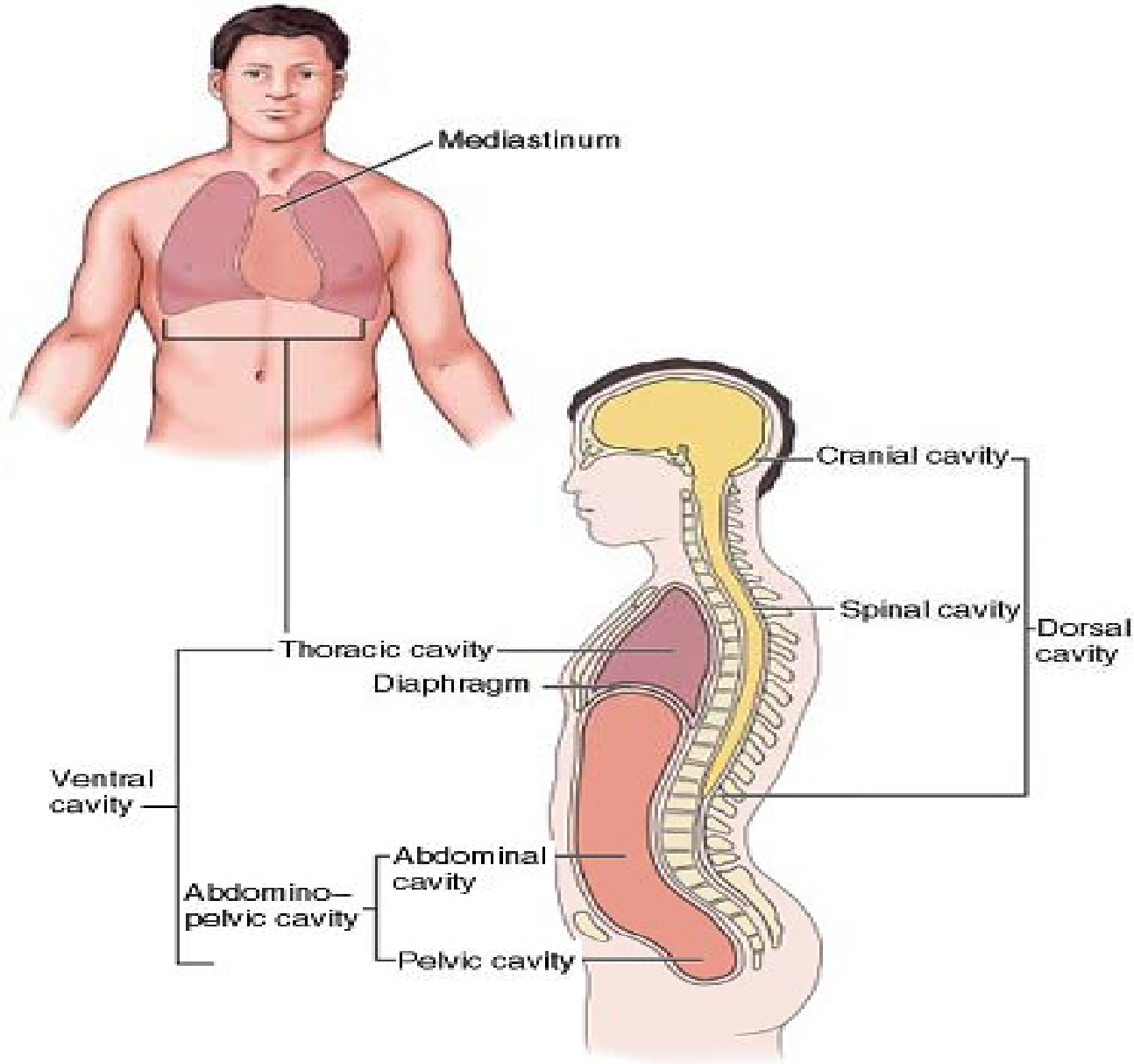
Human Body

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

Human Body

- 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

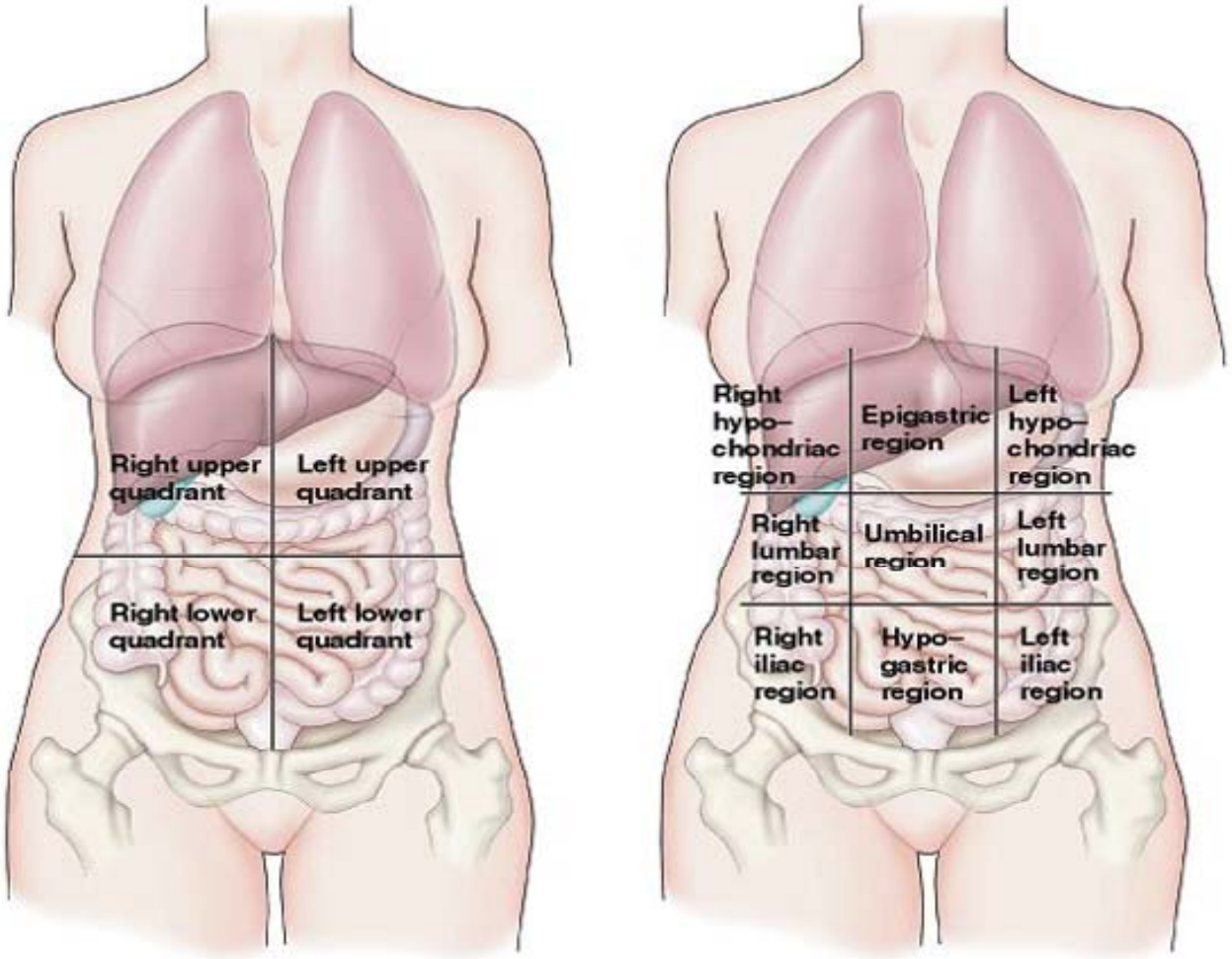

Mediastinum
Cranial cavity
Spinal cavity
Dorsal cavity
Thoracic cavity
Diaphragm
Ventral cavity
Abdominal cavity
Abdomino–pelvic cavity
Pelvic cavity

Human Body

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

Human Body

- 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.


Right upper quadrant
Left upper quadrant
Right lower quadrant
Left lower quadrant
Right hypo–chondriac region
Epigastric region
Left hypo–chondriac region
Right lumbar region
Umbilical region
Left lumbar region
Right iliac region
Hypo–gastric region
Left iliac region