Introduction to anatomy

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Course contents

- Definition of anatomy and Physiology
- Subivision of anatomy
- Subdivision of physiology
- Terminology
- Anatomical position
- Body parts and region
- Planes of ther body
- Cavities of the body

Anatomy

Learning Outcomes

After reading this section, you should be able to

A. Define anatomy and describe the levels at which anatomy can be studied.

B. explain the importance of the relationship between structure and function

The word ***anatomy*** means to dissect, or cut and separate, the parts of the body for study.

Anatomy – may be defined as the study of the structure and shape of the body and body parts & their relationships to one another.

- **Anatomy can be divided into :**
- gross anatomy and
- microscopic anatomy

Forms of Gross Anatomy

- Surface anatomy – study of the internal structures related to the overlying skin surface
- Regional anatomy – study of specific area
- Systemic anatomy – study of system
- Developmental anatomy – study of the developmental changesthat occurs in the body before birth
- Radiographic anatomy- study of the internal structures as visuailzed by x-ray images or specialized scanning procedure

Microscopic anatomy includes two major subdivisions

- Cytology – study of cell
- Histology – study of tissue

Two basic approaches to the study of anatomy are:

Systemic anatomy is the study of the body by systems, such as the cardiovascular, nervous, skeletal, and muscular systems. It is the approach taken in this and most introductory textbooks.

Regional anatomy is the study of the organization of the body by areas. Within each region, such as the head, abdomen, or arm, all systems are studied simultaneously.

Physiology

- Physiology is the study of function of the human body and its parts
- Physiology is the brach of medical science which deals with the normal functions of all different organs of the body

Subdivision of the physiology

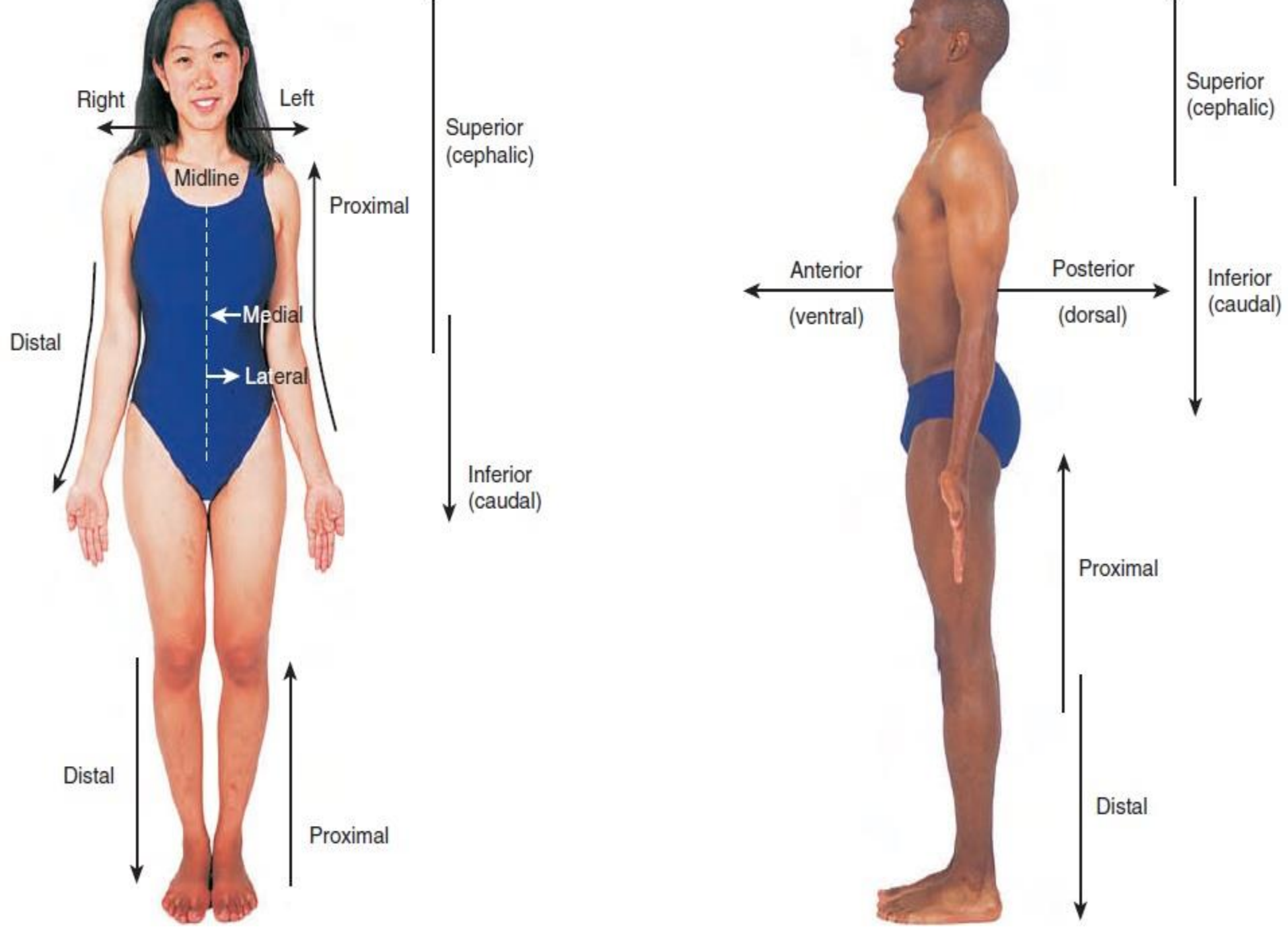
1. Renal physiology- kidney function and urine production
2. Neurophysiology-explain the workings of the nervous system
3. Cardiovascular physiology-function of the blood and blood vessels
4. Respirtory physiology-function and mechanism of respiraion

