وزارة التعليم العالي والبحث العلمي
الجامعة التقنية الجنوبية
المعهد التقني العمارة
قسم التمريض

الحقيبة التدريسية لمادة التشريح

الصف الاول

تدريسي المادة

الاستاذ الدكتورحيدركريم عبود

الفصل الدراسي الأول

1st lecture
Anatomical Terms

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Anatomy : Is the study of the structure of body parts and their relationships to one another by the method of dissection and is divided into:

1. microscopic anatomy.

2. macroscopic or gross anatomy

Microscopic anatomy: Study the structures of cells or tissues by the use of a microscope .

The cell : is the basic building block of life ,consists from cell membrane, cytoplasm and the nucleus.

The tissues :are groups of cells similar in shapes , functions and contain inter cellular materials.

The organ: is a structure that contains at least two different types of tissues functioning together for a common purpose.

There are **4** primary **tissue types** in the human body:

1. Epithelial Tissue:

Some examples : the outer layer of the skin, the inside of the mouth and stomach, and the tissue surrounding the body's organs.

2. Connective Tissue:

Connective tissue adds support and structure to the body.

Some examples :the inner layers of skin, tendons, ligaments, cartilage, bone and fat tissue. Blood is also considered a form of connective tissue.

3. Muscle Tissue:

A specialized tissue that can contract. Examples are the muscles throughout body.

4. Nerve Tissue:

- Has the ability to generate and conduct electrical signals in the body.

Nerve tissue is two cell types:

- Neurons : Cells that convert stimuli into electrical impulses to the brain.
- Neuroglia : supportive cells.

Macroscopic anatomy (or Gross anatomy):

The study of structures of the human body that are observable with the naked eye or (without the use of a microscope).

subdivided in to:

1. **Surface anatomy:** study of internal structures

- As they relate to overlying skin,
- In relation to true land mark and arbitrary lines (this land mark and lines facilitates the study) .

2. Systemic anatomy: which means study of systems such as skeletal, muscular ,circulatory,…etc.

3. Regional anatomy: studies the region of the body such as head ,neck, abdomen.

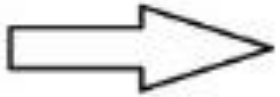
Anatomical position:

When the body is standing upright or erect with the upper limbs hanging by the sides and the face and the palms of the hands directed forward .

Supine position: When the body is lying face up in the anatomical position.

Prone position: When the body is lying face down in the anatomical position .

The Anatomical Position



Supine

Prone

Planes of the Body, lines and directions:

For clinical purposes, and for good description, the external surface of the human body divided into anatomical region by arbitrary lines and planes either vertical or horizontal.

1-Vertical planes:

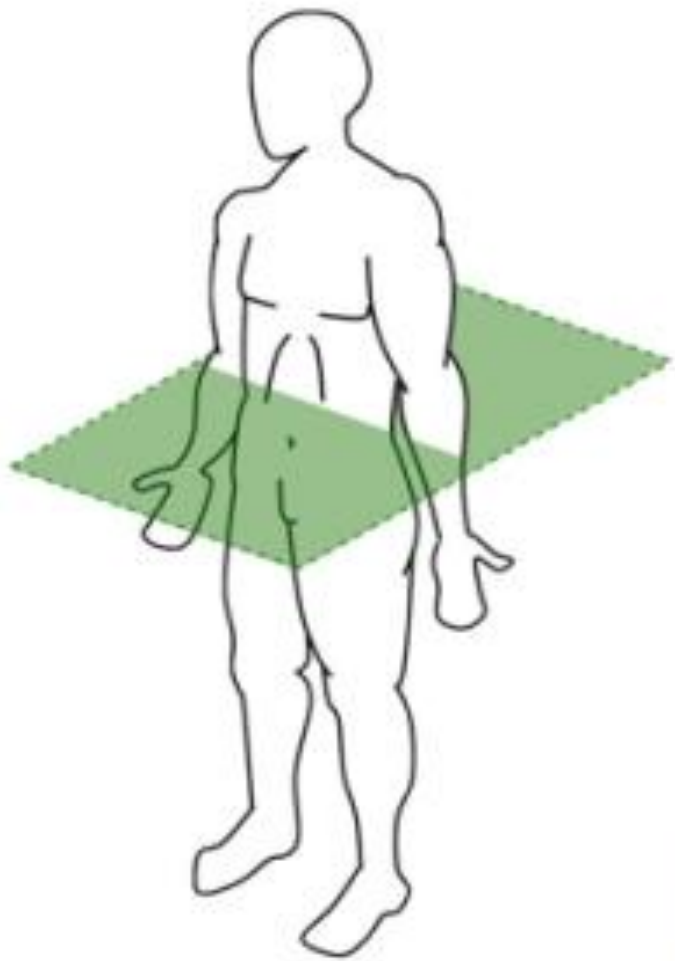
A. Sagittal Plane: running from front to back (Antero Posterior) dividing the body into right and left parts.

B. Frontal (Coronal Plane) : dividing the body into anterior and posterior (ventral and dorsal) portion.

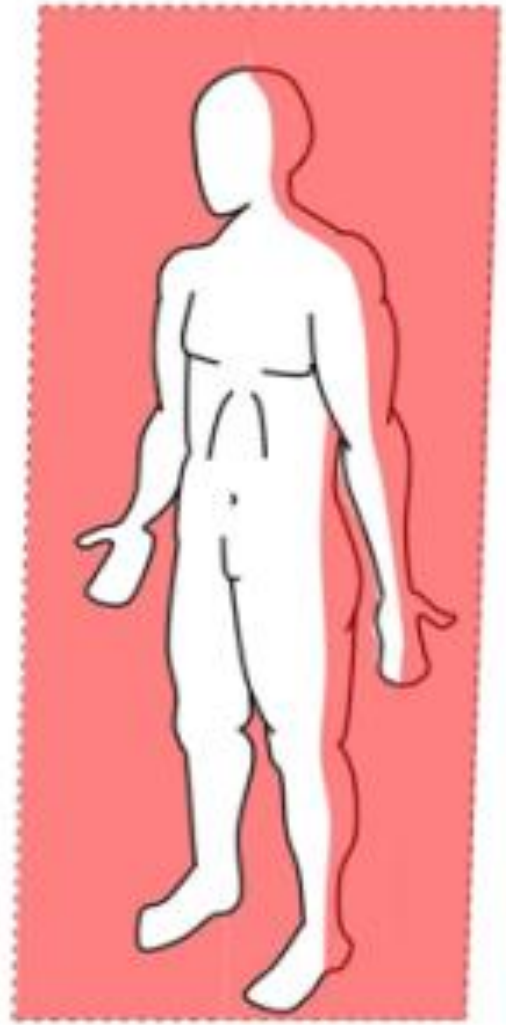
2-Horizontal planes (Transverse Plane)

Divides the body or limbs into lower parts, and upper parts in relation to the anatomical position.

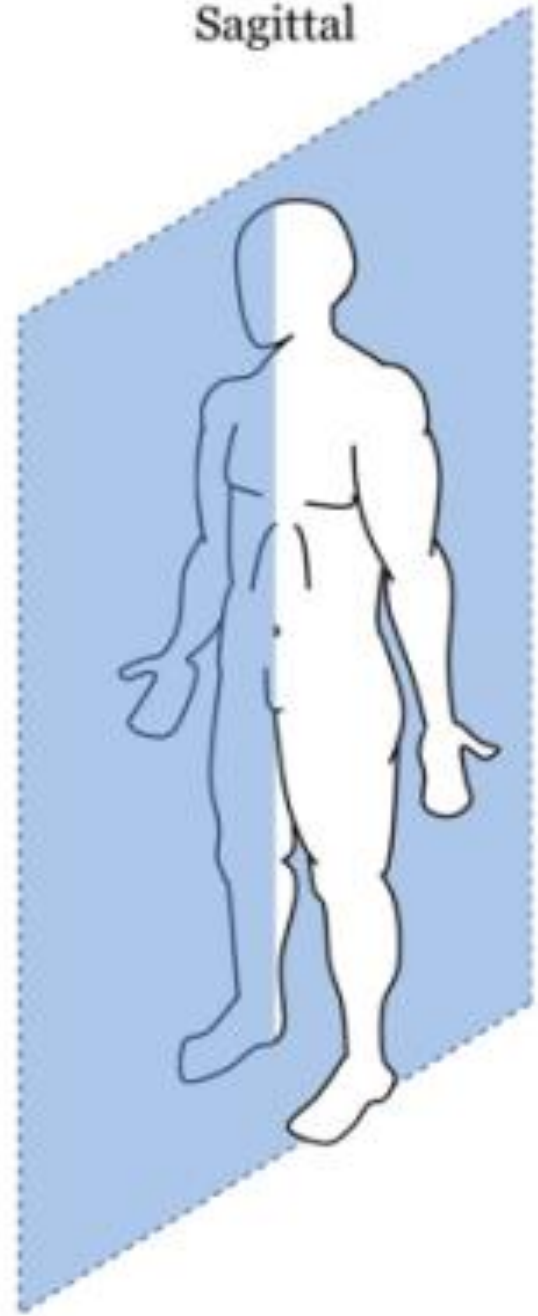
Transverse



Frontal



Sagittal



Vertical lines:

1. Anterior median line: the anterior border of the median plane.

2. Posterior median line: the posterior border of the median plane.

3. Mid clavicular line: vertical lines from the middle of the clavicle to the middle of the inguinal region passing through the areola.

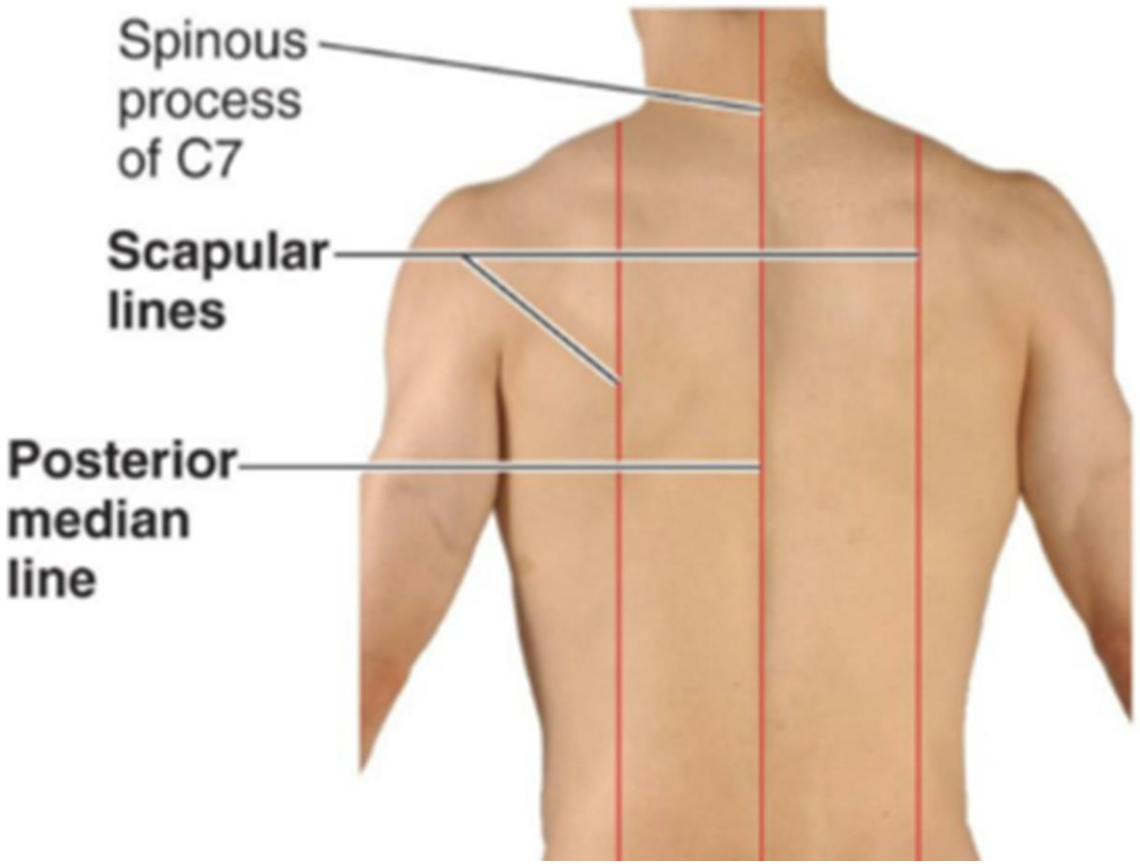
4. Mid sternal line: vertical lines (middle line of the sternum).

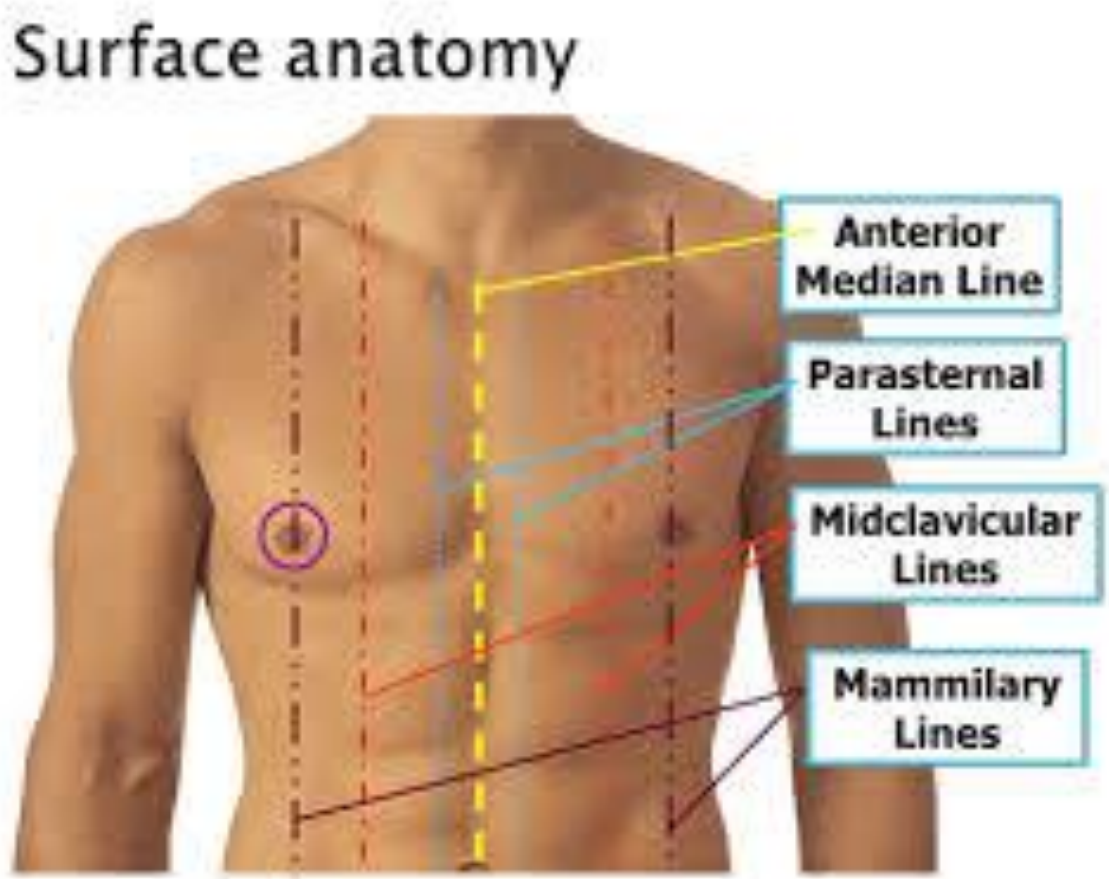
5. The anterior axillary lines are drawn vertically from the anterior axillary folds.

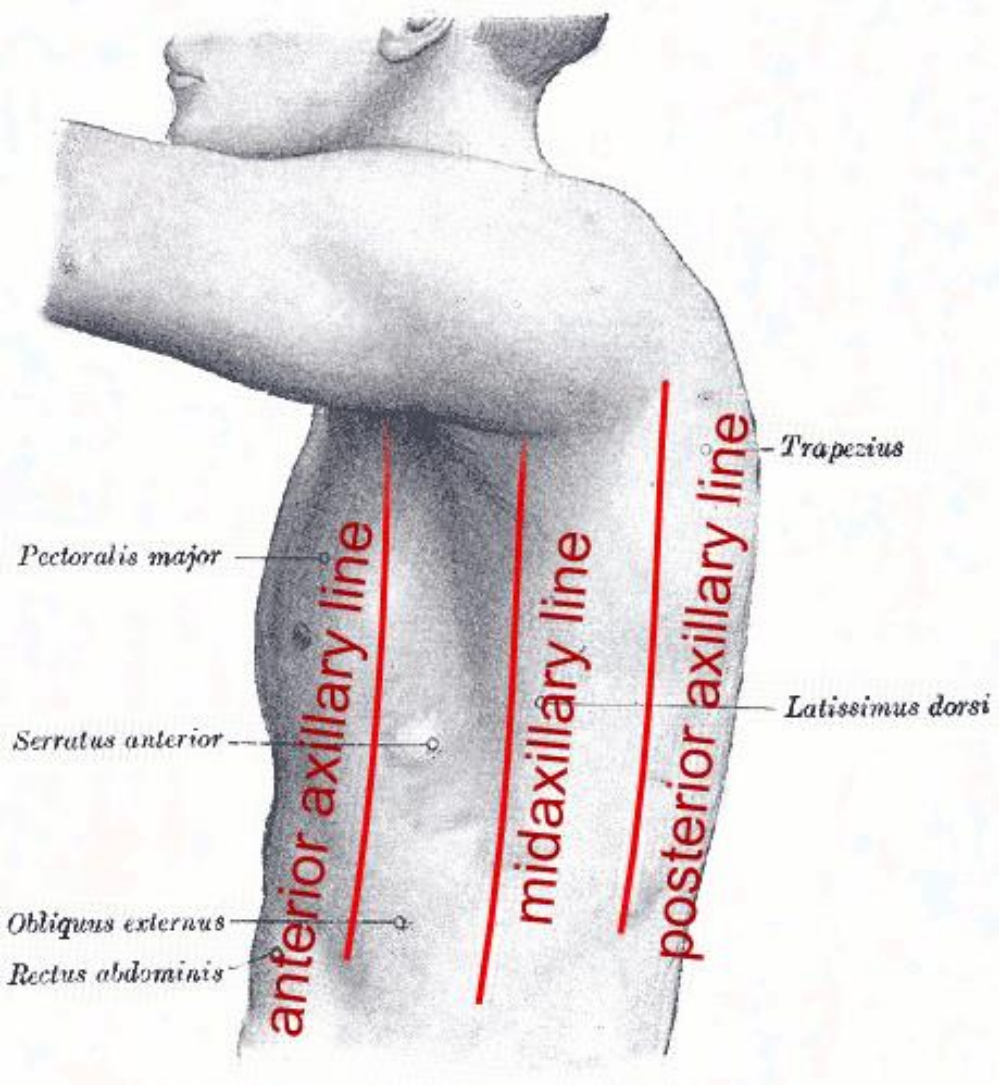
6. The posterior axillary lines are drawn vertically from the posterior axillary folds.

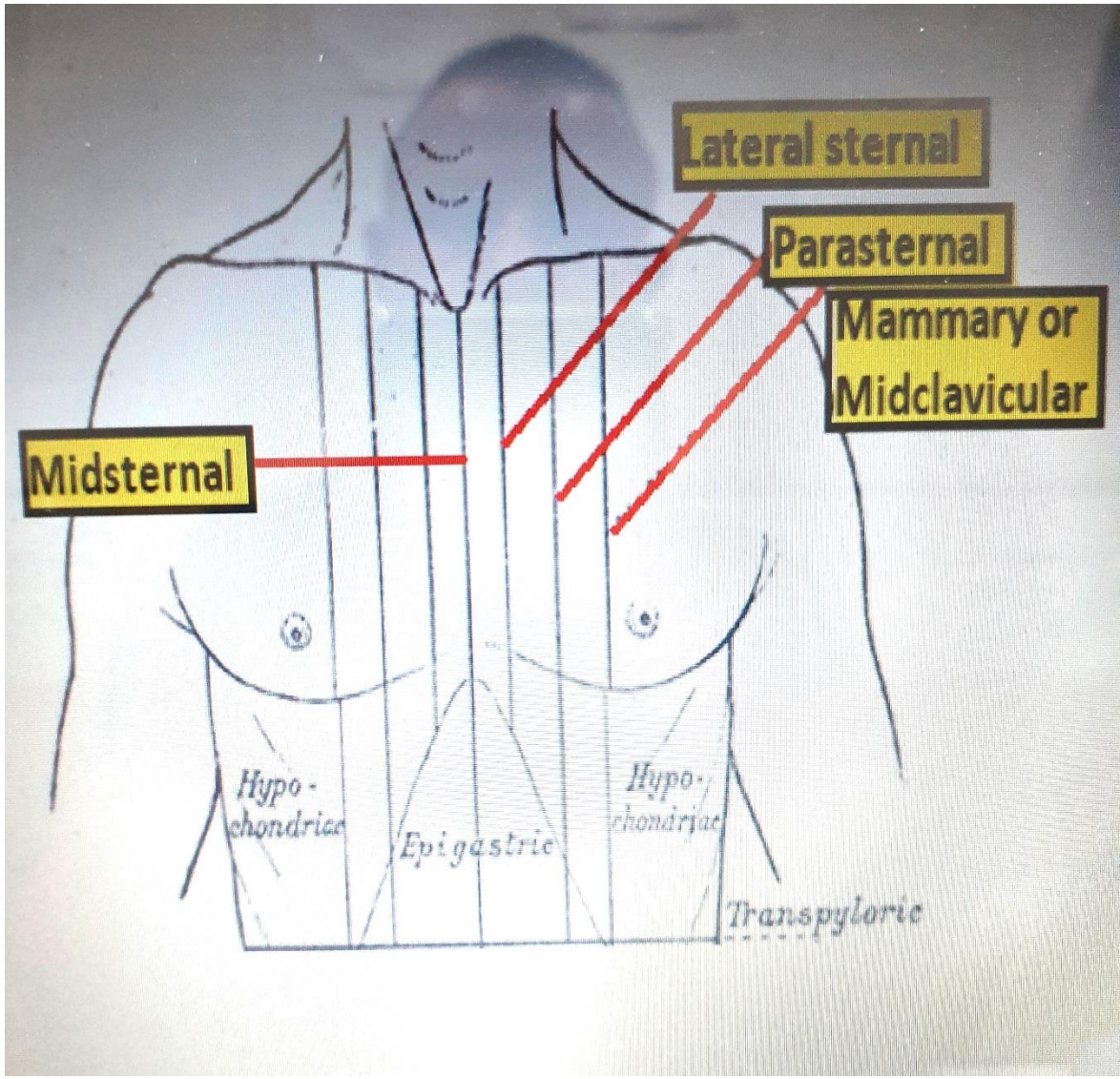
7. The mid axillary line runs downward from the apex of the axilla.

8. Scapular line on the posterior surface of the thorax is drawn vertically through the inferior angle of the scapula.


Spinous process of C7
Scapular lines
Posterior median line


Surface anatomy
Anterior Median Line
Parasternal Lines
Midclavicular Lines
Mammilary Lines


anterior axillary line
midaxillary line
posterior axillary line
Trapezius
Pectoralis major
Latissimus dorsi
Serratus anterior
Obliquus externus
Rectus abdominis


Lateral sternal
Parasternal
Mammary or Midclavicular
Midsternal
Hypo-chondriac
Epigastric
Hypo-chondriac
Transpyloric

Directional Terms:

1. Superior, cranial, cephalic : toward the head.

In the feet : superior is replaced by **dorsum.**

2. Inferior, caudal: away from the head (nearer to the feet). In the feet: Inferior is replaced by **planter**.

3. Anterior , Ventral : toward the front of the body.

In the hands : **Palmer** used instead of anterior .

4. Posterior, dorsal: toward the back of the body.

5. Medial: toward the midline.

6. Lateral: away from the midline.

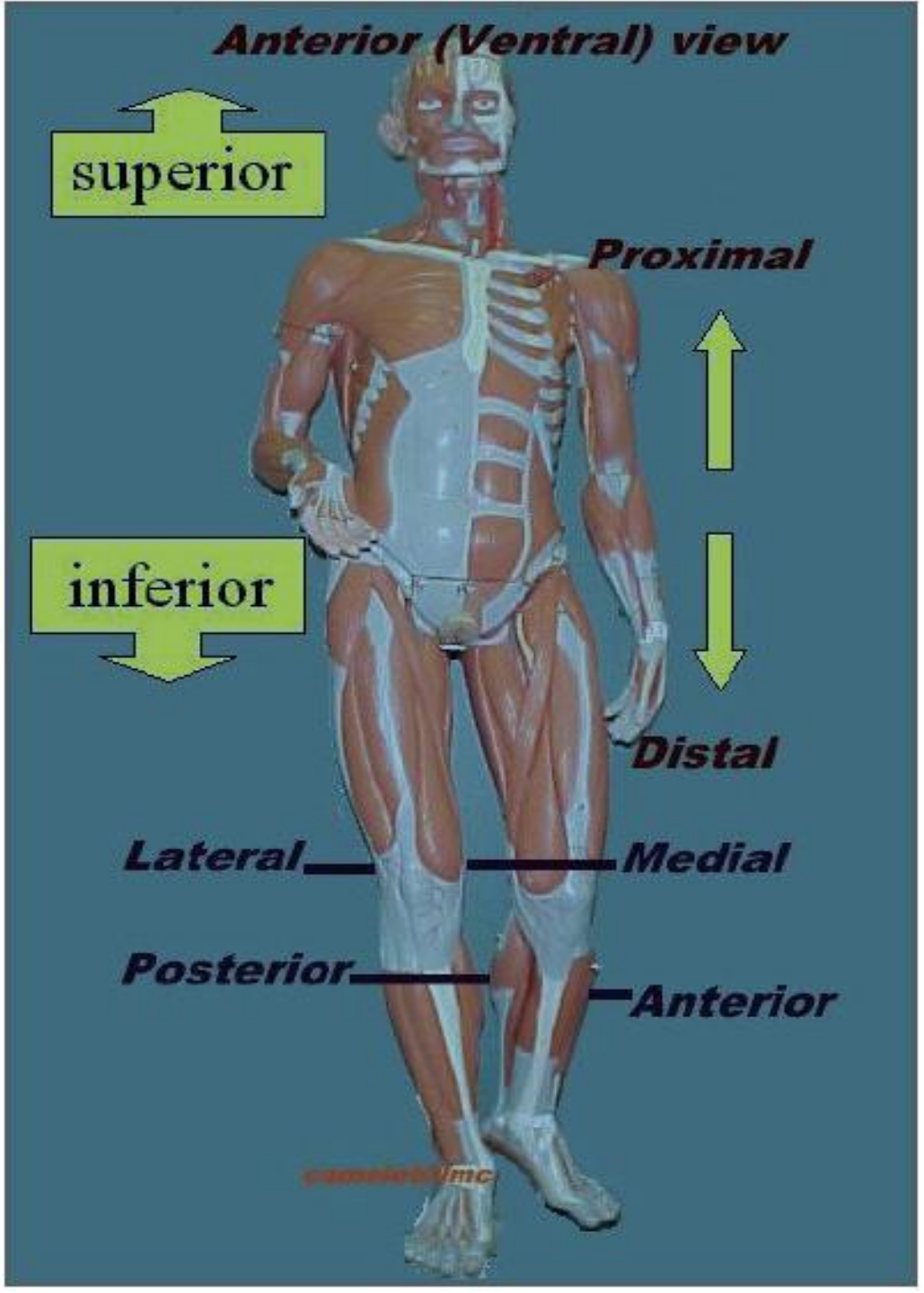
7. Intermediate: between medial and lateral structure.

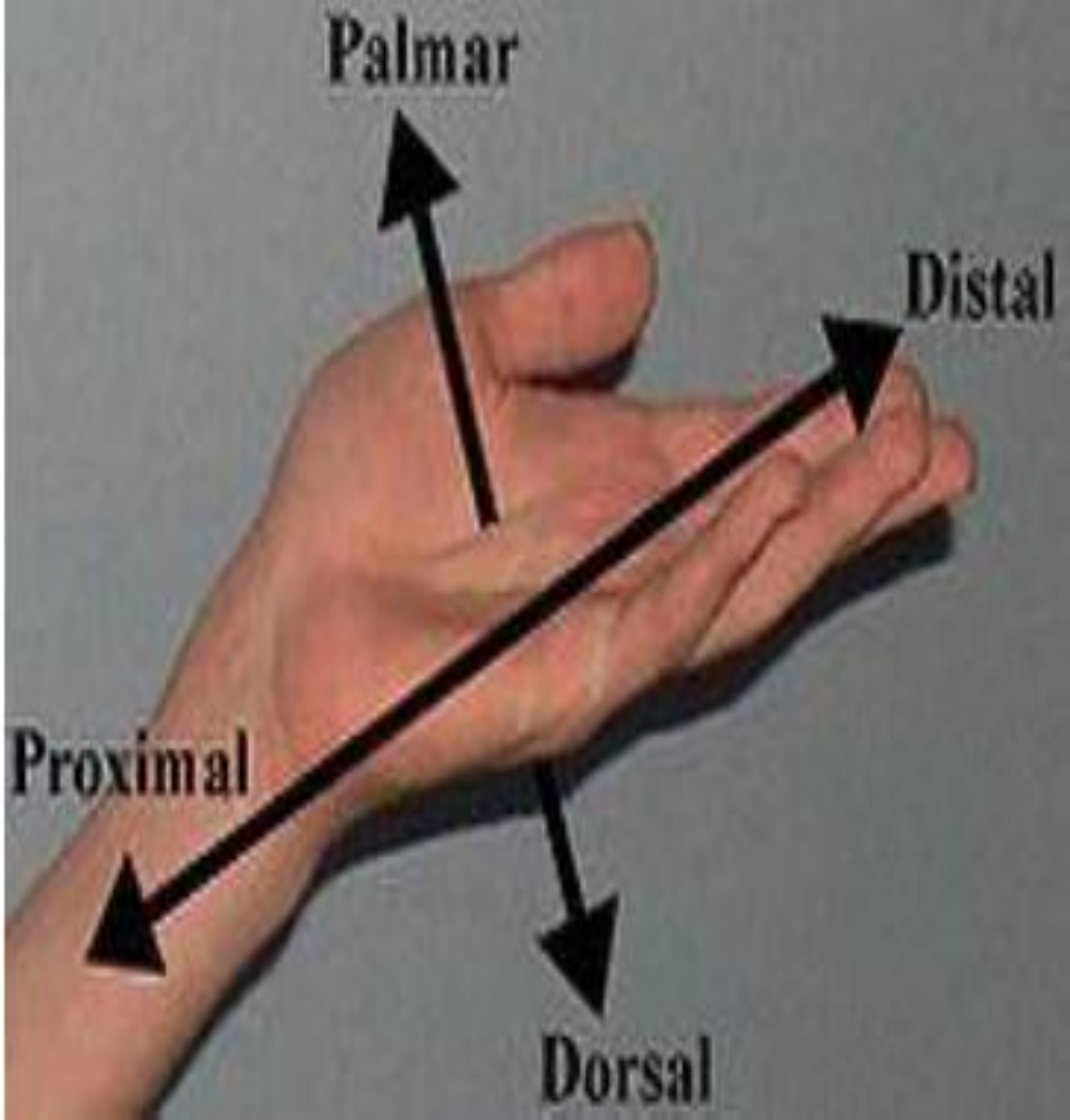
8. Proximal: closer to the origin of the body parts.

9. distal : far from the origin of the body parts.

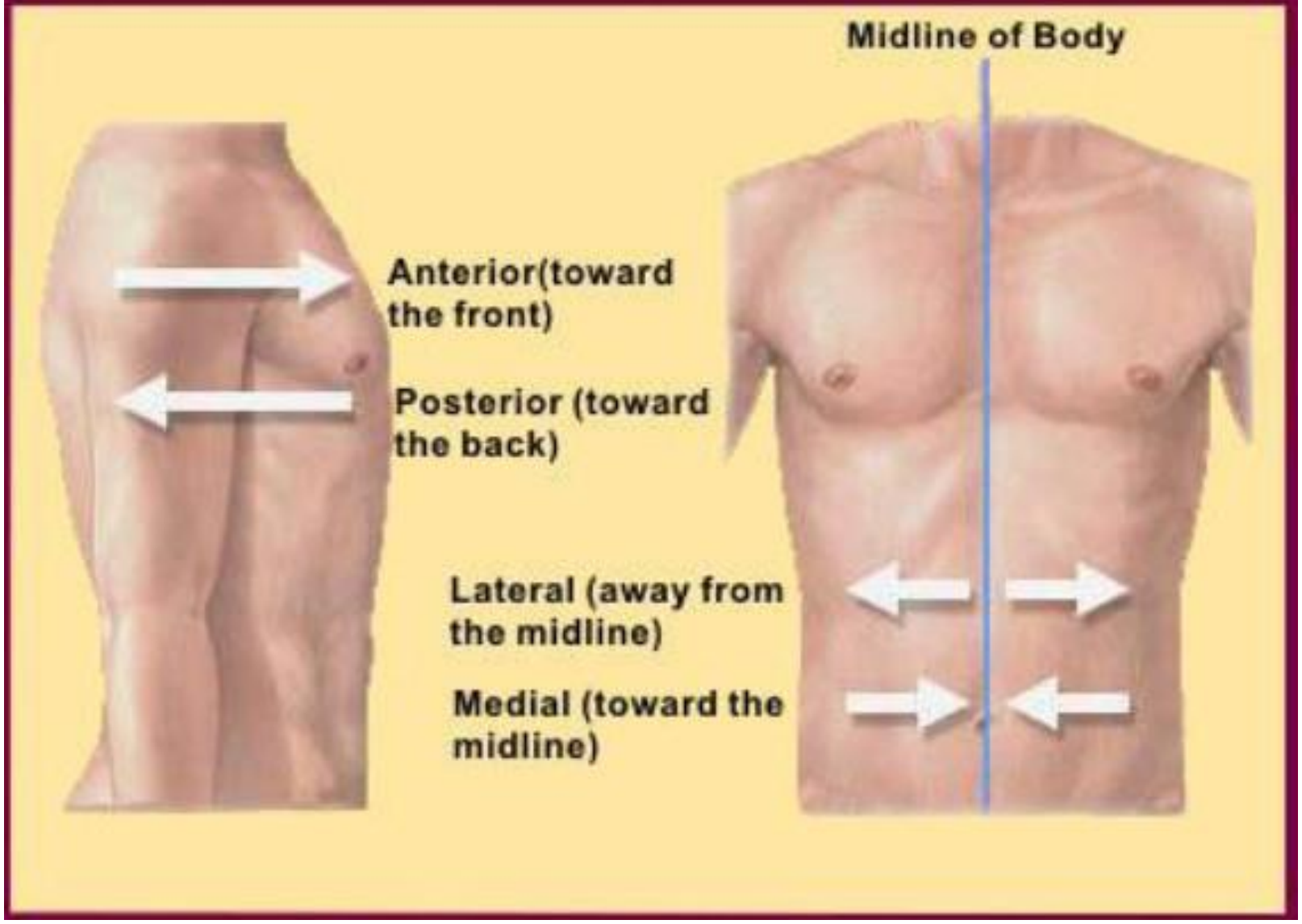
10. Superficial: toward the body surface.

11. deep : away from the body surface.


