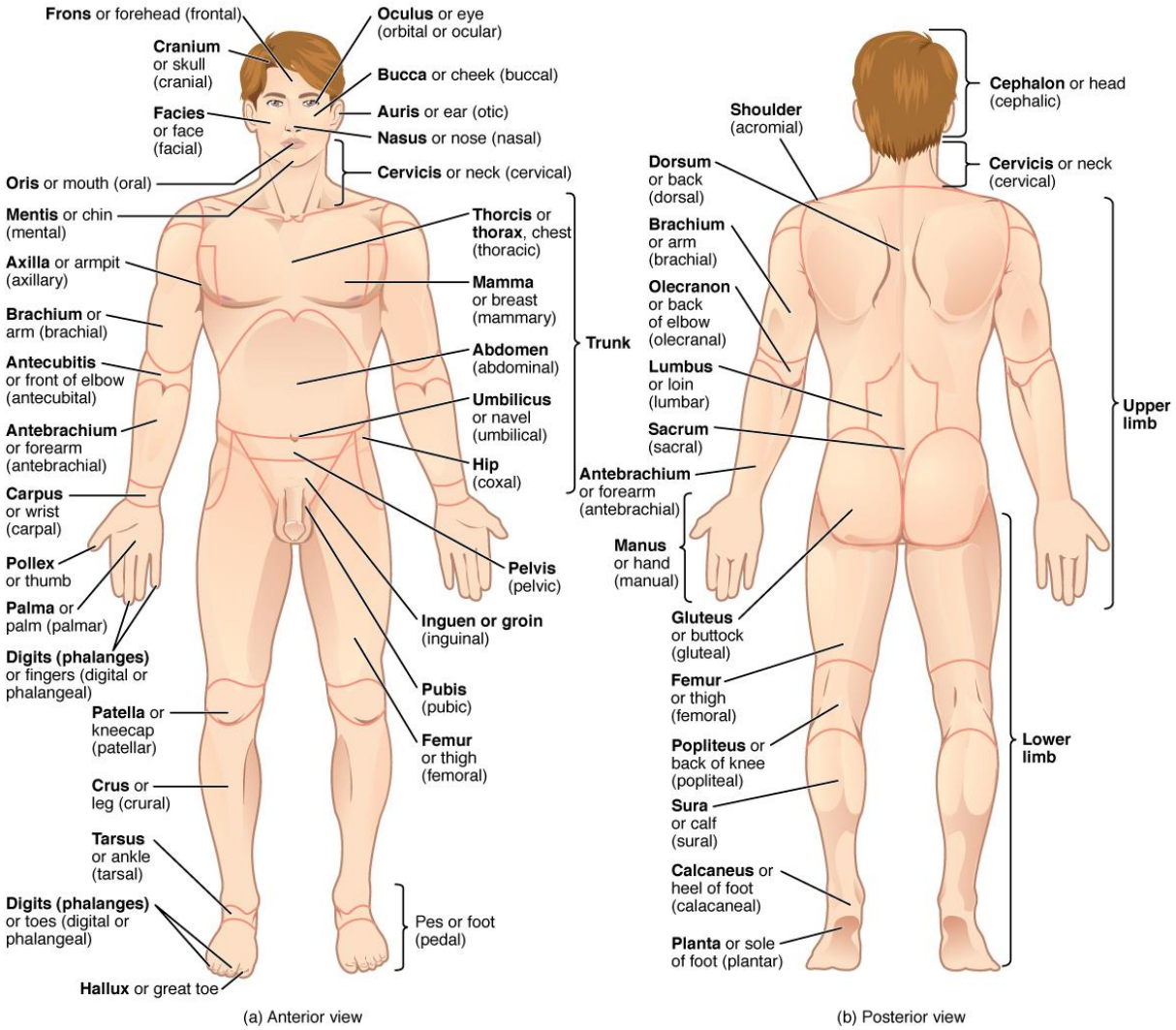
ANATOMY AND PHYSIOLOGY (C.I.)

HUMAN ANATOMY
(Mod. A)

ANATOMICAL TERMINOLOGY

ANATOMICAL POSITION



ANATOMICAL POSITION:

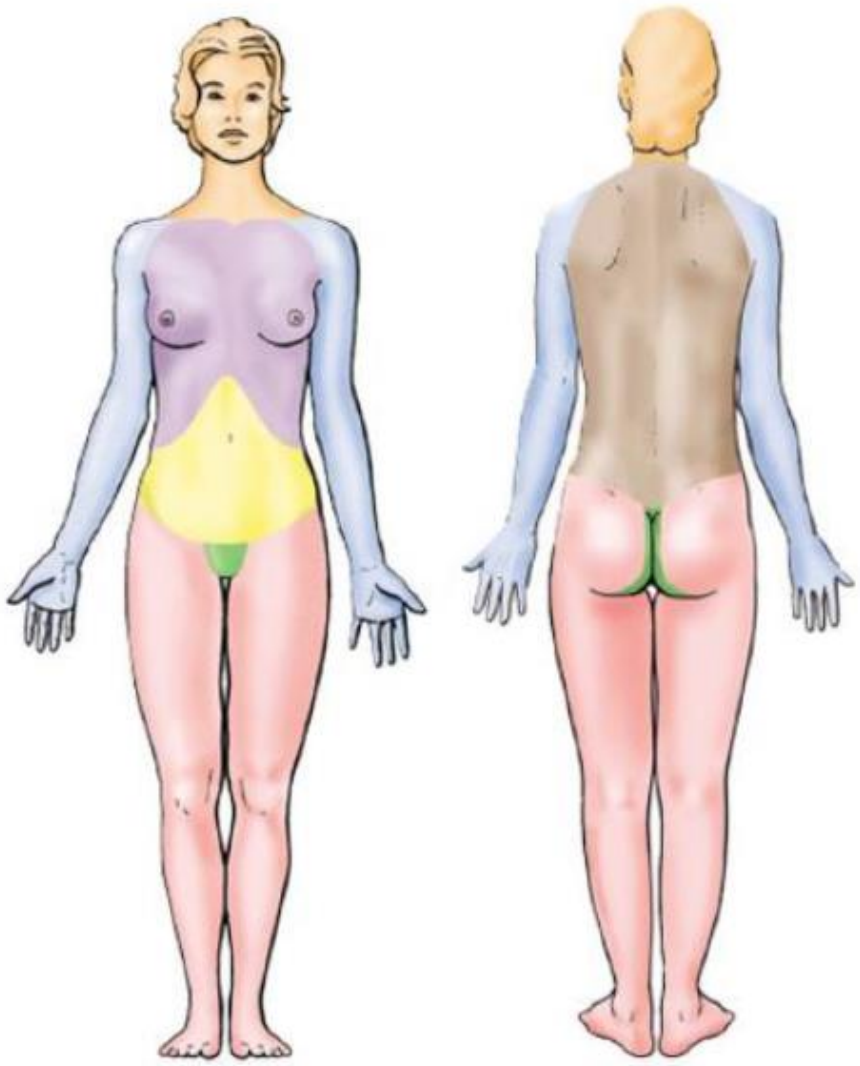
is the reference position. All anatomical descriptions, to avoid ambiguity, refer to the body in this position.