Terminology

Body Positions

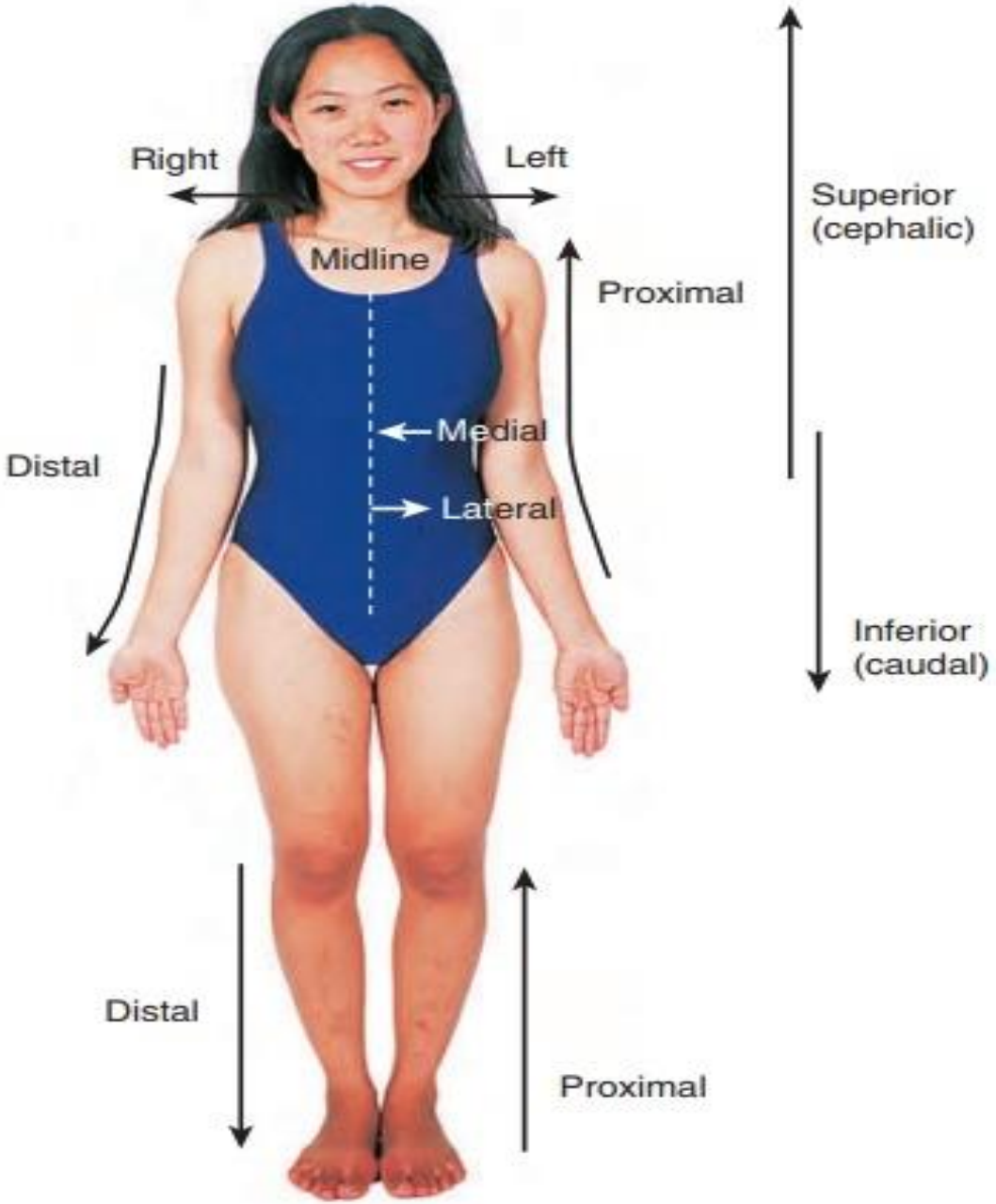
The **anatomical position** refers to a person

- standing erect with the face directed forward,
- the upper limbs hanging to the sides, and
- the palms of the hands facing forward
- Feets togather
- Hand erect and eyes looking straight in front
- A person is **supine** when lying face upward and **prone** when lying face downward


Right
Left
Midline
Proximal
Superior
(cephalic)
Medial
Distal
Lateral
Inferior
(caudal)
Distal
Proximal
Superior
(cephalic)
Anterior
(ventral)
Posterior
(dorsal)
Inferior
(caudal)
Proximal
Distal

Directional Terms

Directional terms describe parts of the body relative to each other .It is important to become familiar with these directional terms as soon as possible because you will see them repeatedly throughout the text. **Right and left** are used as directional terms in anatomical terminology. Up is replaced by **superior,**down by **inferior,**front by **anterior,** and back by **posterior.**


Right
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Midline
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Inferior
(caudal)
Distal
Proximal

Directional Terms for the Human Body

Dorsal	Toward the back (synonymous with *posterior*)
Ventral	Toward the belly (synonymous with *anterior*)
Proximal	Closer to a point of attachment
Distal	Farther from a point of attachment
Lateral	Away from the midline of the body
Medial	Toward the middle or midline of the body
Superficial	Toward or on the surface
Deep	Away from the surface, internal

Directional Terms for the Human Body

Term	Definition*
Right	Toward the body's right side
Left	Toward the body's left side
Inferior	Below
Superior	Above
Anterior	Toward the front of the body
Posterior	Toward the back of the body