Anterior (Ventral) view
superior
Proximal
inferior
Distal
Lateral
Medial
Posterior
Anterior

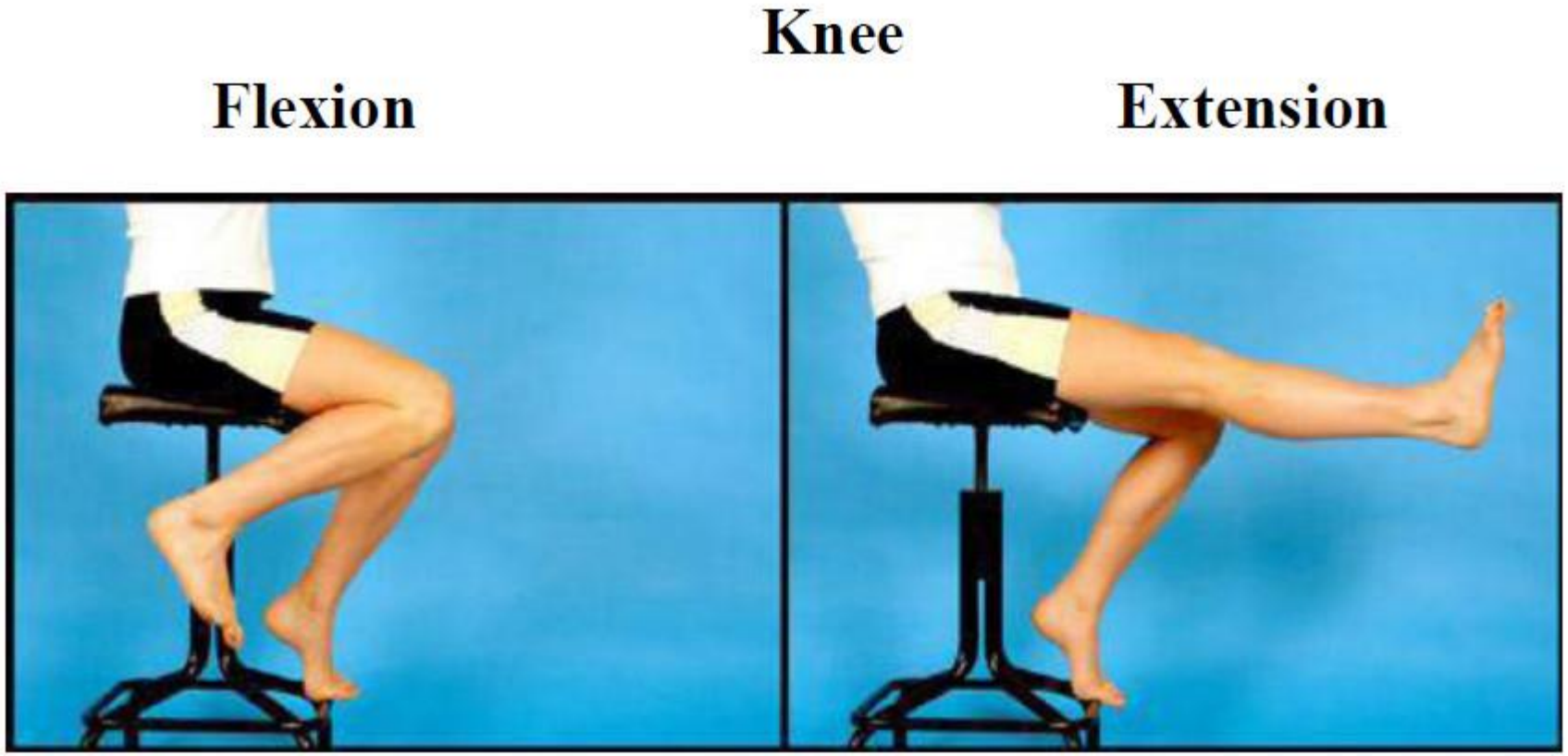

Palmar
Distal
Proximal
Dorsal

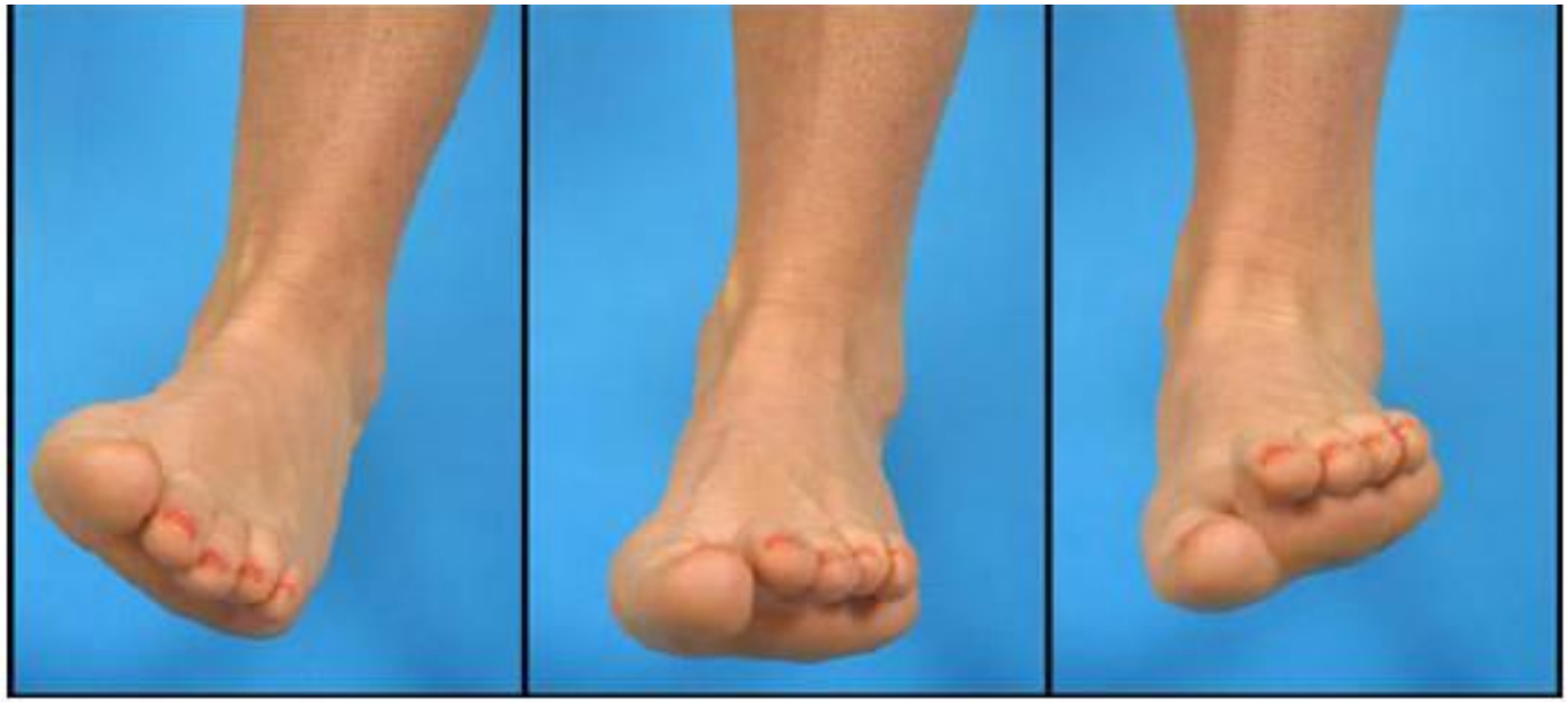
Anatomical Terms



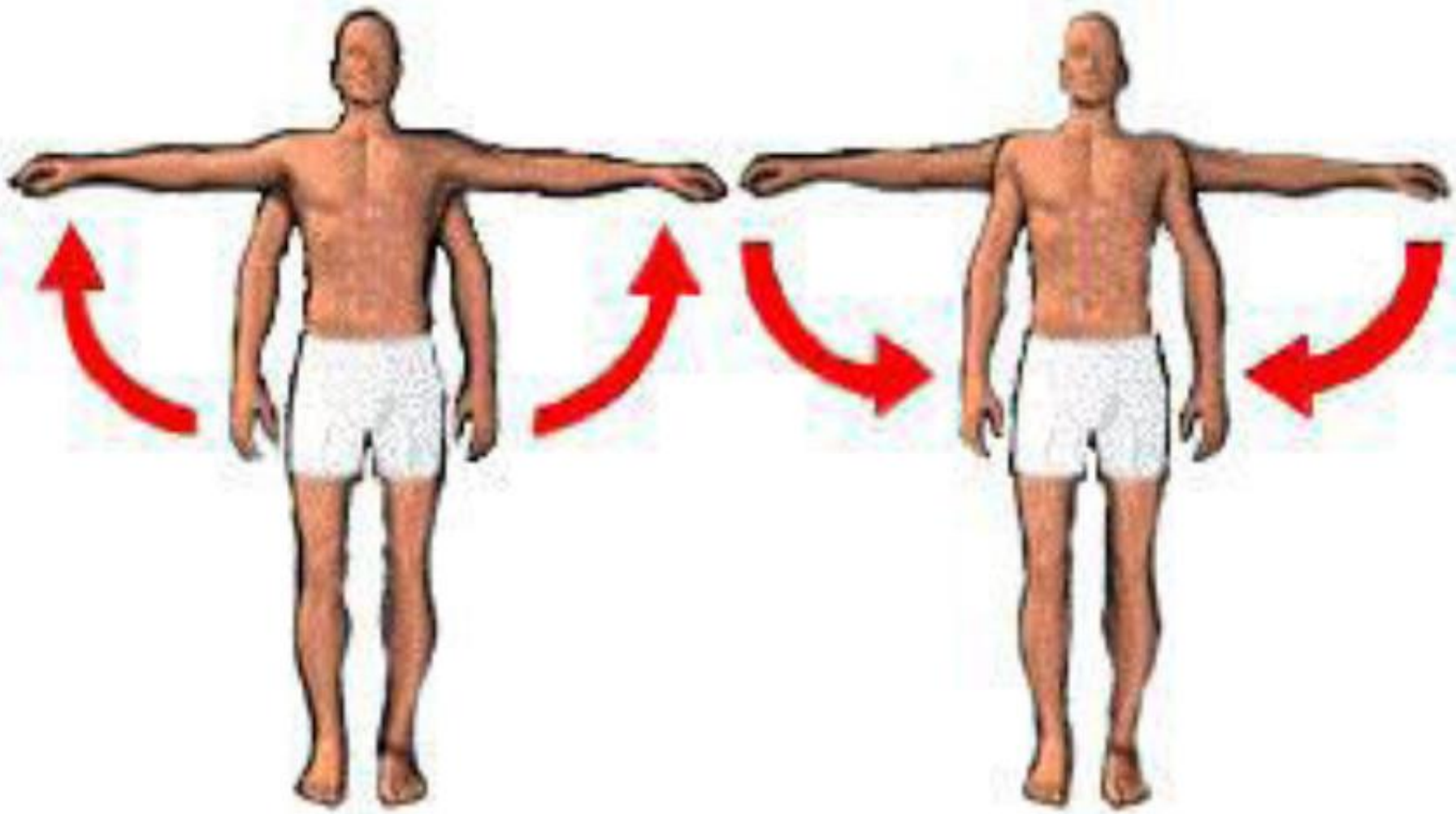
Types of movement:

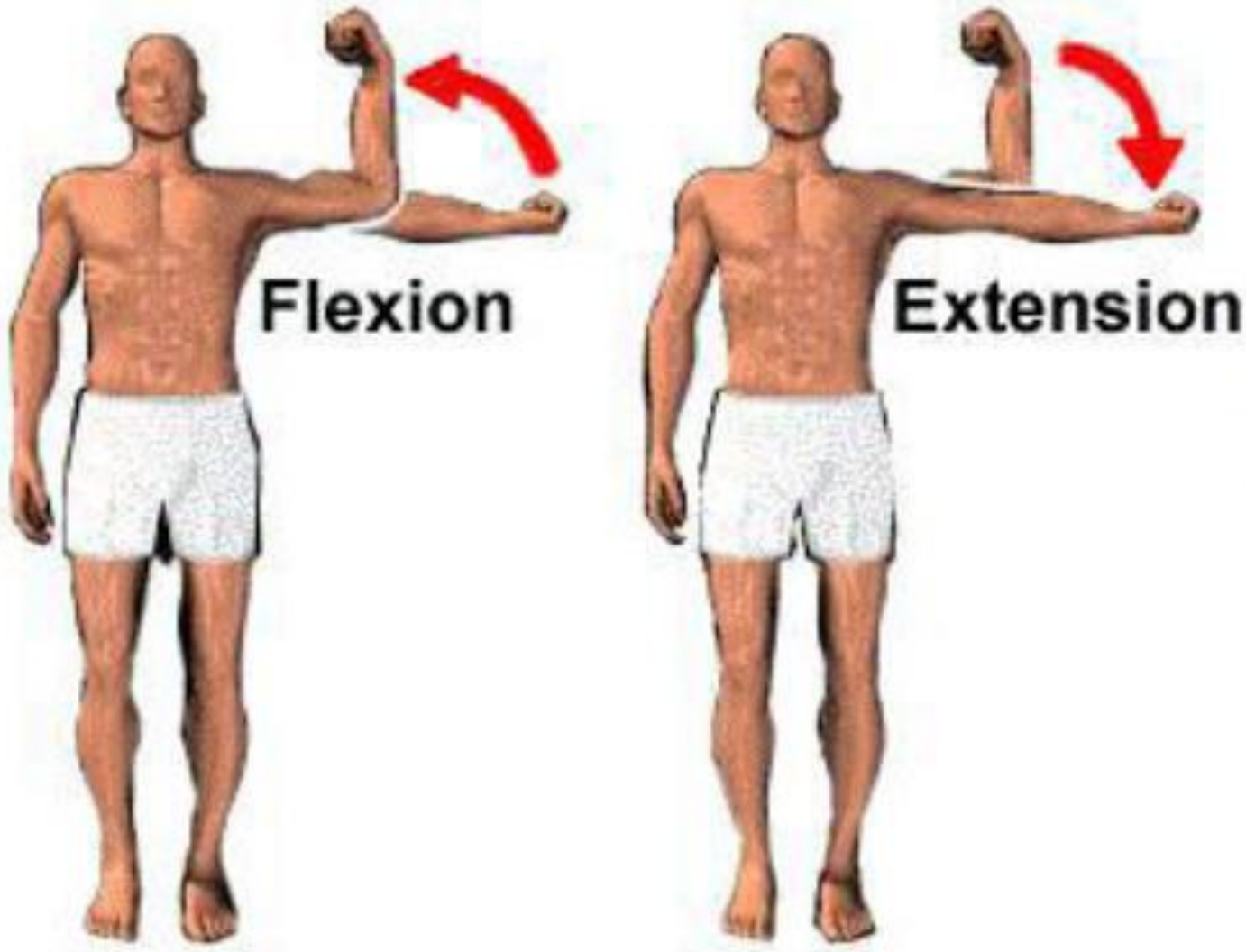
different types of movement have specific terms, often in pairs to describe opposite movements.





Inversion **Neutral** **Eversion**


Abduction
Adduction


Flexion
Extension

المصادر:

1. Grant's atlas of anatomy (twelfth edition) 2009.

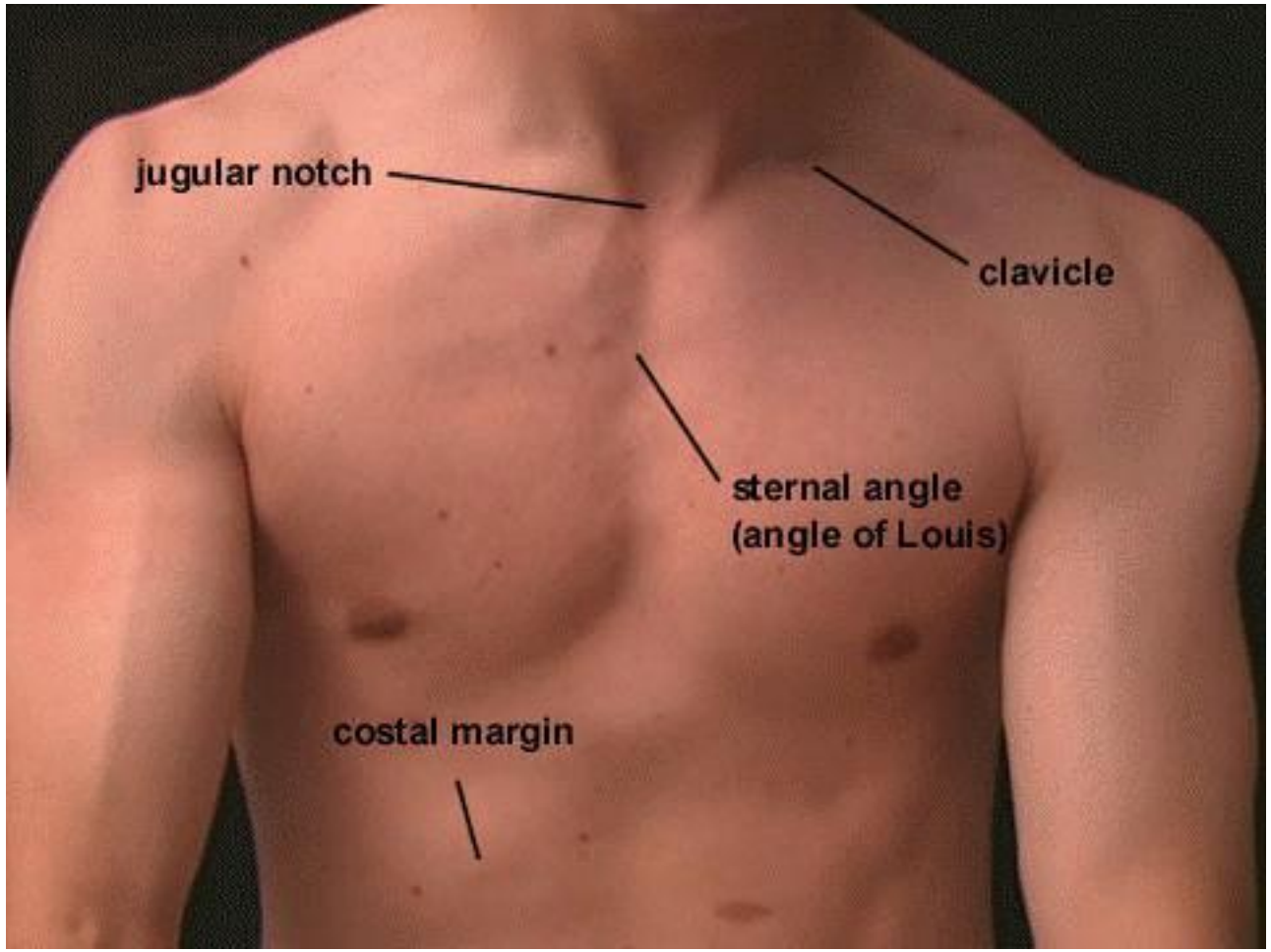
2. مبادئ علم التشريح لطلبة معاهد المهن الصحية

. الدكتور عبد الرحمن محمود الرحيم / وزارة الصحة 3891

3. King ham anatomy – Oxford – London / 1987 .

4. Wikipedia, From Wikipedia, the free encyclopedia

The surface anatomy of heart



Surface anatomy of the heart:

- The heart is an important chest organ.
- Lying in the center of thoracic cavity .
- On the superior surface of diaphragm .
- Anterior to the vertebral column.
- Posterior to the sternum.
- In between the lungs
- The location of heart on the chest wall can be draw by 4 imaginary lines formed the boundaries of the heart:

1-Superior border of the heart:

- Formed by drawing a line between 2 points:
- The 1st One finger breadth **left** to the sternum on **2nd intercostal space.**
- The 2nd One finger breadth **right** to the sternum on **2nd intercostal space.**

2-Inferior border of the heart:

Formed by drawing a curve line between 2 points :

- **Left** of the sternum in the **5th intercostal space** at the **mid-clavicular line (** which represent the apex beat**).**
- One finger breadth **right** of the sternum on the **6th costal cartilage**.

3-Right border of the heart:

A curve line to the right between the right end of the superior and inferior border of the heart.

4. Left border of the heart:

A curve line to the left between the left end of the superior and inferior border of the heart.

Borders of the hearts

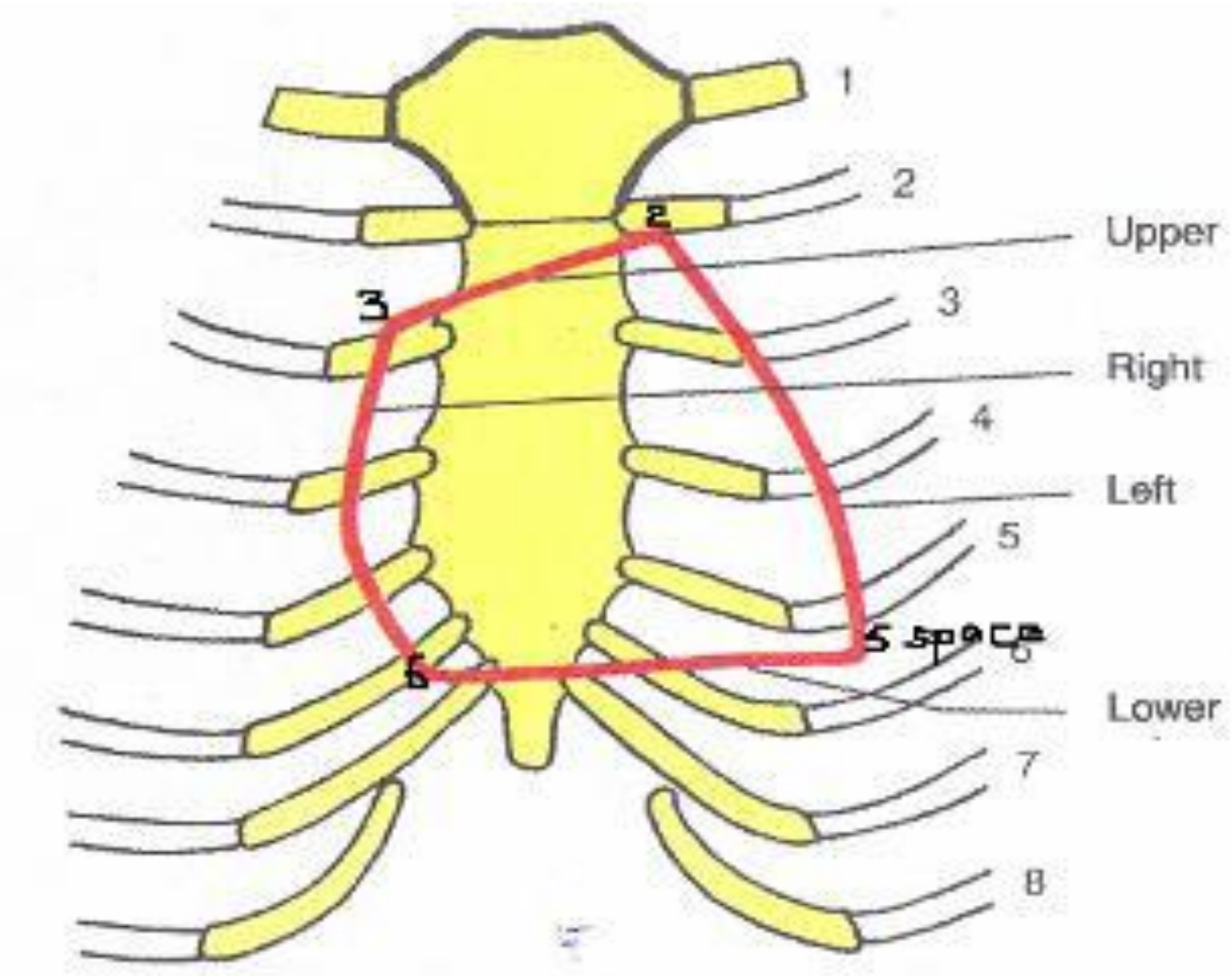
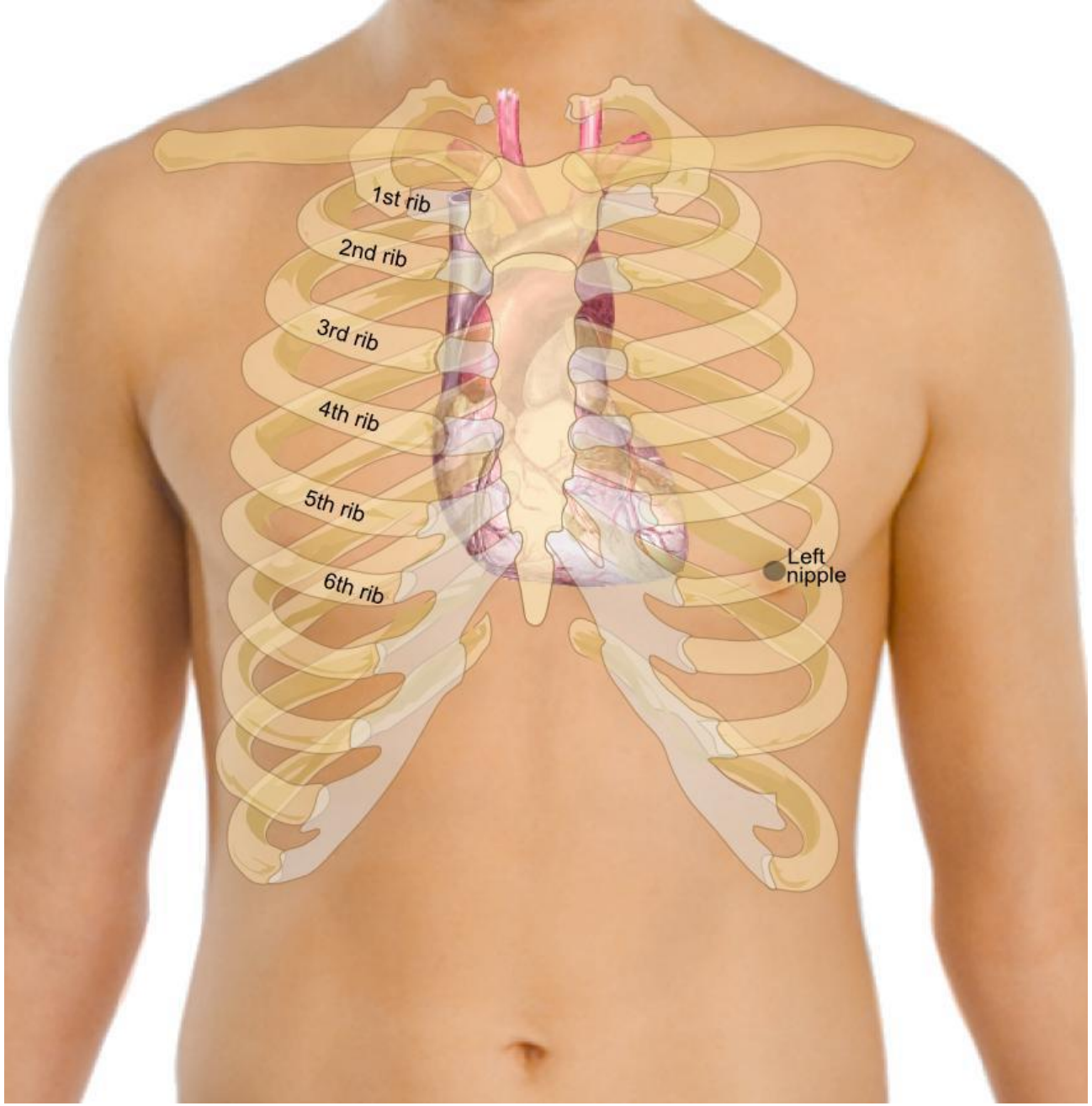
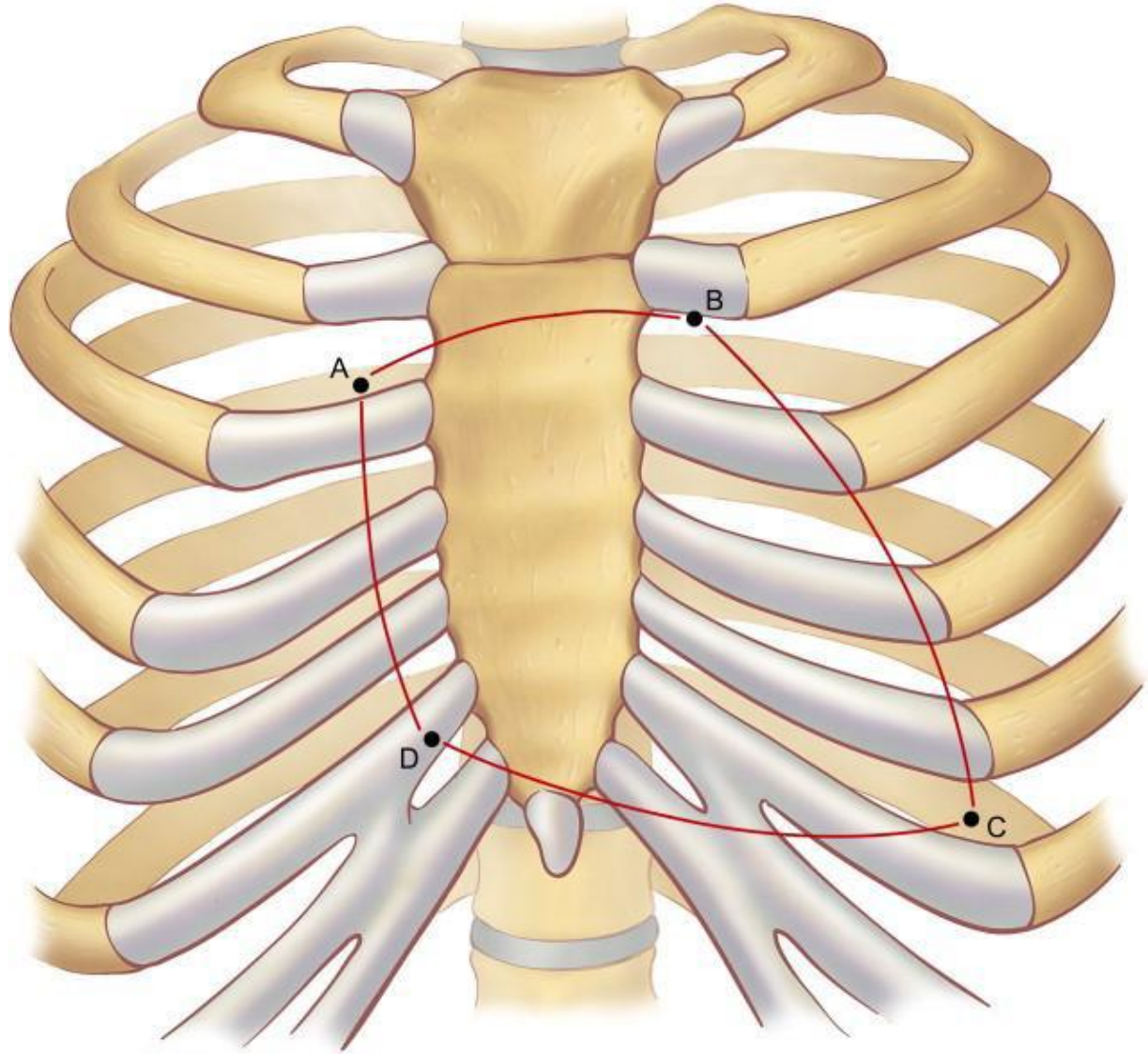


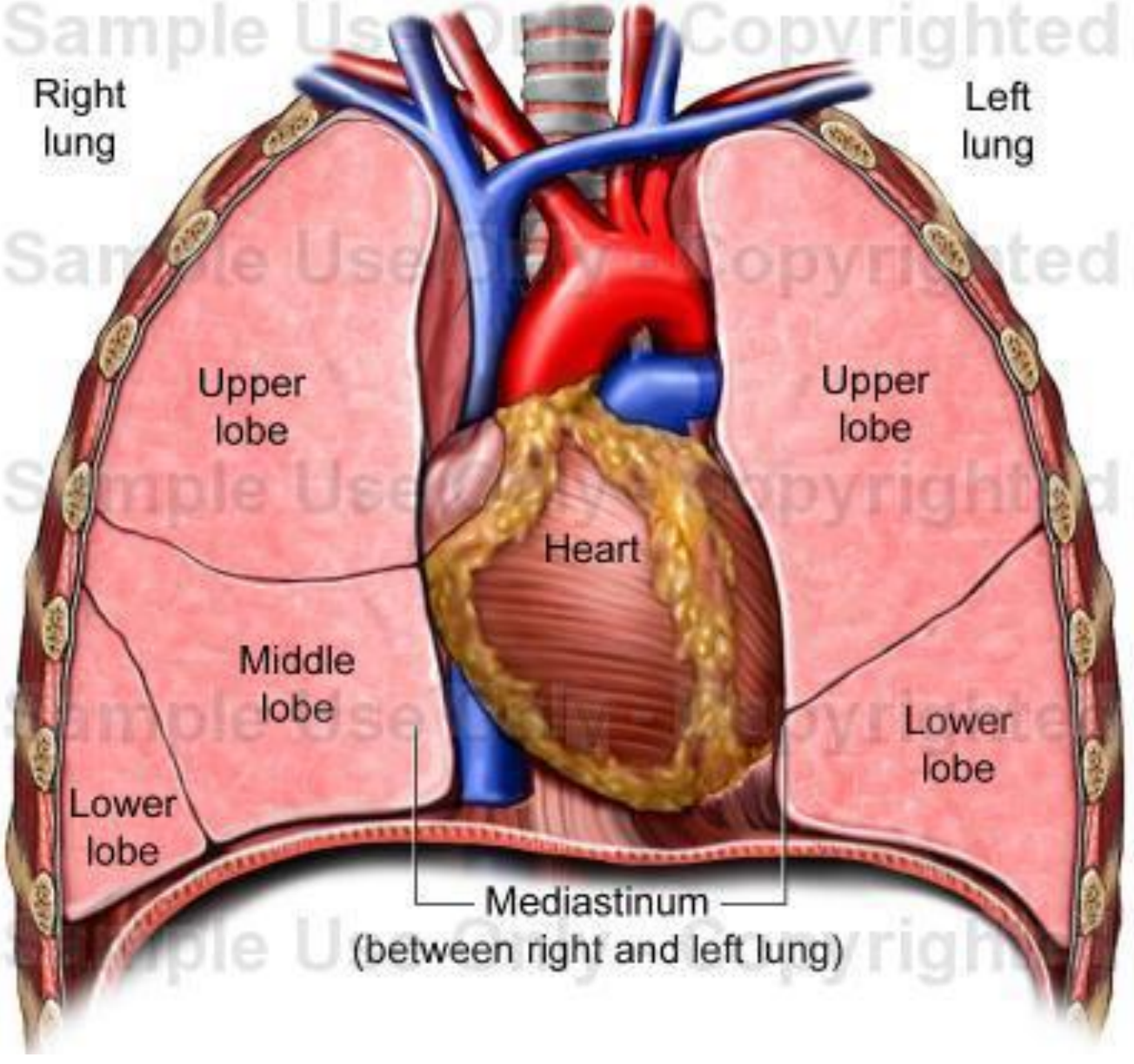
Fig. 18.8: Surface projection of the borders of the heart.

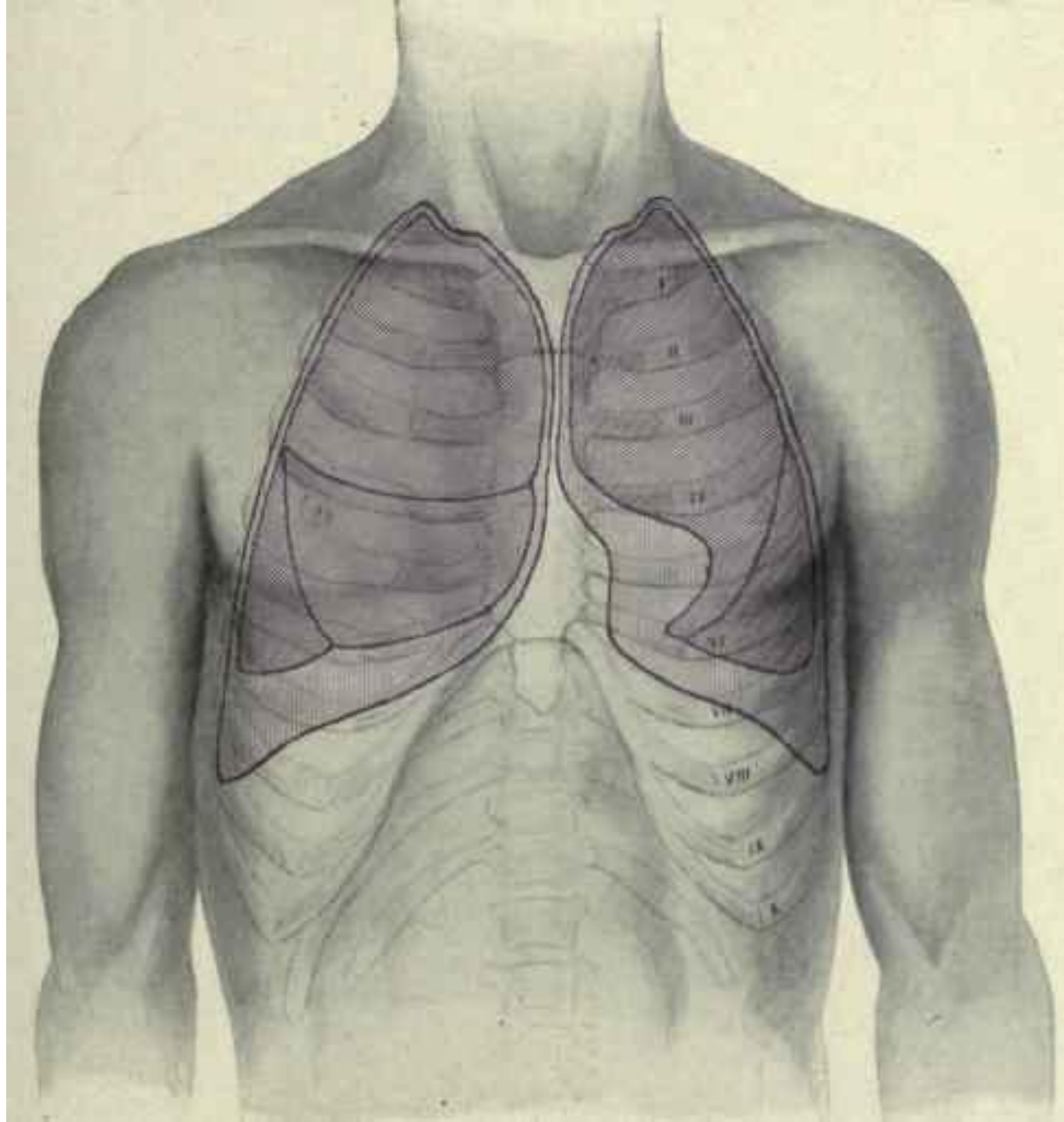

1st rib
2nd rib
3rd rib
4th rib
5th rib
6th rib
Left nipple



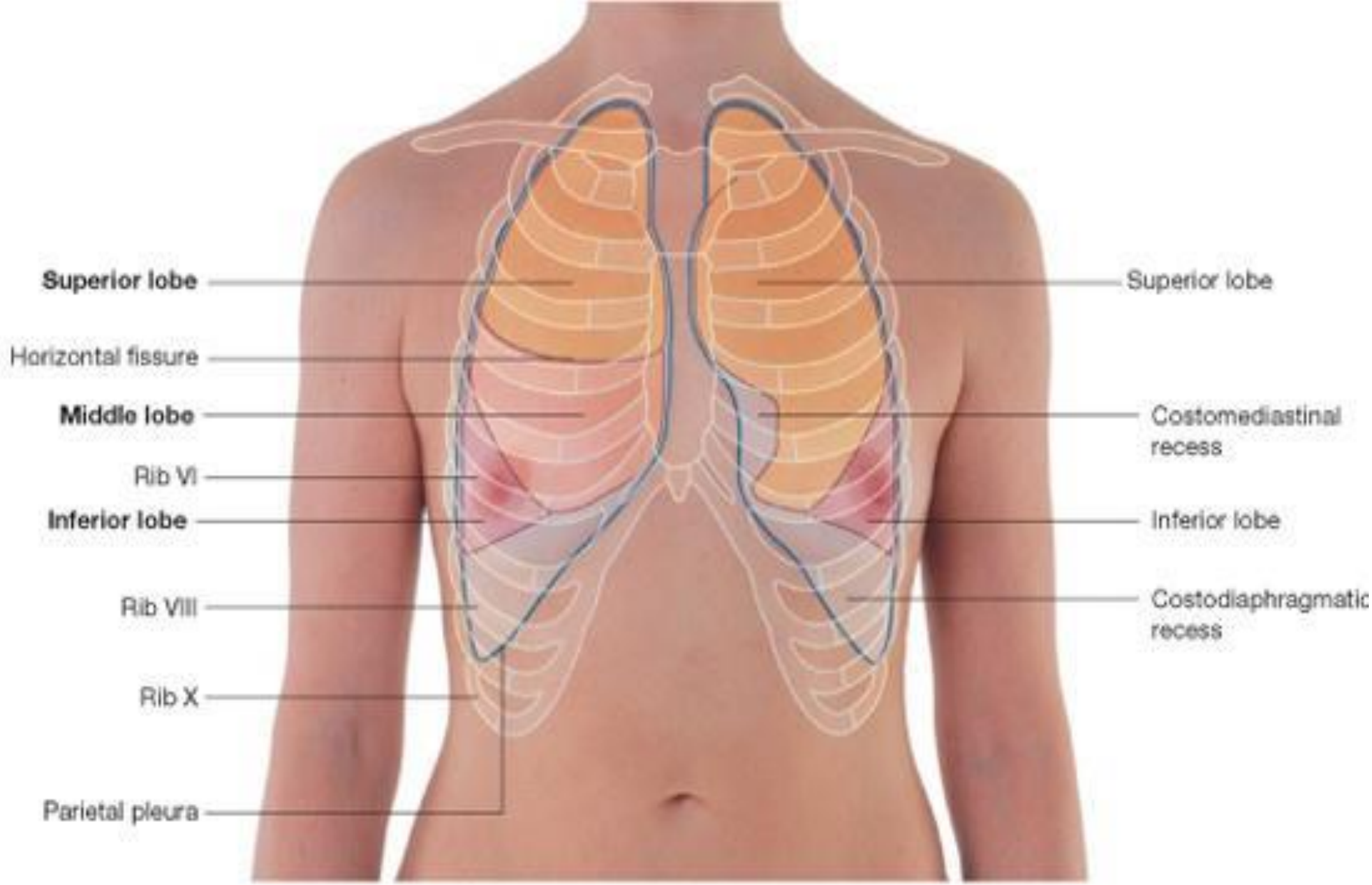
A Upper border of right 3rd costal cartilage.
B Lower border of left 2nd costal cartilage.
C Apex beat at left 5th intercostal space, lateral to mid-clavicular line.
D Middle of right 6th costal cartilage

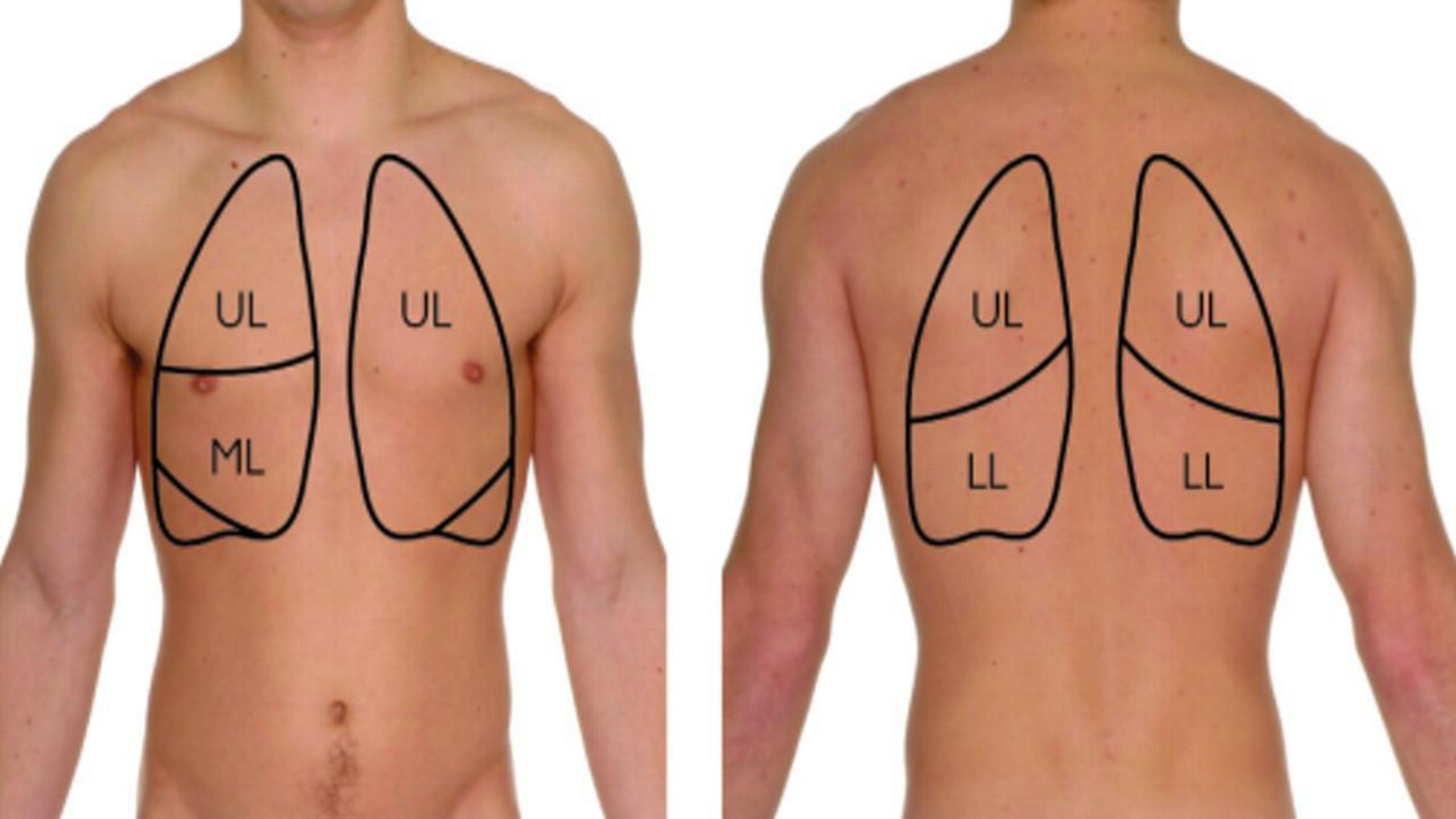
Surface anatomy of the lungs





- The lungs are essential organs of respiration.
- They are two in number located on either side of the thoracic cavity.
- Separated from each other by the mediastinum (contain the heart ,blood vessels and the trachea and esophagus).
- The right lung has 3 lobes ,the superior is separated from the middle lobes by a horizontal fissure ,the middle lobe is separated from the inferior lobe by the oblique fissure.
- The left lung has 2 lobes, the superior is separated from the inferior lobe by the oblique fissure.