It is represented by the human body:

- standing upright
- upper limbs held out to each side
- palms of the hands facing forward
- hands with extended fingers

BODY REGIONS

- Head/Neck
- Upper limb
- Lower limb
- Thorax
- Dorsum
- Abdomen
- Pelvis/perineum



TRUNK
in a broad sense

Pectoral girdle (clavicle + scapula)

Pelvic girdle (hip bone)

LIMBS / EXTREMITIES

Head

Neck

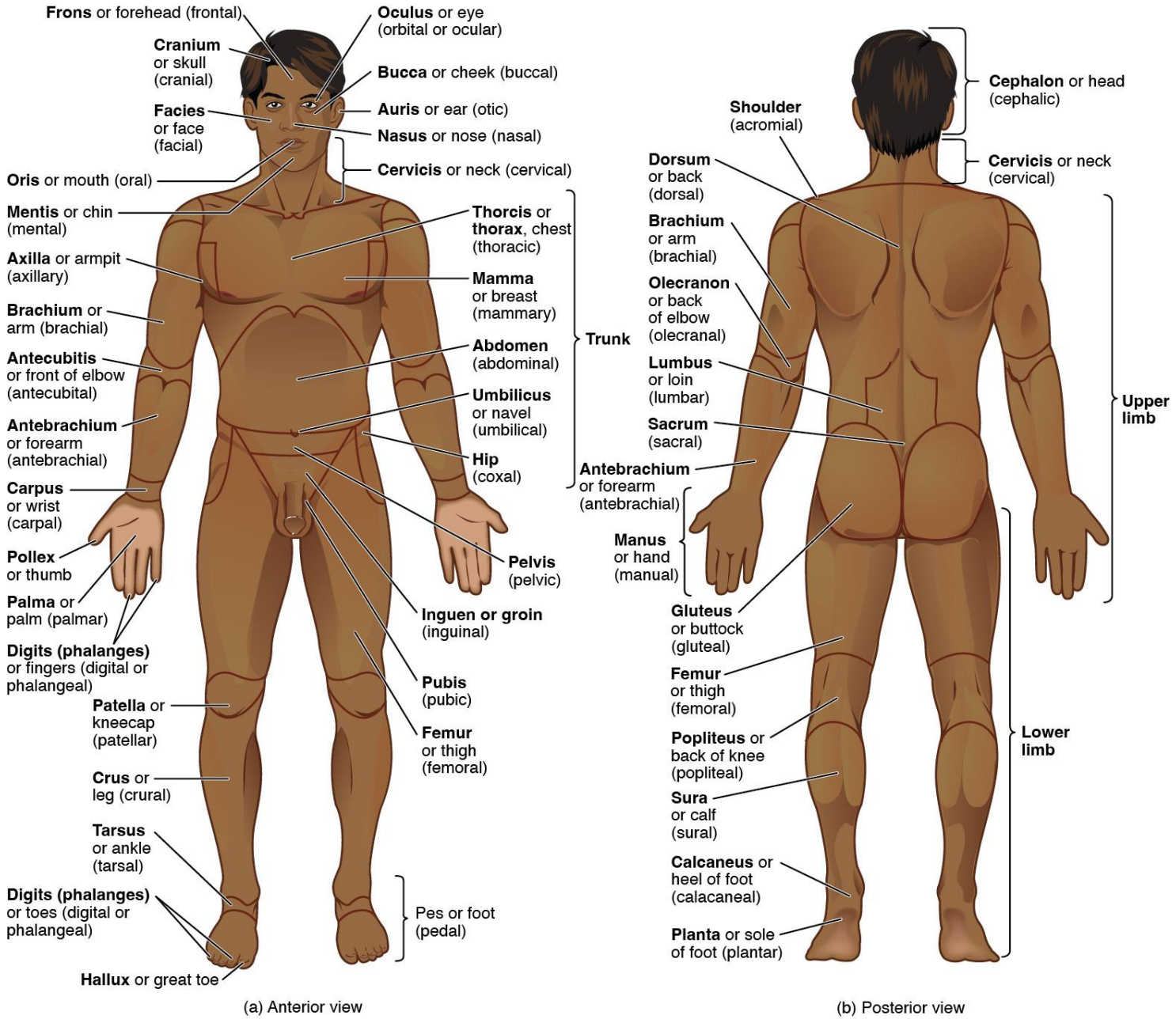
Trunk
in a narrow sense

- Thorax
- Abdomen
- Pelvis/Perineum

Upper limbs

Lower limbs

REGIONAL TERMS



The human body's regions have **specific terms** to help increase precision.

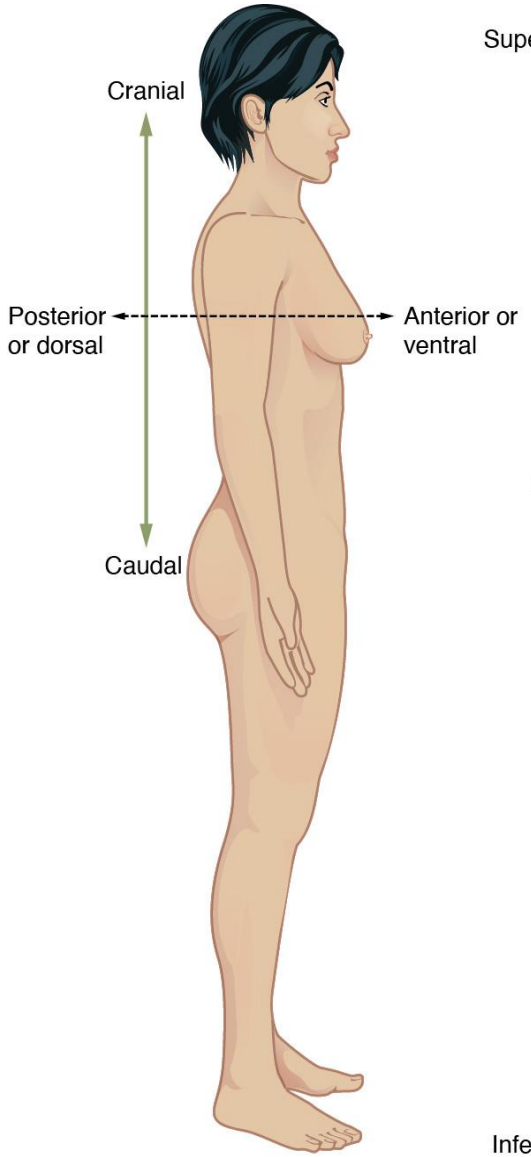
Notice that:

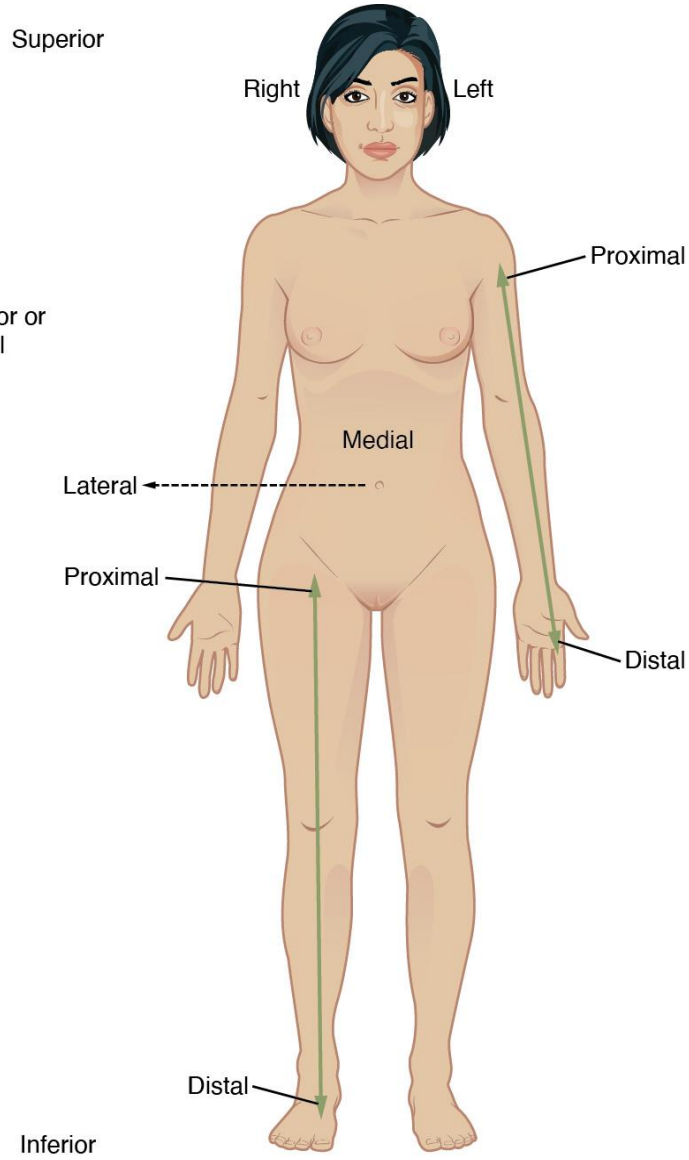
- the term "brachium" or "arm" is reserved for the "upper arm", which is the portion between the shoulder and the elbow.
- "Antebrachium" or "forearm" is the portion between the elbow and the wrist.
- The term "femur" or "thigh" indicates the portion between the hip and the knee.
- "Leg" or "crus" is reserved for the portion of the lower limb between the knee and the ankle.