Body Parts and Regions

The central region of the body consists of the **head, neck,** and **trunk.**

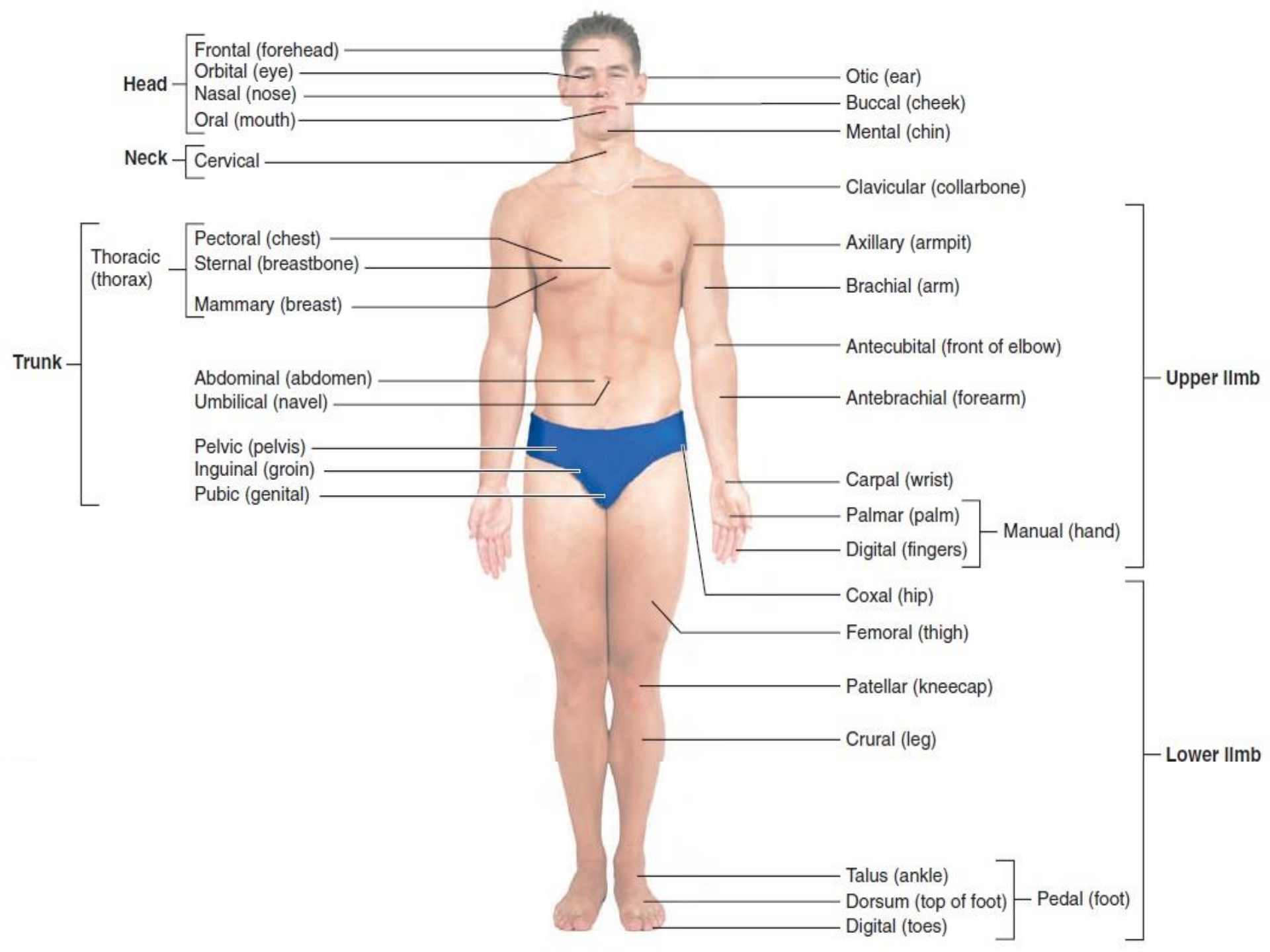
The trunk can be divided into:

The thorax (chest),

The abdomen (region between the thorax and pelvis), and

pelvis (the inferior end of the trunk associated with the hips).

The upper limb is divided into:
the arm, forearm, wrist, and hand.
The **arm** extends from the shoulder to the elbow, and the **forearm** extends from the elbow to the wrist.
The lower limb is divided into: the thigh, leg, ankle, and foot. The **thigh** extends from the hip to the knee, and the **leg** extends from the knee to the ankle.


Head
Frontal (forehead)
Orbital (eye)
Nasal (nose)
Oral (mouth)
Neck
Cervical
Trunk
Thoracic (thorax)
Pectoral (chest)
Sternal (breastbone)
Mammary (breast)
Abdominal (abdomen)
Umbilical (navel)
Pelvic (pelvis)
Inguinal (groin)
Pubic (genital)
Otic (ear)
Buccal (cheek)
Mental (chin)
Clavicular (collarbone)
Axillary (armpit)
Brachial (arm)
Antecubital (front of elbow)
Antebrachial (forearm)
Carpal (wrist)
Palmar (palm)
Digital (fingers)
Manual (hand)
Upper limb
Coxal (hip)
Femoral (thigh)
Patellar (kneecap)
Crural (leg)
Talus (ankle)
Dorsum (top of foot)
Digital (toes)
Pedal (foot)
Lower limb

The abdomen is often subdivided superficially into four sections, or **quadrants,** by two imaginary lines—one horizontal and one vertical—The quadrants formed are:

the right-upper quadrants

left-upper quadrants

right-lower and

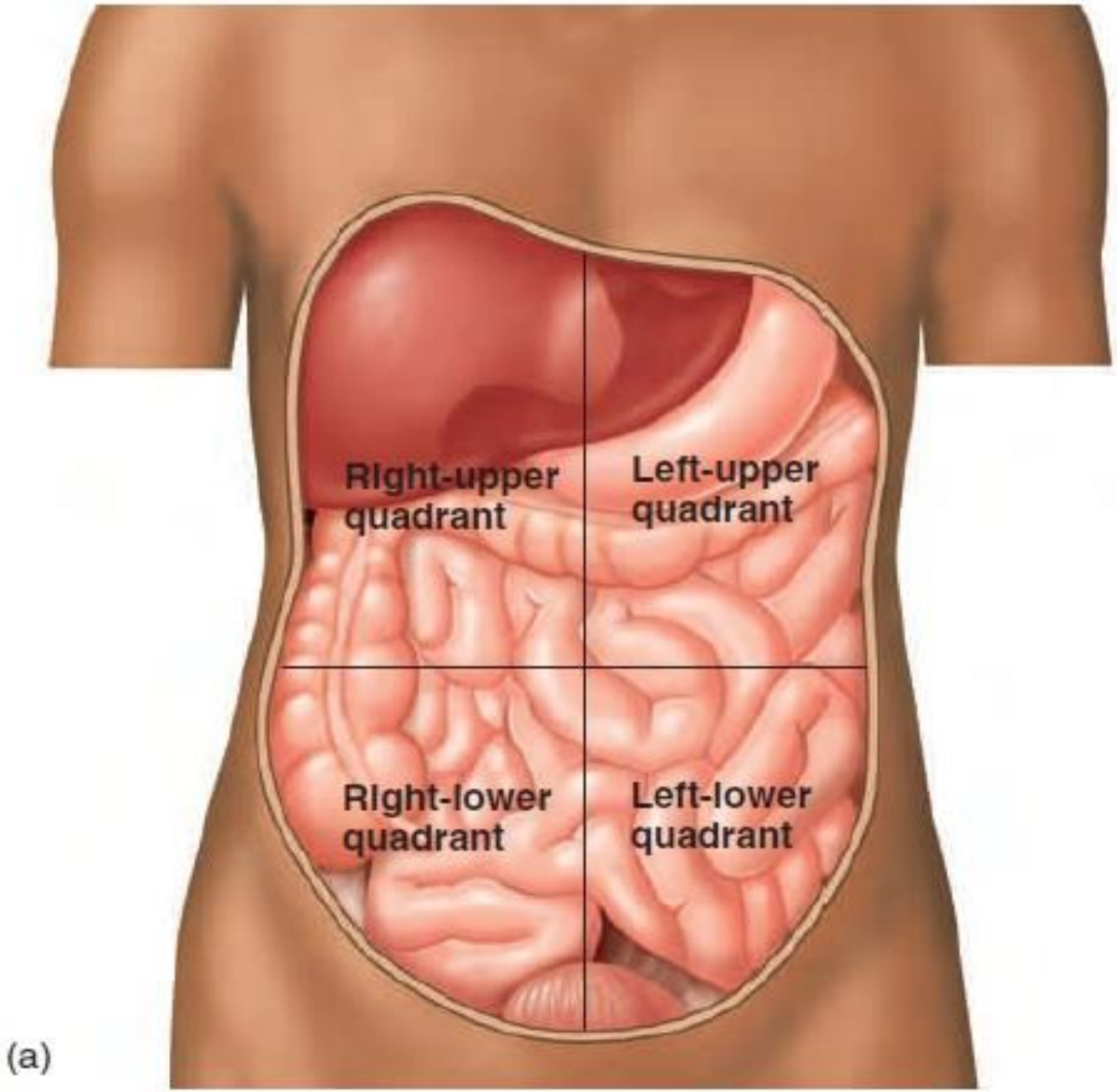
left-lower quadrants.

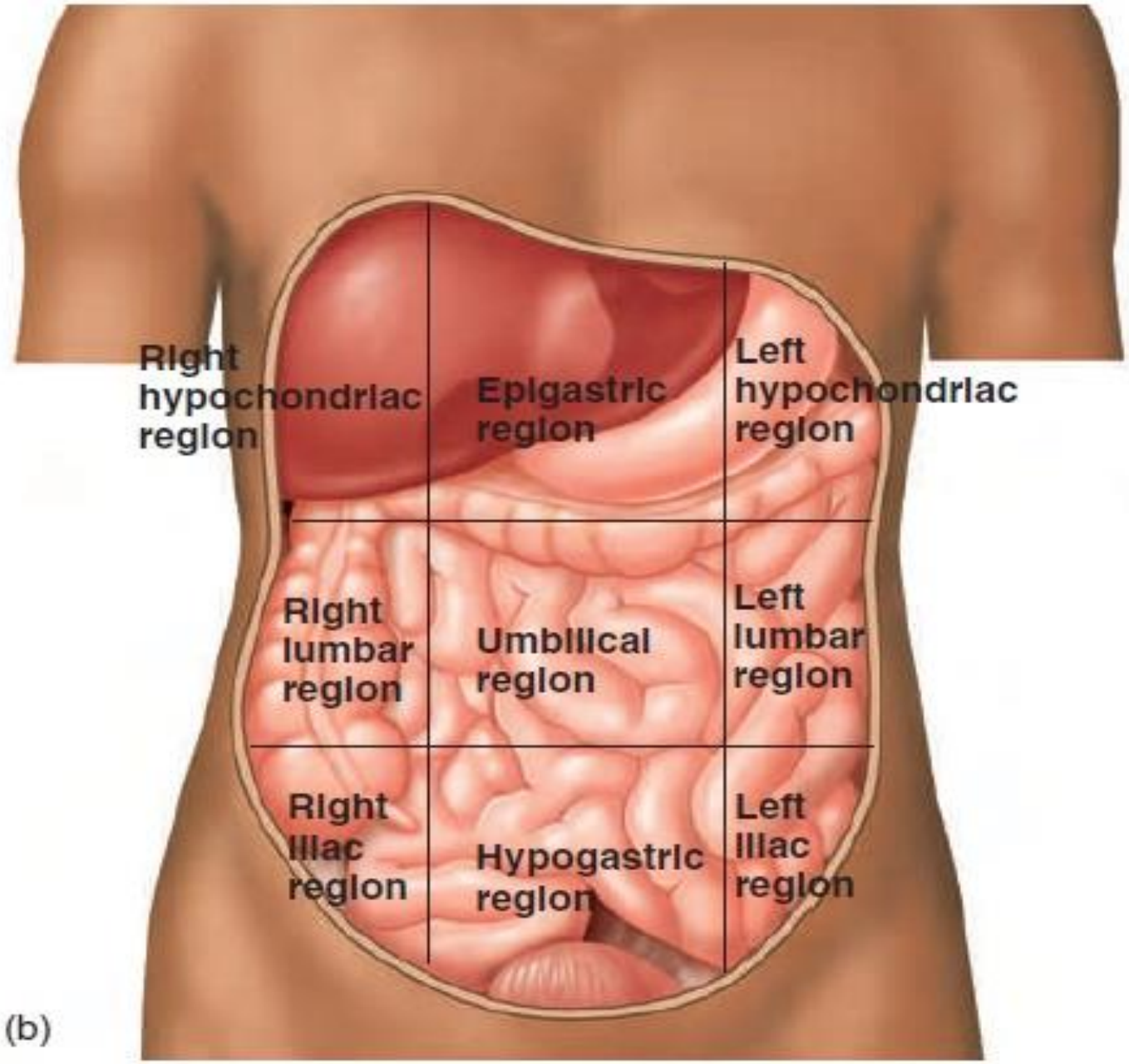
In addition to these quadrants, the abdomen is sometimes subdivided into **regions** by four imaginary lines—two horizontal and two vertical.