Superior lobe
Horizontal fissure
Middle lobe
Rib VI
Inferior lobe
Rib VIII
Rib X
Parietal pleura
Superior lobe
Costomediastinal recess
Inferior lobe
Costodiaphragmatic recess


UL
UL
ML
UL
UL
LL
LL

The apex of the lungs (narrow superior tip) lies above the level of 1st rib , 3 cm above the medial third of clavicle.

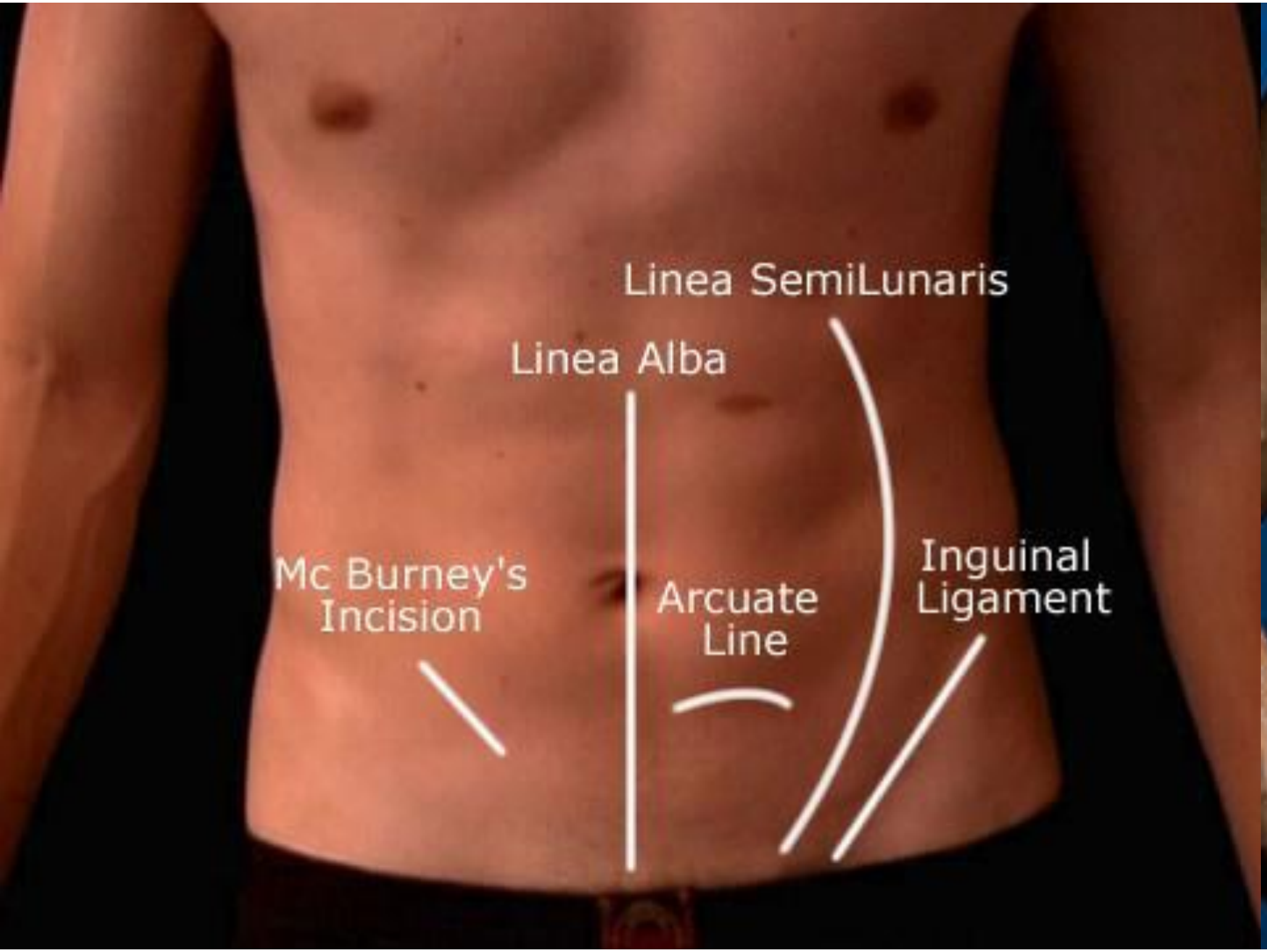
- The base of the lungs semi lunar and concave rest on the dome of the diaphragm the right sided is higher than the left.

Surface anatomy of the abdomen

- On the anterior surface of the abdomen, the **(umbilicus)** is the prominent depression or projection in the midline of the abdominal wall midway between the xiphoid process and the pubic symphysis.
- In the midline the **linea alba**, a tendinous structure that extends inferiorly from the xiphoid process to the pubic symphysis, this line divides the anterior abdominal wall into right and left halves.
- The **linea semilunaris** is a curved line or groove (convex laterally) that extends from the 9th costal cartilage to the pubic tubercle.

This indicates the lateral border of the left and right rectus abdominis muscle.

- The superior aspect of the ilium **(iliac crest)** terminates anteriorly at the anterior superior iliac spine.
- The **inguinal ligament** is attached to the anterior superior iliac spine, which forms the lower boundary of the abdominal wall.


Linea SemiLunaris
Linea Alba
Mc Burney's Incision
Arcuate Line
Inguinal Ligament

For clinical purpose:

The abdomen is divided into parts by:

1. Two vertical lines (extend on each side of the body from the cartilage of the eighth rib to the center of the inguinal ligament).

2. Two horizontal lines (The upper horizontal line passes along the level of the cartilages

of the ninth rib, the lower along the iliac crests (top of hip bone).

Abdominal Quadrant

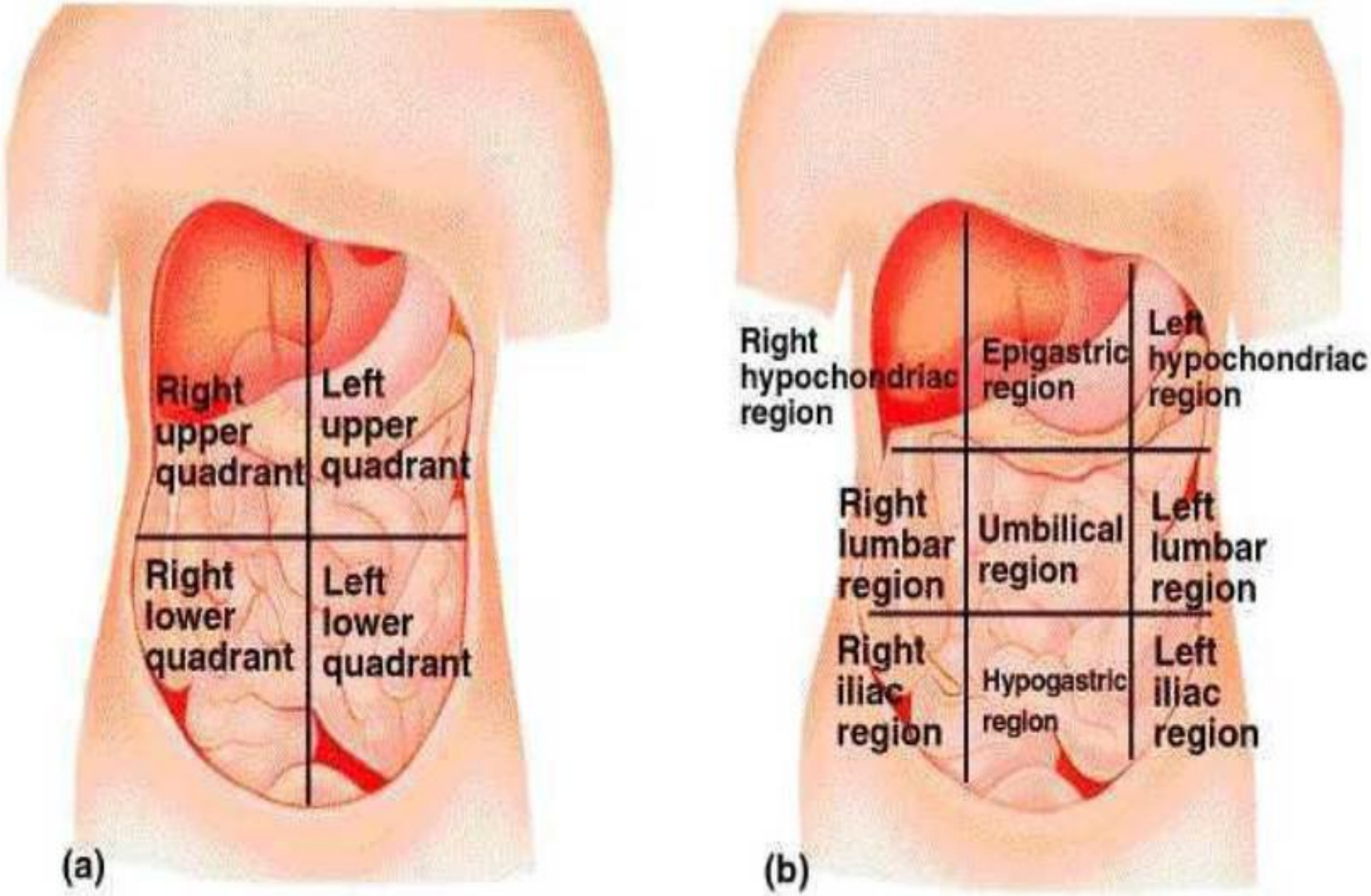
1. Right Upper Quadrant (RUQ).

2. Right Lower Quadrant (RLQ).

3. Left Upper Quadrant (LUQ).

4. Left Lower Quadrant (LLQ

Subdivisions of the Abdomen



Abdominopelvic Regions:

1. Umbilical.

2. Epigastric.

3. Hypo gastric.

4. Right iliac or inguinal.

5. left iliac or inguinal.

6. Right lumbar.

7. left lumbar.

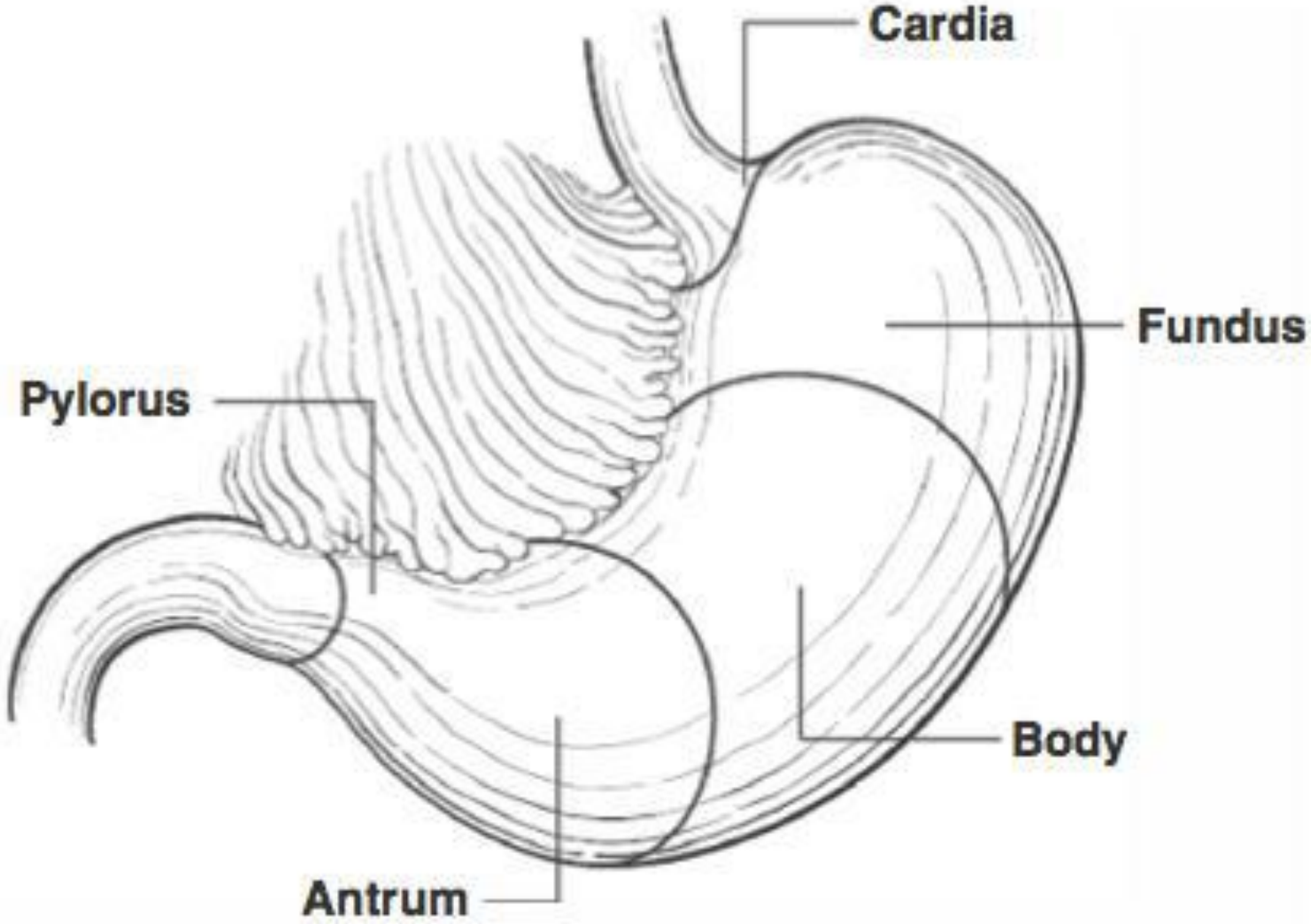
8. Right hypochondriac.

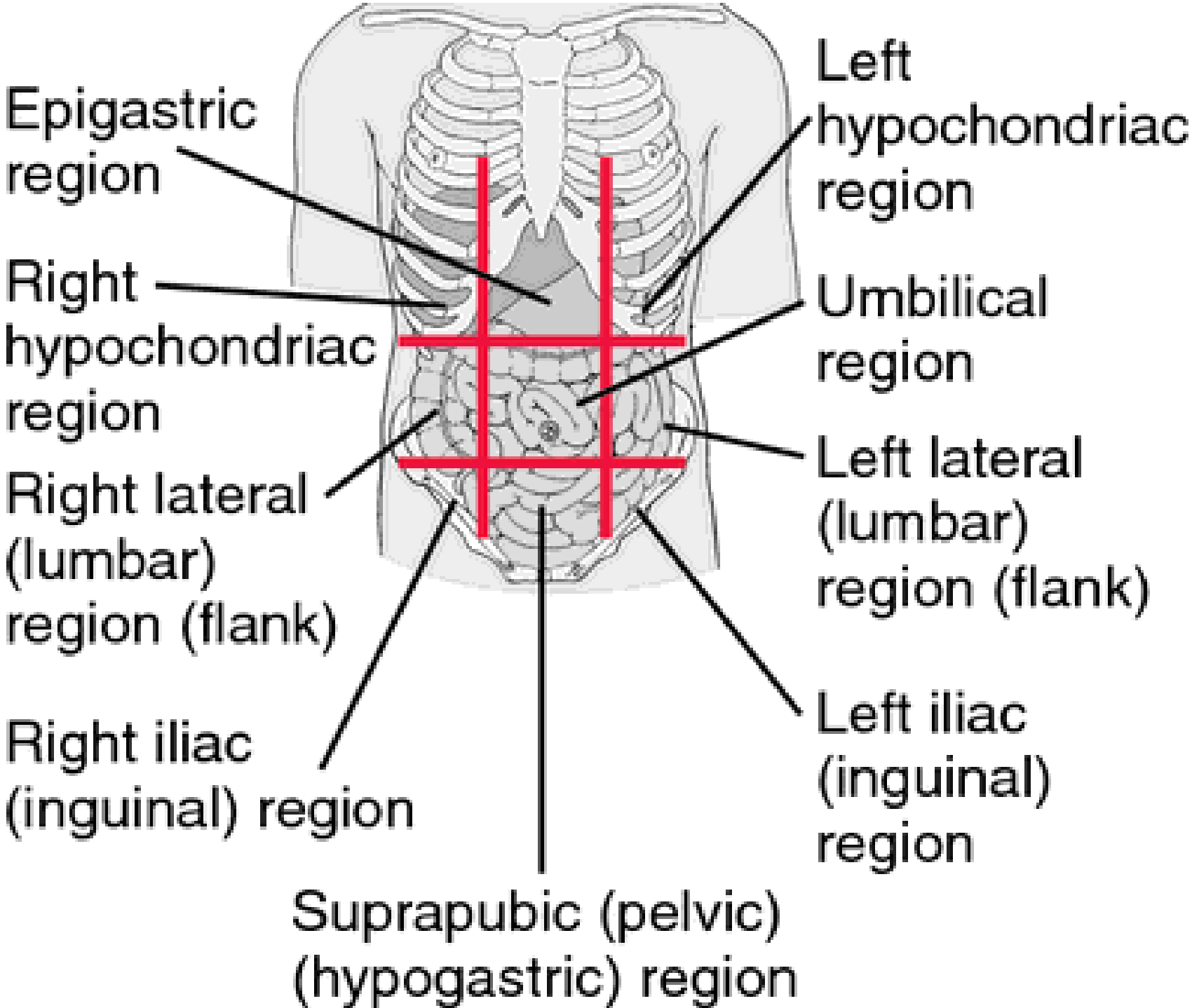
9. left hypochondriac

3rd lecture
Anatomy of stomach, liver, spleen, small and large intestine

Anatomy of the stomach :

- Important organ of the digestive system .
- Located at the epigastric region .
- Inferior to diaphragm.
- Anterior to the spleen and pancreas .
- Posterior to the left side of the liver.
- In the supine position, the stomach commonly lies in the right and left upper quadrants, or (epigastric, umbilical, and left hypochondriac and lumbar regions).


Cardia
Fundus
Pylorus
Body
Antrum


Epigastric region
Right hypochondriac region
Right lateral (lumbar) region (flank)
Right iliac (inguinal) region
Suprapubic (pelvic) (hypogastric) region
Left hypochondriac region
Umbilical region
Left lateral (lumbar) region (flank)
Left iliac (inguinal) region

Resemble J shape.

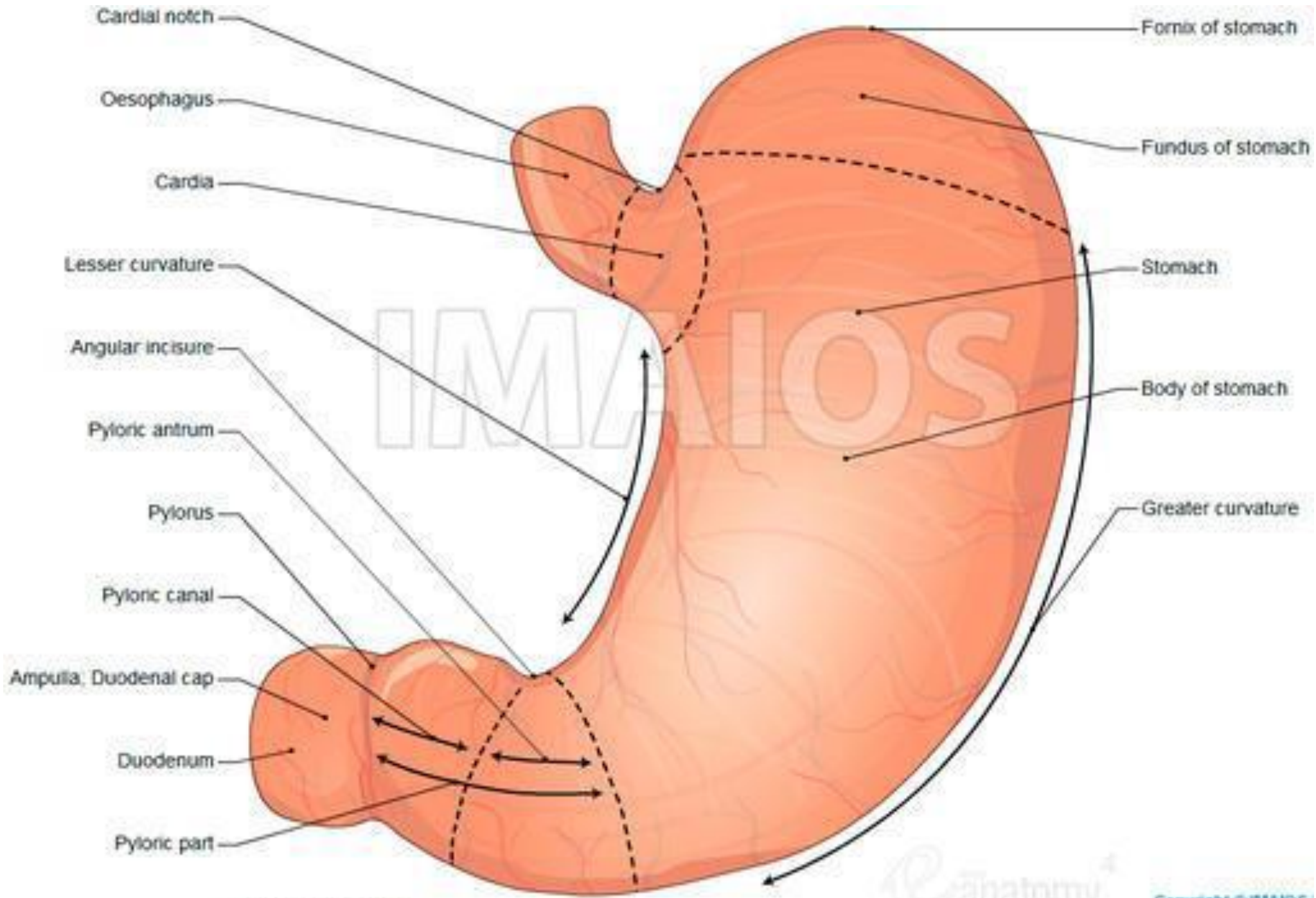
- It is formed from the following parts:
- **Cardiac orifice,** (the gastro-esophageal junction), the sphincter prevents the return of gastric content to the esophagus.
- In the left lateral line **fundus** elevated and punched part reaches as high as the fifth intercostal space or the sixth costal cartilage, a little below the apex of the heart.

Body

- **Pylorus** (pyloric orifice) is on the transpyloric line about 5 cm. below the seventh right sterno costal articulation, formed of 2 parts:
- Muscular sphincter
- Pyloric canal.

Greater curvature a curved line is drawn from the cardiac orifice to the summit of the fundus, then downward and to the left, finally turning medially to the pyloric orifice, it is 3 to 4 time greater than lesser curvature.

Lesser curvature A curved line, convex downward and to the left begin at the gastro esophageal junction reach the pylorus.


Cardial notch
Oesophagus
Cardia
Lesser curvature
Angular incisure
Pyloric antrum
Pylorus
Pyloric canal
Ampulla, Duodenal cap
Duodenum
Pyloric part
Fornix of stomach
Fundus of stomach
Stomach
Body of stomach
Greater curvature
IMAIOS
Anatomy
Illustrations : A. Micheau - MD
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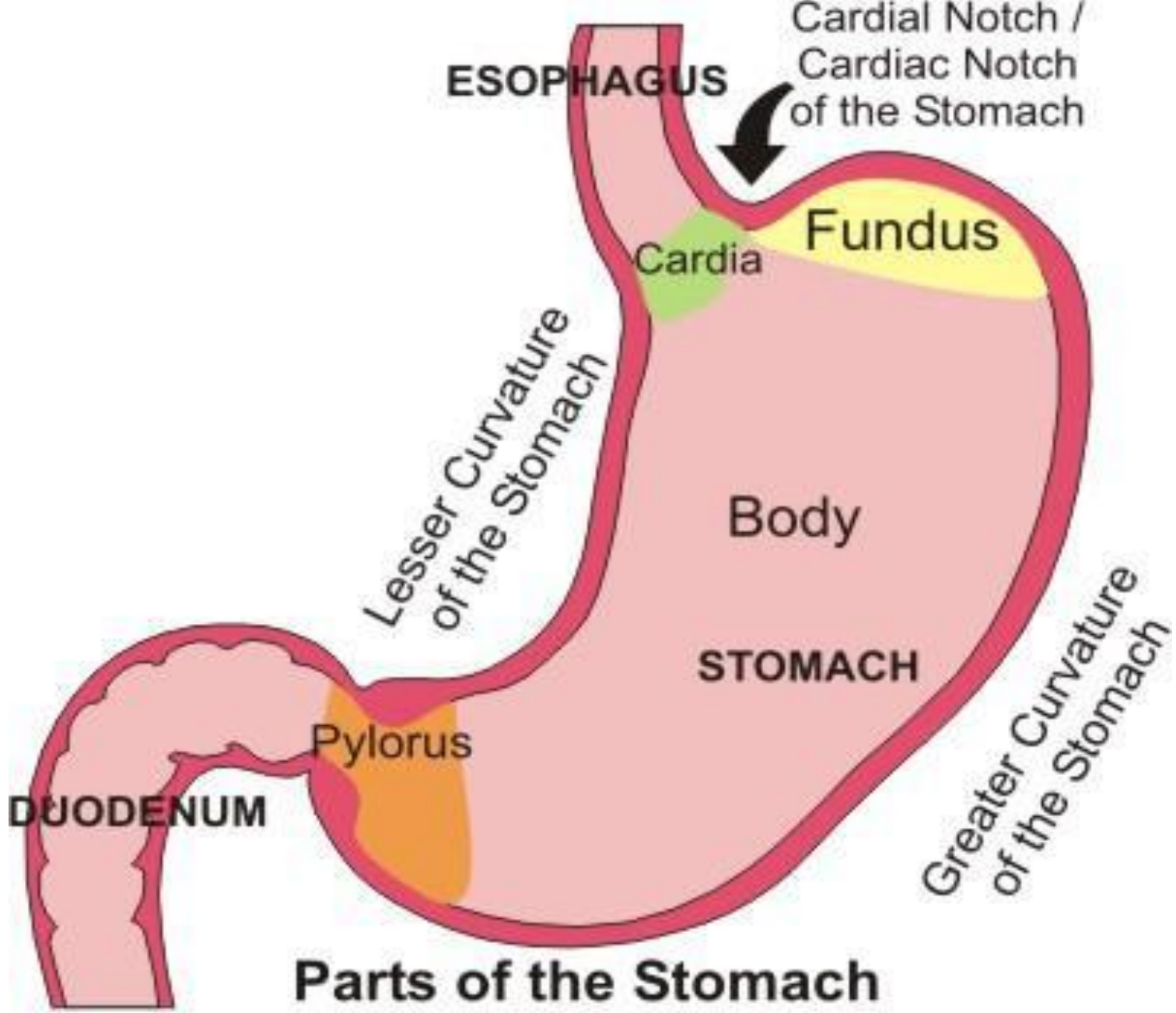


Parts of the Stomach

Health Hype

www.healthhype.com

Surface anatomy of liver

- The largest gland in the body.
- Occupying the whole right hypochondrium, the greater part of the epigastric region, and may extend into the left hypochondrium.

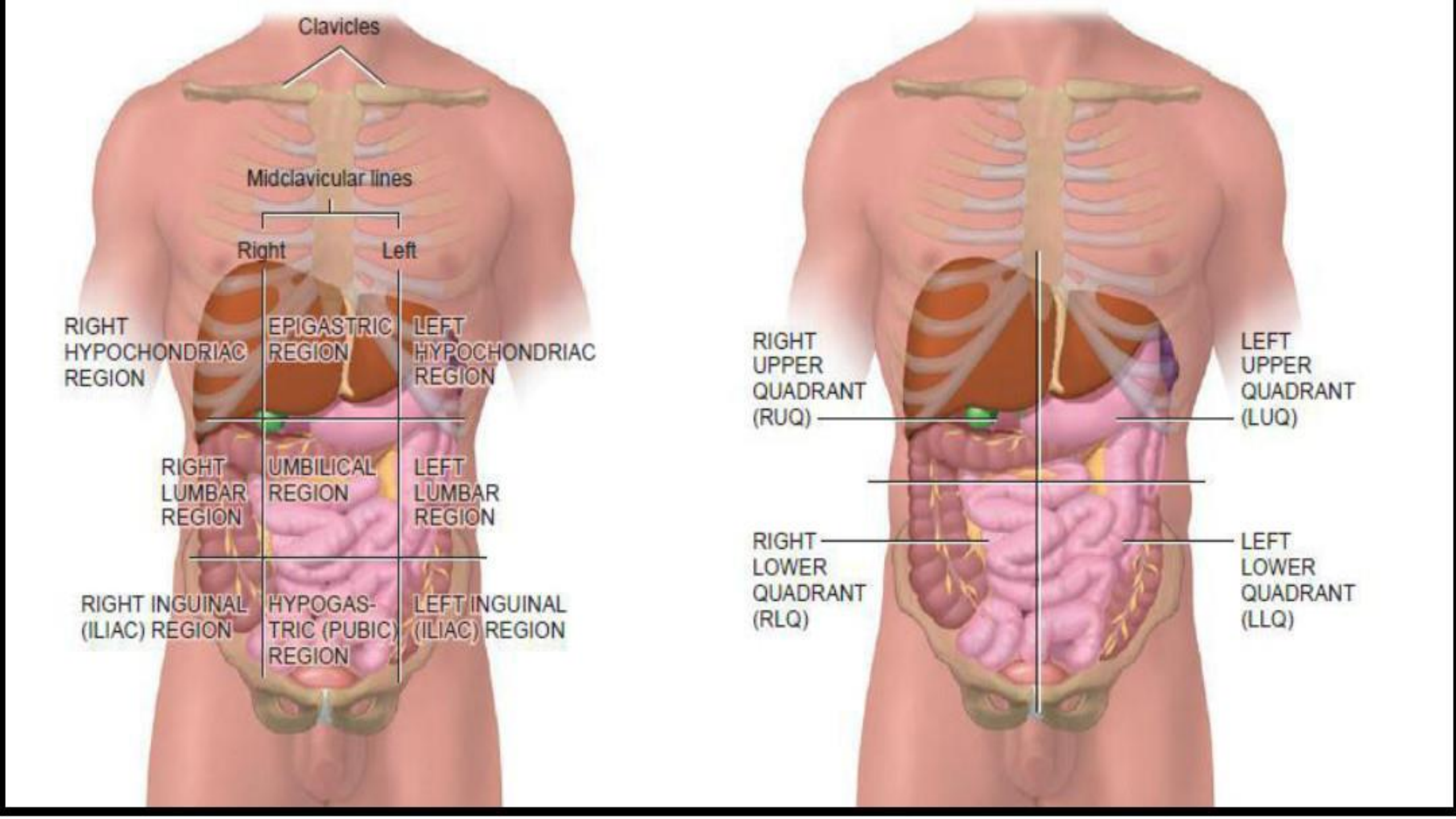
Lobes:

It consist from:

1. **Right lobe** : It occupies the right hypochondrium.
2. **Left lobe** :is smaller situated in the epigastric and left hypochondriac regions.
3. **Quadrate lobe** :is situated on the under surface of the right lobe.
4. **Caudate lobe** :is situated upon the posterior surface of the right lobe .

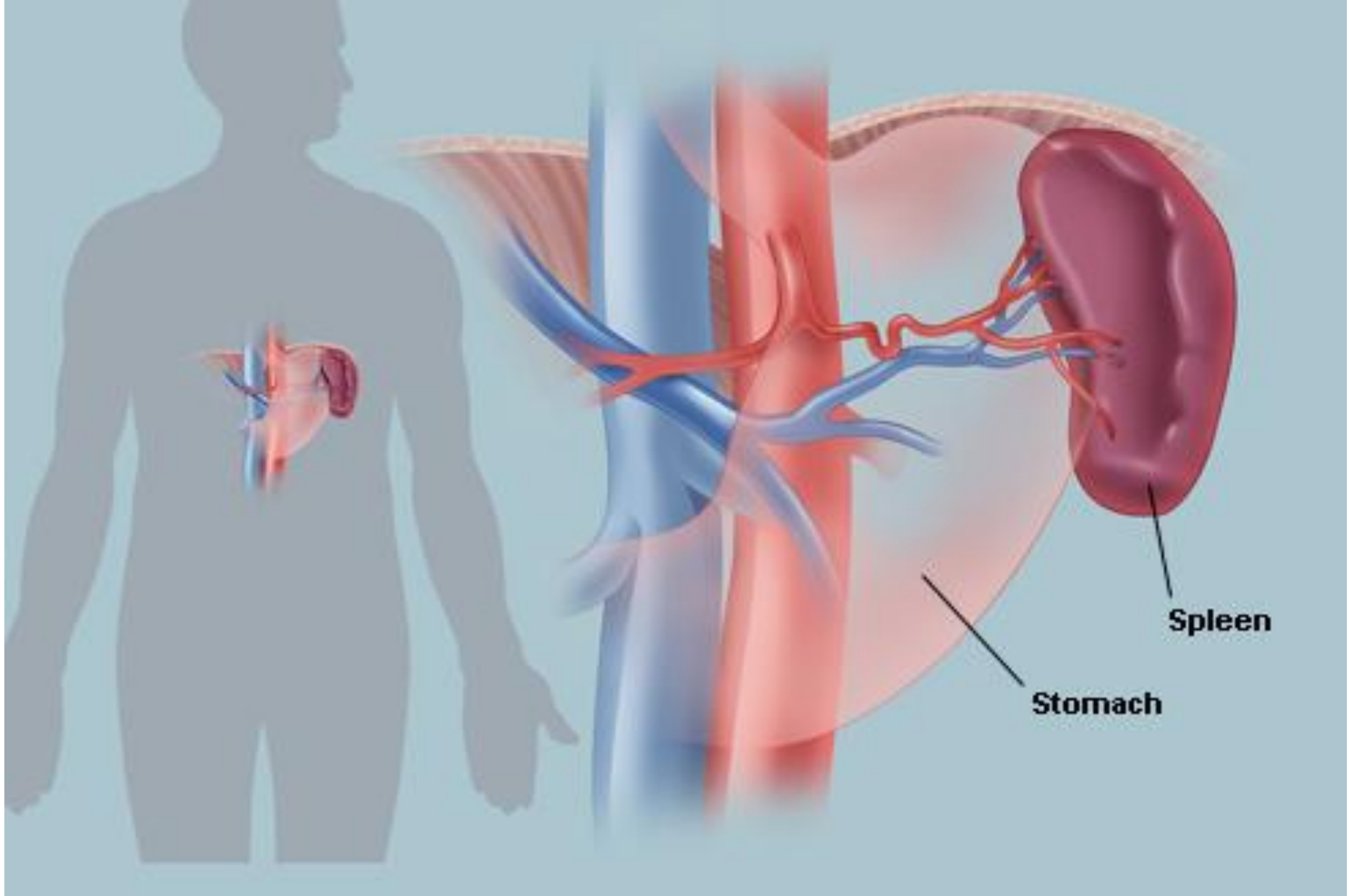
Relation:

- The **superior surface** consist of a part of both (R. and L.) lobes.
- It is convex, and fits under the diaphragm which in front separates it:
- On the right from the 6th to the 10th ribs and their cartilages.
- On the left from the 7th and 8th costal cartilages.
- Its middle part lies behind the xiphoid process.
- The liver lies predominantly in the thorax; although it is classified as an abdominal organ.
- The liver cannot be palpated in the abdomen; if it can this is a sign of enlargement.

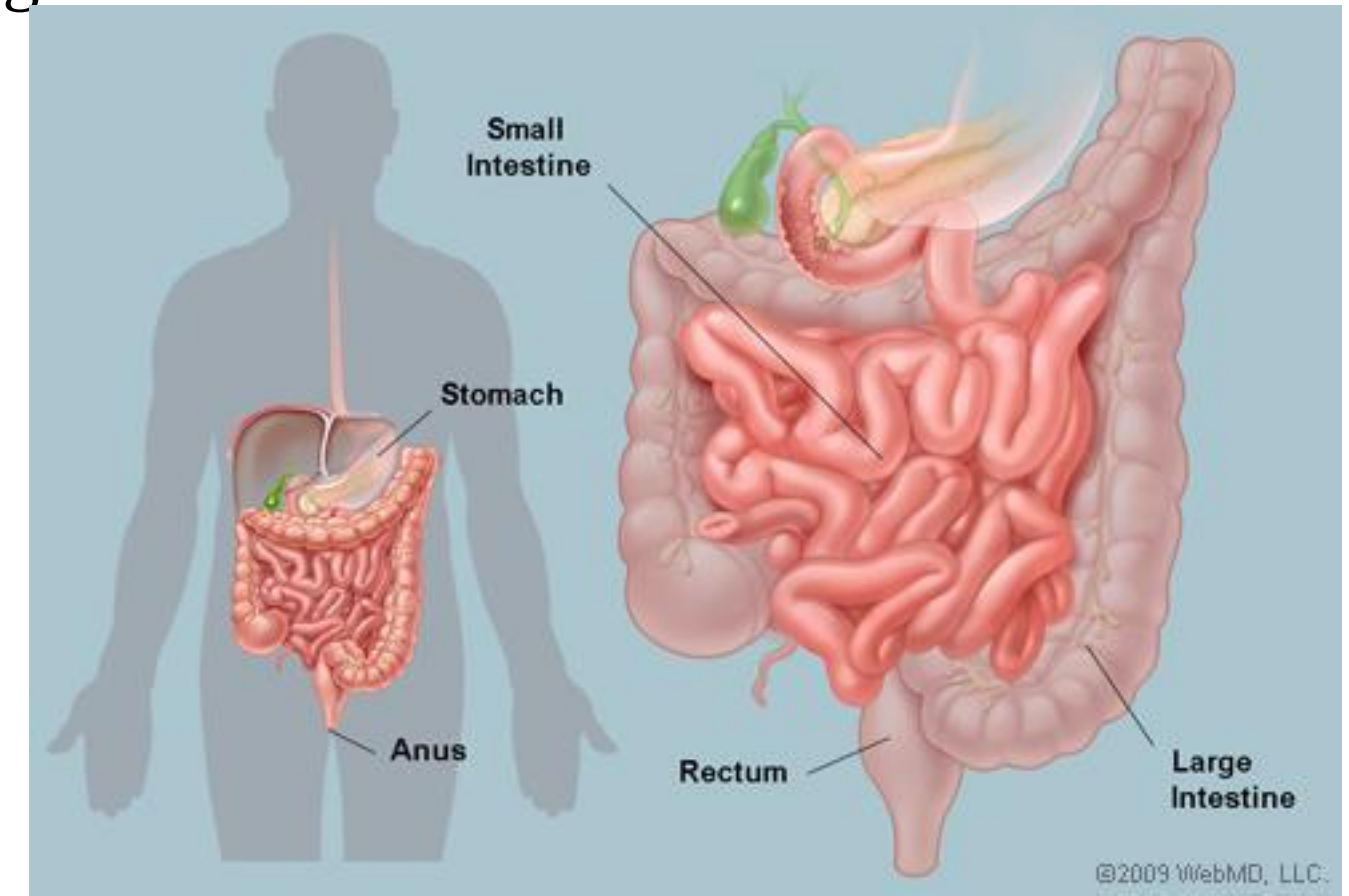

Clavicles
Midclavicular lines
Right
Left
RIGHT HYPOCHONDRIAC REGION
EPIGASTRIC REGION
LEFT HYPOCHONDRIAC REGION
RIGHT LUMBAR REGION
UMBILICAL REGION
LEFT LUMBAR REGION
RIGHT INGUINAL (ILIAC) REGION
HYPOGAS-TRIC (PUBIC) REGION
LEFT INGUINAL (ILIAC) REGION
RIGHT UPPER QUADRANT (RUQ)
LEFT UPPER QUADRANT (LUQ)
RIGHT LOWER QUADRANT (RLQ)
LEFT LOWER QUADRANT (LLQ)

Surface anatomy of spleen:

- The spleen is an wedge-shaped secondary lymphoid organ.
- lies in relation to the 9th and 11th ribs.
- located in the left hypochondrium and partly in the epigastrium.
- It is situated between the fundus of the stomach and the diaphragm .
- The spleen is highly vascular its size and weight are variable (size of fist).
- A normal spleen is not palpable.


Spleen
Stomach

The surface anatomy of the intestine: The intestines are a long, continuous tube running from the stomach to the anus. The intestines include: **1.** small intestine. **2.** large intestine. **3.** rectum.



The surface anatomy of the intestine:

The intestine is a long, continuous tube running from the stomach to the anus.