DIRECTIONAL TERMS

DIRECTIONAL TERMS are essential for describing the relative locations of different body structures.

- **Anterior** (or **ventral**) Describes the front or direction toward the front of the body. The toes are anterior to the foot.
- **Posterior** (or **dorsal**) Describes the back or direction toward the back of the body. The popliteus is posterior to the patella.
- **Superior** (or **cranial**) describes a position above or higher than another part of the body proper. The orbits are superior to the oris.
- **Inferior** (or **caudal**) describes a position below or lower than another part of the body proper; near or toward the tail (in humans, the coccyx, or lowest part of the spinal column). The pelvis is inferior to the abdomen.
- **Lateral** describes the side or direction toward the side of the body. The thumb (pollex) is lateral to the digits.
- **Medial** describes the middle or direction toward the middle of the body. The hallux is the medial toe.
- **Proximal** describes a position in a limb that is nearer to the point of attachment or the trunk of the body. The brachium is proximal to the antebrachium.
- **Distal** describes a position in a limb that is farther from the point of attachment or the trunk of the body. The crus is distal to the femur.
- **Superficial** describes a position closer to the surface of the body. The skin is superficial to the bones.
- **Deep** describes a position farther from the surface of the body. The brain is deep to the skull.





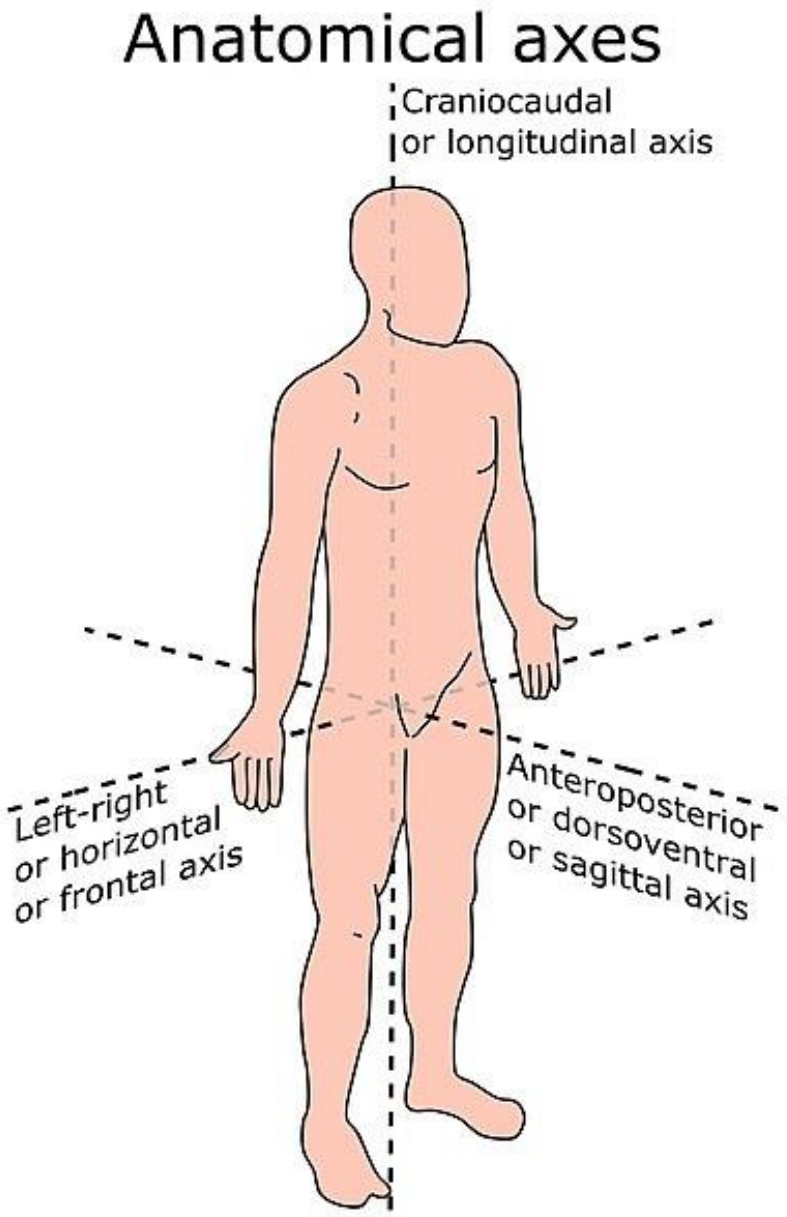
DIRECTIONAL TERMS

TABLE I.I Directional Terms for the Human Body

Term	Etymology	Definition*	Example
Right		Toward the body's right side	The right ear
Left		Toward the body's left side	The left ear
Inferior	Lower	Below	The nose is inferior to the forehead.
Superior	Higher	Above	The mouth is superior to the chin.
Anterior	To go before	Toward the front of the body	The teeth are anterior to the throat.
Posterior	*Posterus,* following	Toward the back of the body	The brain is posterior to the eyes.
Dorsal	*Dorsum,* back	Toward the back (synonymous with *posterior*)	The spine is dorsal to the breastbone.
Ventral	*Venter,* belly	Toward the belly (synonymous with *anterior*)	The navel is ventral to the spine.
Proximal	*Proximus,* nearest	Closer to a point of attachment	The elbow is proximal to the wrist.
Distal	*di* + *sto,* to be distant	Farther from a point of attachment	The knee is distal to the hip.
Lateral	*Latus,* side	Away from the midline of the body	The nipple is lateral to the breastbone.
Medial	*Medialis,* middle	Toward the middle or midline of the body	The bridge of the nose is medial to the eye.
Superficial	*Superficialis,* surface	Toward or on the surface	The skin is superficial to muscle.
Deep	*Deop,* deep	Away from the surface, internal	The lungs are deep to the ribs.

*All directional terms refer to a human in the anatomical position.

AXES, PLANES and SECTIONS of the BODY



The anatomical axes are imaginary lines that cross the body in the three dimensions of space:

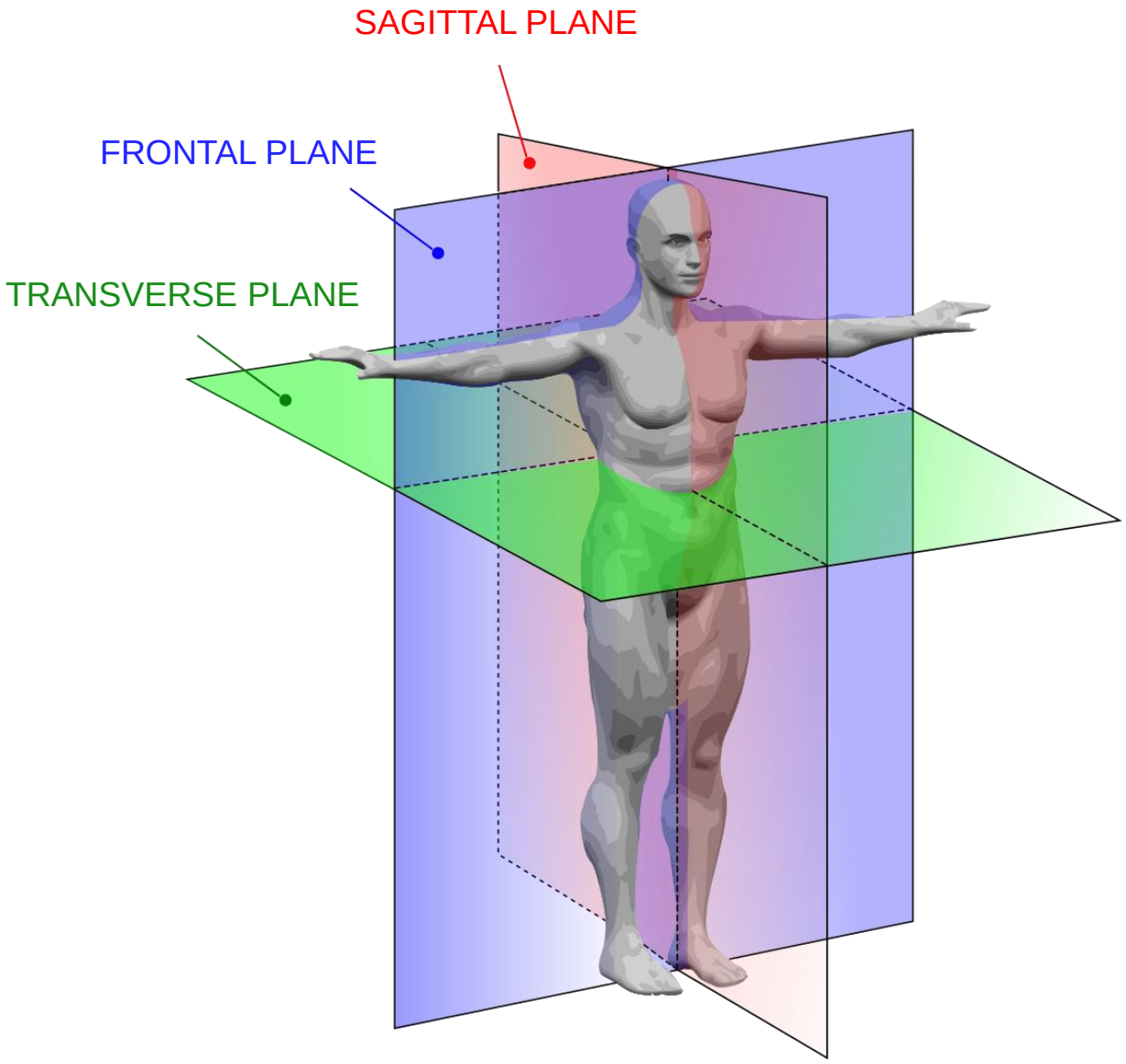
LENGTH, WIDTH, DEPTH

LONGITUDINAL OR CRANIOCAUDAL AXIS (y)
it is perpendicular to the base of support when the body is standing upright

HORIZONTAL OR LEFT-RIGHT AXIS (x)
it is perpendicular to longitudinal axis

SAGITTAL OR DORSOVENTRAL AXIS (z)
it goes from the anterior surface to the posterior surface of the body; it is perpendicular to longitudinal and horizontal axes

AXES, PLANES and SECTIONS of the BODY



When two axes intersect each other, they form planes

SAGITTAL PLANE

Plane passing through the **LONGITUDINAL** and **SAGITTAL** axes. It runs in an antero-posterior position, dividing the body vertically into right and left sides. If this vertical plane runs directly down the middle of the body, it is called the **median plane**.

FRONTAL PLANE or coronal plane

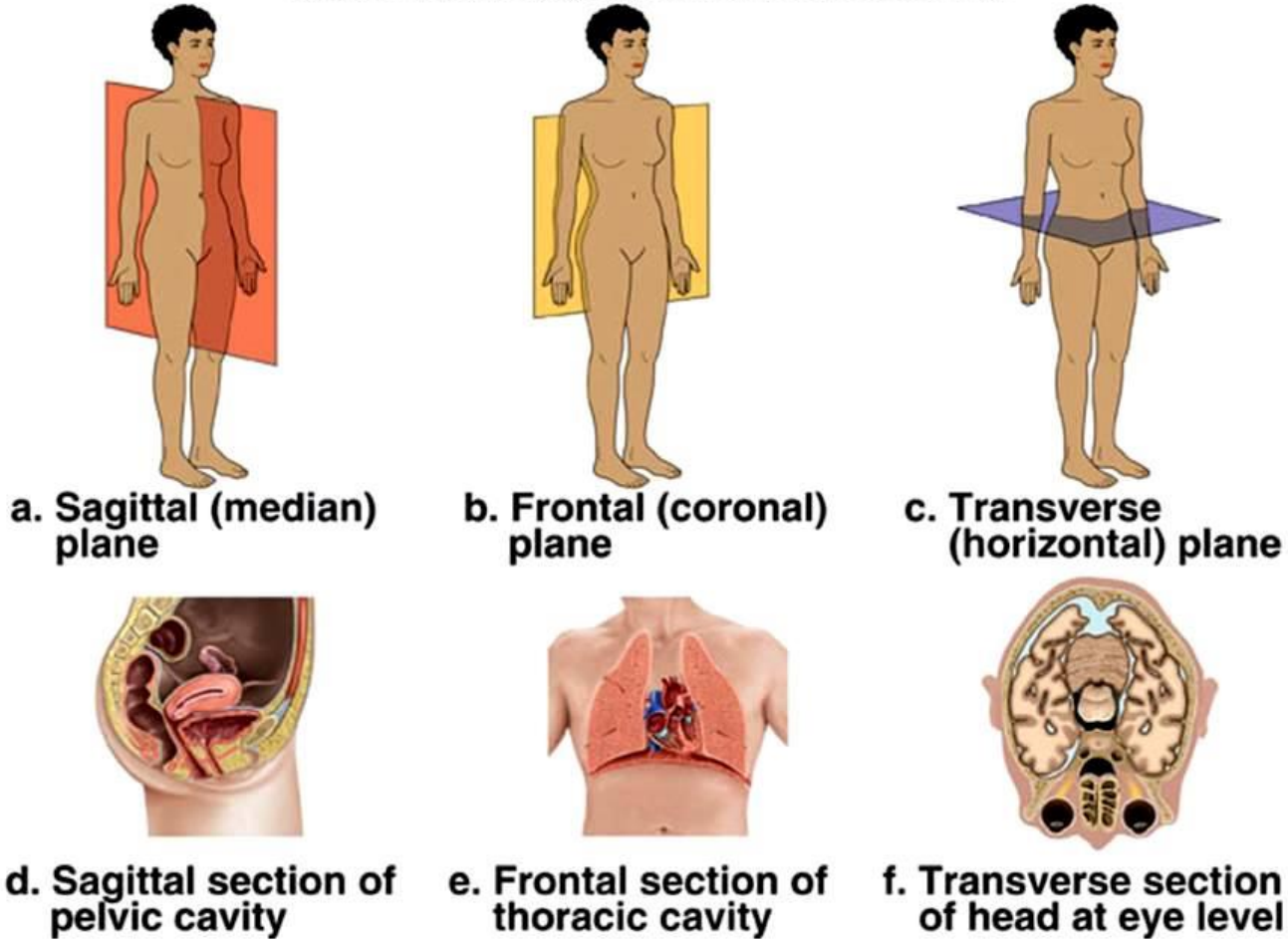
Plane passing through the **HORIZONTAL** and **LONGITUDINAL** axes. It runs vertically in a latero-lateral position, dividing the body into an anterior (front) portion and a posterior (rear) portion.