These four lines create in nine regions:

- Epigastric region
- Right and left hypochondriac region
- Umbilical region
- Right and left lumbar region
- Hypogastric region and
- Right and left iliac region

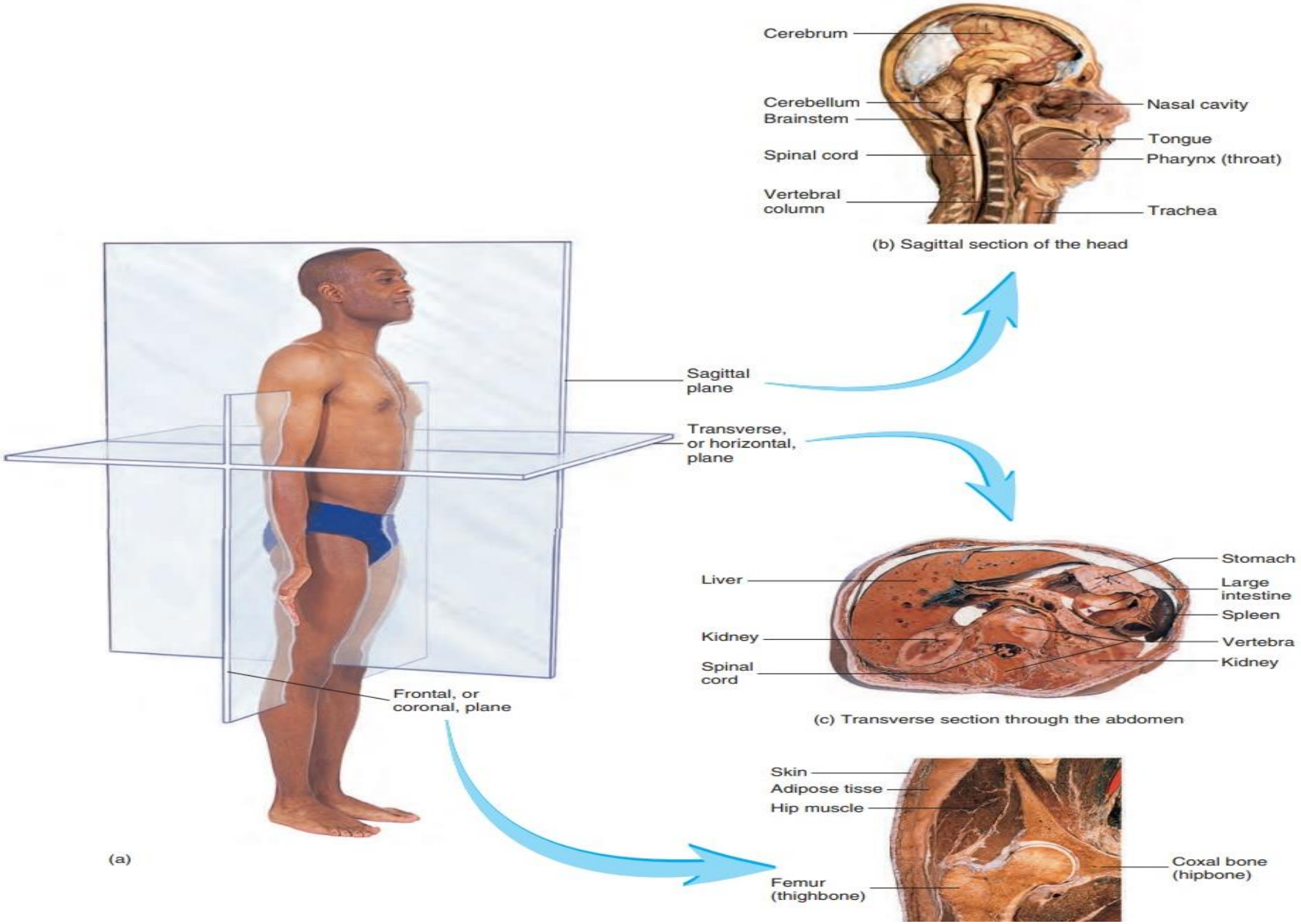
Clinicians use the quadrants or regions as reference points for locating the underlying organs. For example, the appendix is in the right-lower quadrant, and the pain of an acute appendicitis is usually felt there


Right-upper quadrant
Left-upper quadrant
Right-lower quadrant
Left-lower quadrant
(a)