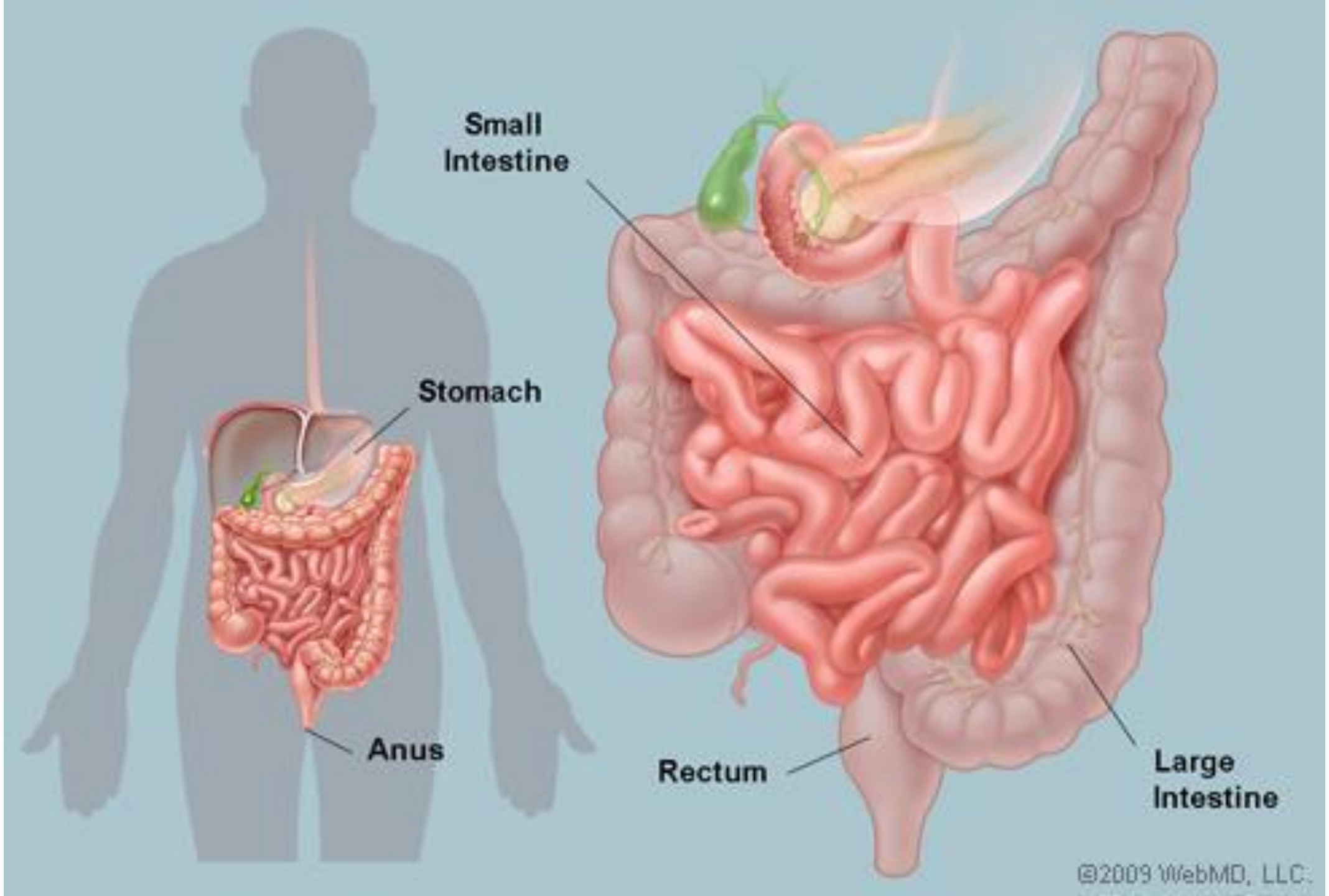
The intestine include:

1. small intestine.

2. large intestine.

3. rectum.

4.Anus and anal canal.


Small Intestine
Stomach
Anus
Rectum
Large Intestine
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The **small intestine** (small bowel):

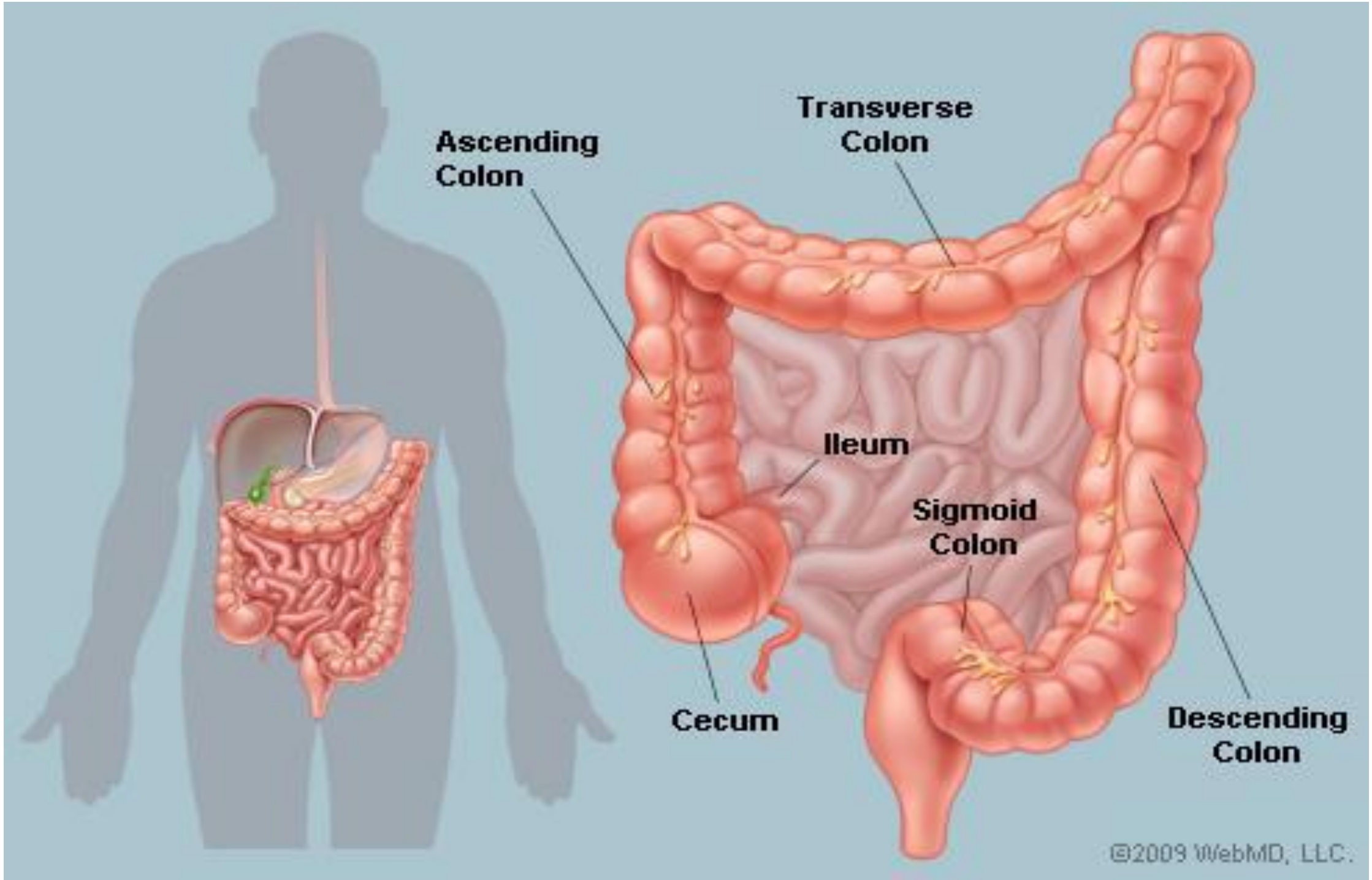
- It is about 20 feet long and about one inch in diameter.
- The coils of small intestine occupy the front of the abdomen.
- **It consists of three parts:**

1. duodenum (the C-shaped part), or horseshoe-shaped structure that lies in the upper abdomen near the midline.

2. jejunum (the coiled midsection), the coils of the jejunum are situated on the left side (in the left lumbar and iliac regions, and in the left half of the umbilical region).

3. ileum (the last section).

- The coils of the ileum lie toward the right (in the right lumbar and iliac regions, in the right half of the umbilical region, and in the hypogastric region).
- A portion of the ileum is within the pelvis.
- The end of the ileum is (the **ileocolic junction)**.


Ascending Colon
Transverse Colon
Ileum
Sigmoid Colon
Cecum
Descending Colon
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The large intestine:

- It is that part of the digestive tube between the terminal ileum and anus.
- It is about 5 feet long and about 3 inches in diameter.
- The large intestine forms inverted U over the coiled small intestine.
- Consist of three major segments:

1.Caecum 2.Colon 3.Rectum.

1. The caecum

It is a blind-ended pouch that carries a worm-like extension called the vermiform appendix.

It is connects to The ileum (last part of the small intestine)

2. The **colon:** It is constitutes the majority of the length of the large intestine.

It is divided into **4** parts:

A-ascending colon

B-transverse colon

C-descending colon

D-sigmoid colon

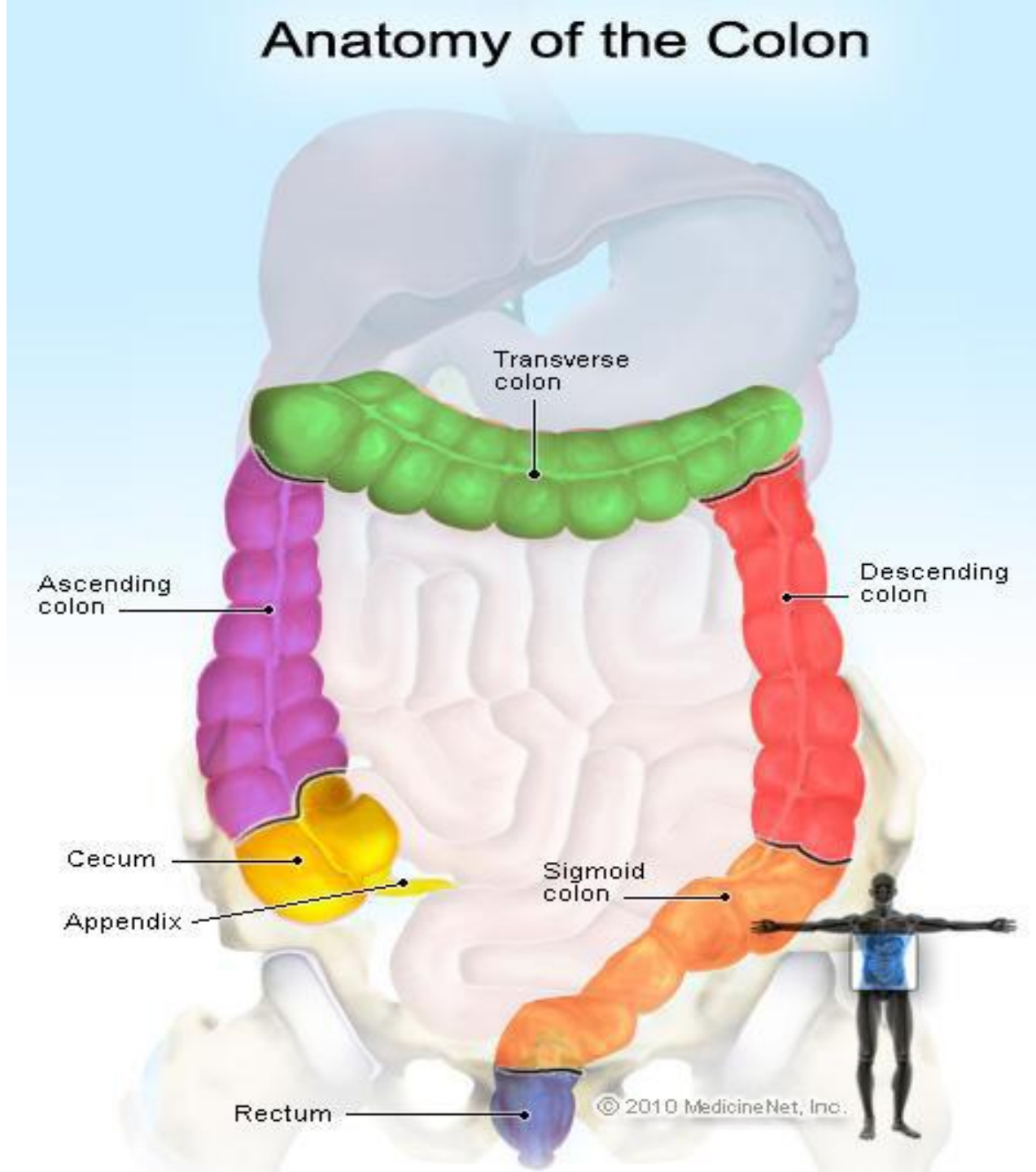
A. The **ascending colon** travels up the right side of the abdomen.

B. The **transverse colon** runs across the abdomen

C. The **descending colon** travels down the left abdomen.

D. The **sigmoid colon** is a short curving of the colon, ascends just above the pubis just before the rectum**.**

3. The rectum is the short, terminal segment of the digestive tube, continuous with the anal canal.


Anatomy of the Colon
Transverse colon
Ascending colon
Descending colon
Cecum
Appendix
Sigmoid colon
Rectum
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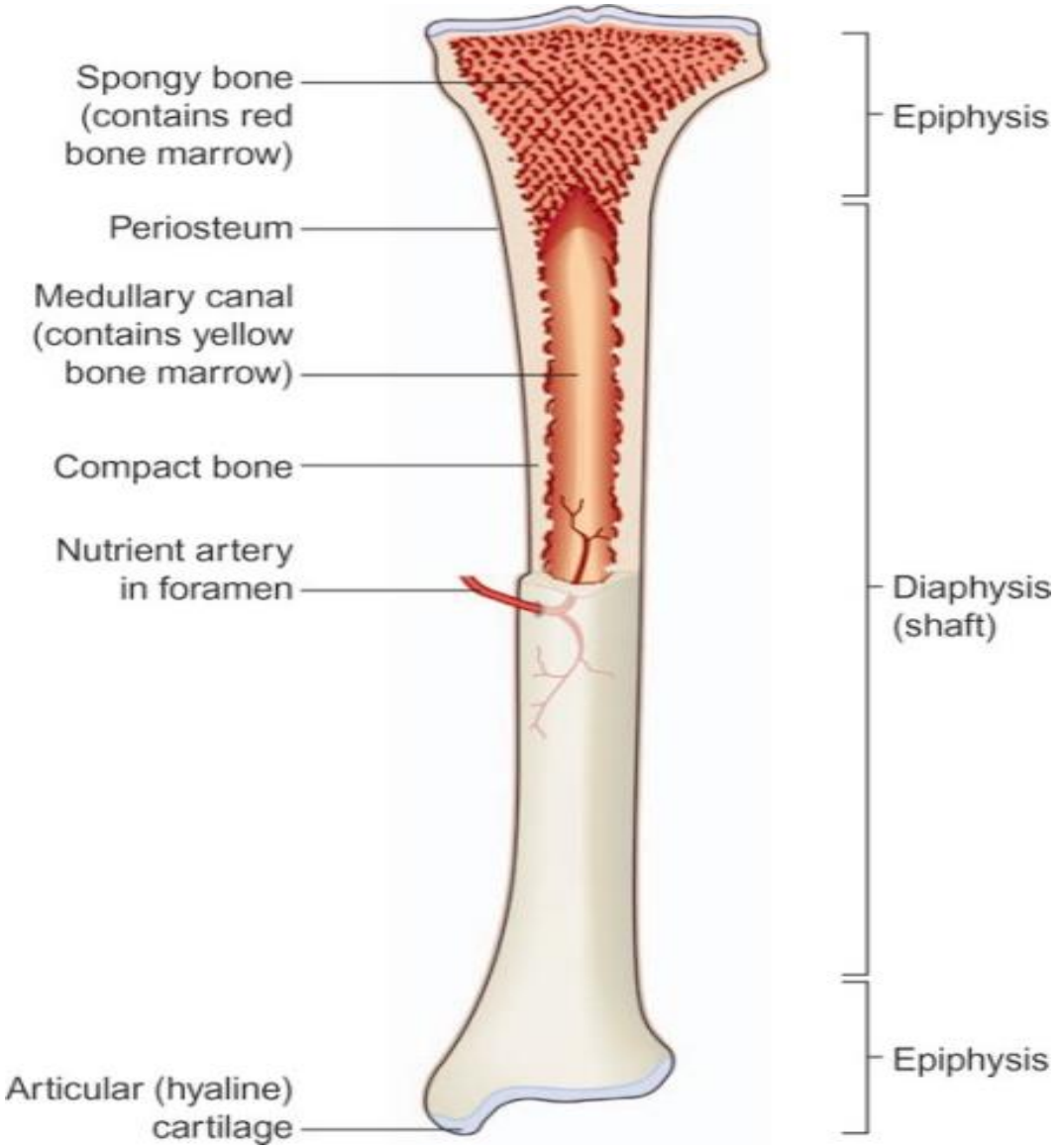
The musculoskeletal system anatomy

The musculoskeletal system consists of the bones of the skeleton, their joints and the skeletal (voluntary) muscles that move the body.

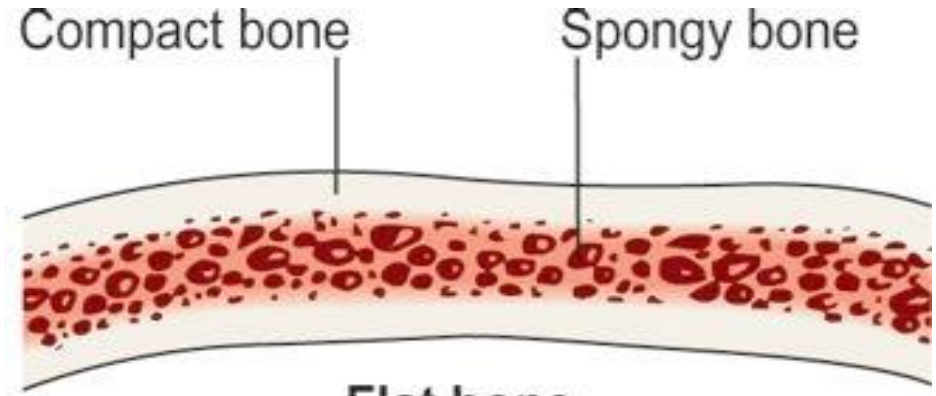
Types of bones

Bones are classified as **long, short, irregular, flat and sesamoid.**

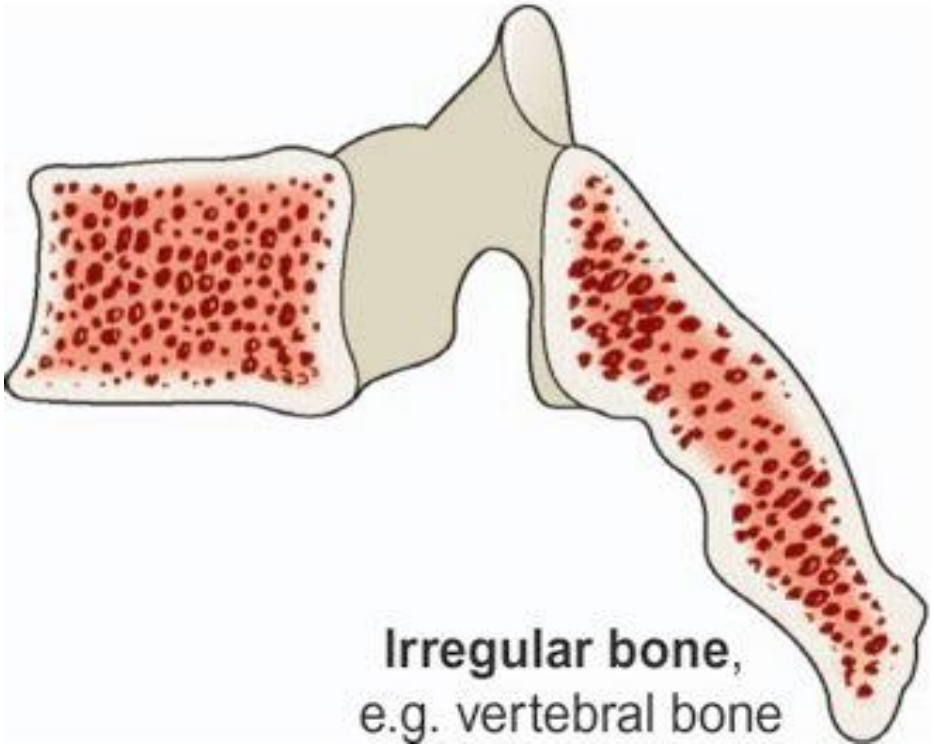
A mature long bone – partially section



Sections of flat and irregular bones

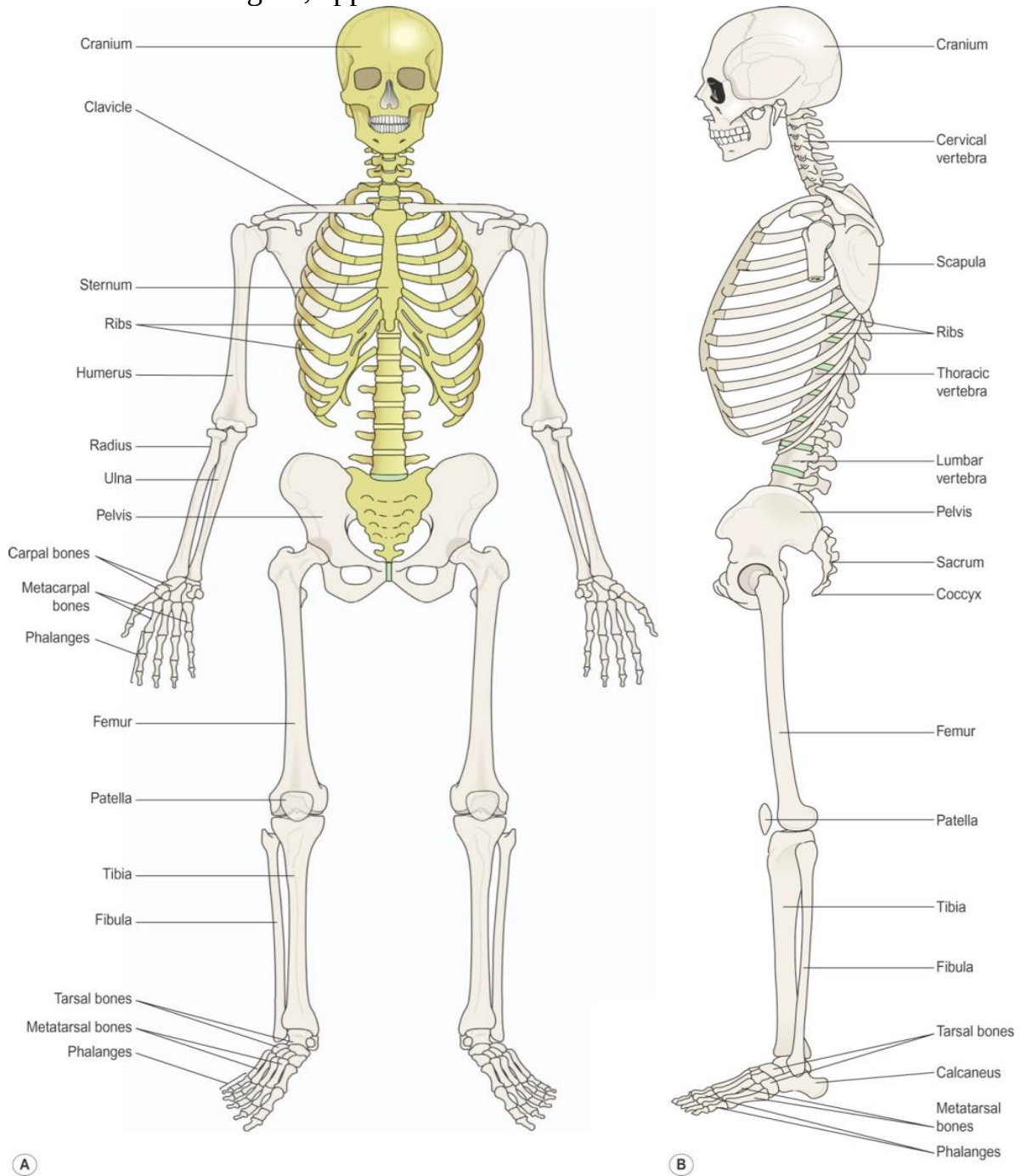


Flat bone,
e.g. skull



Irregular bone,
e.g. vertebral bone

The skeleton. Axial skeleton in gold, appendicular skeleton in brown. **A.** Anterior view. **B.** Lateral view



Skull

The skull rests on the upper end of the vertebral column and its bony structure is divided into two parts: the cranium and the face.

Cranium

The cranium is formed by a number of flat and irregular bones, these are:

(**1 frontal bone , 2 parietal bones, 2 temporal bones, 1 occipital bone, 1 sphenoid bone and 1 ethmoid bone**).

Frontal bone

This is the bone of the forehead. It forms part of the orbital cavities (eye sockets) and the prominent ridges above the eyes, the supraorbital margins.

Parietal bones

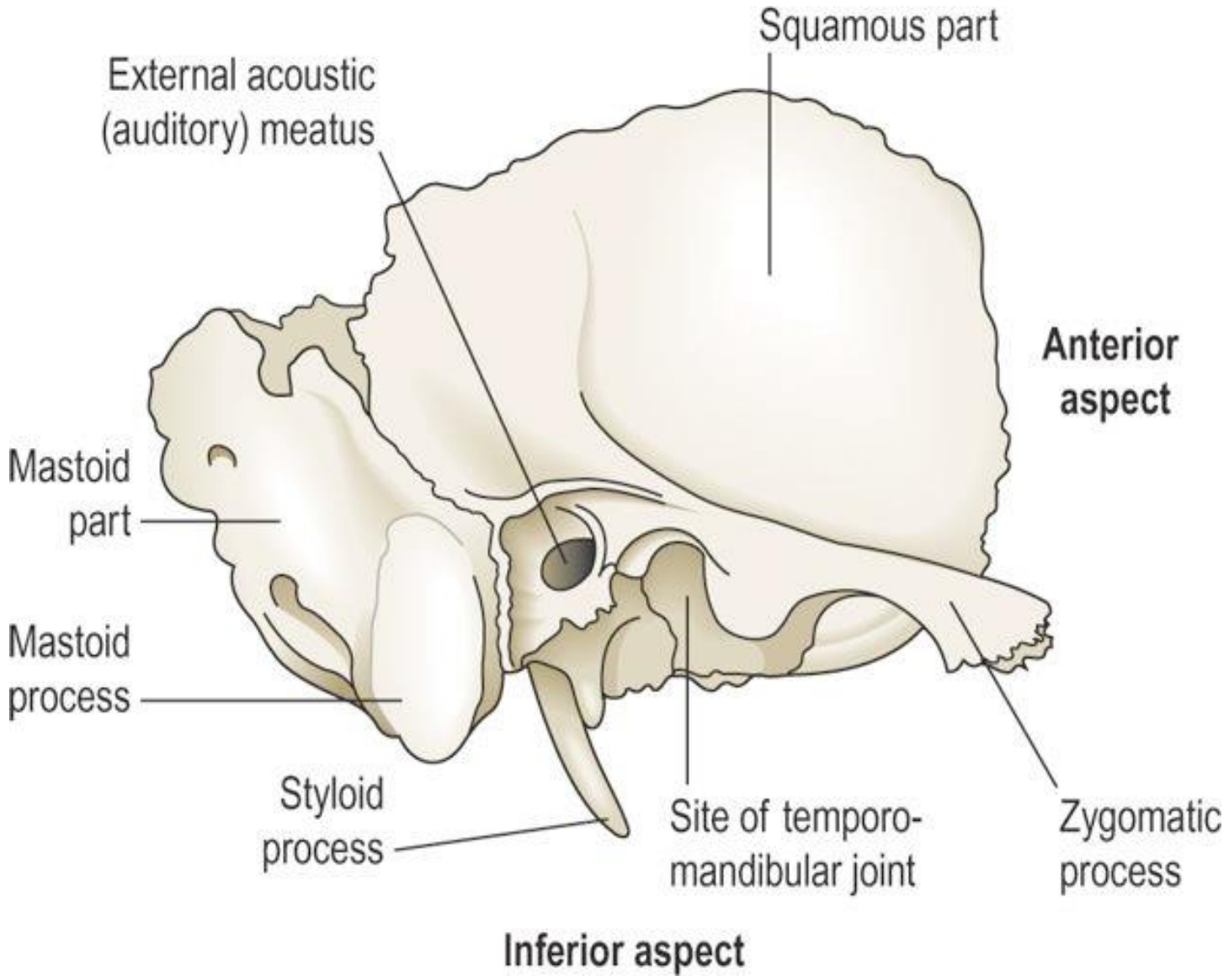
These bones form the sides and roof of the skull.

The inner surface is concave and is grooved to accommodate the brain and blood vessels.

Temporal bones

These bones lie one on each side of the head and form fibrous immovable joints with the parietal, occipita, sphenoid and zygomatic bones.

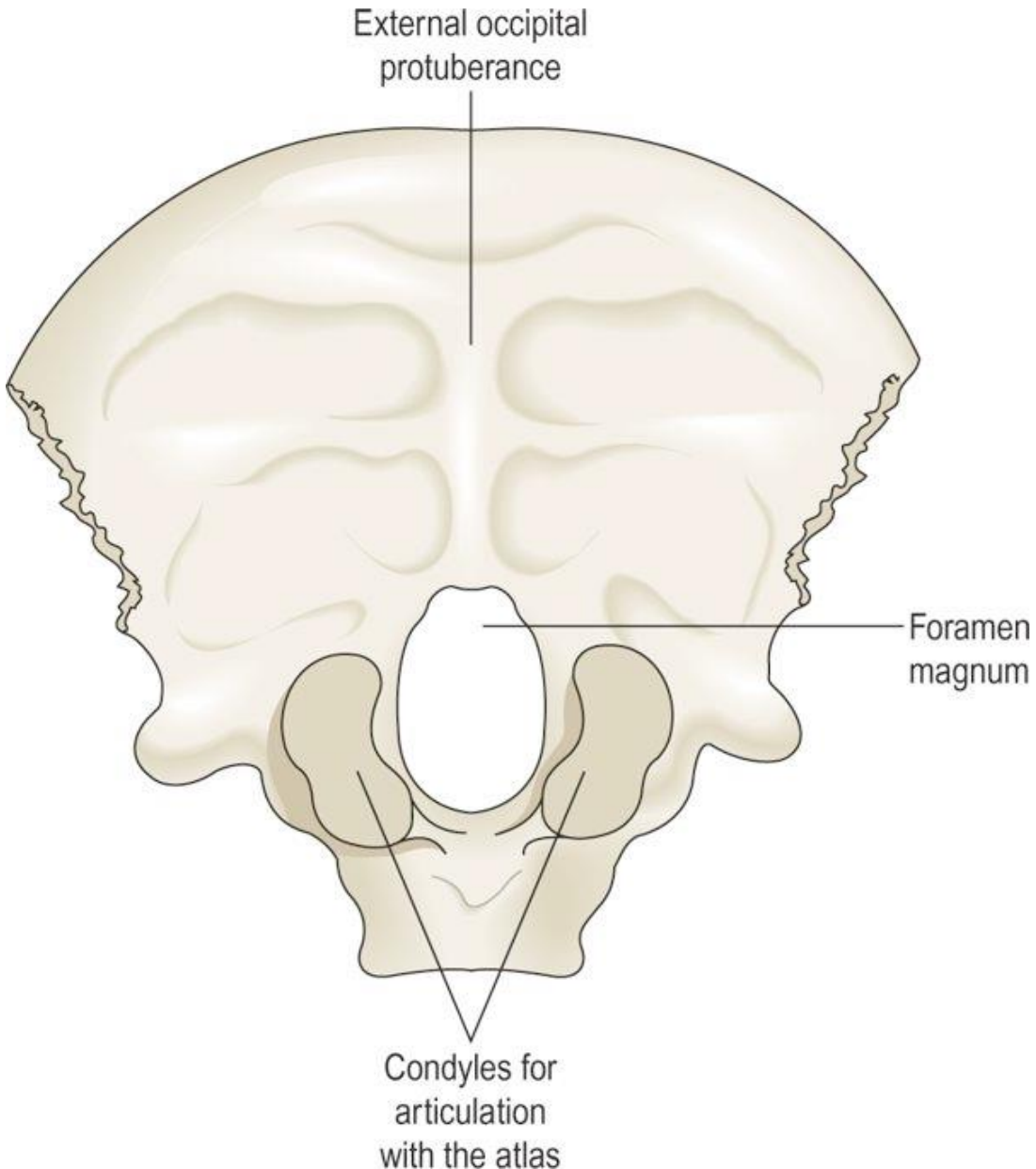
The right temporal bone lateral view



Occipital bone

This bone forms the back of the head and part of the base of the skull. It has immovable fibrous joints with the parietal, temporal and sphenoid bones.

The occipital bone – viewed from below

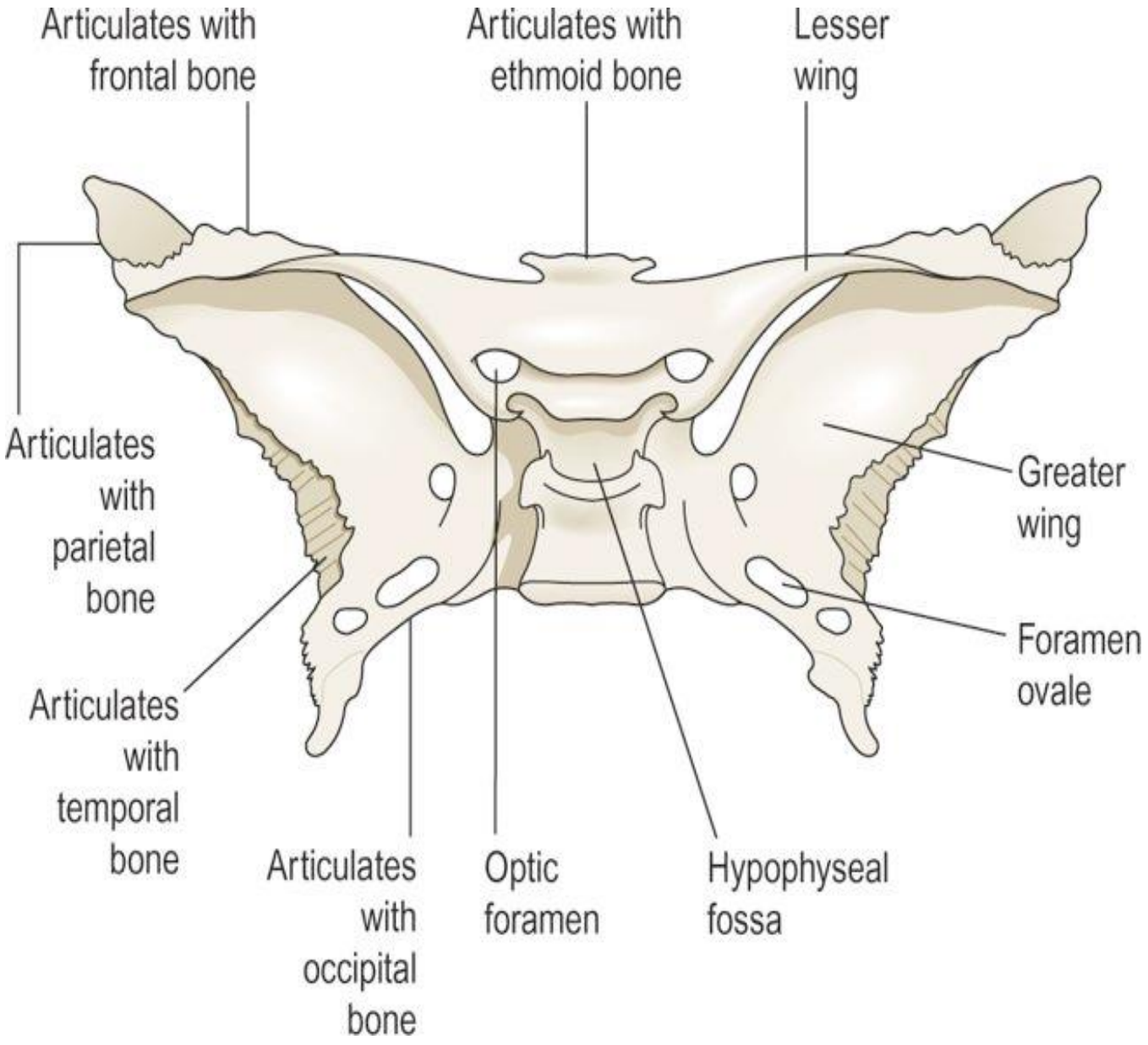


Sphenoid bone

This bone occupies the middle portion of the base of the skull.

It links the cranial and facial bones and cross-braces the skull.

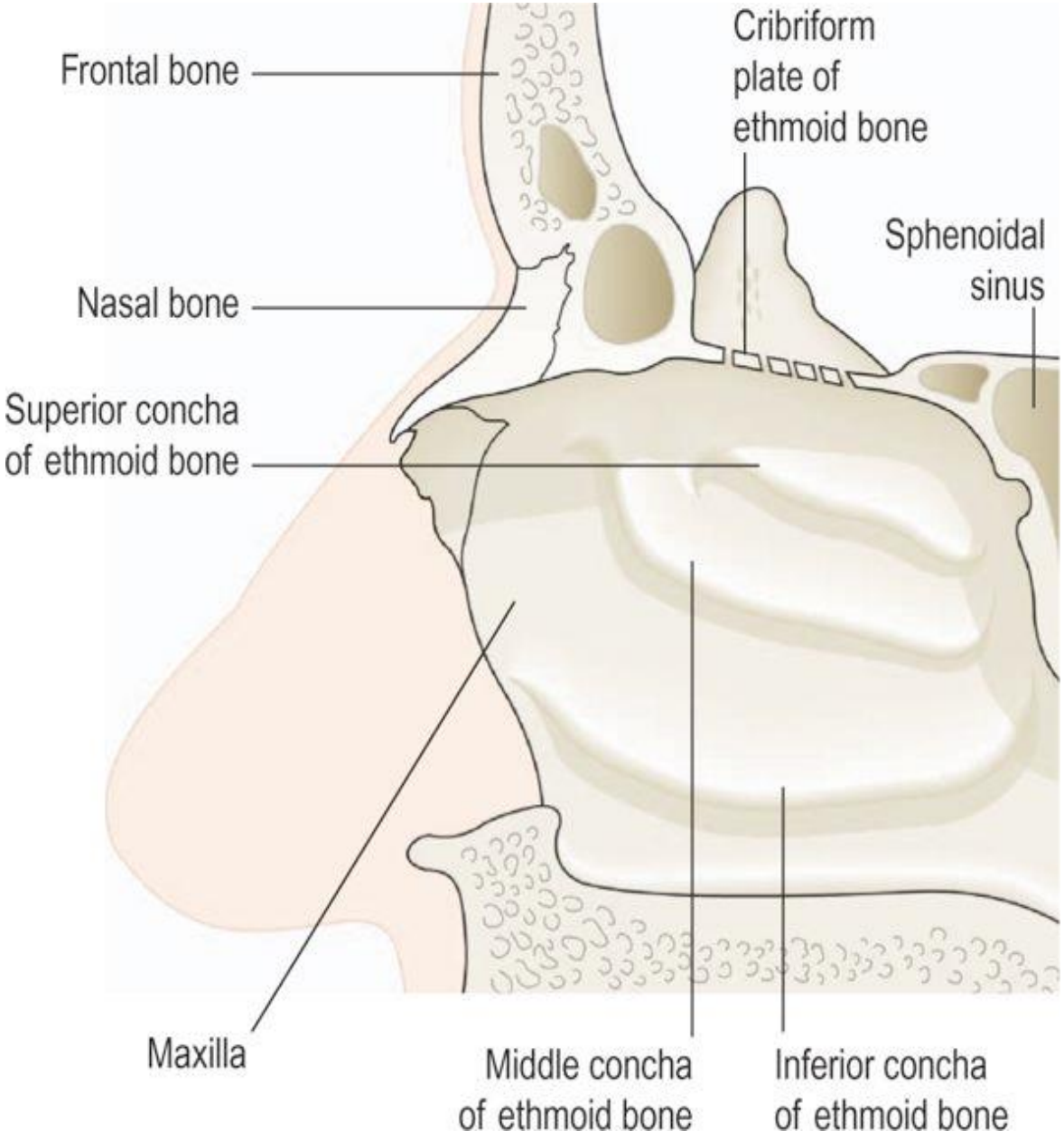
The sphenoid bone – viewed from above



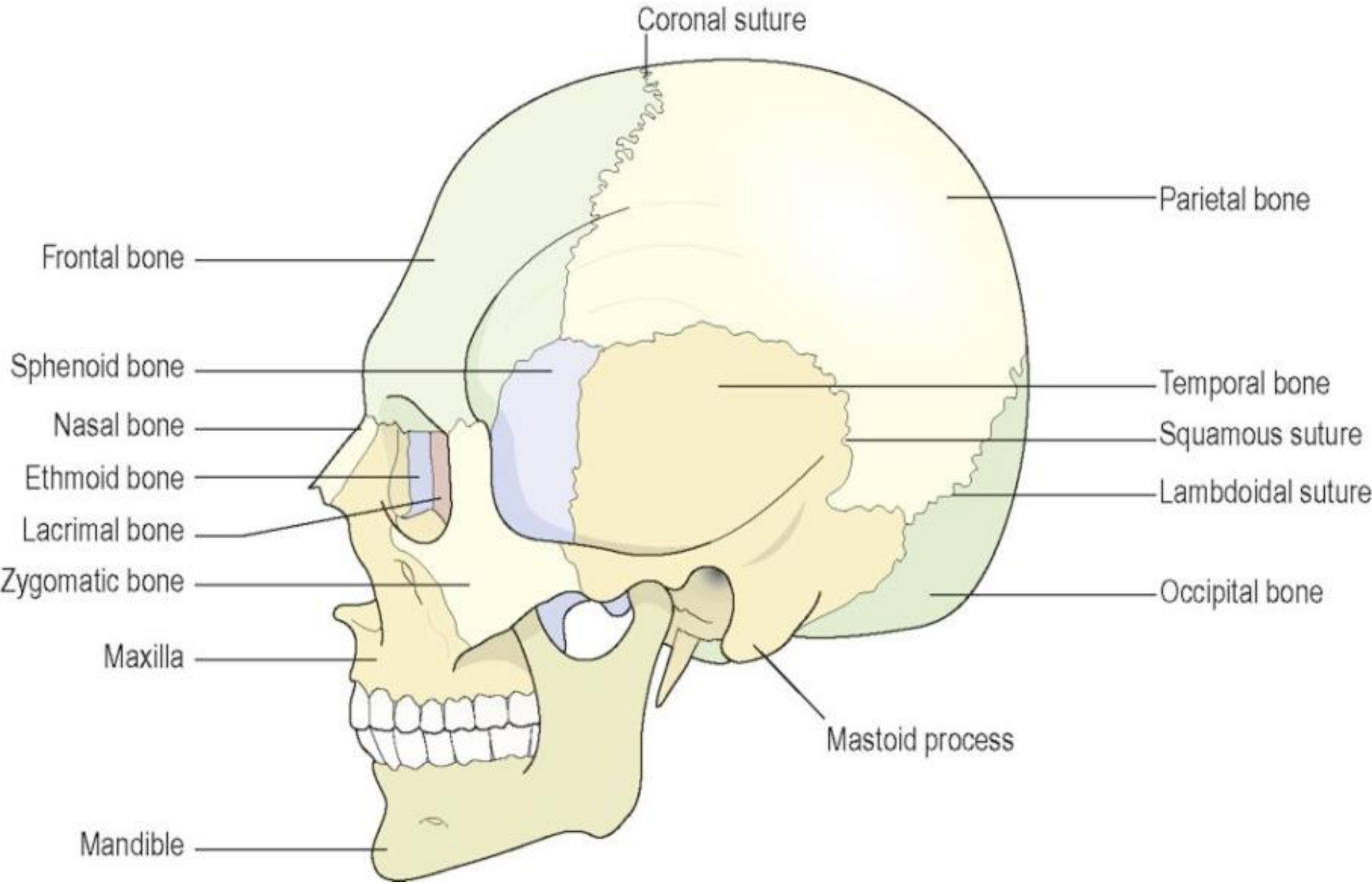
Ethmoid bone

The ethmoid bone occupies the anterior part of the base of the skull and helps to form the orbital cavity, the nasal septum and the lateral walls of the nasal cavity.