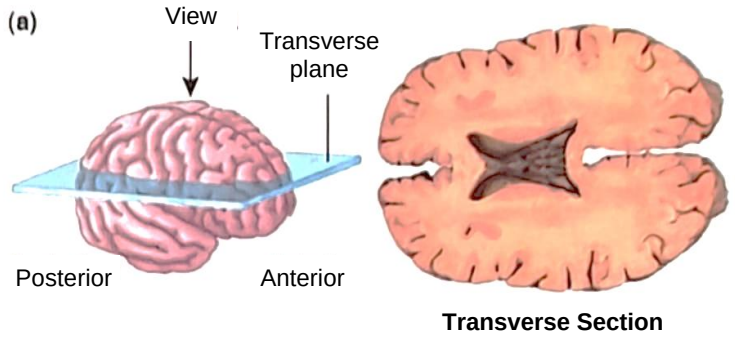
TRANSVERSE PLANE

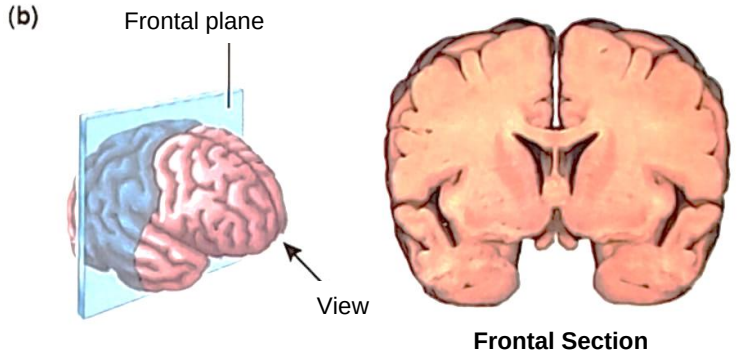
Plane passing through the **HORIZONTAL** and **SAGITTAL** axes, it is perpendicular to the sagittal and frontal planes. It divides the body horizontally into upper and lower portions.

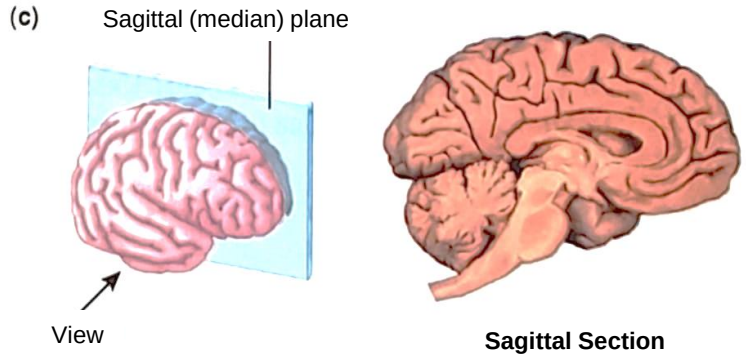
AXES, PLANES and SECTIONS of the BODY

A **SECTION** is a cut of the body or one of its organs made along one of the planes just described.