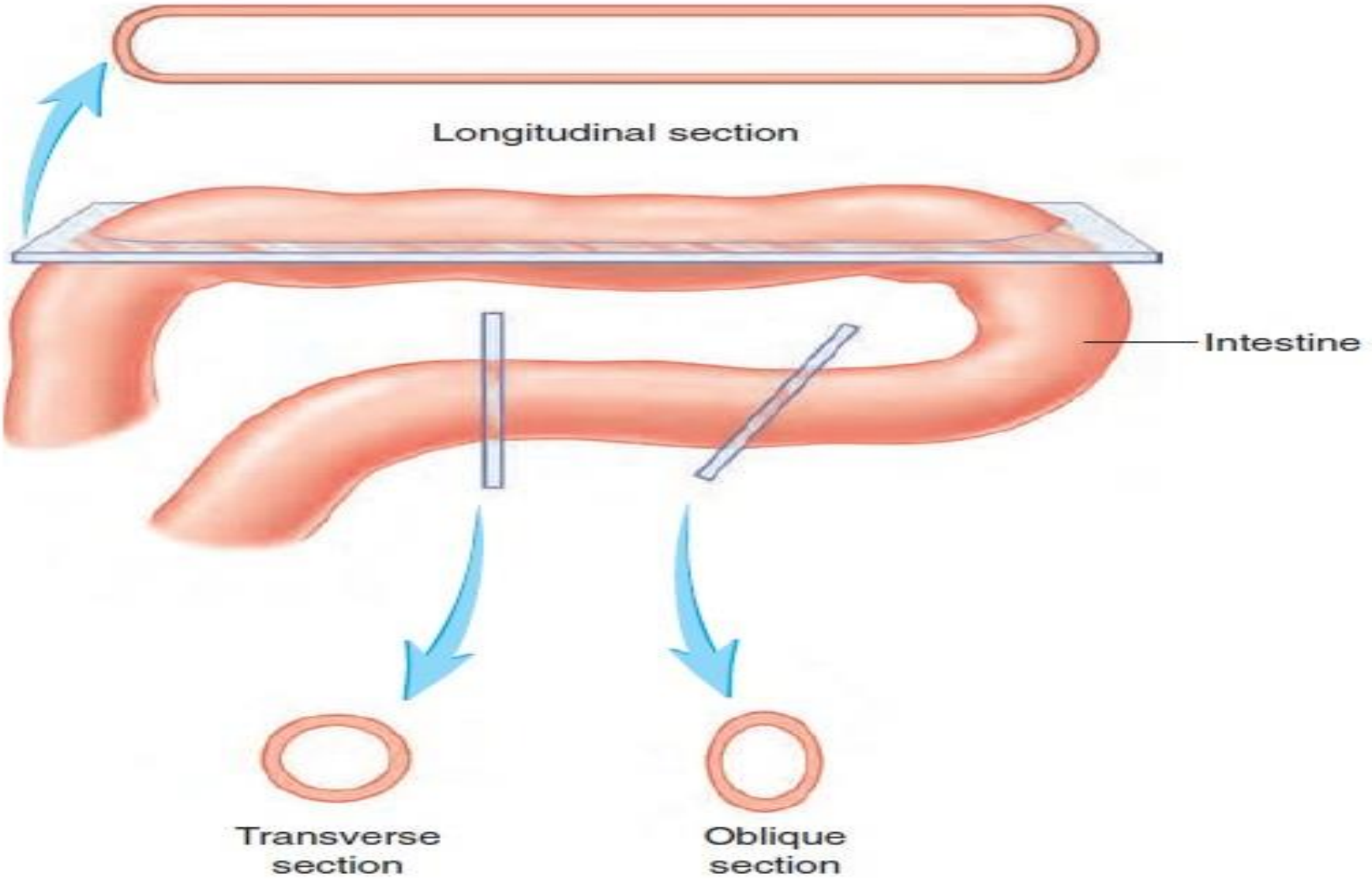

Right hypochondriac region
Epigastric region
Left hypochondriac region
Right lumbar region
Umbilical region
Left lumbar region
Right iliac region
Hypogastric region
Left iliac region
(b)

Planes

- A **sagittal plane** runs vertically through the body and separates it into right and left parts.
- A **median plane** is a sagittal plane that passes through the midline of the body, dividing it into equal right and left halves.
- A **transverse plane,** or *horizontal plane,* runs parallel to the surface of the ground, dividing the body into superior and inferior parts.
- A **frontal plane,** or *coronal plane,* runs vertically from right to left and divides the body into anterior and posterior parts.


Cerebrum
Cerebellum
Brainstem
Spinal cord
Vertebral column
Nasal cavity
Tongue
Pharynx (throat)
Trachea
(b) Sagittal section of the head
Sagittal plane
Transverse, or horizontal, plane
Frontal, or coronal, plane
(a)
Liver
Kidney
Spinal cord
Stomach
Large intestine
Spleen
Vertebra
Kidney
(c) Transverse section through the abdomen
Skin
Adipose tisse
Hip muscle
Femur (thighbone)
Coxal bone (hipbone)

Organs are often sectioned to reveal their internal structure . A cut through the long axis of the organ is a **longitudinal section,** and a cut at a right angle to the long axis is a **transverse section.**
a cut is made across the long axis at other than a right angle, it is called an **oblique section**