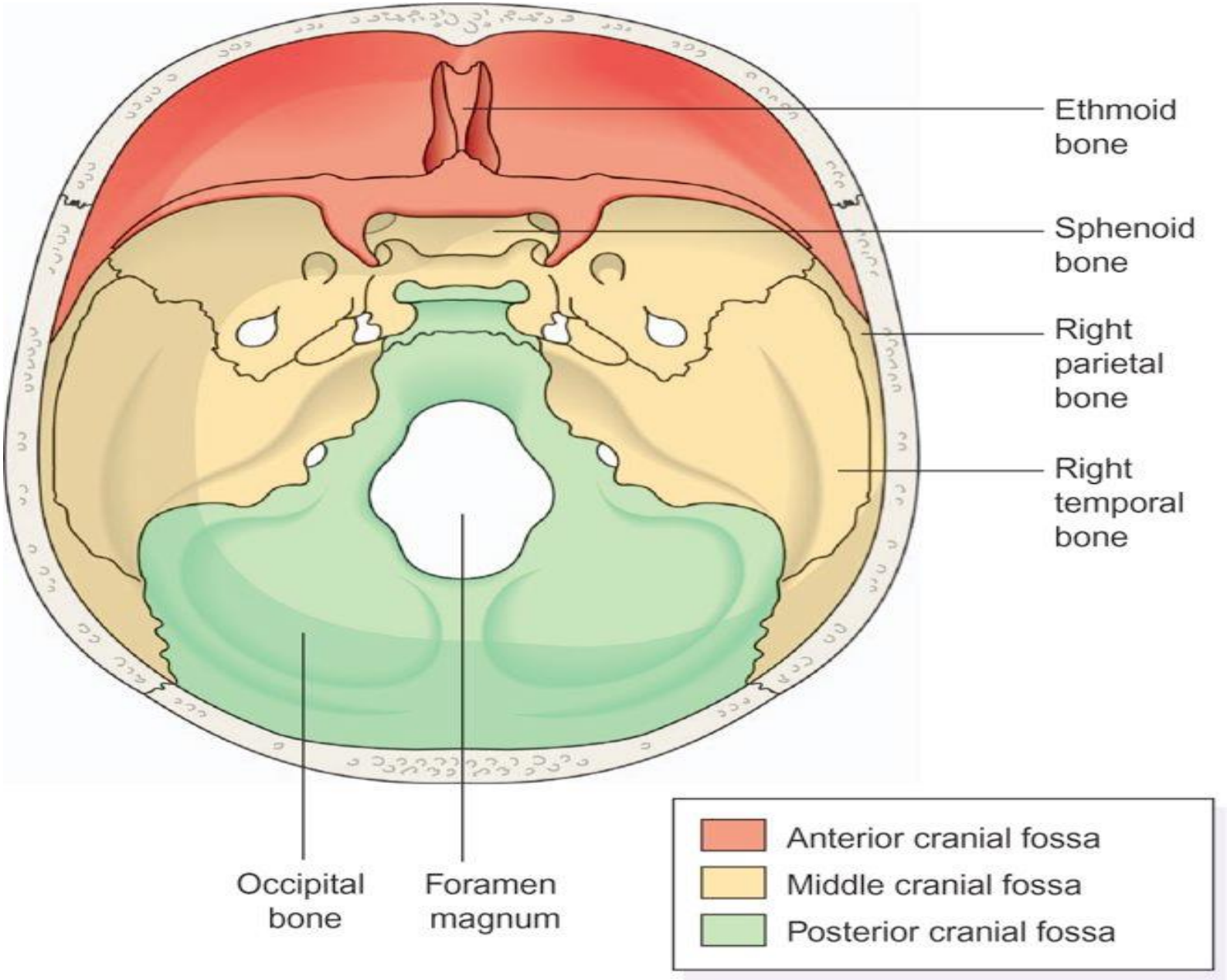
The right ethmoid bone and its related structures



The bones of the skull and their sutures (joints)



The bones forming the base of the skull and the cranial fossae – viewed from above

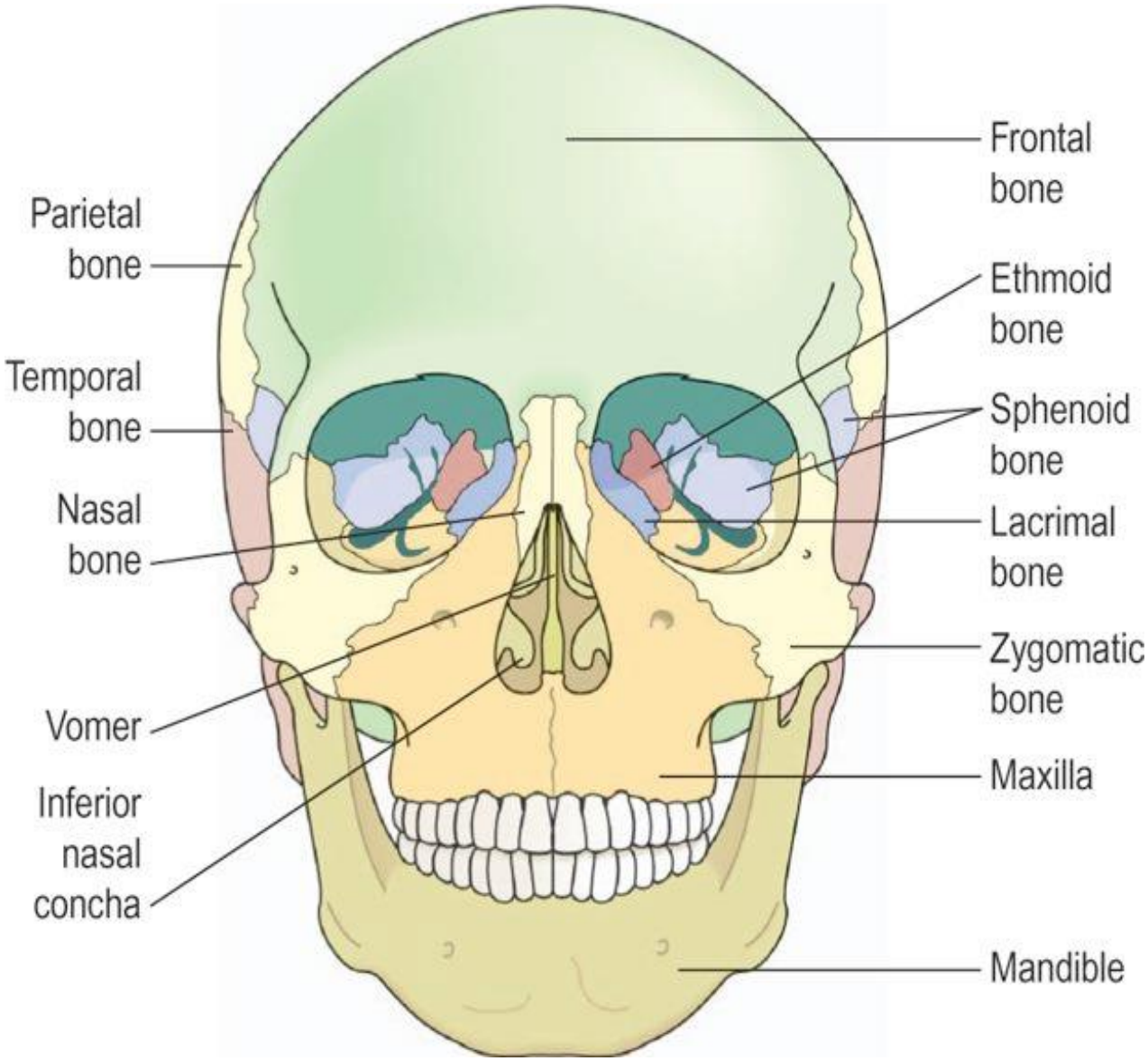


Face

The skeleton of the face is formed by 13 bones:

- 2 zygomatic (cheek) bones
- 1 maxilla
- 2 nasal bones
- 2 lacrimal bones
- 1 vomer
- 2 palatine bones
- 2 inferior conchae
- 1 mandible.

The bones of the face. Anterior view



Zygomatic (cheek) bones

The zygomatic bone originates as two bones that fuse before birth. They form the prominences of the cheeks and part of the floor and lateral walls of the orbital cavities.

Maxilla (upper jaw bone)

This originates as two bones, but fusion takes place before birth. The maxilla forms the upper jaw, the anterior part of the roof of the mouth, the lateral walls of the nasal cavity and part of the floor of the orbital cavities.

Nasal bones

These are two small flat bones that form the greater part of the lateral and superior surfaces of the bridge of the nose.

Lacrimal bones

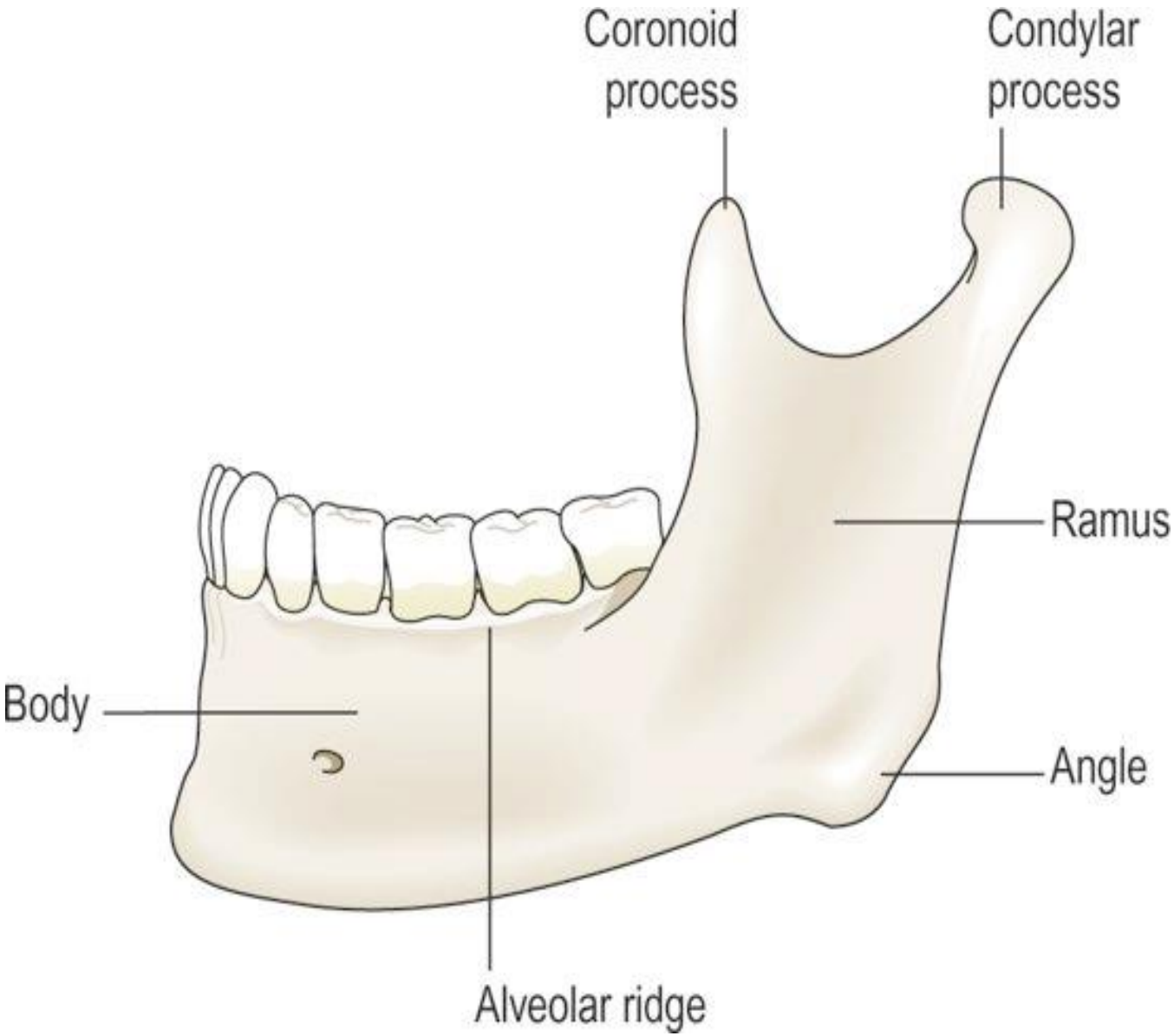
These two small bones are posterior and lateral to the nasal bones and form part of the medial walls of the orbital cavities.

Mandible (lower jaw bone)

This is the lower jaw, the only movable bone of the skull. It originates as two parts that unite at the midline.

Each half consists of two main parts: a curved body with the alveolar ridge containing the lower teeth and a ramus, which projects upwards almost at right angles to the posterior end of the body.

The left mandible. Lateral view



Sinuses

Sinuses are cavities containing air and are present in the sphenoid, ethmoid, maxillary and frontal bones.

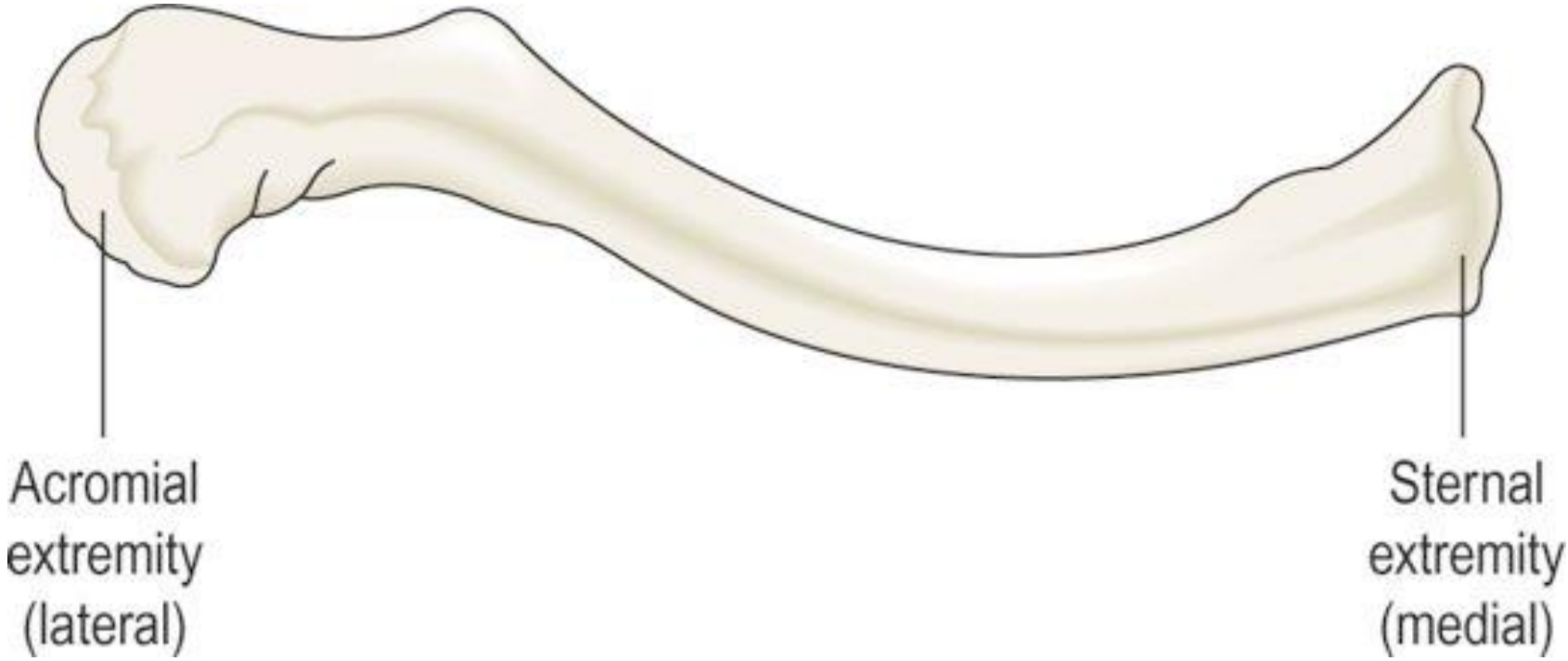
Shoulder girdle

The shoulder girdle consists of two scapulae and two clavicles.

Clavicle (collar bone)

The clavicle is an S-shaped long bone. The clavicle provides the only bony link between the upper limb and the axial skeleton.

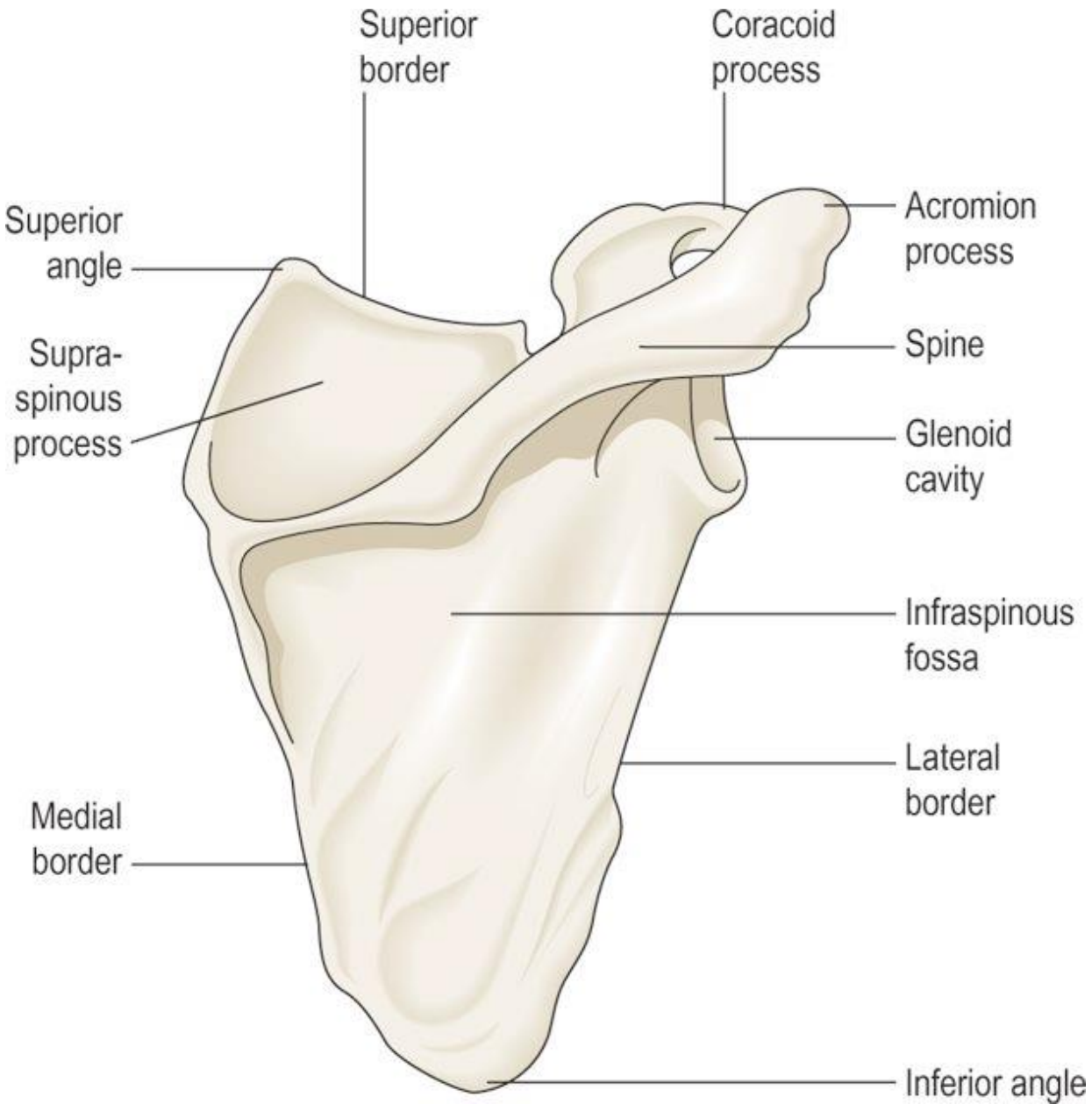
Clavicle (collar bone)



Scapula (shoulder blade)

The scapula is a flat triangular-shaped bone, lying on the posterior chest wall superficial to the ribs and separated from them by muscles.

The right scapula. Posterior view



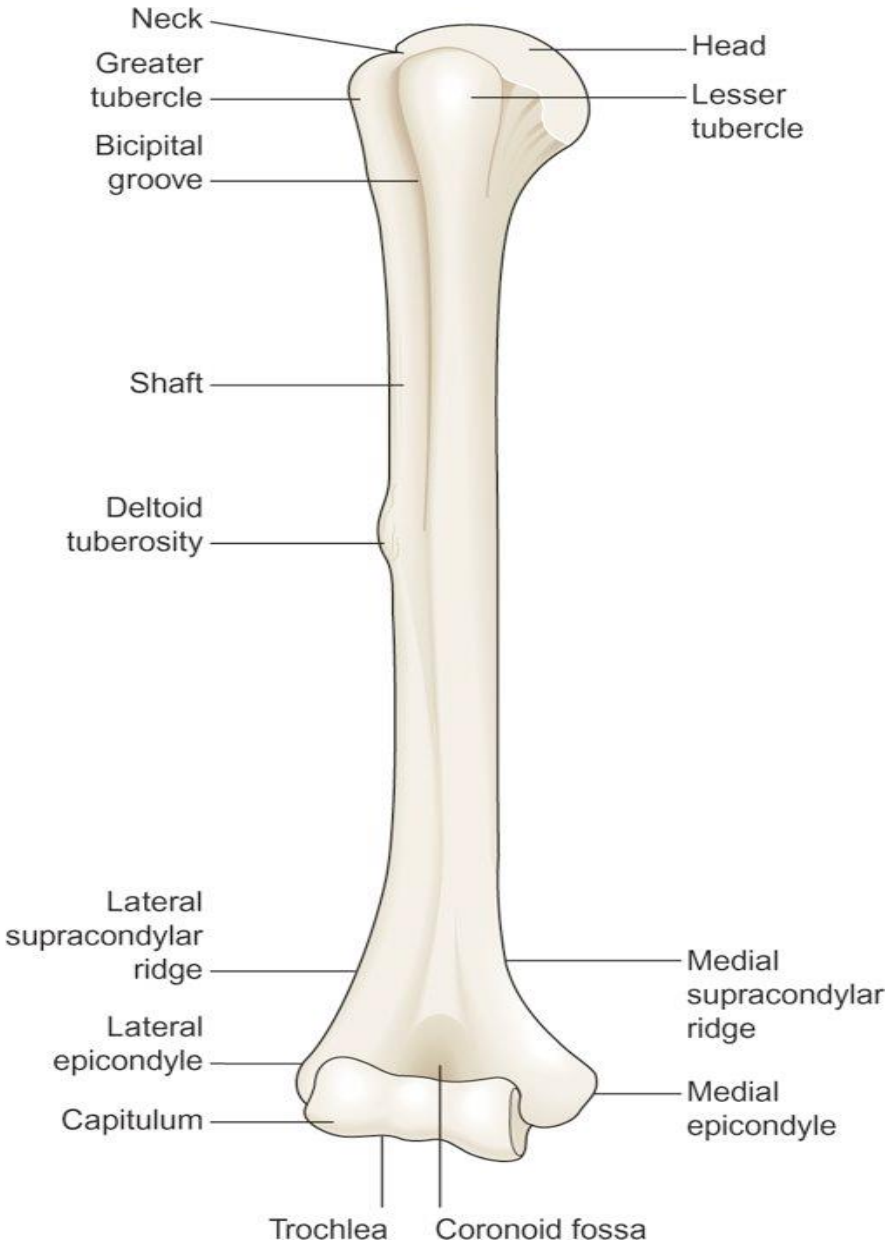
The upper limb

Humerus

This is the bone of the upper arm. The head sits within the glenoid cavity of the scapula, forming the shoulder joint.

The distal end of the bone presents two surfaces that articulate with the radius and ulna to form the elbow joint.

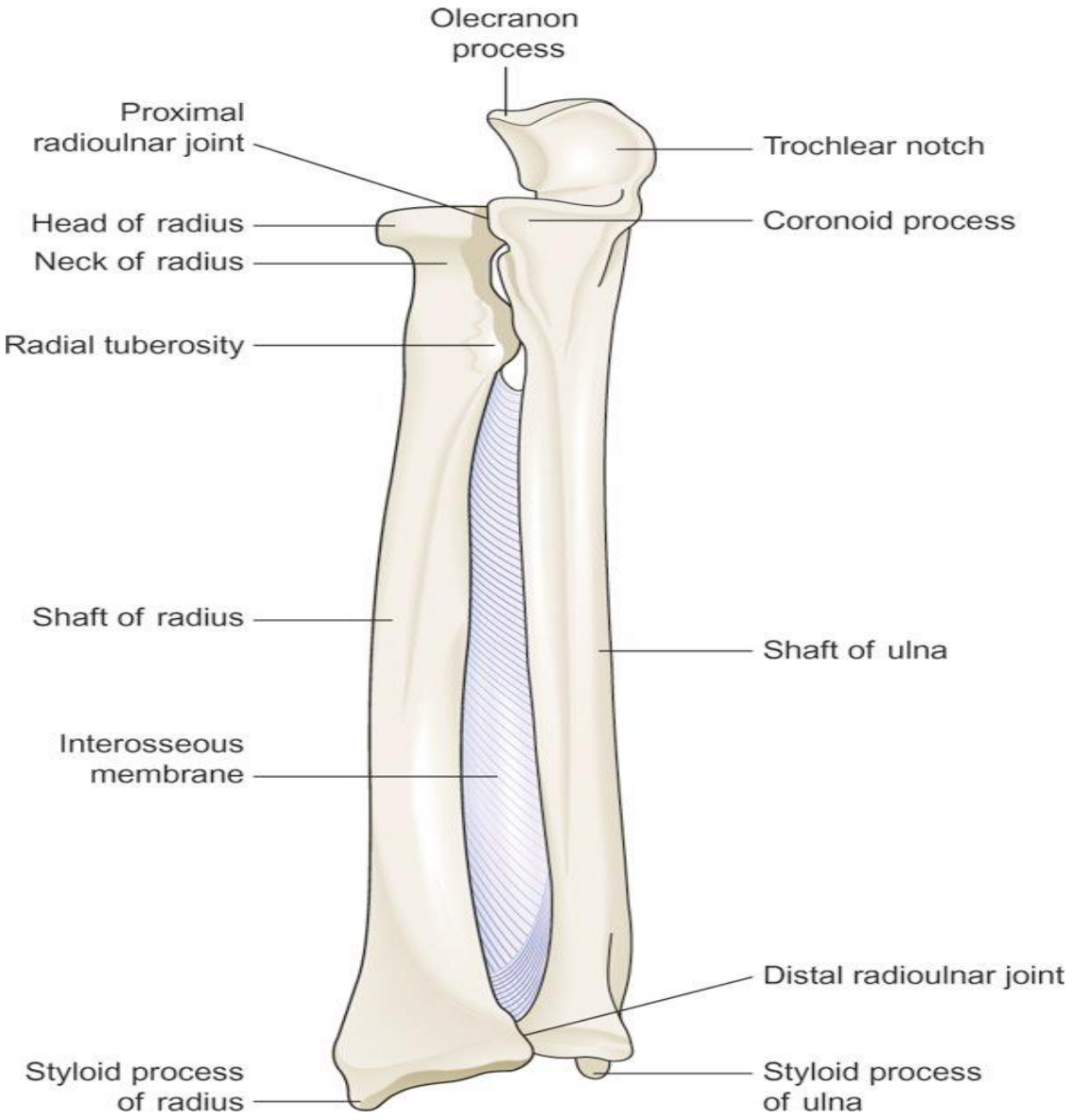
The right humerus. Anterior view



Ulna and radius

These are the two bones of the forearm. They articulate with the humerus at the elbow joint, the carpal bones at the wrist joint and with each other at the proximal and distal radioulnar joints.

The right radius and ulna with the interosseous membrane.
Anterior view

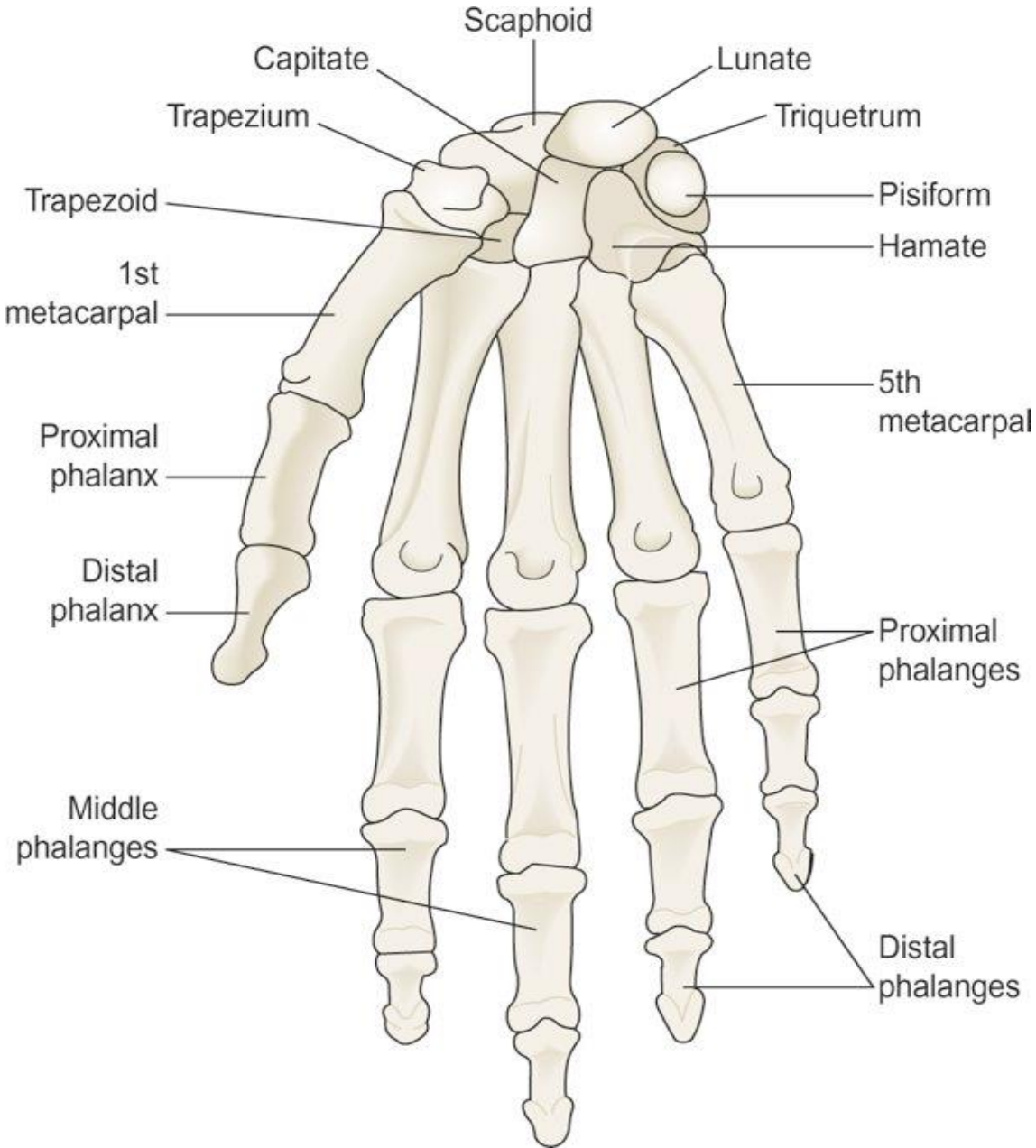


Carpal (wrist) bones

There are eight carpal bones arranged in two rows of four. From outside inwards they are:

- **proximal row**: scaphoid, lunate, triquetrum, pisiform
- **distal row**: trapezium, trapezoid, capitate, hamate.

The bones of the hand, wrist and fingers. Anterior view



Metacarpal bones (bones of the hand)

These five bones form the palm of the hand. They are numbered from the thumb side inwards. The proximal ends articulate with the carpal bones and the distal ends with the phalanges.

Phalanges (finger bones)

There are 14 phalanges, three in each finger and two in the thumb. They articulate with the metacarpal bones and with each other, by hinge joints.

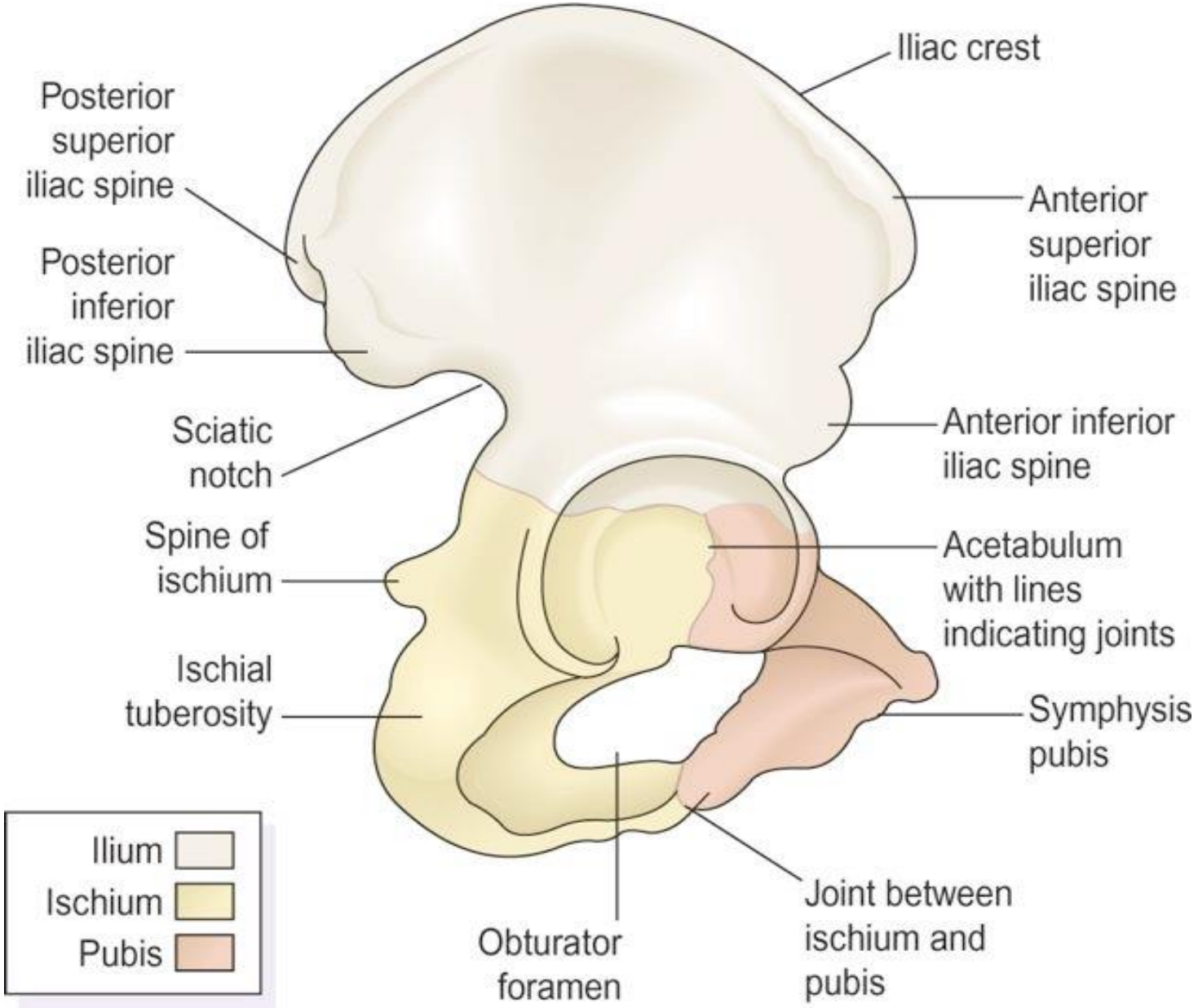
Pelvic girdle and lower limb: The lower limb forms a joint with the trunk at the pelvic girdle.

The pelvic girdle: The pelvic girdle is formed from two innominate (hip) bones. The pelvis is the term given to the basin-shaped structure formed by the pelvic girdle and its associated sacrum.

Innominate (hip) bones: Each hip bone consists of three fused bones: the ilium, ischium and pubis.

On its lateral surface is a deep depression, the acetabulum, which forms the hip joint with the almost-spherical head of femur.