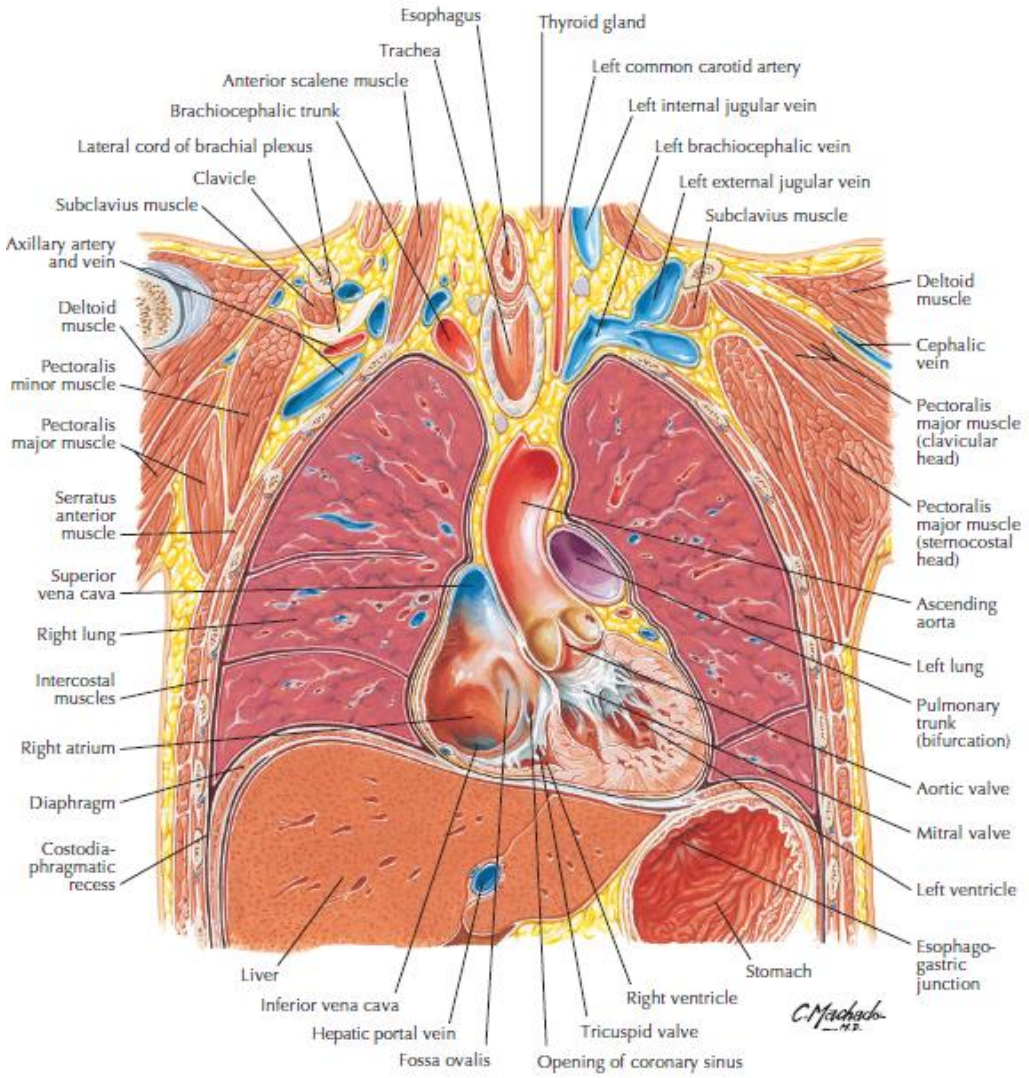






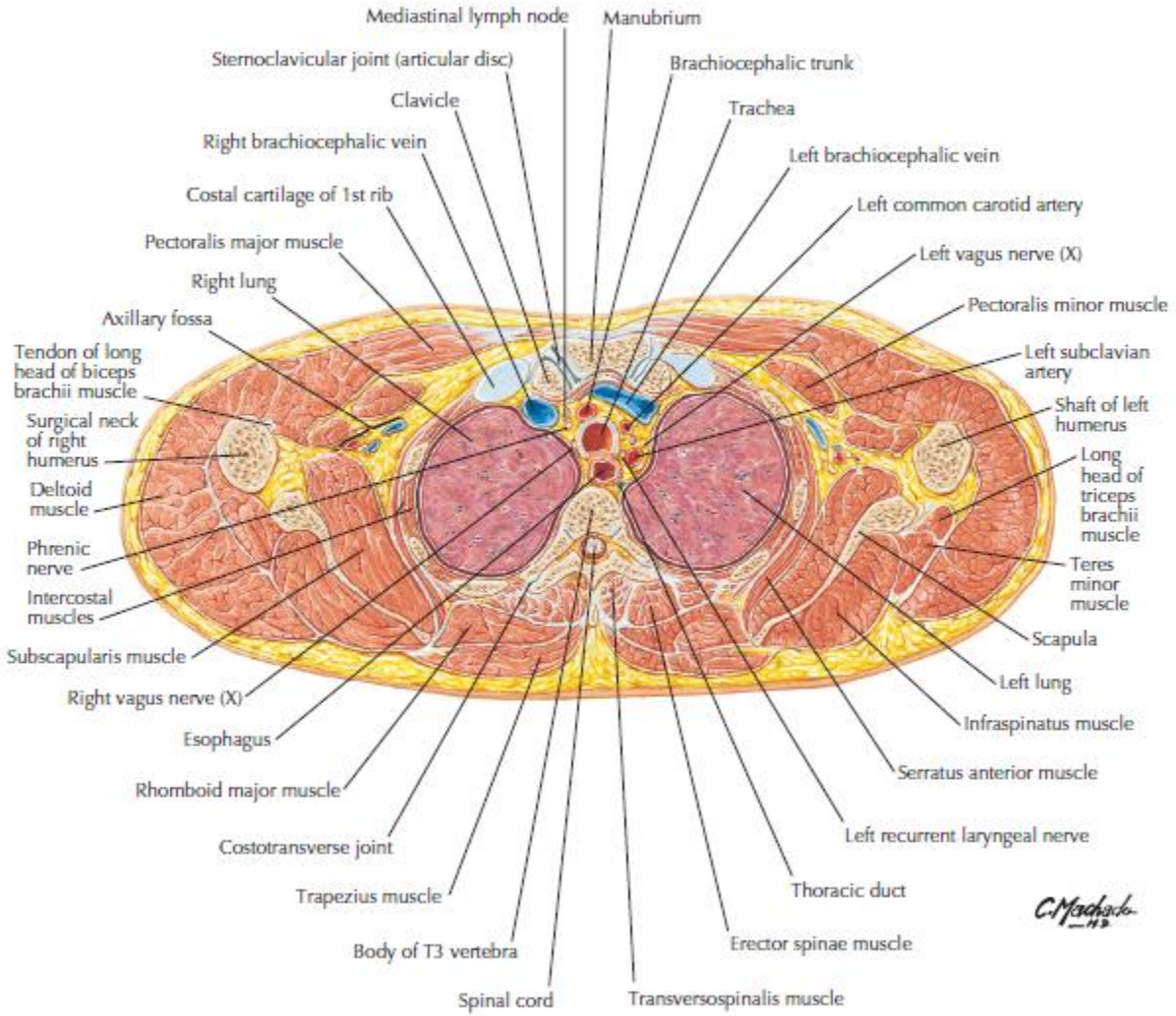


AXES, PLANES and SECTIONS of the BODY



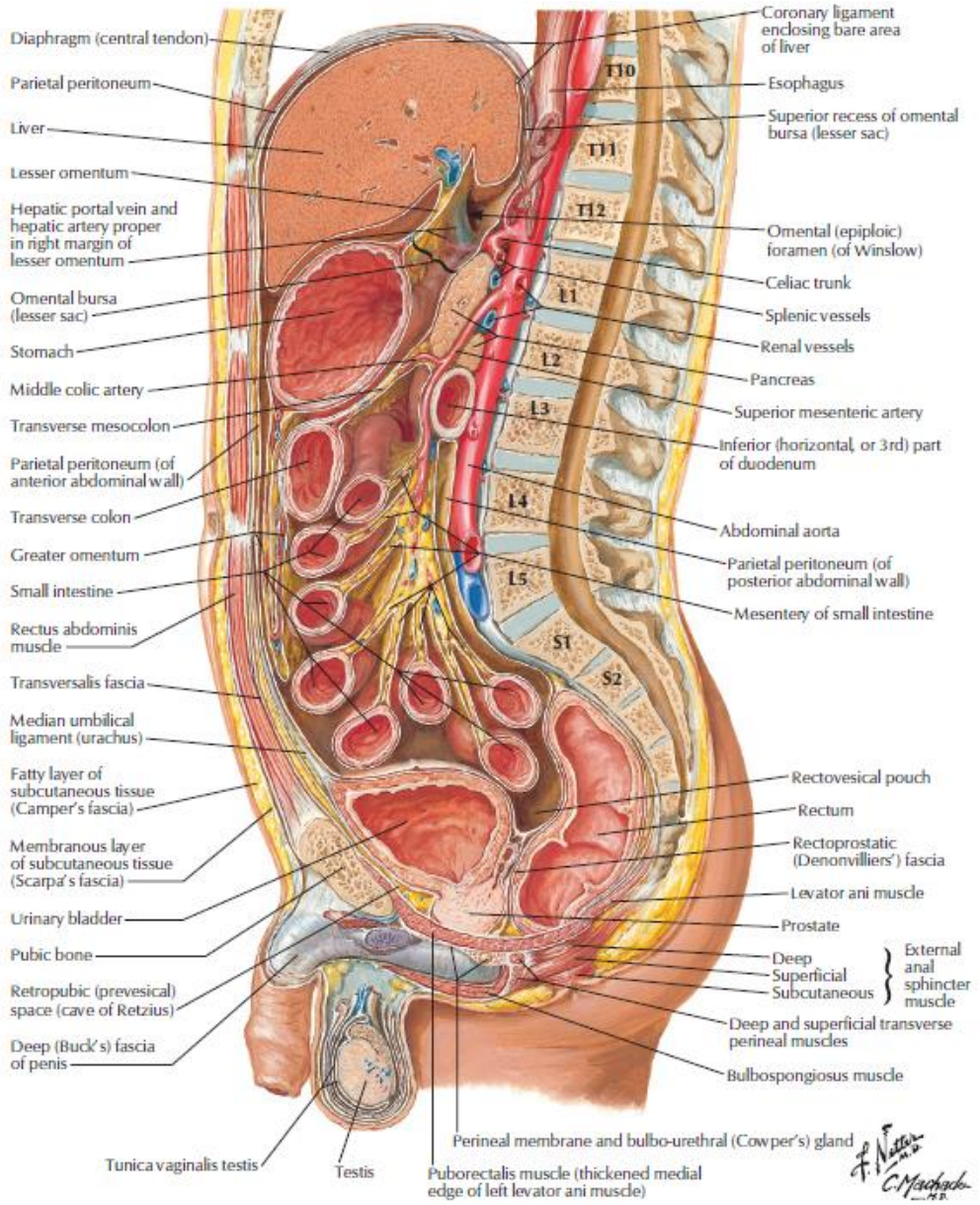
Frontal or coronal section of the thorax

AXES, PLANES and SECTIONS of the BODY



Transvers section of the thorax

AXES, PLANES and SECTIONS of the BODY



Sagittal section of the abdomen

BODY CAVITIES

DORSAL CAVITY

Cranial cavity
Vertebral cavity

BODY CAVITIES

Spaces within the human body which contain and protect delicate internal organs.