Longitudinal section
Intestine
Transverse section
Oblique section

Cavity of the body

- **Main cavities of the body**

1.Dorsal cavity: Cranial cavity, vertebral canal

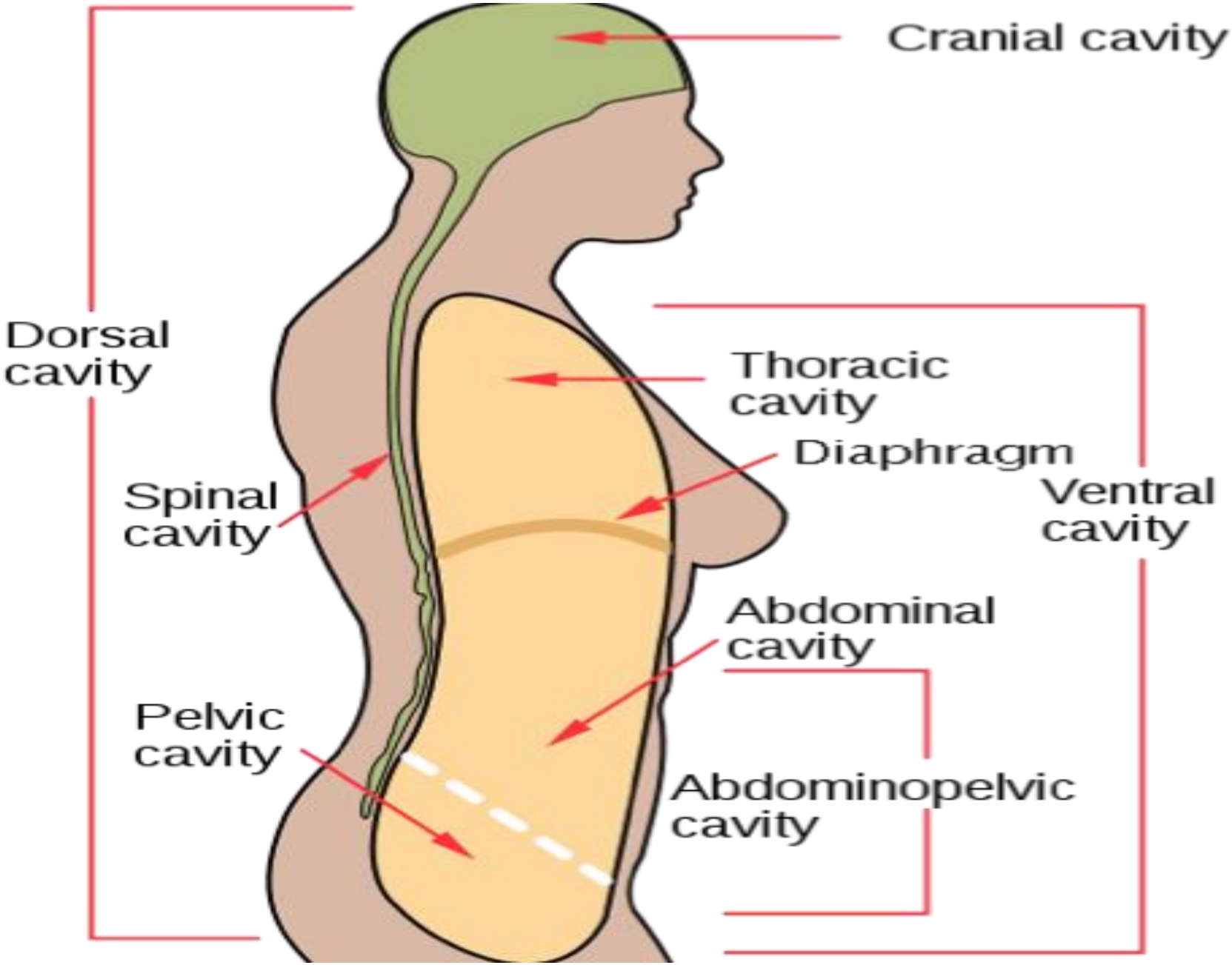
2.Ventral cavity: Thoracic cavity,

abdominopelvic cavity

Main contents of body cavities :