The right hip bone. Lateral view

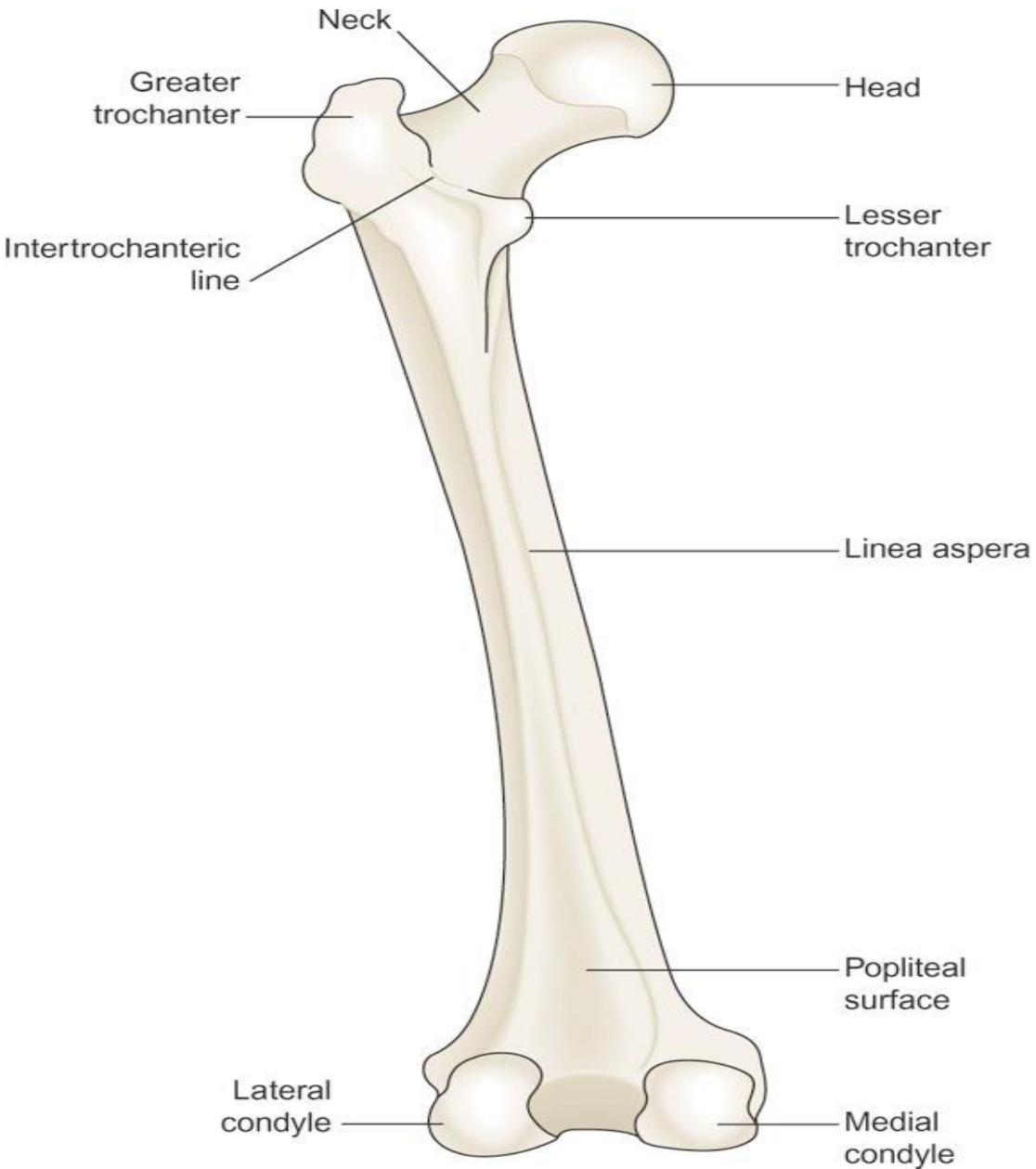


The lower limb

Femur (thigh bone): The femur is the longest and heaviest bone of the body.

The function of the femur is to transmit the weight of the body through the bones below the knee to the foot.

The left femur. Posterior view

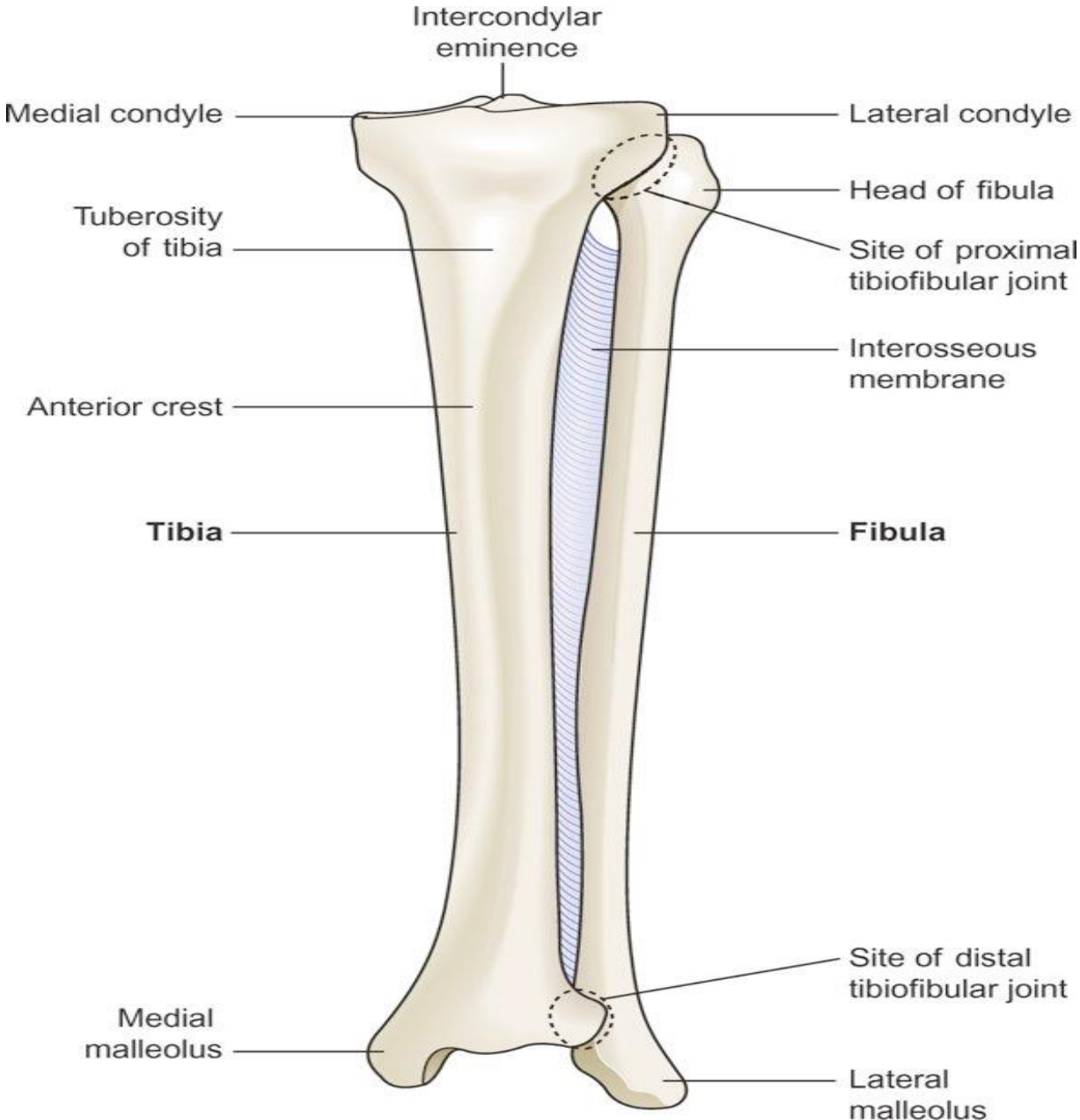


Tibia (shin bone): The tibia is the medial of the two bones of the lower leg.

Fibula: The fibula is the long slender lateral bone in the leg. This helps to stabilise the ankle joint

Patella (knee cap): This is a roughly triangular-shaped sesamoid bone associated with the knee joint.

The left tibia and fibula with the interosseous membrane. Anterior view



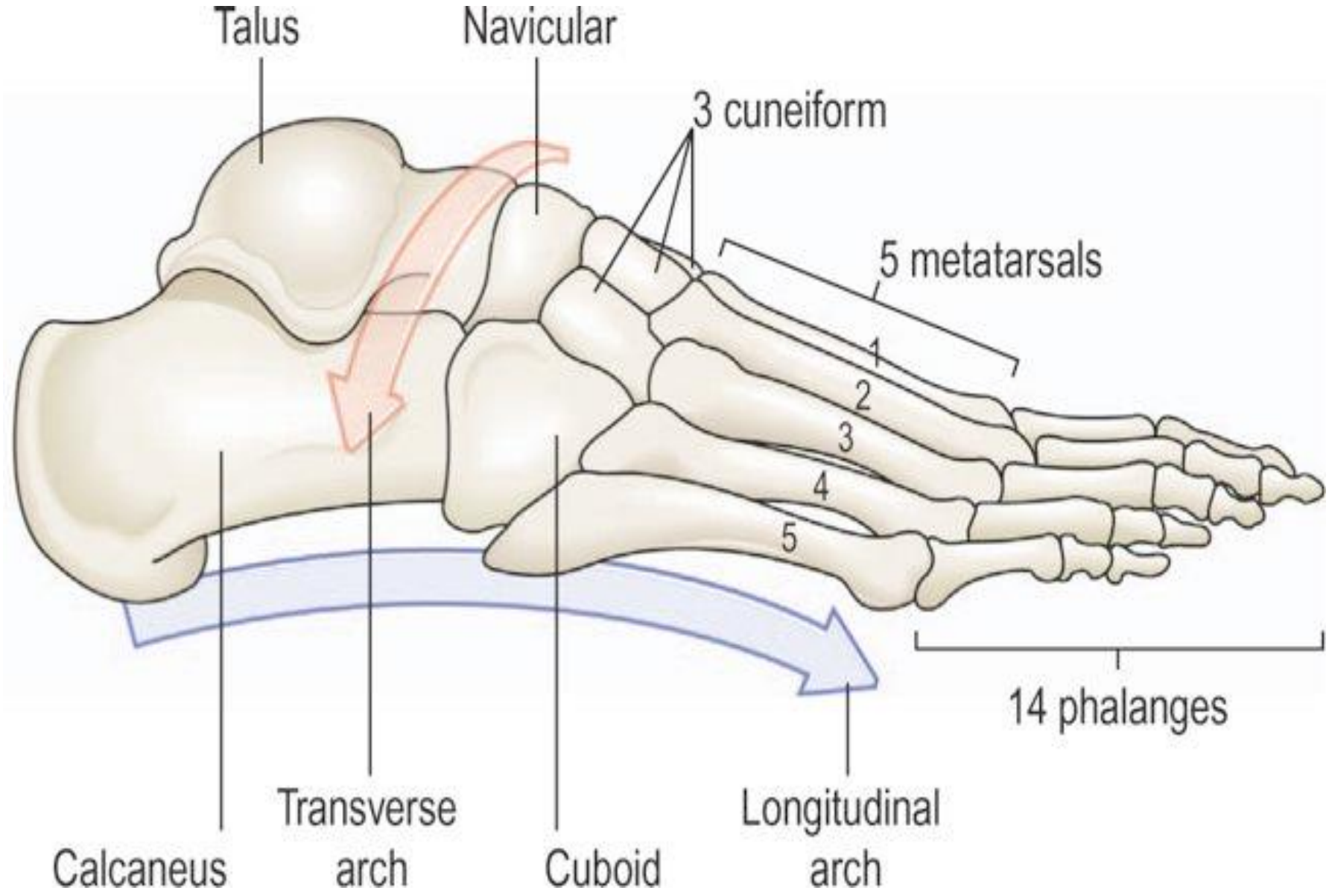
Tarsal (ankle) bones: The seven tarsal bones forming the posterior part of the foot (ankle) are the talus, calcaneus, navicular, cuboid and three cuneiform bones.

Metatarsals (bones of the foot): These are five bones, numbered from inside out, which form the greater part of the dorsum of the foot.

At their proximal ends they articulate with the tarsal bones and at their distal ends, with the phalanges.

Phalanges (toe bones): There are 14 phalanges arranged in a similar manner to those in the fingers, i.e. two in the great toe (the hallux) and three in each of the other toes.

The bones of the foot. Lateral view



Muscles of the face

Occipitofrontalis (unpaired): It raises the eyebrows.

Levator palpebrae superioris: It raises the eyelid.

Orbicularis oculi: It closes the eye and when strongly contracted ‘screws up’ the eyes.

Buccinator: This is the flat muscle of the cheek (‘the trumpeter's muscle’).

Orbicularis oris (unpaired): It closes the lips.

Masseter: In chewing it draws the mandible up to the maxilla.

Temporalis: It closes the mouth and assists with chewing.

Pterygoid: It closes the mouth.

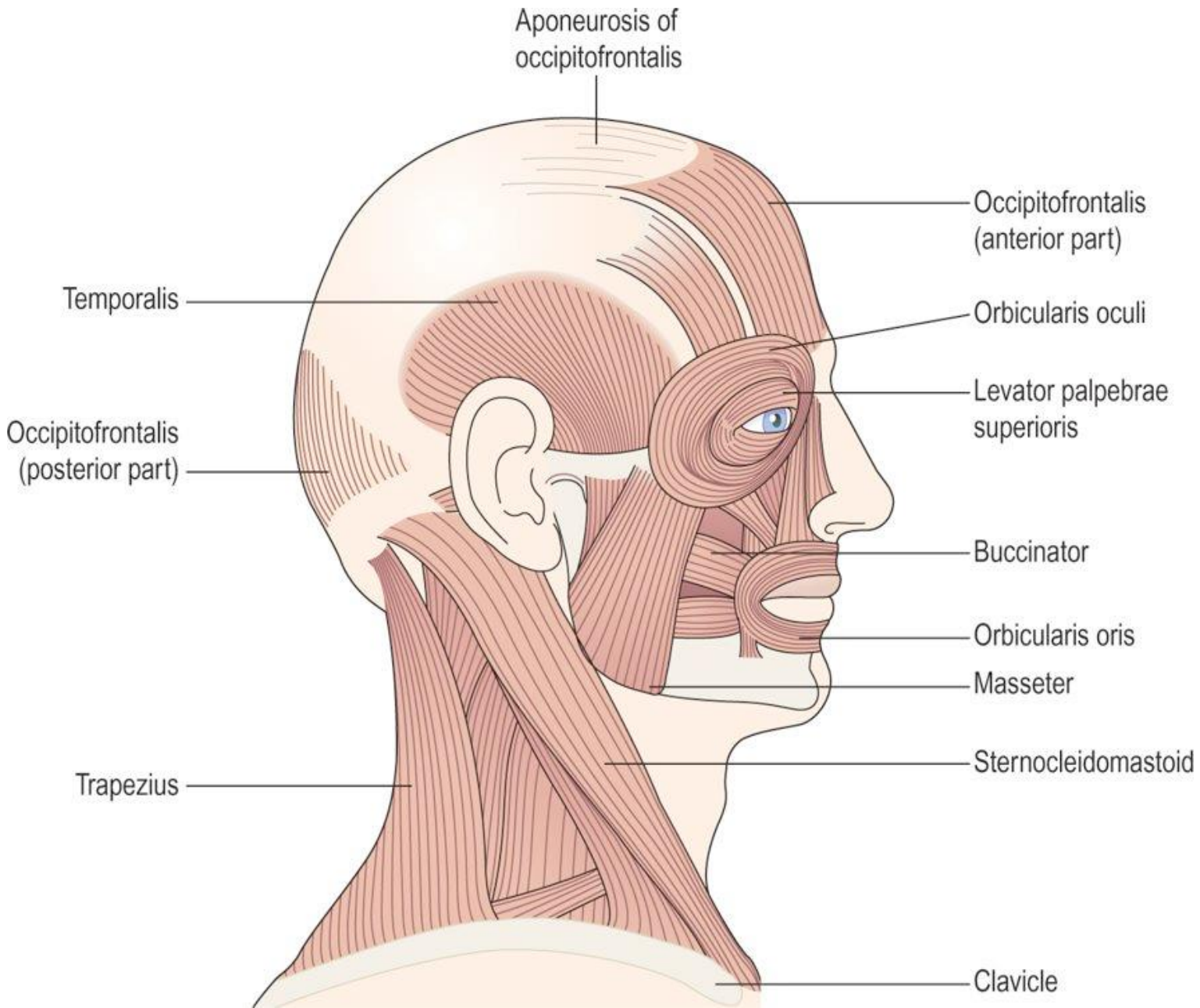
Muscles of the neck

Sternocleidomastoid: It assists in turning the head from side to side.

Trapezius: This muscle covers the shoulder and the back of the neck.

It pulls the head backwards.

The main muscles on the right side of the face, head and neck



Muscles of the back

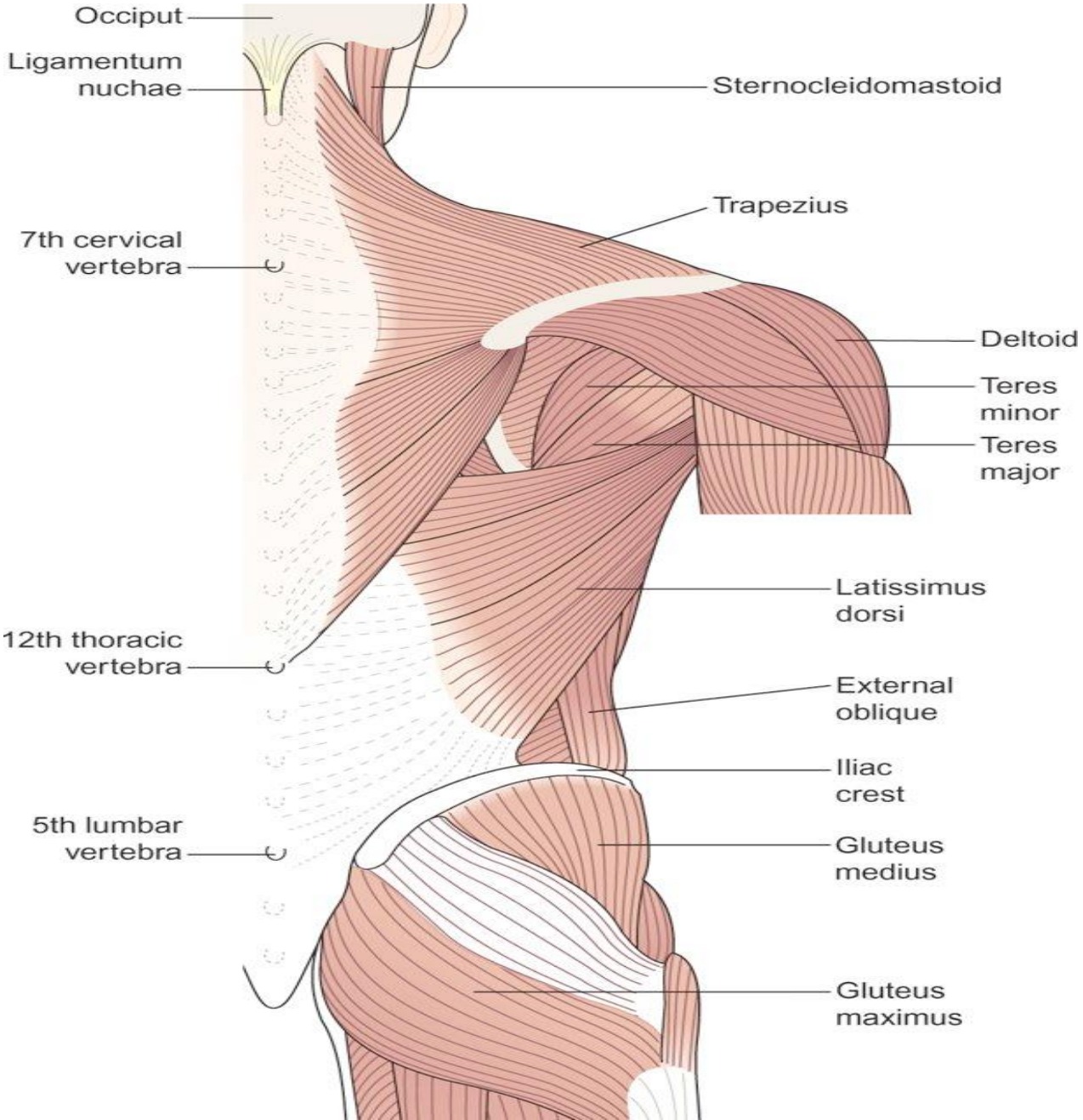
Latissimus dorsi: It adducts, medially rotates and extends the arm.

Teres major: It extends, adducts and medially rotates the arm.

Quadratus lumborum (L&R): Together the two muscles fix the lower rib during respiration and cause extension of the vertebral column (bending backwards).

Sacrospinalis (erector spinae): The contraction causes extension of the vertebral column.

The main muscles of the back



Muscles of the abdominal wall

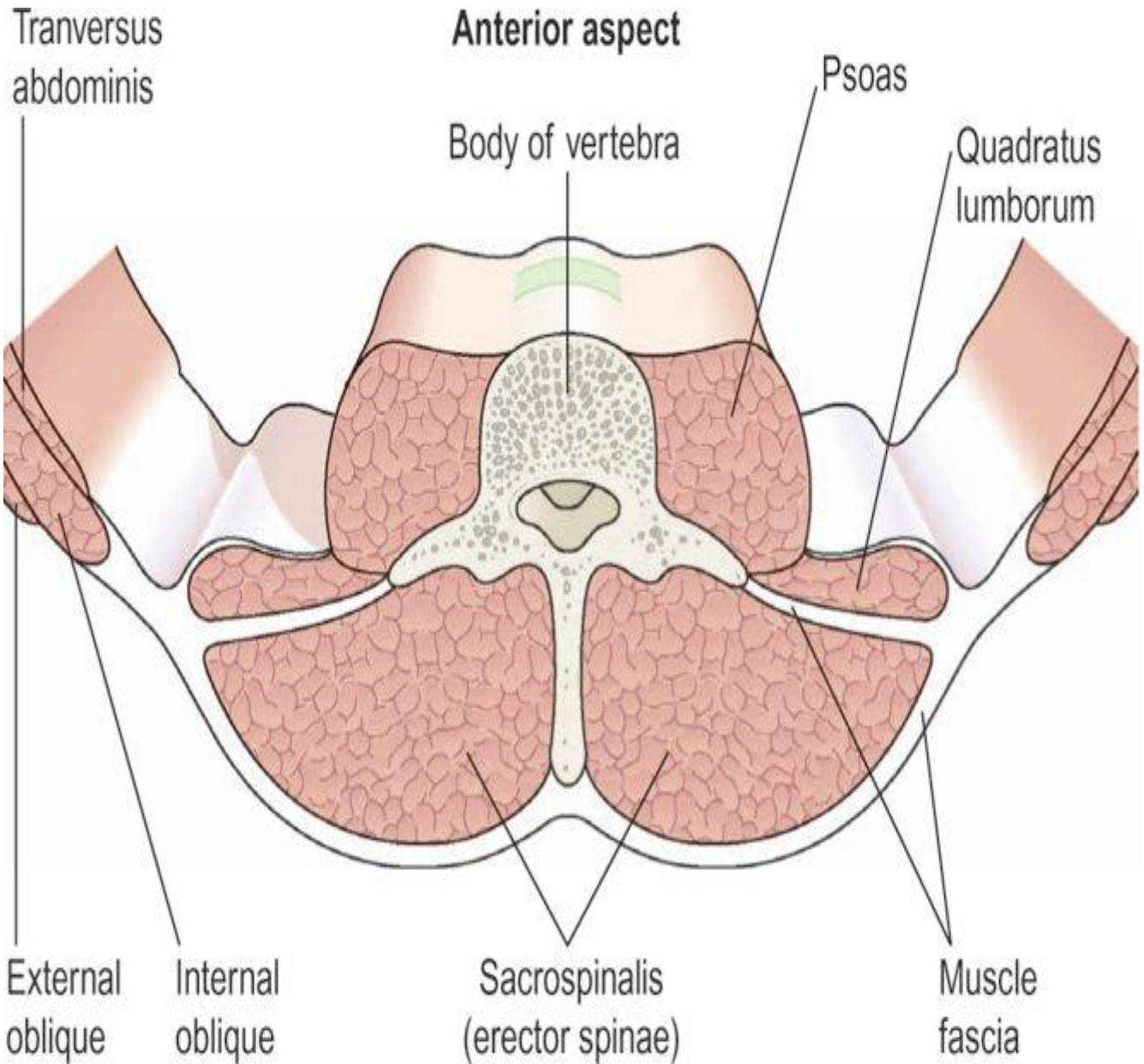
Rectus abdominis (L&R)

External oblique

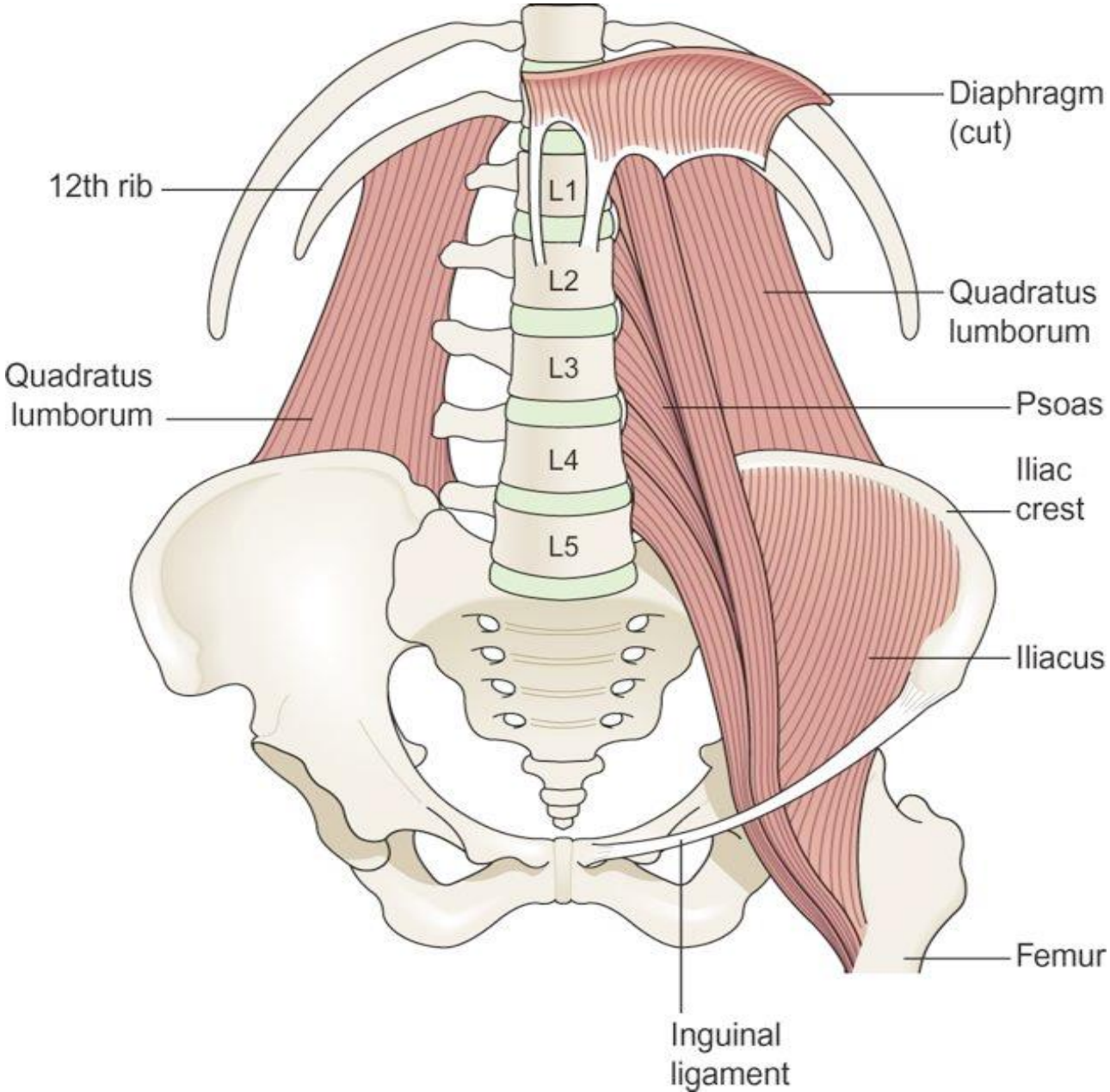
Internal oblique

Transversus abdominis

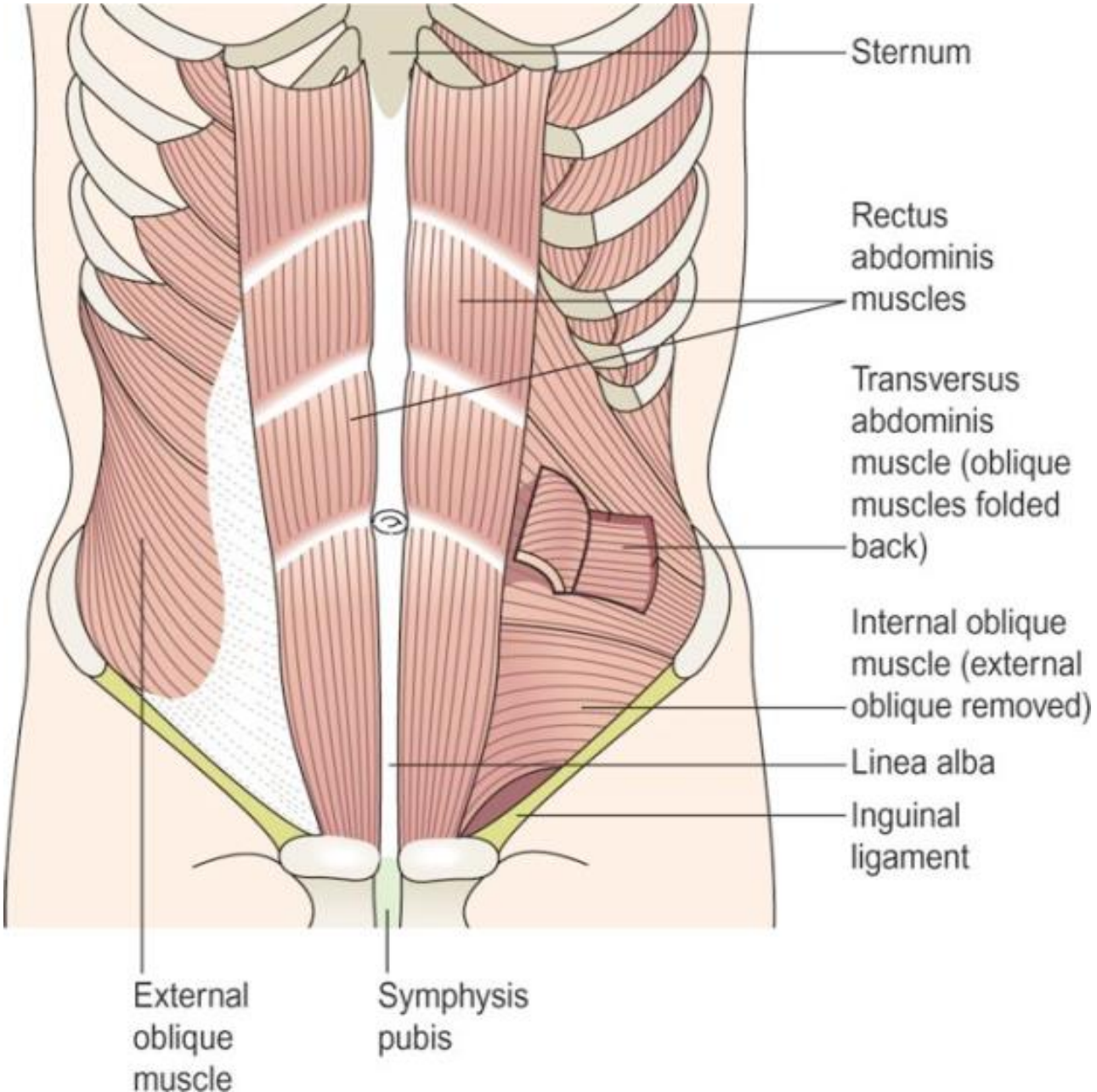
Transverse section of the posterior abdominal wall: a lumbar vertebra and its associated muscles



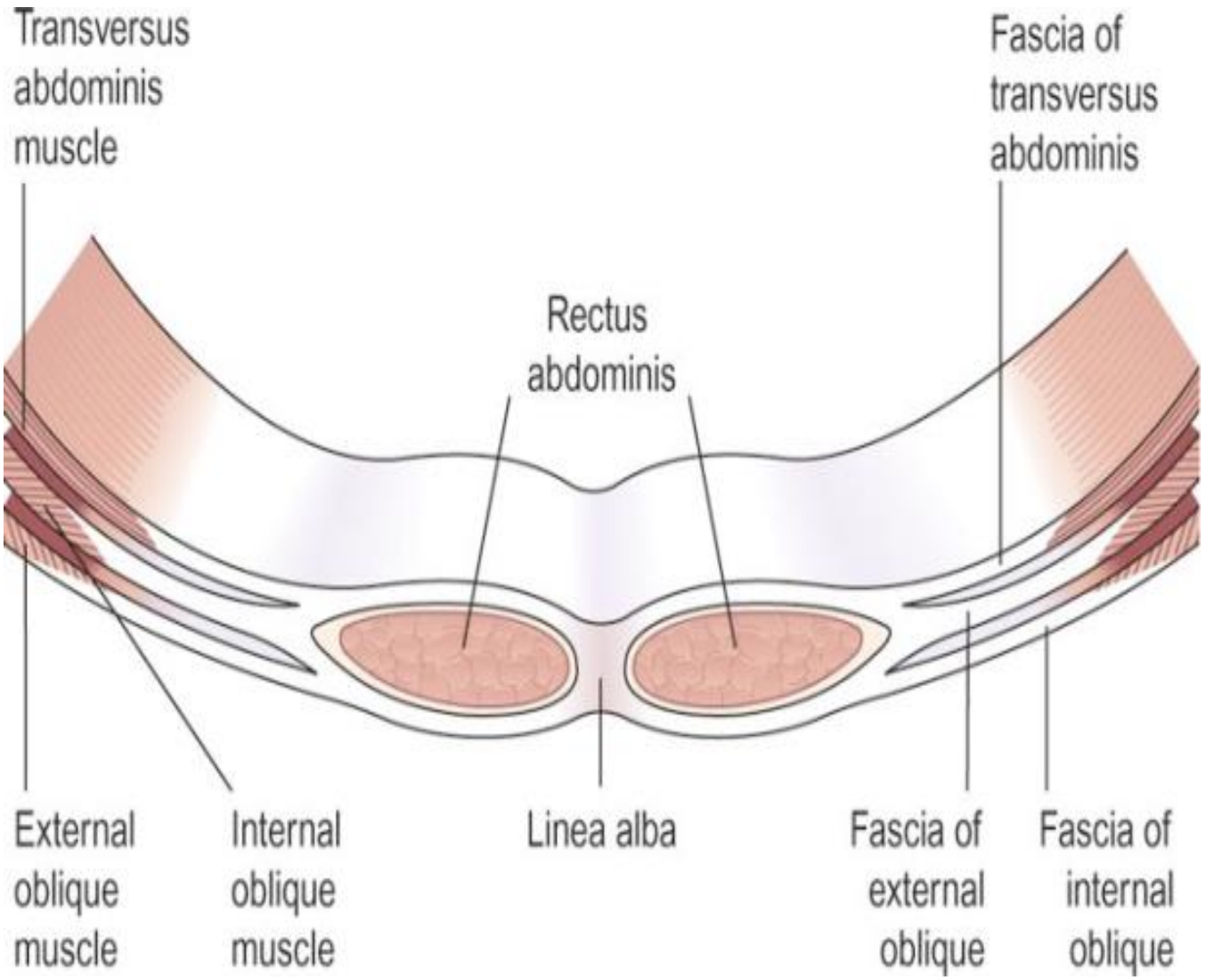
The deep muscles of the posterior abdominal wall



The muscles of the anterior abdominal wall



Transverse section of the muscles and fasciae of the anterior abdominal wall



Muscles of the shoulder and upper limb

Deltoid: It forms the fleshy and rounded contour of the shoulder.

Pectoralis major: This lies on the anterior thoracic wall.

Coracobrachialis: This lies on the upper medial aspect of the arm.

Biceps: This lies on the anterior aspect of the upper arm.

Brachialis: This lies on the anterior aspect of the upper arm deep to the biceps.

Triceps

Brachioradialis

Pronator quadrates

Pronator teres

Supinator

Flexor carpi radialis

Flexor carpi ulnaris

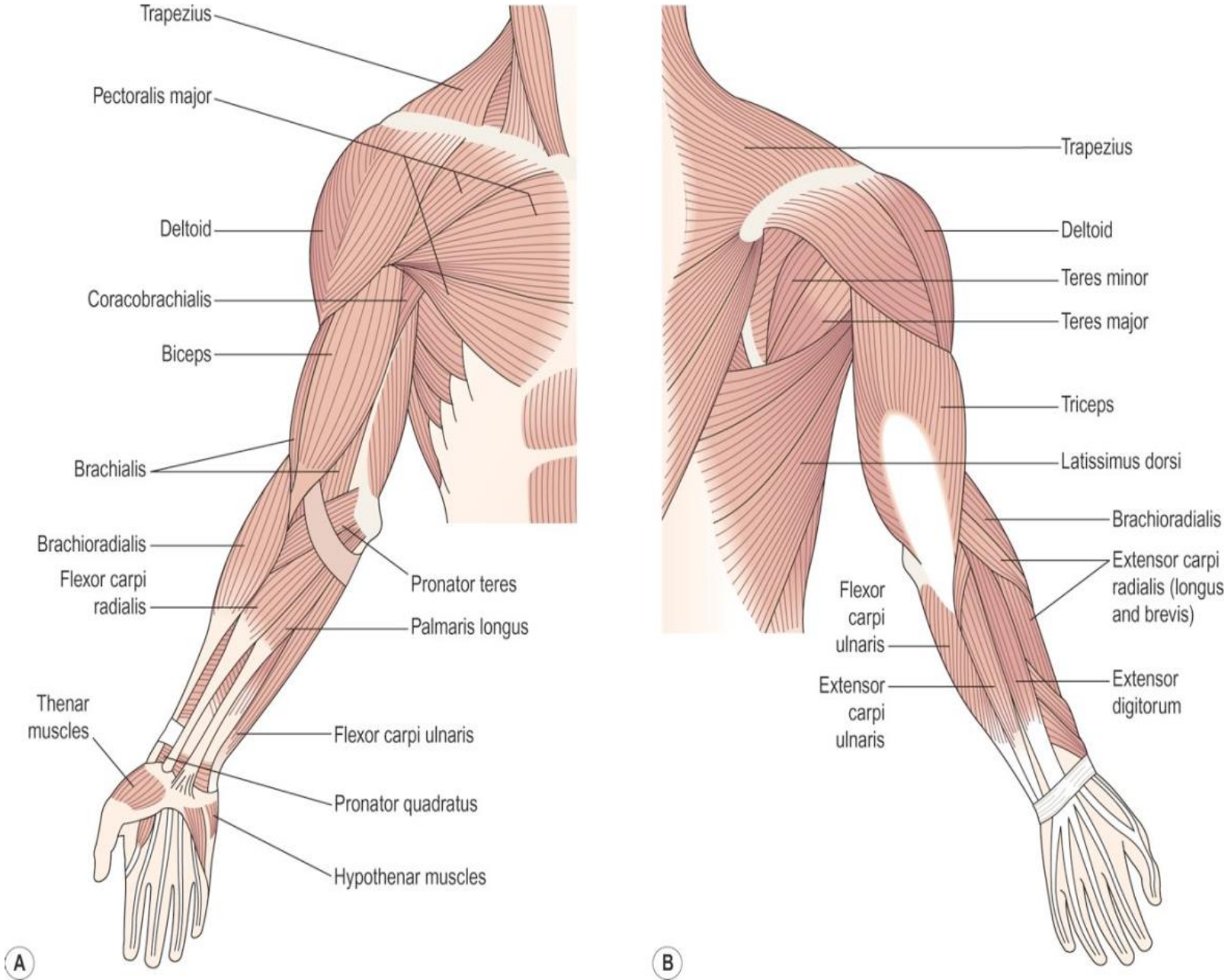
Extensor carpi radialis longus and brevis

Extensor carpi ulnaris

Palmaris longus

Extensor digitorum

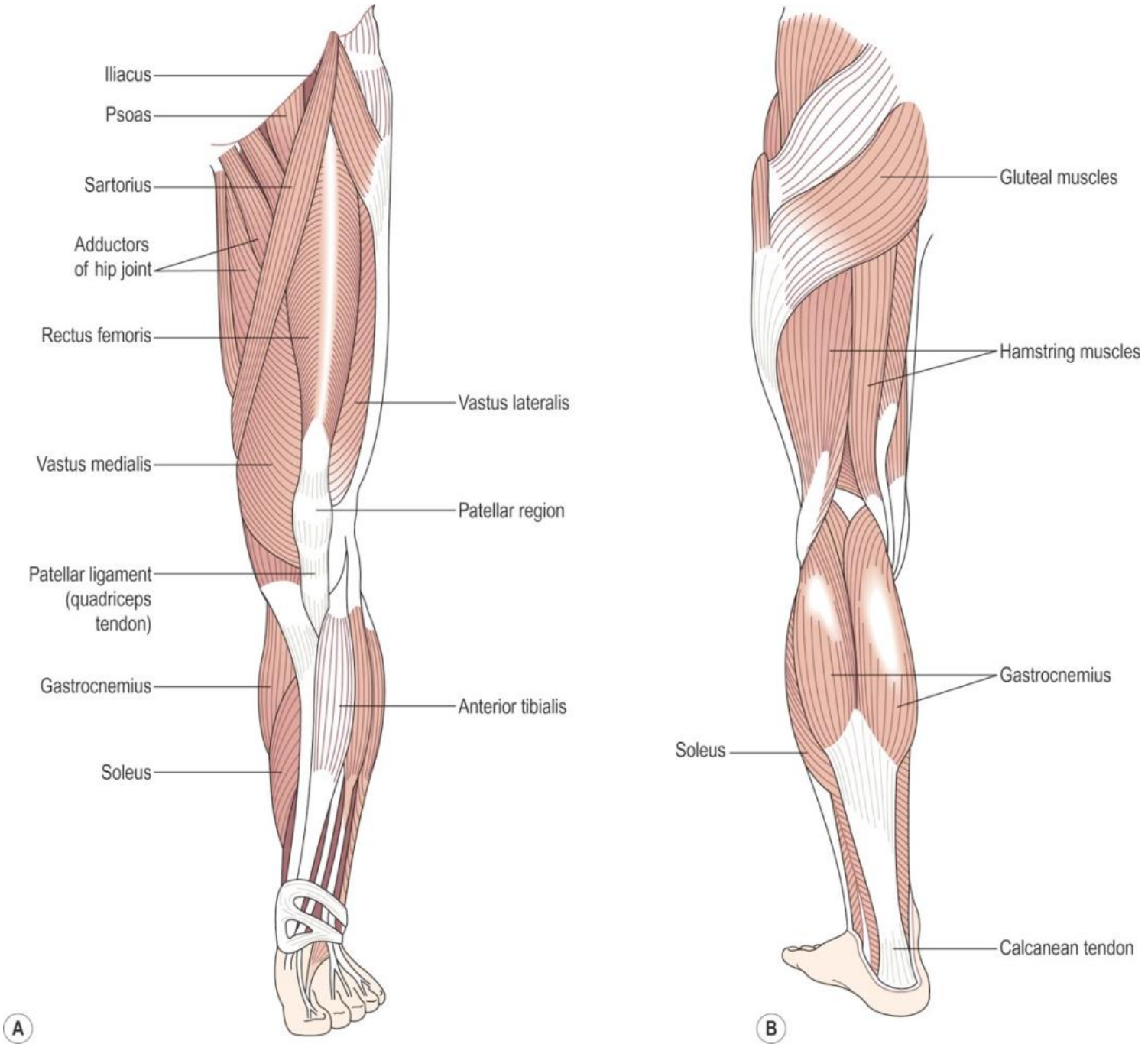
The main muscles of the shoulder and upper limb. A. Anterior view. B. Posterior view



Muscles of the hip and lower limb

Psoas
Iliacus
Obturators
Gluteals
Sartorius
Hamstrings
Gastrocnemius
Anterior tibialis
Soleus

The main muscles of the lower limb. A. Anterior view. **B.** Posterior view



Anatomy of vertebral column and chest wall

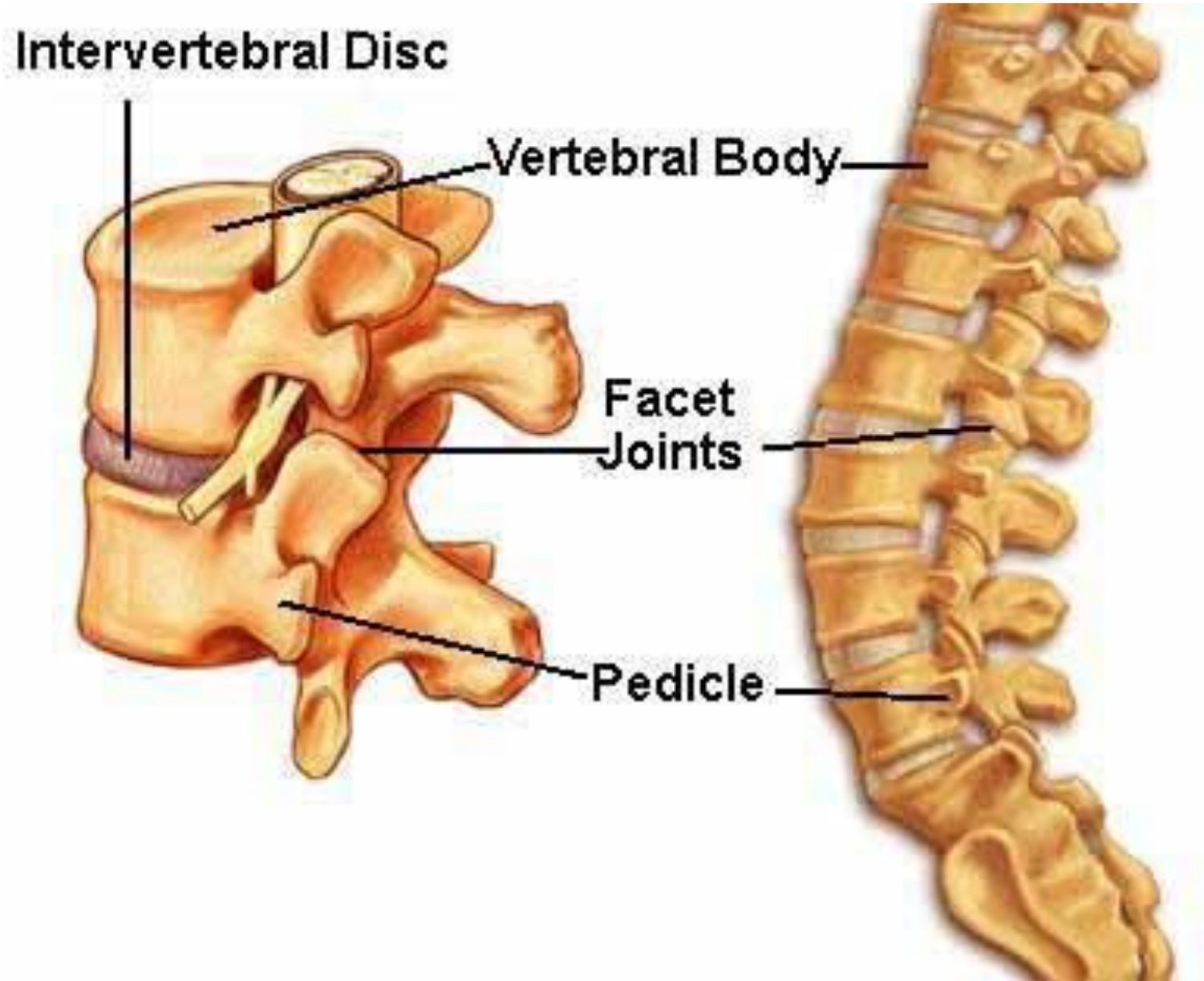
6th lecture

Vertebral column

It consists of irregular bones called **vertebrae**.