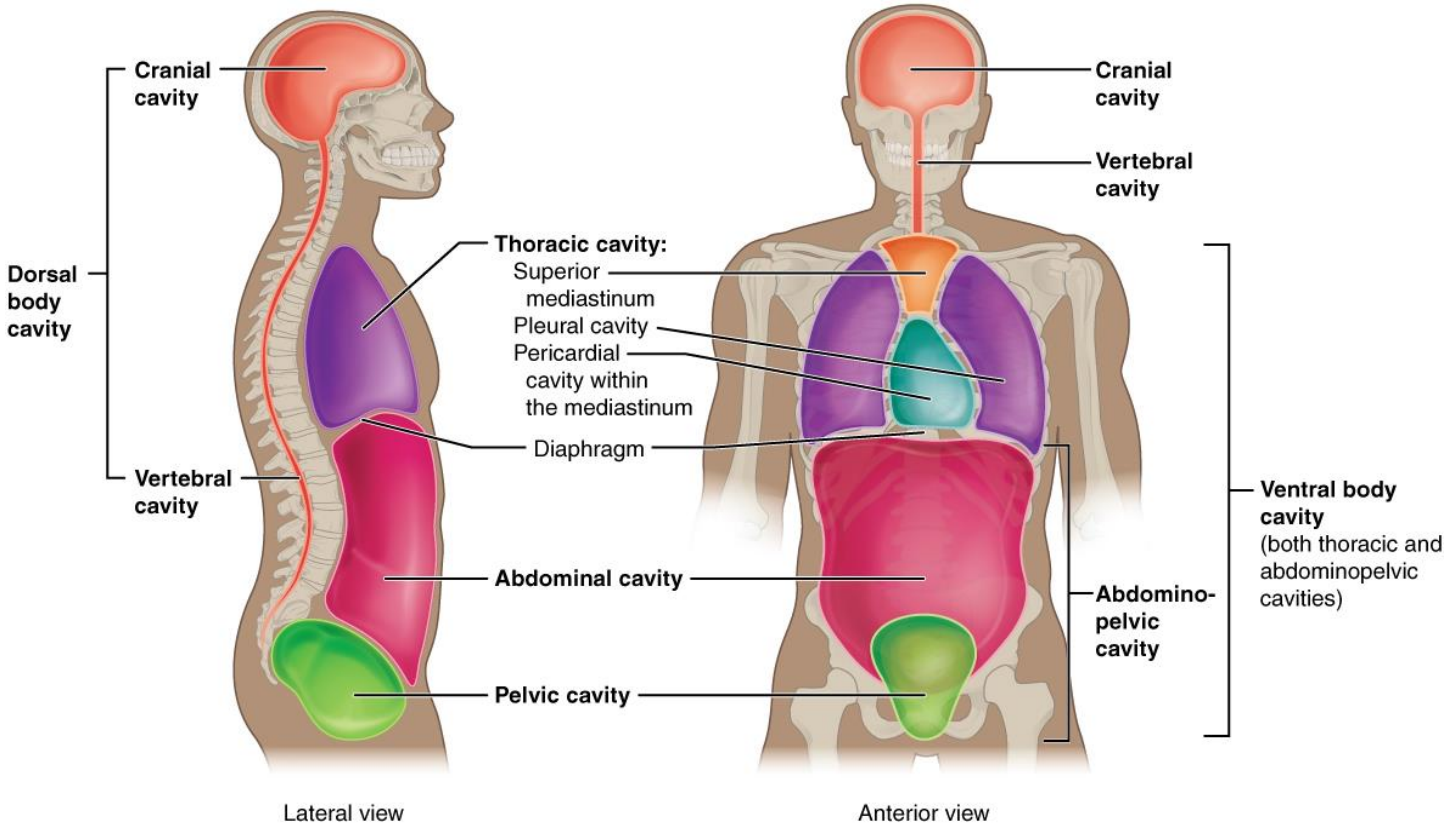
The ventral cavity allows for significant changes in the size and shape of the organs as they perform their functions.

VENTRAL CAVITY

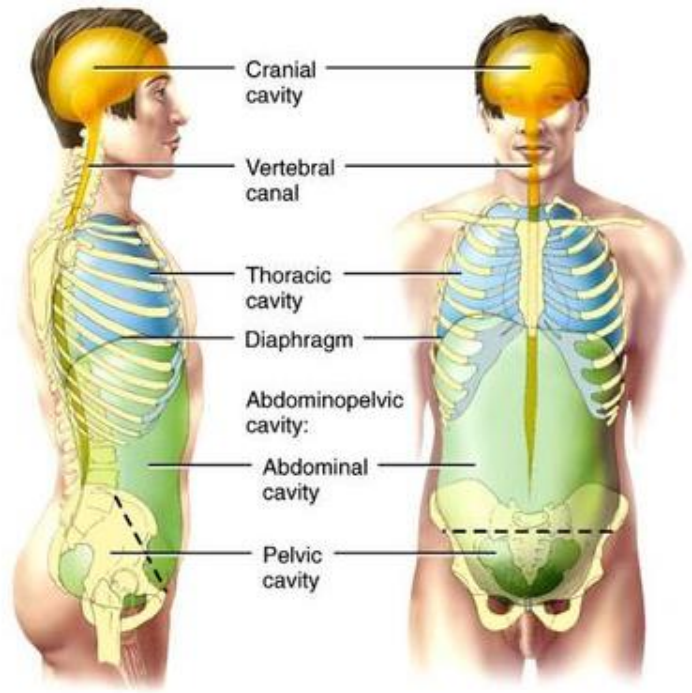
Thoracic cavity

Abdominal cavity

Pelvic cavity



BODY CAVITIES

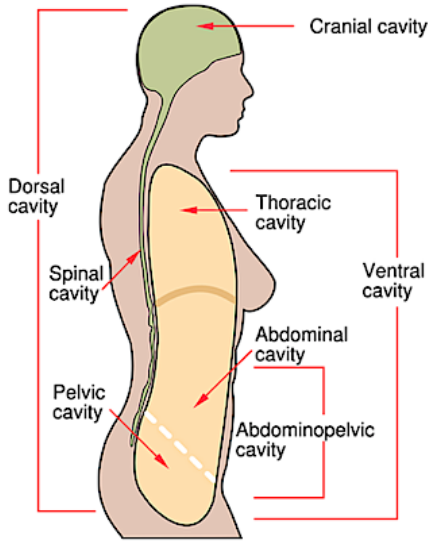


(a) Right lateral view (b) Anterior view

CAVITY	COMMENTS
Cranial cavity	Formed by cranial bones and contains brain.
Vertebral canal	Formed by vertebral column and contains spinal cord and the beginnings of spinal nerves.
Thoracic cavity*	Chest cavity; contains pleural and pericardial cavities and mediastinum.
Pleural cavity	Each surrounds a lung; the serous membrane of each pleural cavity is the pleura.
Pericardial cavity	Surrounds the heart; the serous membrane of the pericardial cavity is the pericardium.
Mediastinum	Anatomic region in the central portion of the thoracic cavity between the medial walls of pleural cavities; extends from sternum to vertebral column and from first rib to diaphragm; contains all the structures of the thoracic cavity other than the lungs, including, for example, the heart, thymus, esophagus, trachea, and several large blood vessels.
Abdominopelvic cavity	Subdivided into abdominal and pelvic cavities.
Abdominal cavity	Contains stomach, spleen, liver, gallbladder, small intestine, and most of large intestine; the serous membrane of the abdominal cavity is the peritoneum.
Pelvic cavity	Contains urinary bladder, portions of large intestine, and internal organs of reproduction.