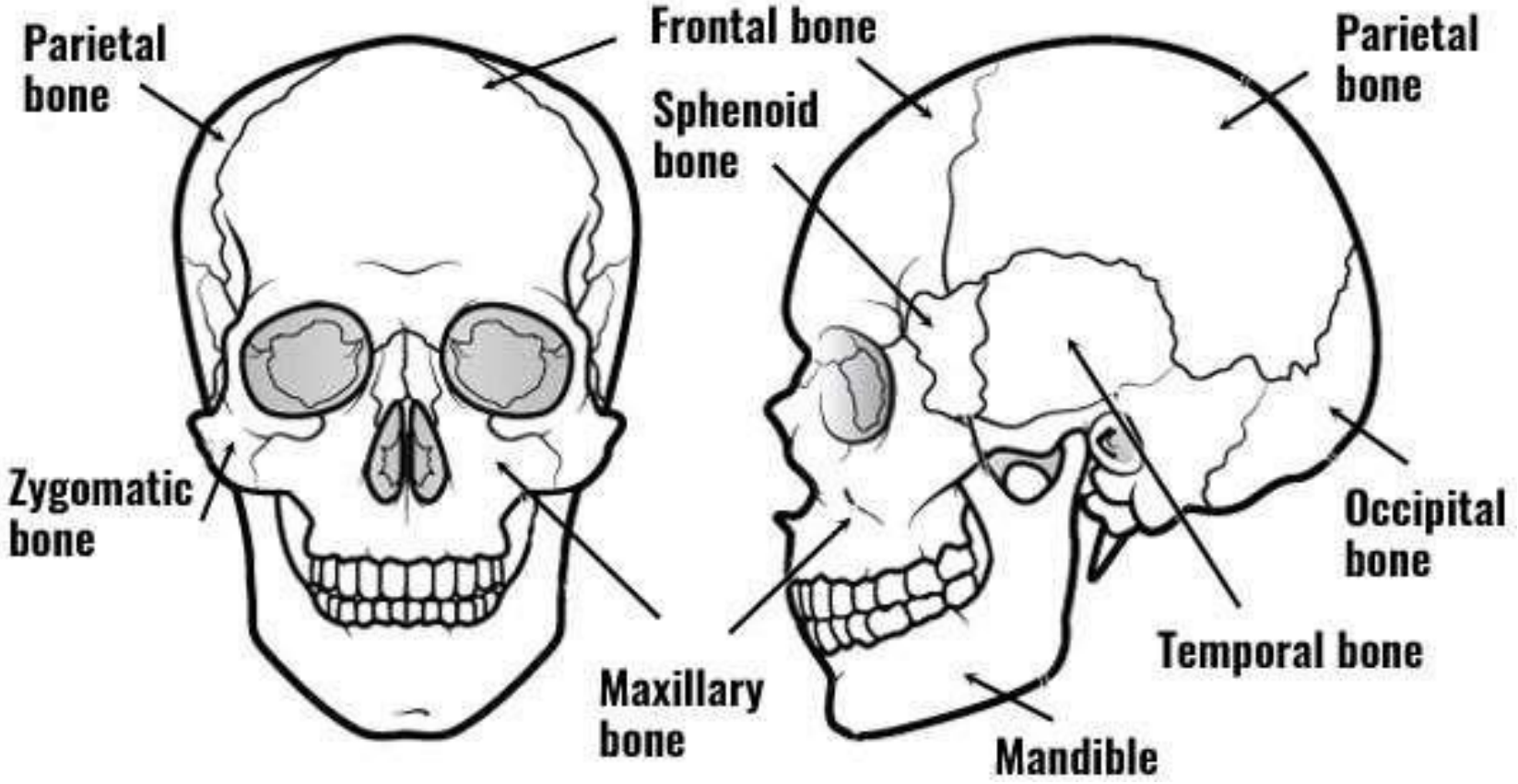
- Cranial cavity: brain

  Vertebral canal: spinal cord


Cranial cavity
Dorsal cavity
Thoracic cavity
Diaphragm
Spinal cavity
Ventral cavity
Abdominal cavity
Pelvic cavity
Abdominopelvic cavity

Cranial cavity - Skull

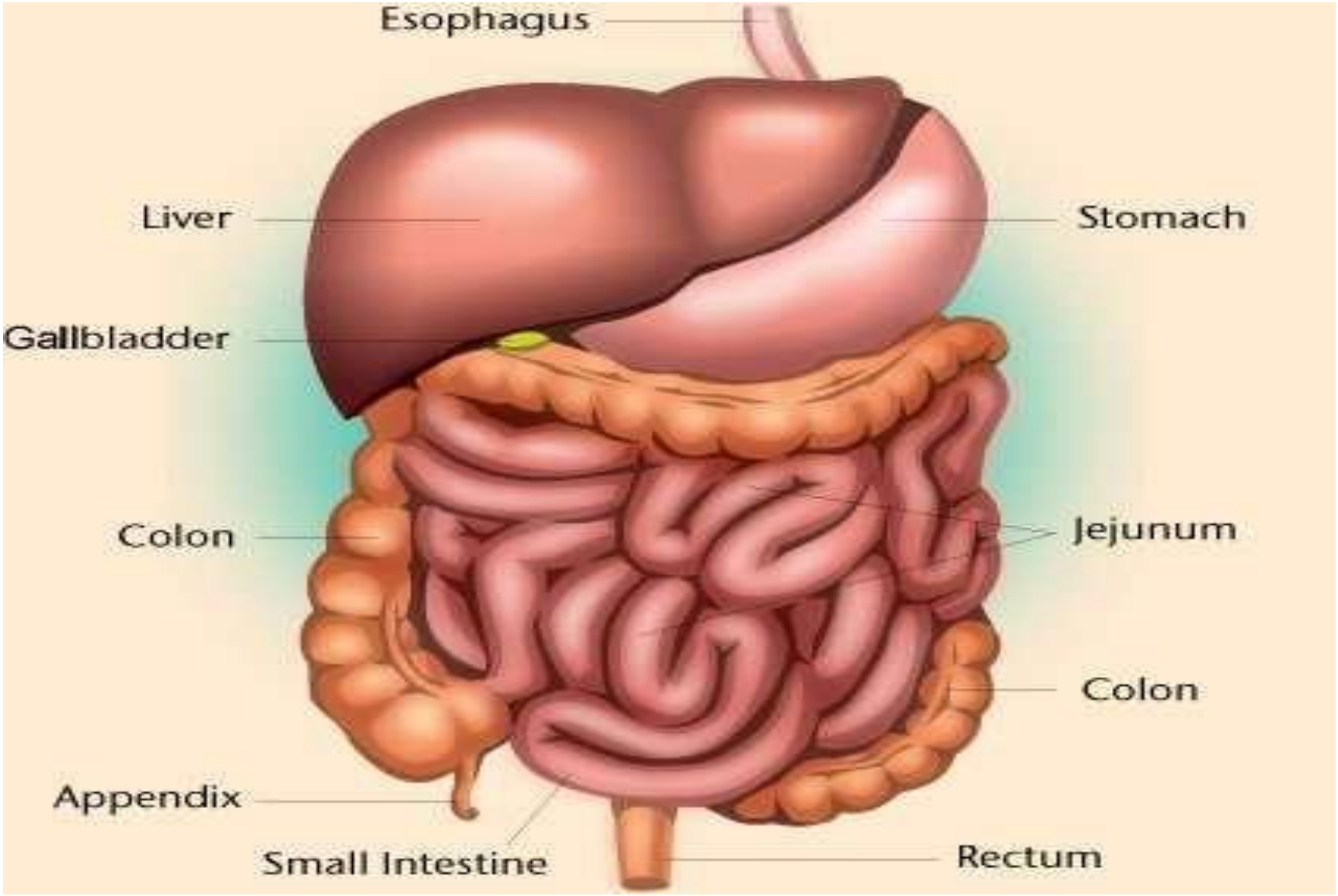
The **cranial cavity**, also known as **intracranial space**, is the space within the skull.The skull, also known as the cranium, contains the brain.



Thoracic cavity

- **Thoracic cavity** is the division of the body **cavity** that lies above the diaphragm, is bounded peripherally by the wall of the **chest**, and contains:
- **heart**,
- **lungs**,and
- **thymus gland**,
- **muscles** and various other internal structures.

Abdominopelvic cavity



Abdominopelvic cavity

- The **abdominopelvic cavity** is a body cavity that consists of :
- Abdominal cavity and pelvic cavity
- Contains:
  - stomach
  - liver
  - pancreas

Abdominopelvic cavity

- spleen
- Gallbladder
- Kidneys and
- small and large intestines.
- urinary bladder and
- internal reproductive organs
- Rectum

Significance of anatomy and physiology

- Understand the structure and function of the human body
- Provides learners with the primary base required to help patient in the medical profession
- Understand the location of major organs
- Understand the physiological function of the body
- Gain knowledge about the body
- Provides concept about relationship between the anatomy and physiology