- Articulate with each other by ligament and disc which called **inter vertebral discs.**
- The vertebral column consists of 26 bones from the skull to the pelvis.
- The vertebral column is divided into 5 major regions given a name according to its location.

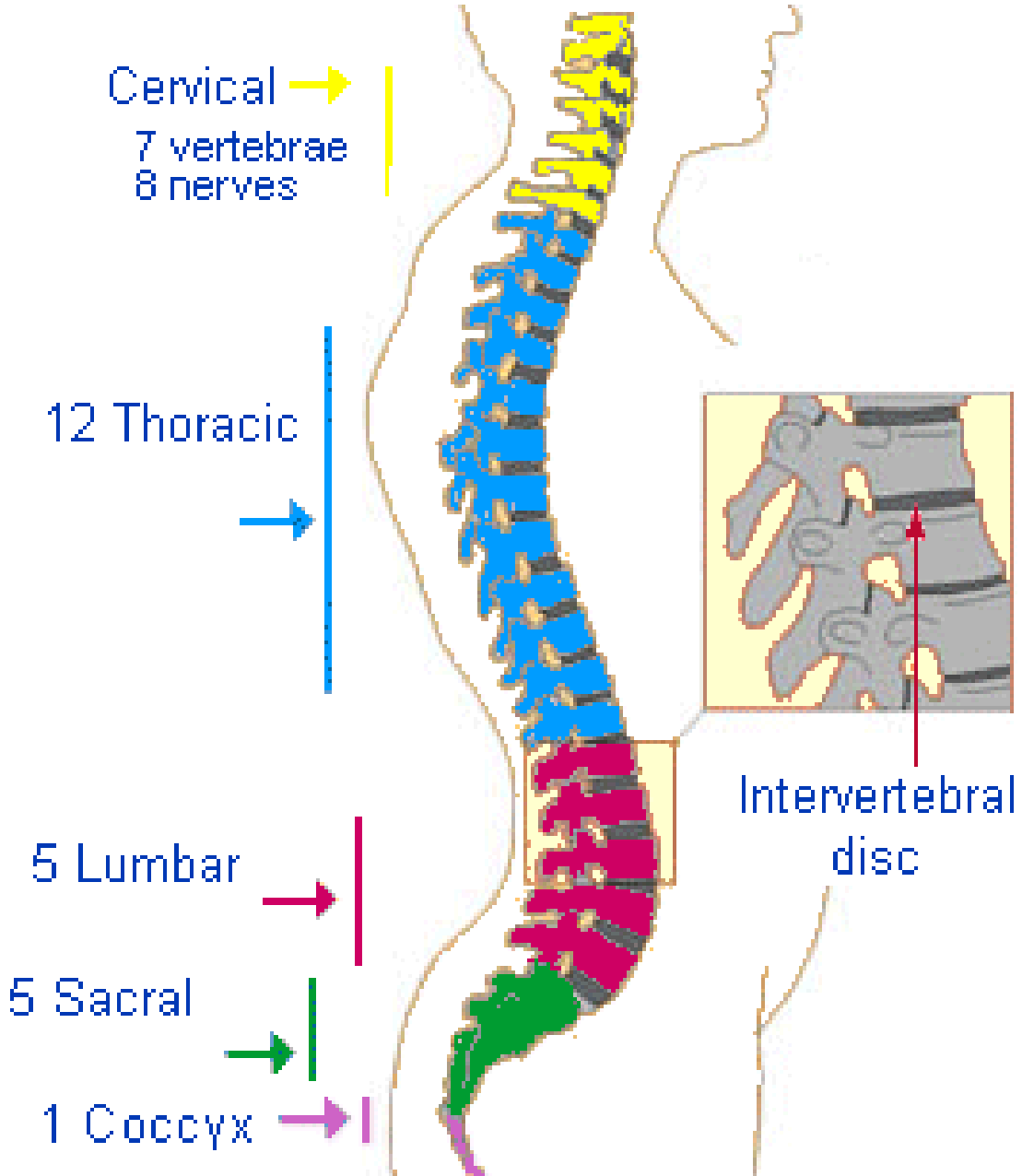
vertebra



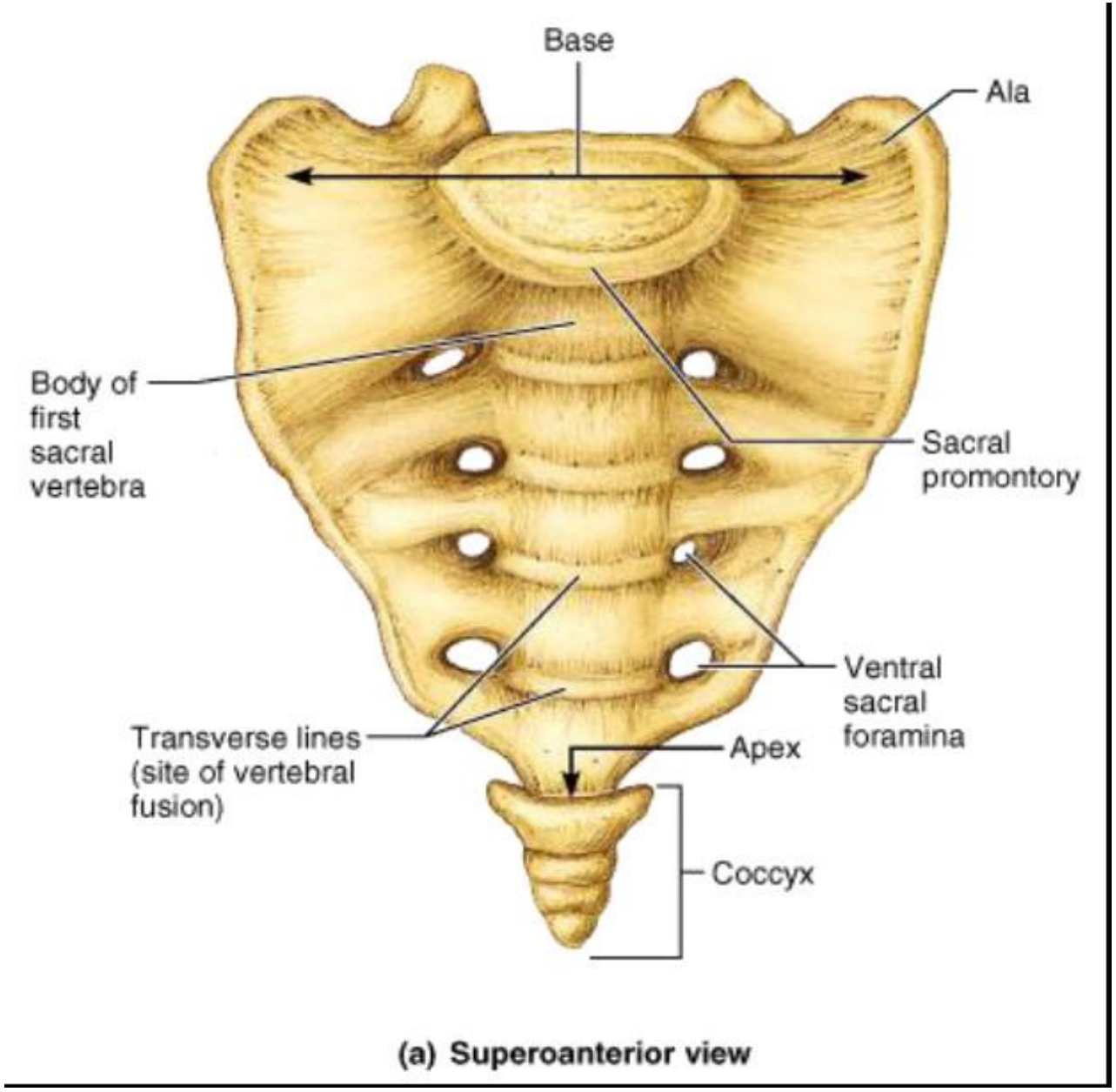
Regions of the vertebral column:

- The cervical region – 7 vertebrae
- The thoracic region – 12 vertebrae .
- The lumbar region – 5 vertebrae .
- The sacrum – 1 bone fused from 5 vertebrae .
- The coccyx – 1 bone fused from 4 vertebrae .

Regions of the vertebral column



Sacrum and coccyx



Vertebral column has 4 curvatures:

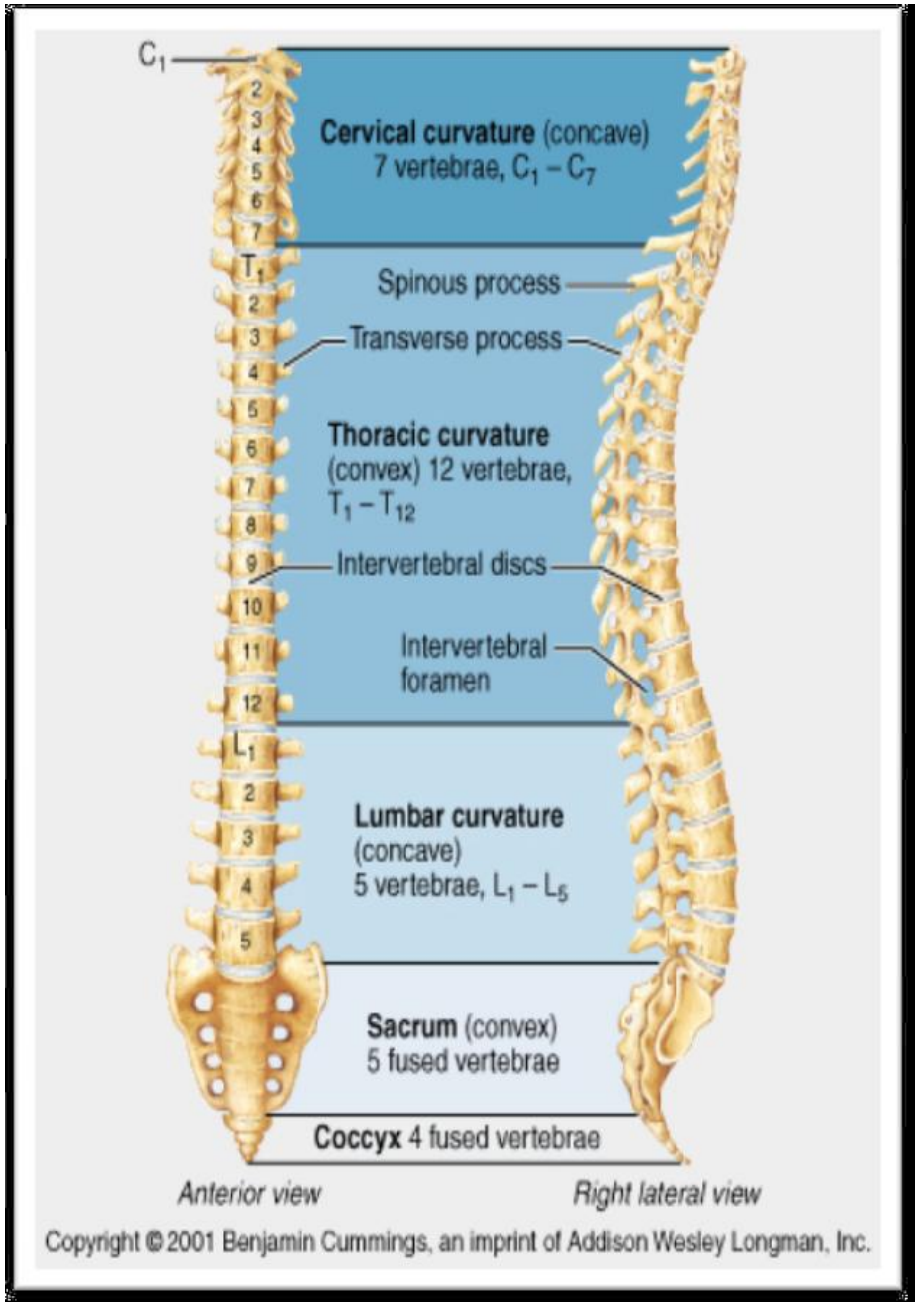
1. Cervical curvature :concave.

2. Thoracic curvature: convex.

3. Lumber curvature : concave.

4. Sacro- coccygeal: convex.

Vertebral column curvatures



Typical vertebrae:

Consists of:

1-Body of the vertebrae.

2- Vertebral arch:

a) Pedicle.

b) Lamina.

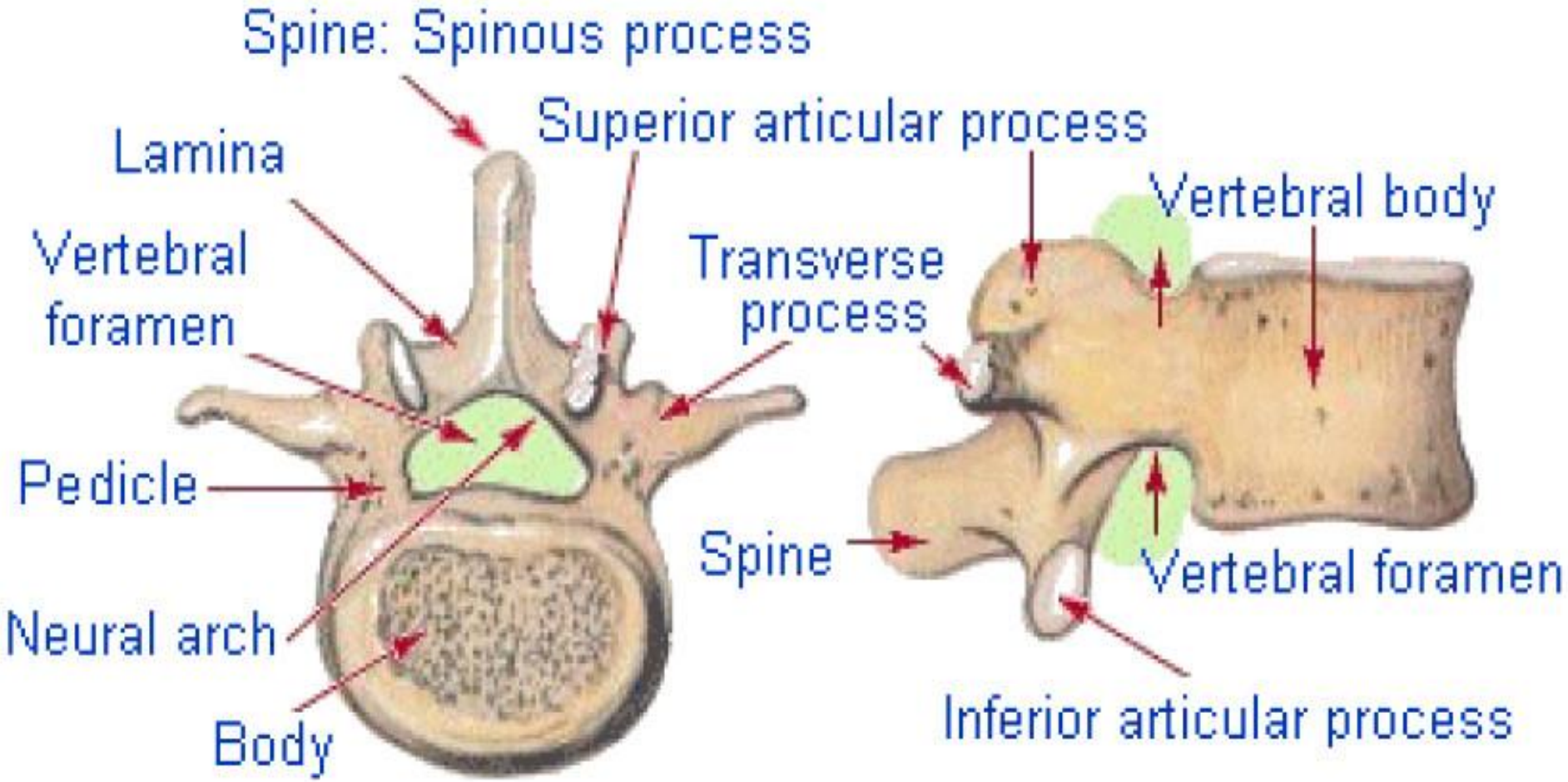
3-Vertebral processes:

a) Spine.

b) Transverse process.

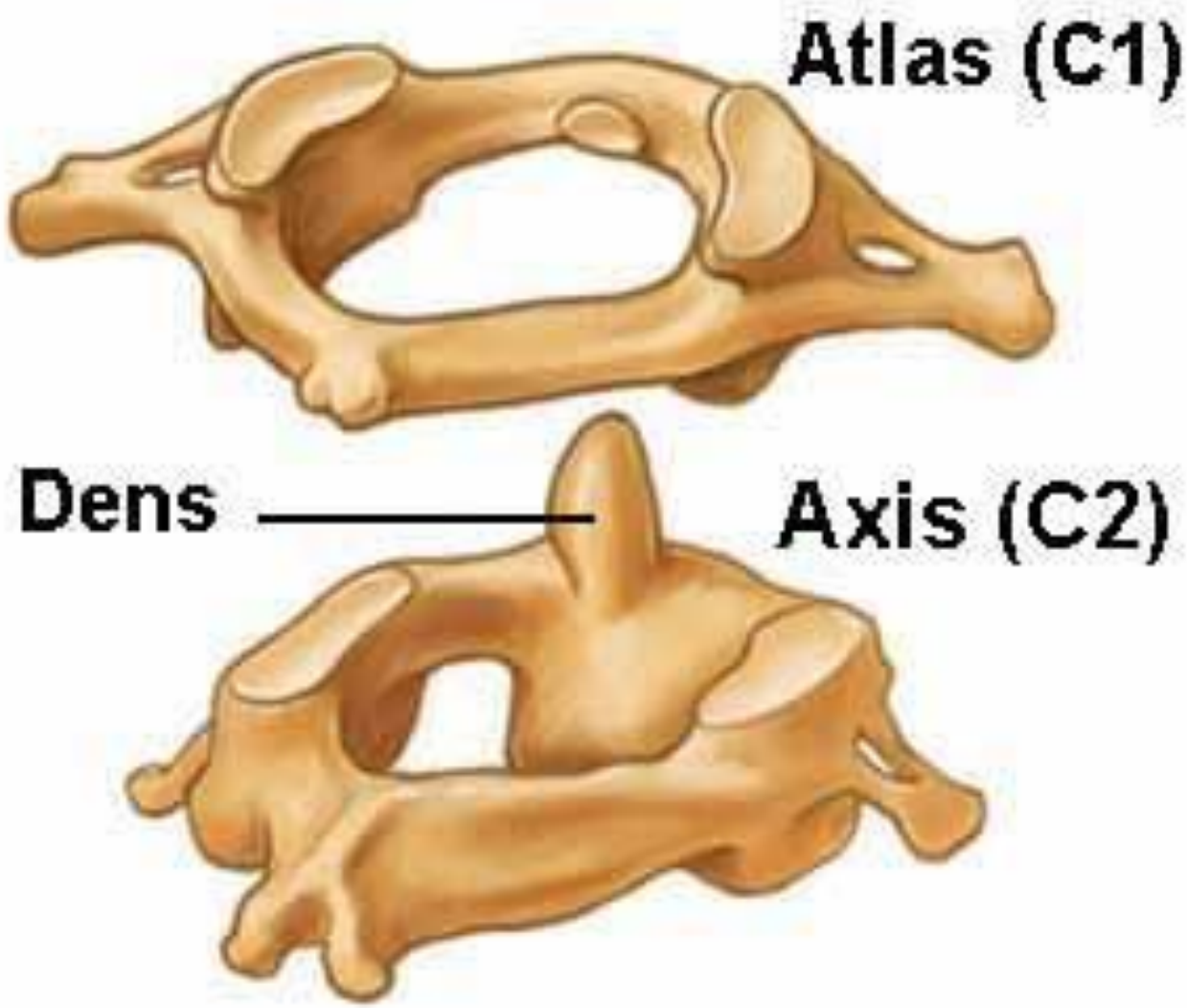
c) Articular process.

Typical vertebra

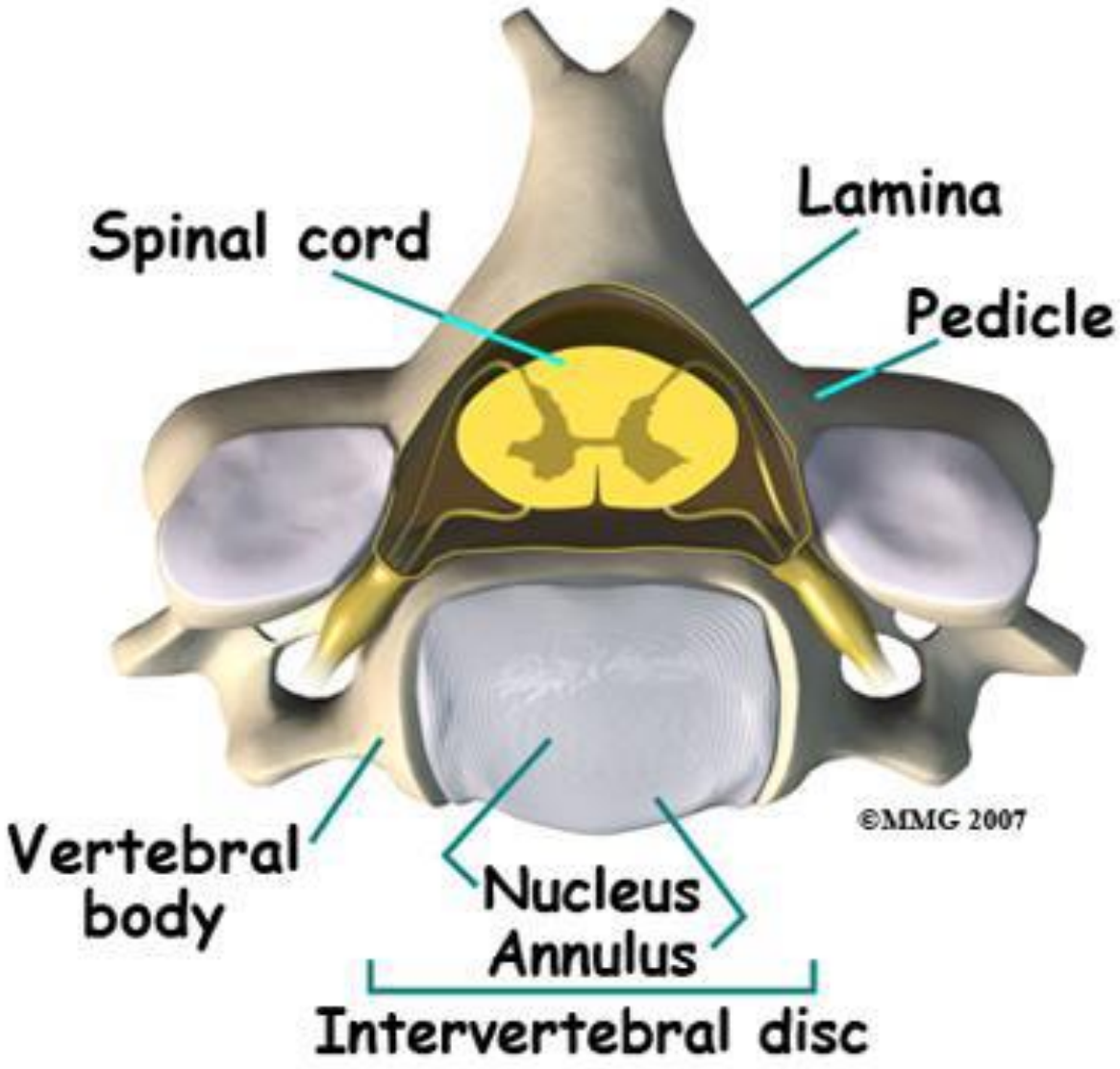


The (inter)vertebral foramen contains the spinal cord. Spinal nerves exit vertebral canals through the vertebral foramina.

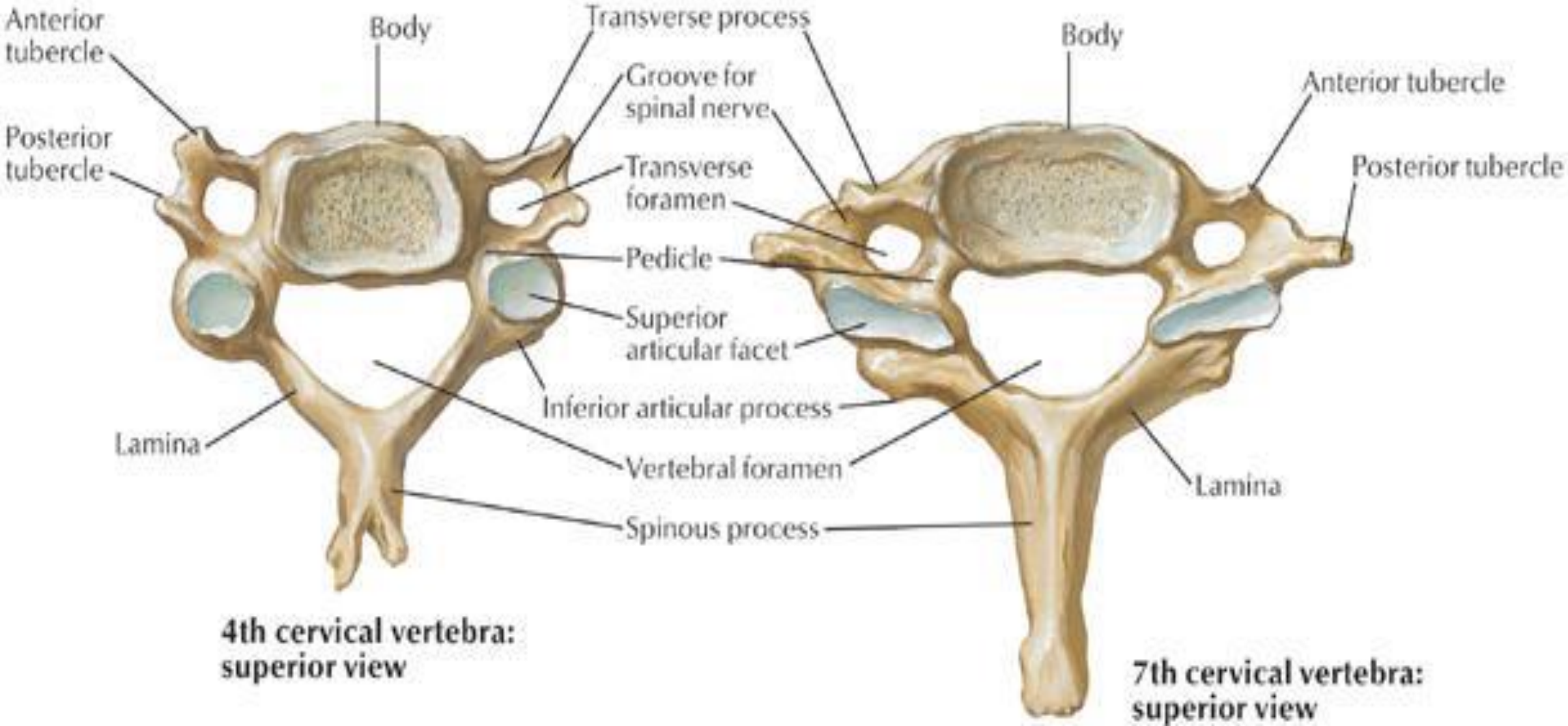
Cervical vertebrae (c1,c2)



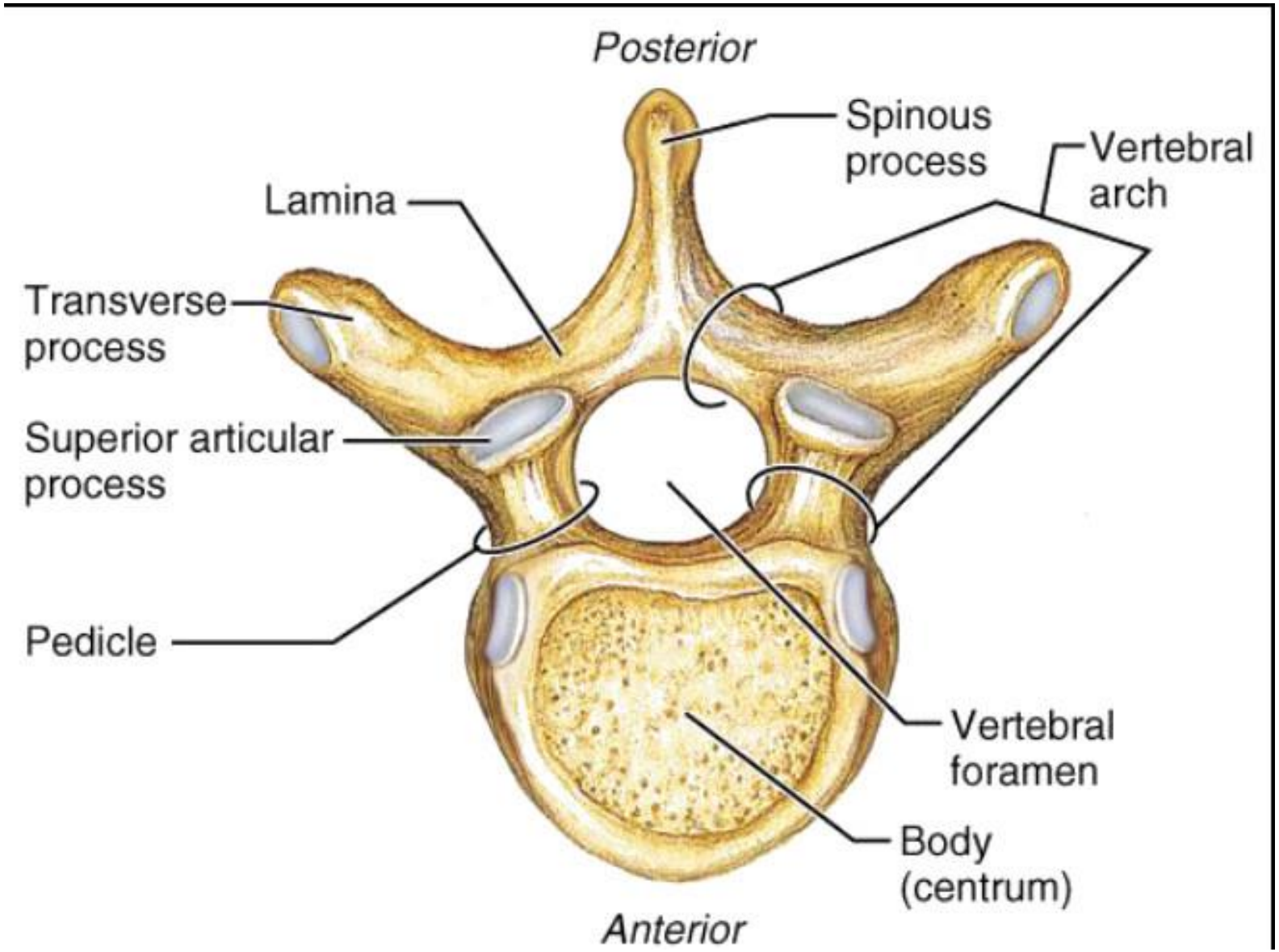
cervical vertebrae (c3 ,c4, c5 ,c6)



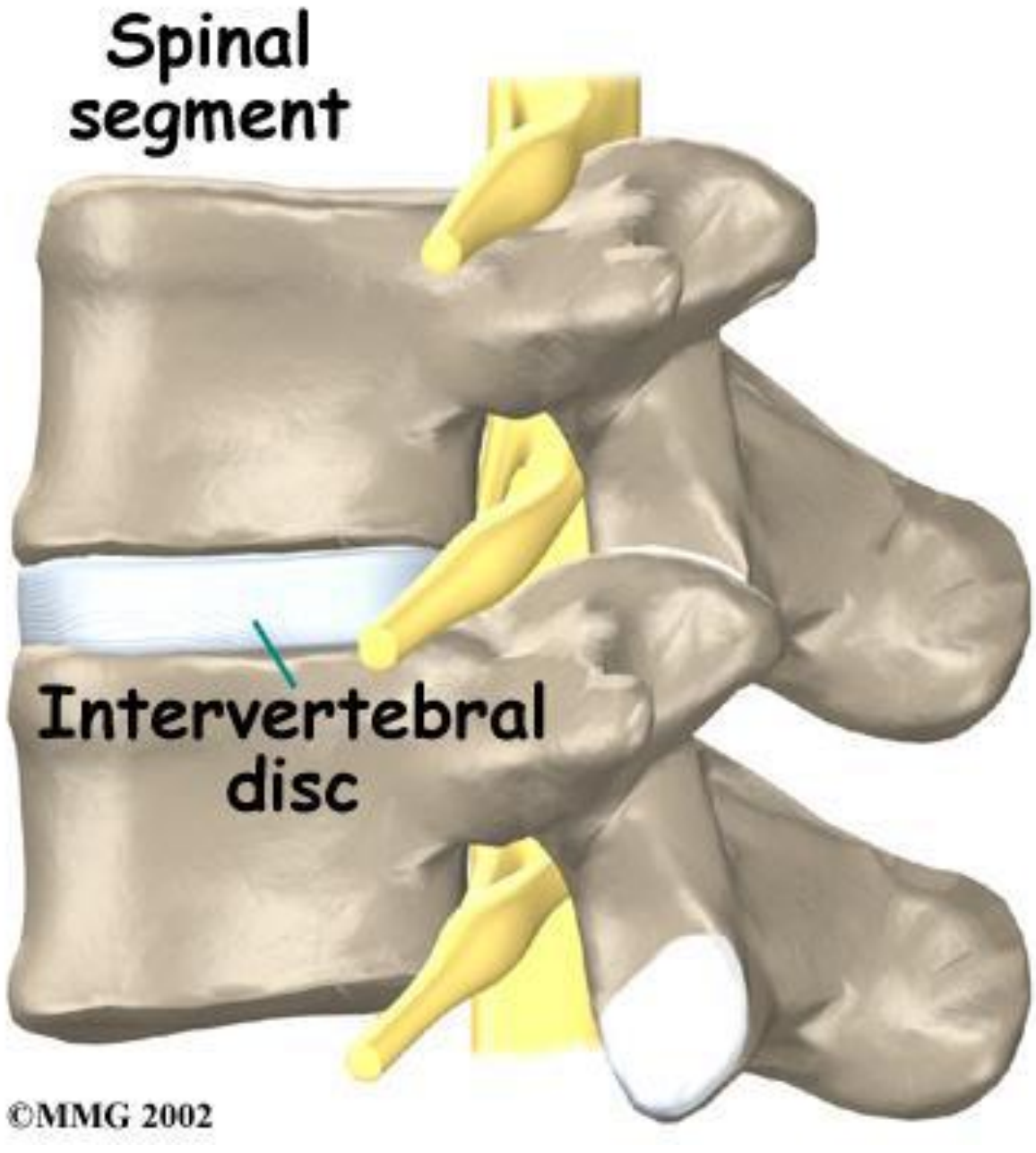
Cervical vertebrae (c4, c7)



Thoracic vertebrae



Lumbar vertebrae



Anatomy of the chest wall (chest skeleton):

The skeleton of the thorax:

- It has a conical shape.
- Narrower at the top and broader at the bottom.
- Longer behind than in front.