* See figure 1.10 for details of the thoracic cavity

Figure 01.09 Tortora - PAP 12/e



Body Cavities

Dorsal Cavity

- Cavity in the ***BACK*** of the body

Cranial Cavity

- Brain

Spinal Cavity

- Spinal Cord

Ventral Cavity

- Cavity in the ***FRONT*** of the body

Thoracic Cavity

Pleural Cavities

- Lungs

Mediastinum

- Trachea, Esophagus

Pericardial Cavity

- Heart, Great Vessels

Abdominopelvic Cavity

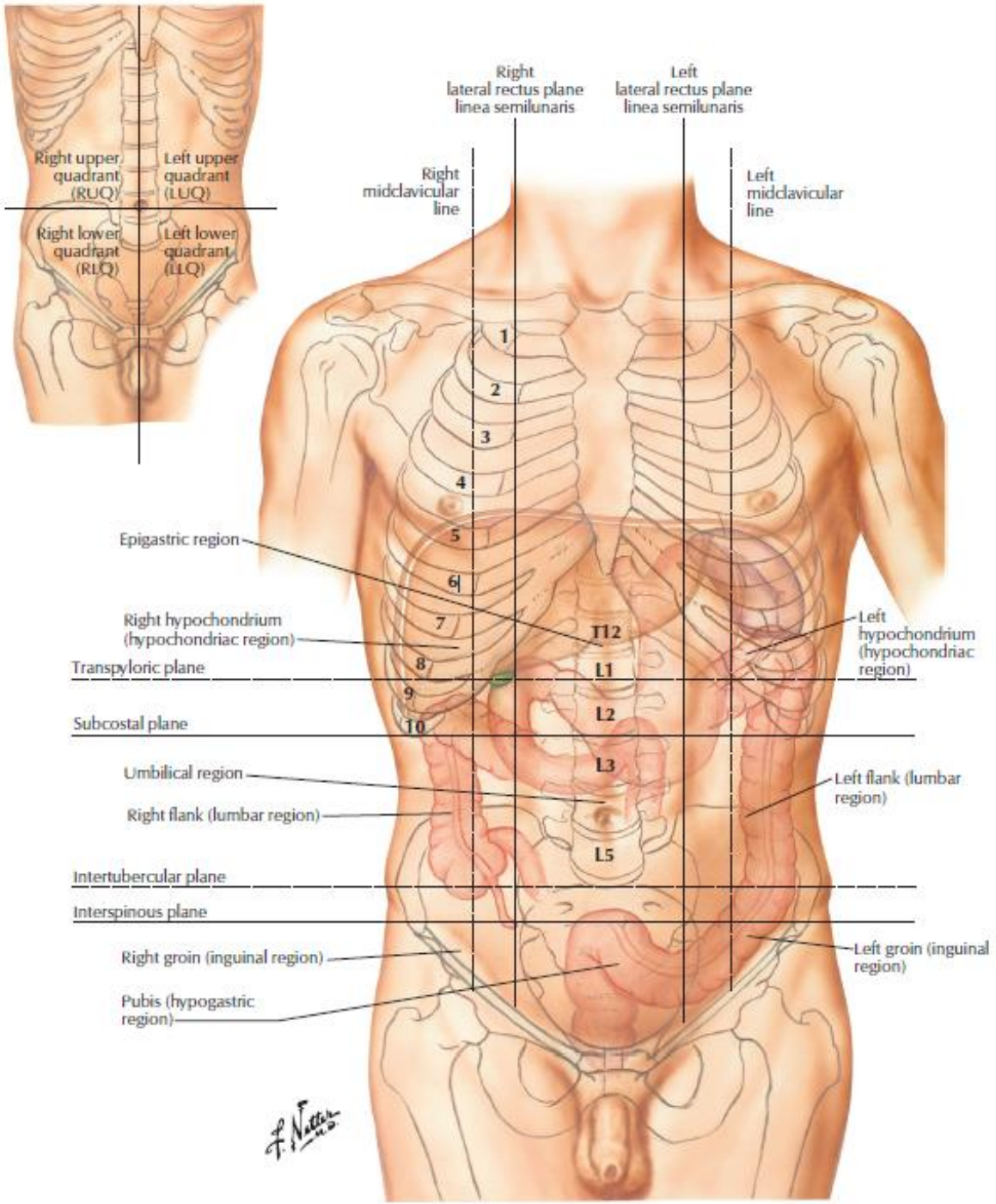
Abdominal

- Liver
- Stomach
- Pancreas
- Intestines

Pelvic

- Bladder
- Reprod. Organs

ABDOMINAL REGIONS AND QUADRANTS



The simpler **quadrants approach**, which is more commonly used in medicine, subdivides the cavity with one median sagittal plane and one transverse plane that intersect at the patient's umbilicus (navel).

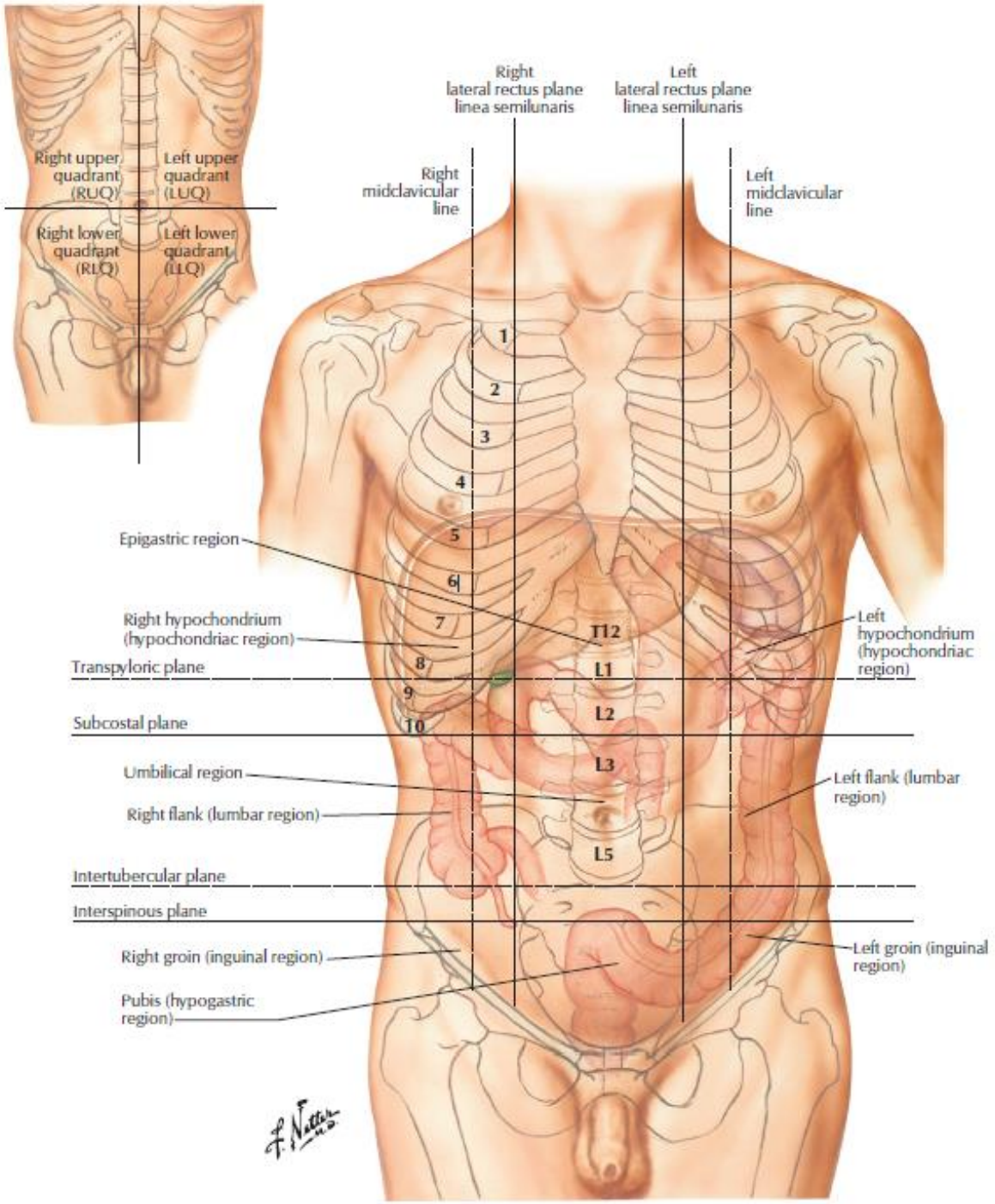
The more detailed **regional approach** subdivides the cavity with

a) two transverse planes
- a subcostal plane, tangent to the lowest point of the rib cage (at the level of the 10th rib)
- an interspinous plane, which passes through the anterosuperior iliac spines (at the level of the pelvis)

These 2 planes divide the abdomen into 3 areas: upper, intermediate and lower areas

b) two lateral planes with respect to the rectus abdominis muscle
- the right lateral plane of the rectus abdominis muscle
- the left lateral plane of the rectus abdominis muscle

ABDOMINAL REGIONS AND QUADRANTS



9 abdominal regions derive from the intersection of these two pairs of planes

In the center of the abdominal cavity:
1. the epigastrium, above
2. the mesogastrium
3. the hypogastrium, below

On the sides, above:
4. the right hypochondrium
5. the left hypochondrium

On the sides, at the intermediate level:
6. the right lumbar region
7. the left lumbar region

On the sides, below:
8. the right inguinal region
9. the left inguinal region

Based on the localization of an abdominal pain in a specific one of these areas, it is possible to have an indication of the organ affected by the pain