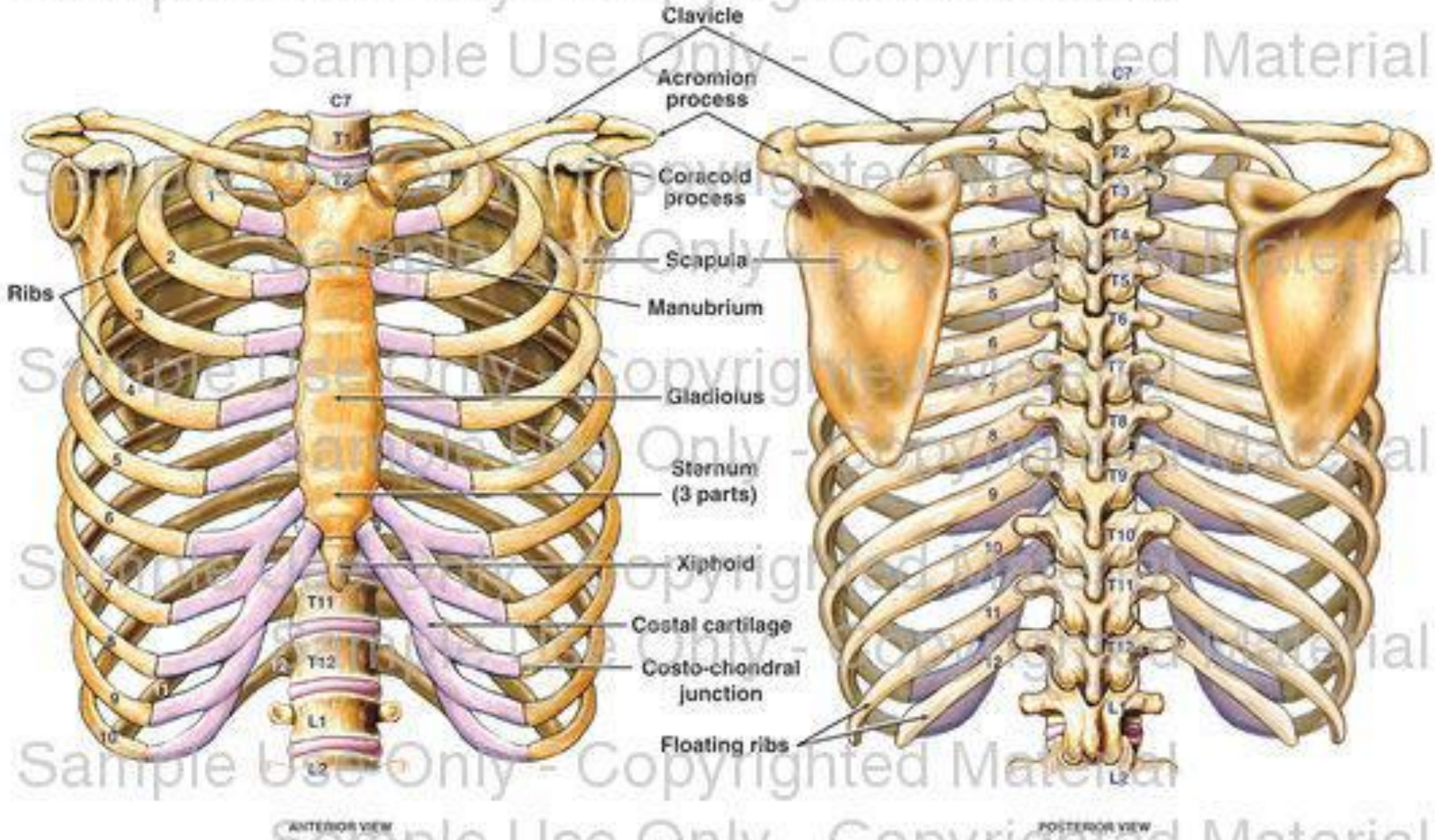
Consists of:

1. The sternum.

2. 12 pairs of ribs and costal cartilages.

3. 12 thoracic vertebrae .

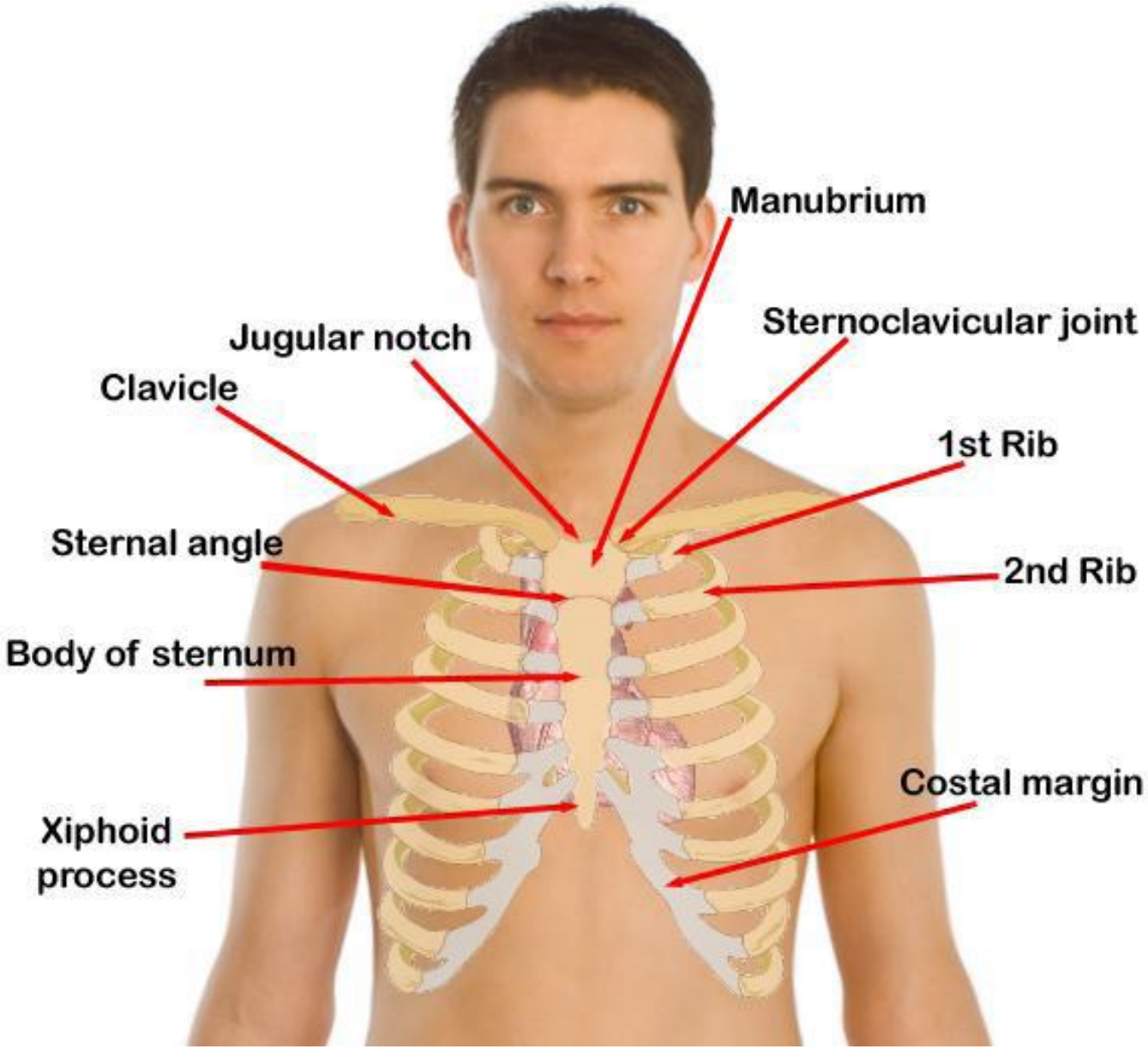
Anatomy of the Thoracic Skeleton (Ribcage)



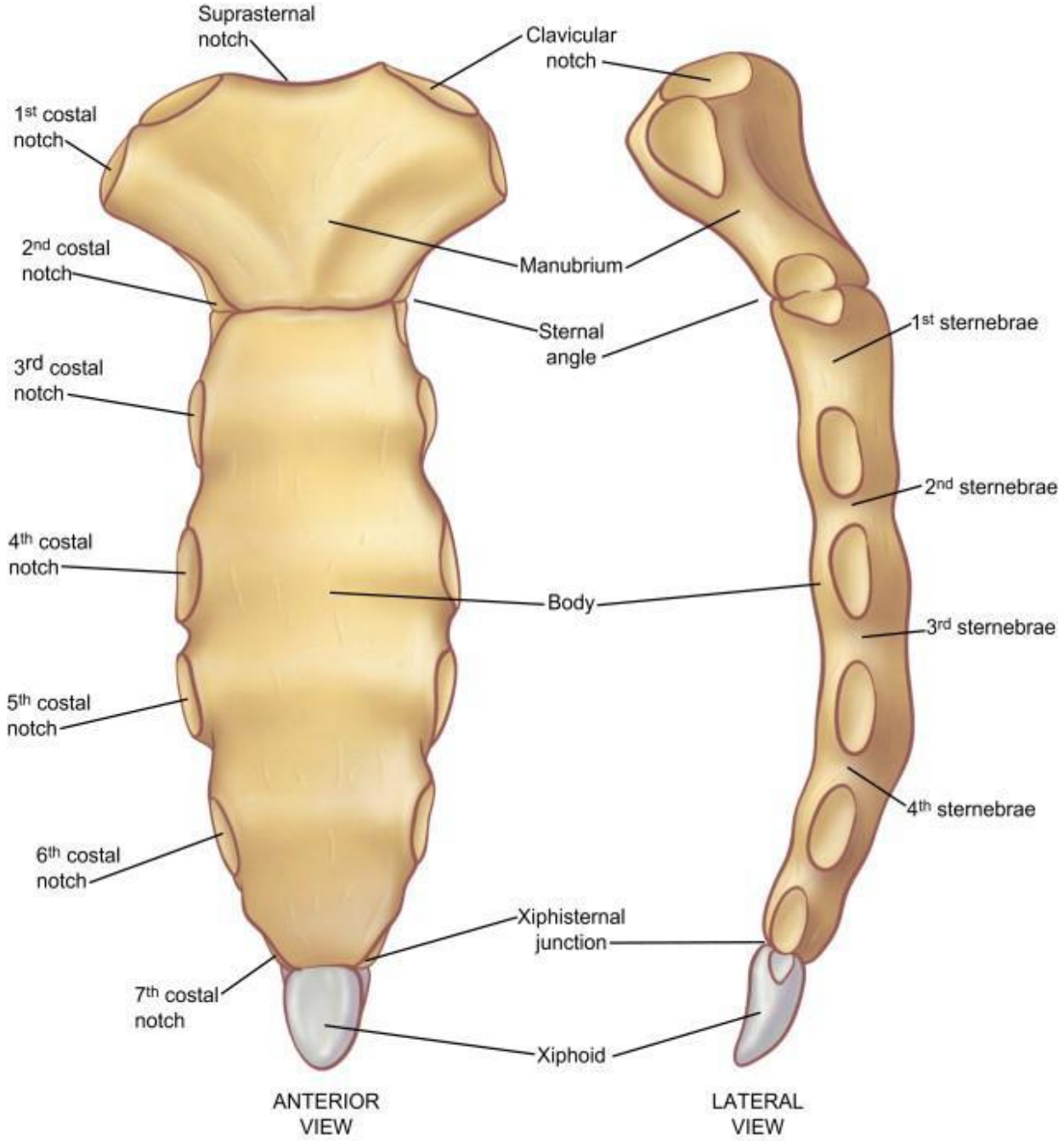
The sternum:

- A narrow, elongated, flattened bone that forms the center of the front of the chest.
- Has 2 surfaces (anterior and posterior).
- Has 2 borders (left and right) which connect with 1st 7 costal cartilage.
- It consists of three parts: manubrium, body and xiphoid process.

sternum


Manubrium
Sternoclavicular joint
Jugular notch
Clavicle
1st Rib
Sternal angle
2nd Rib
Body of sternum
Costal margin
Xiphoid process

Sternum


Suprasternal notch
Clavicular notch
1st costal notch
2nd costal notch
Manubrium
Sternal angle
1st sternebrae
3rd costal notch
2nd sternebrae
4th costal notch
Body
3rd sternebrae
5th costal notch
4th sternebrae
6th costal notch
Xiphisternal junction
7th costal notch
Xiphoid
ANTERIOR VIEW
LATERAL VIEW

Manubrium:

- Upper part**,** articulate with the body of the sternum forming the **sternal angle.**
- The superior border called the **supra sternal notch**.
- In each side articulate with the clavicle forming the L. and R. **sterno clavicular joints**.

The body :

- A middle part **,**flat and has 2 surfaces (anterior and posterior) and 4 borders (superior ,inferior ,right and left) **.**
- The left and right borders articulate with costal cartilages (3-7).
- The superior border articulate with the manubrium.
- The inferior border articulate with the xiphoid process.

xiphoid process:

A lower part that projects down.

The ribs:

- Are flexible, long bones that look like arches (curved to connect the vertebral column).
- There are 12 ribs on each side.
- They are located one below the other.
- Anteriorly forming the costal margin.
- Inter-costal spaces occur between them.

- The first seven (1-7) are called **True ribs**, directly attached to the sternum .
- The (8-10) ribs are called the **false ribs**, their costal cartilages attached to the costal cartilage of the seventh true rib.
- The last two ribs (11-12) are only attached to the vertebral column and are thus called **Floating ribs**, (that are not attached to the sternum) also called the vertebral ribs.

Typical rib:

The typical rib consists of:

A-2 surfaces (external and internal).

B-2 borders (superior rounded and smooth, inferior sharp and thin).

C-Posterior and anterior ends

Posterior end formed from the followings:

A. Head: connects with the body of the vertebrae.

B. **Neck**: situated between head and tubercle.

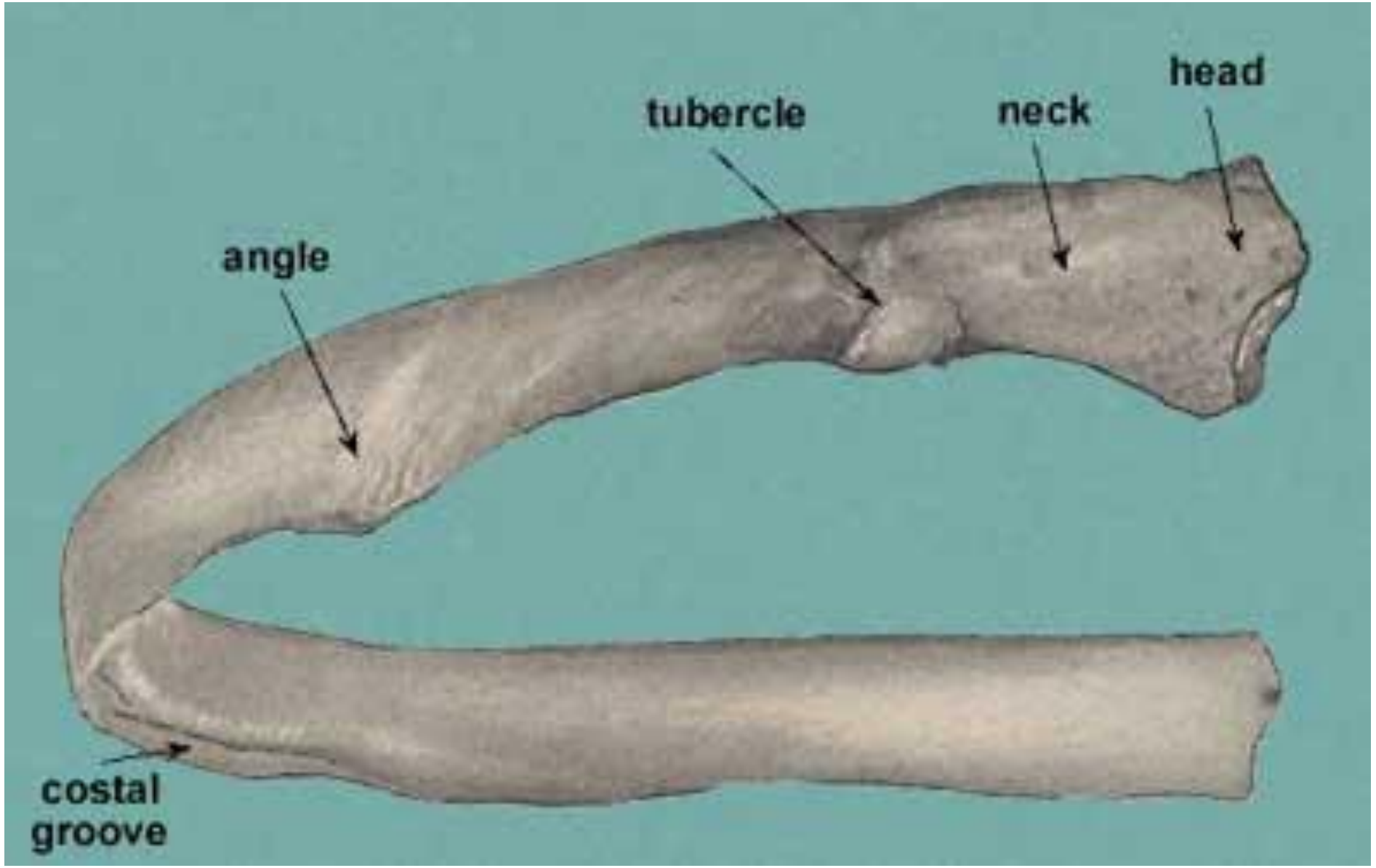
C. **Tubercle**: is a bony growth, that comes after the neck of the rib, connects with the transverse process of the vertebrae.

Anterior end it is concave and articulate with costal cartilage and consists of the followings:

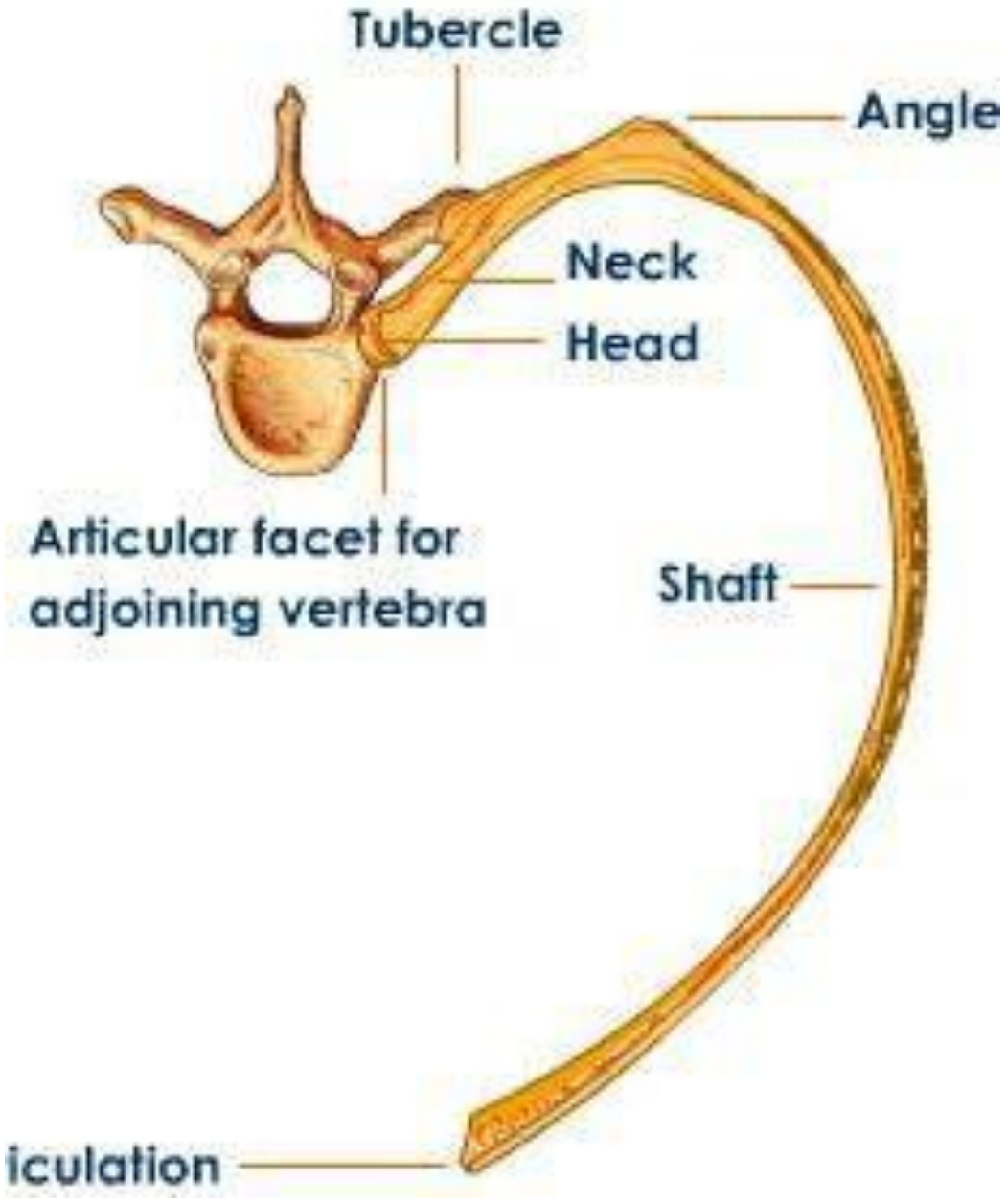
A-Body (shaft) is the longest part of a typical rib.

B-Angle is the point at which the body of the rib starts to curve, just after the tubercle.

Typical rib



Typical rib


Tubercle
Angle
Neck
Head
Articular facet for
adjoining vertebra
Shaft
iculation

Anatomy of the Digestive System (Gastrointestinal tract):

7nth lecture

Digestive System:

- It is a long muscular tube.
- About (9–10 meters).
- Irregular in shape.
- Beginning at the mouth, where food is taken in,
- Terminating at the anus, where the solid waste products of digestion are expelled from the body.

The digestive system composed of two separate types of organs:

1. Digestive organs

2. Accessory digestive organs, that assist in the digestive process: some of them for the mouth and the other are for intestine.

Parts of the digestive system:

1. Oral cavity

2. Pharynx

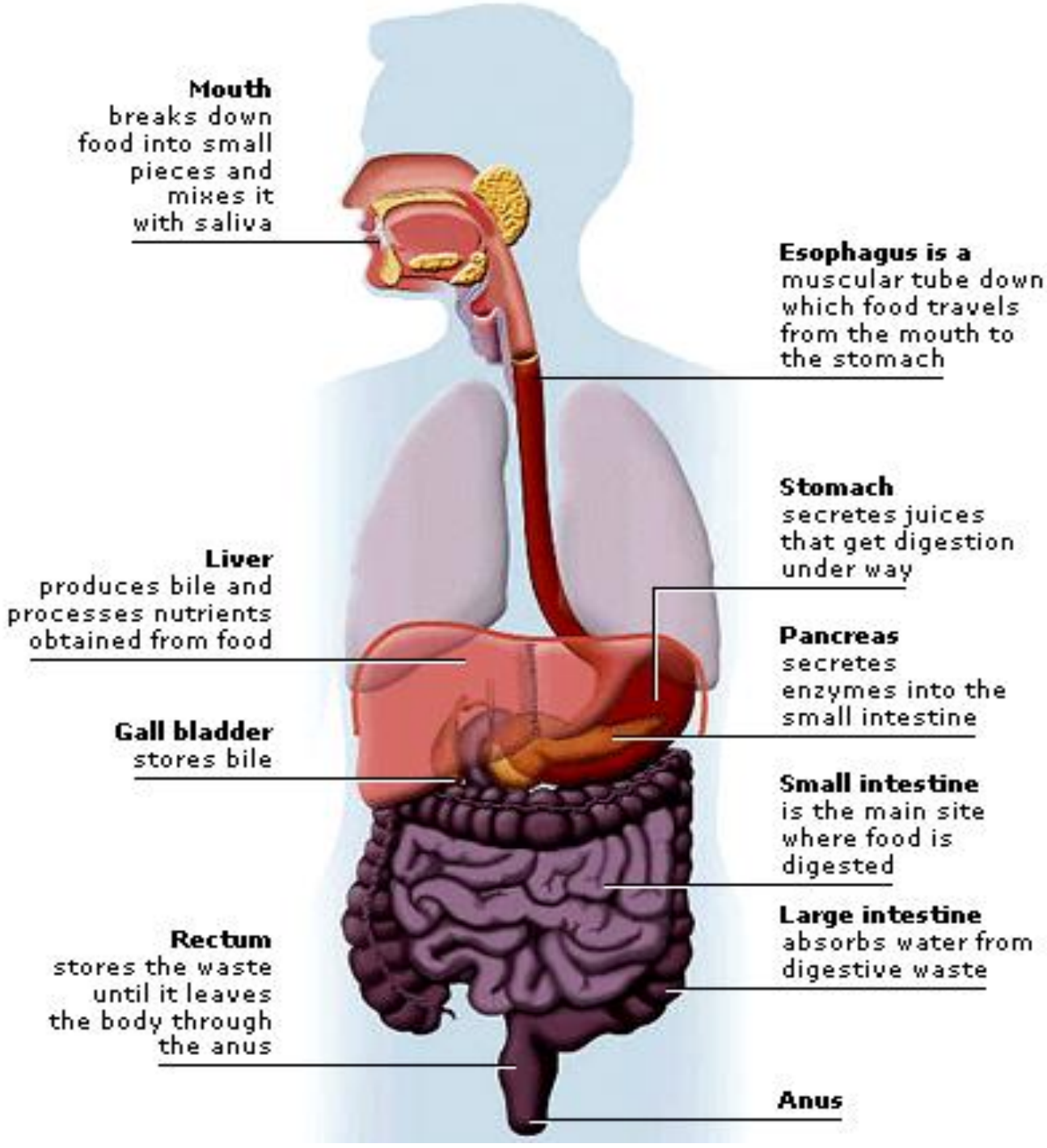
3. Esophagus

4. Stomach

5. Small intestine

6. Large intestine

7. Anus


Mouth
breaks down food into small pieces and mixes it with saliva
Esophagus is a
muscular tube down which food travels from the mouth to the stomach
Stomach
secretes juices that get digestion under way
Liver
produces bile and processes nutrients obtained from food
Pancreas
secretes enzymes into the small intestine
Gall bladder
stores bile
Small intestine
is the main site where food is digested
Large intestine
absorbs water from digestive waste
Rectum
stores the waste until it leaves the body through the anus
Anus

Accessories of the digestive system:

For the mouth :

1. Salivary gland
2. Teeth
3. Tongue

For the intestine:

1. Liver
2. Pancreas
3. Gallbladder

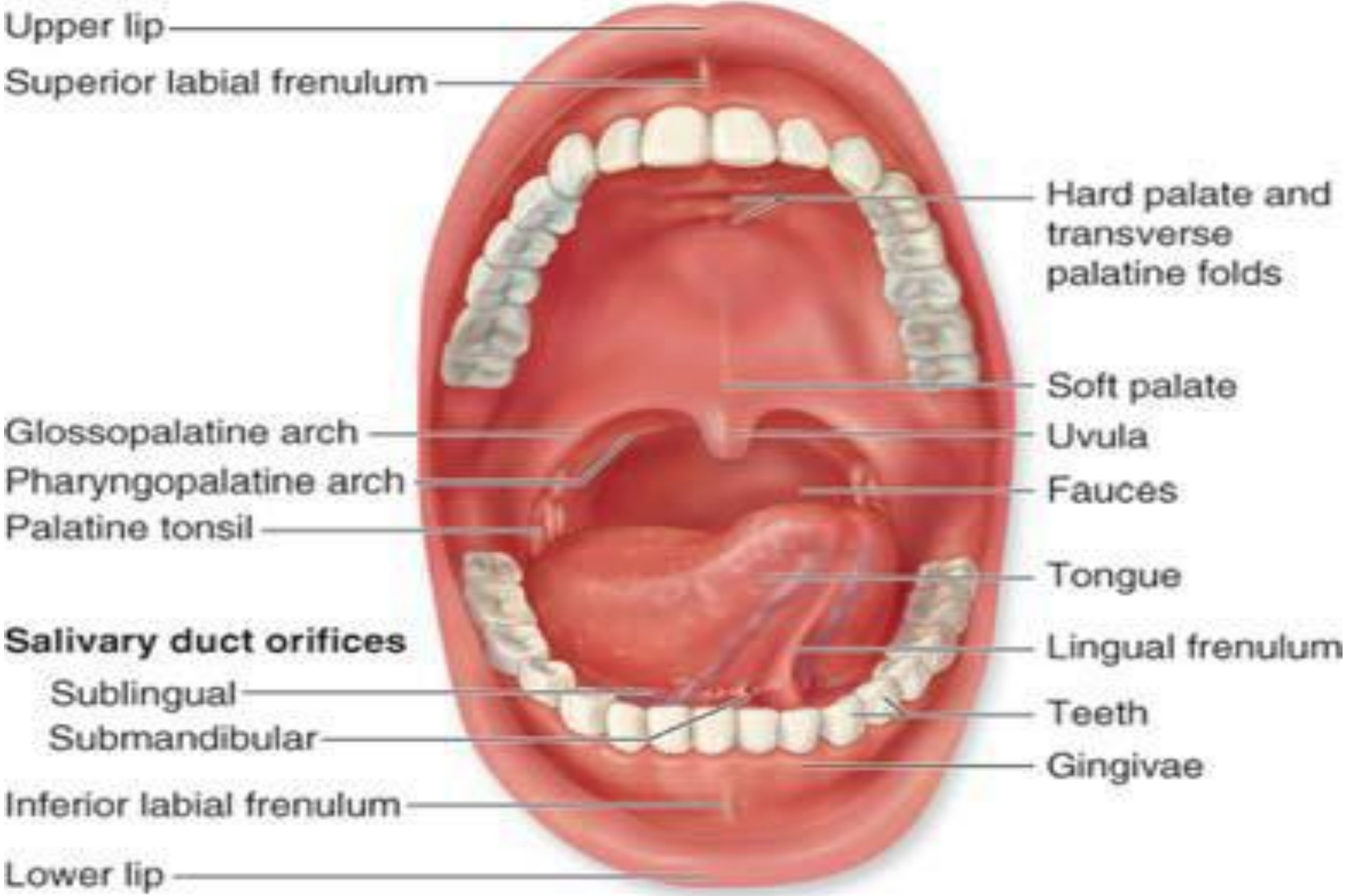
Mouth cavity:

Consists of 2 parts:

1. Vestibule (between teeth and inner surface of check and lips).

2. Mouth cavity proper (located between teeth and pharynx posteriorly).

- It is the entrance of the digestive system.
- Bounded anteriorly by the teeth and lips and posteriorly by the Oropharynx.
- Superior boundary is formed by the hard and soft palates.
- Floor, or inferior surface, contains the tongue as well as the mylohyoid muscle covered with mucosa.



(a)

Palate

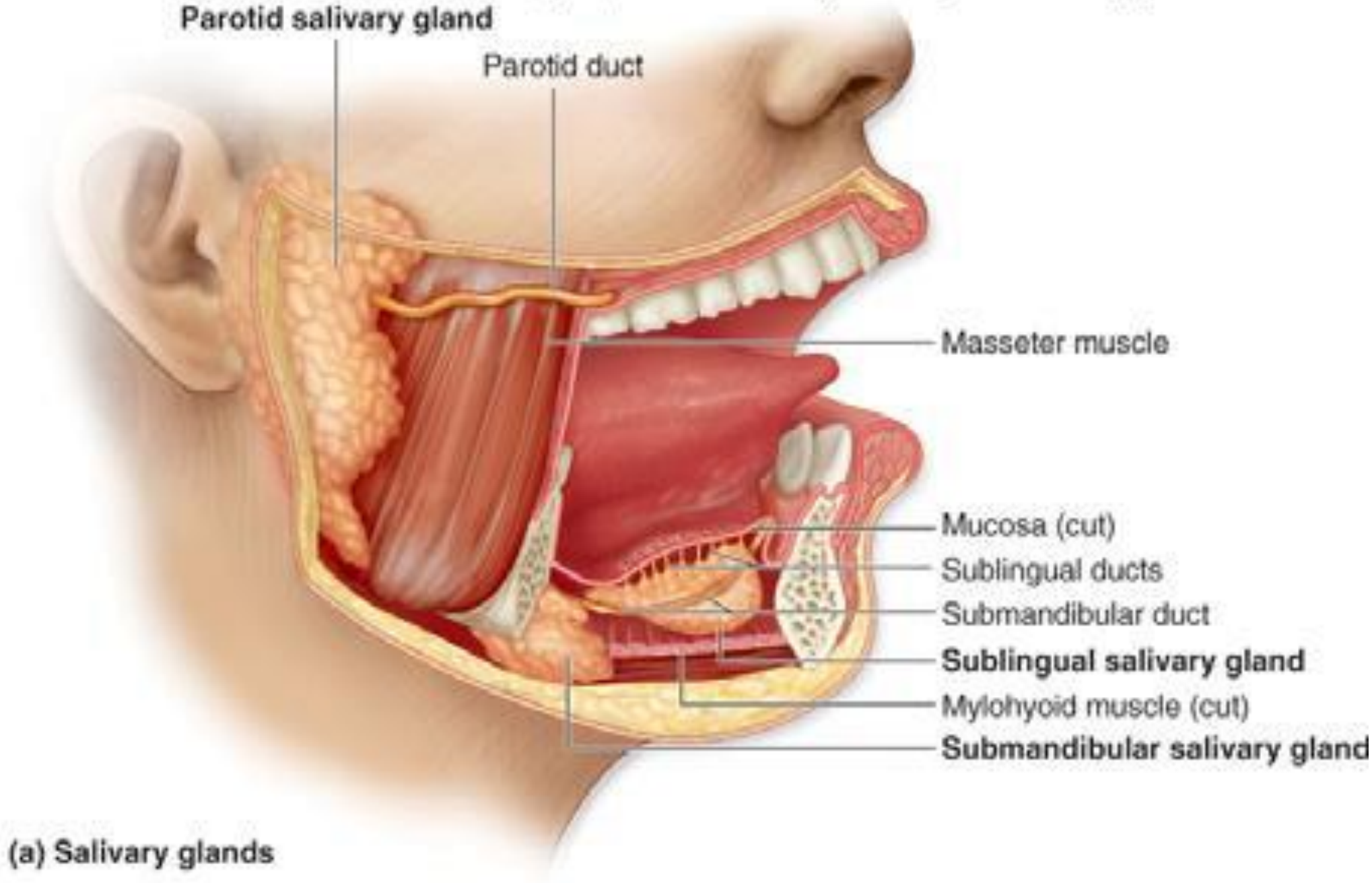
- Anterior two-thirds of the palate is hard and bony (called the **hard palate**).
- Posterior one-third is soft and muscular (called the **soft palate**).
- ✓ Extending inferiorly from posterior part of the soft palate is the **uvula**.
- ✓ When swallowing, the soft palate and the uvula elevate to close off the opening of the nasopharynx.

Tongue:

- An accessory digestive organ.
- It is muscular organ consist of voluntary muscles covered by mucus membrane
- It has 2 surfaces superior and inferior

Function:

1. Aid in Chewing
2. swallowing
3. speech
4. Tasting.



(a) Salivary glands

Teeth:

- It is a bony part grow on both jaw.
- It appears in to 2 stages:

1. 1st stage temporary teeth: start in 6^{th} months and complete in 2 years old
2. 2nd stage permanent teeth: start in 2 years and complete in 21 years old.

Salivary gland:

- It is considered accessory of the mouth.
- It secrete saliva which has important role in the digestion.
- These glands located around mouth cavity and their duct open in it.

Types of the salivary glands:

1. Parotid
2. Submandibular
3. Sublingual.

The Parotid Glands

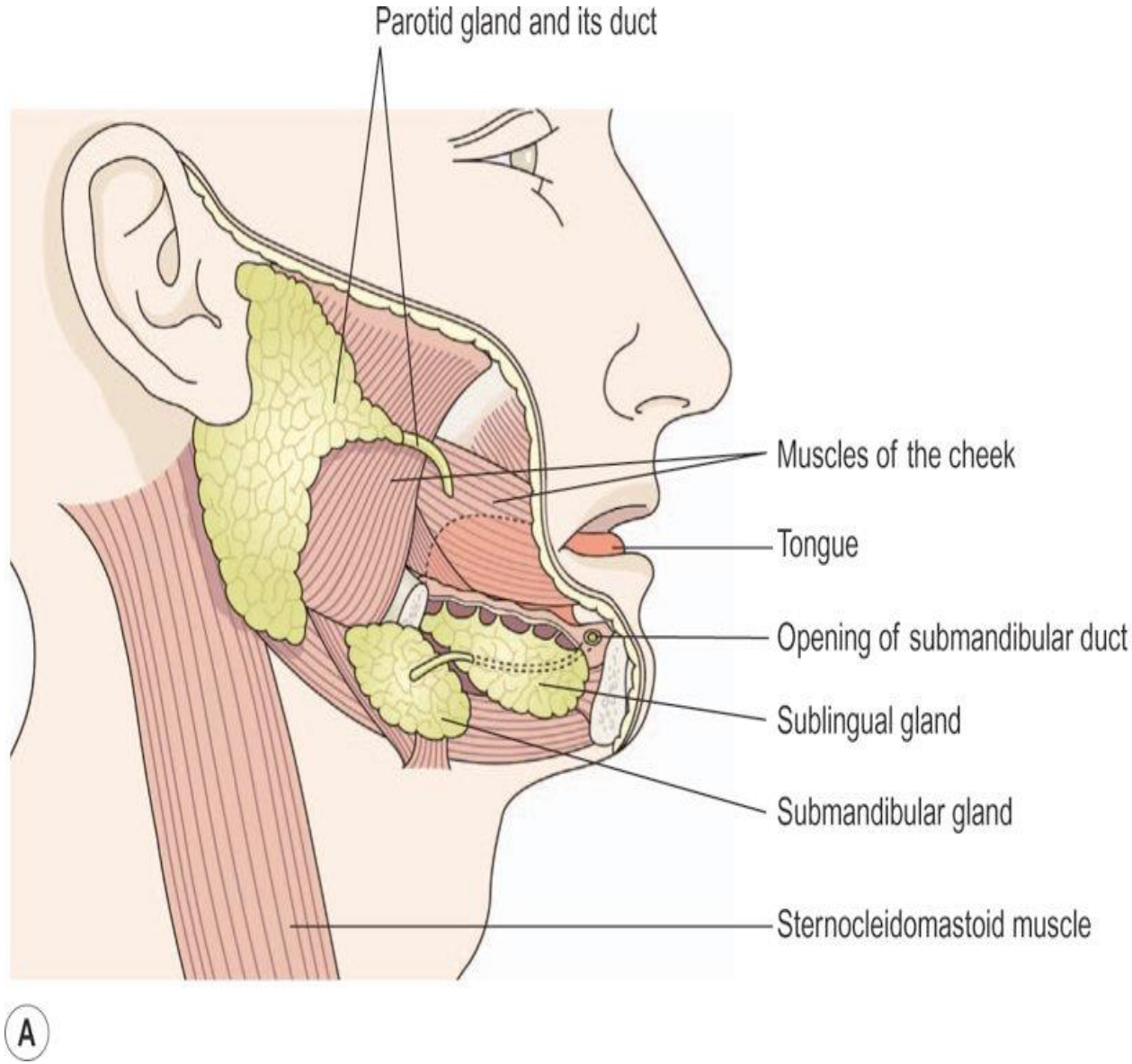
- Largest salivary glands.
- Each parotid gland is located anterior and inferior to the ear.

The Submandibular Glands

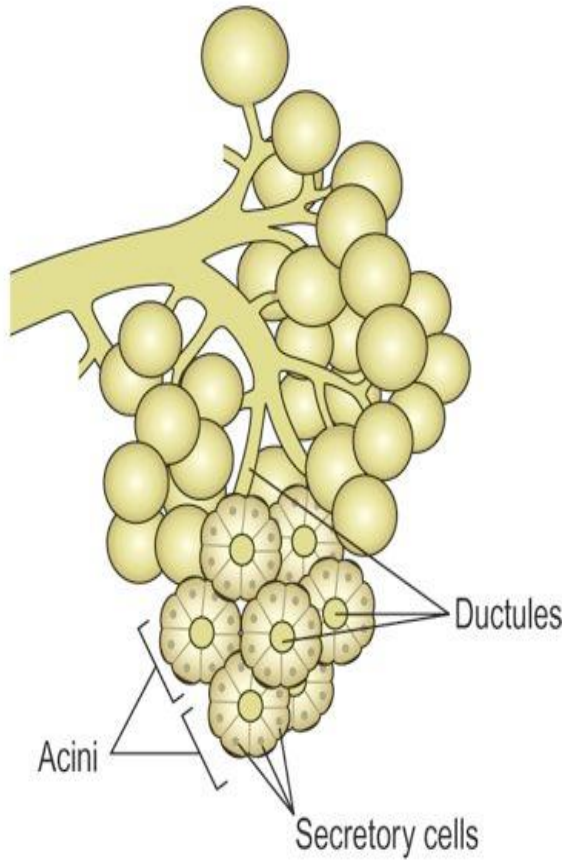
- Inferior to the body of the mandible.
- A duct opens from each gland in the floor of the mouth .

The Sublingual Glands

- Inferior to the tongue and internal to the oral cavity mucosa.
- open onto the inferior surface of the oral cavity, posterior to the submandibular duct papilla.


Parotid gland and its duct
Muscles of the cheek
Tongue
Opening of submandibular duct
Sublingual gland
Submandibular gland
Sternocleidomastoid muscle

A


Ductules
Acini
Secretory cells

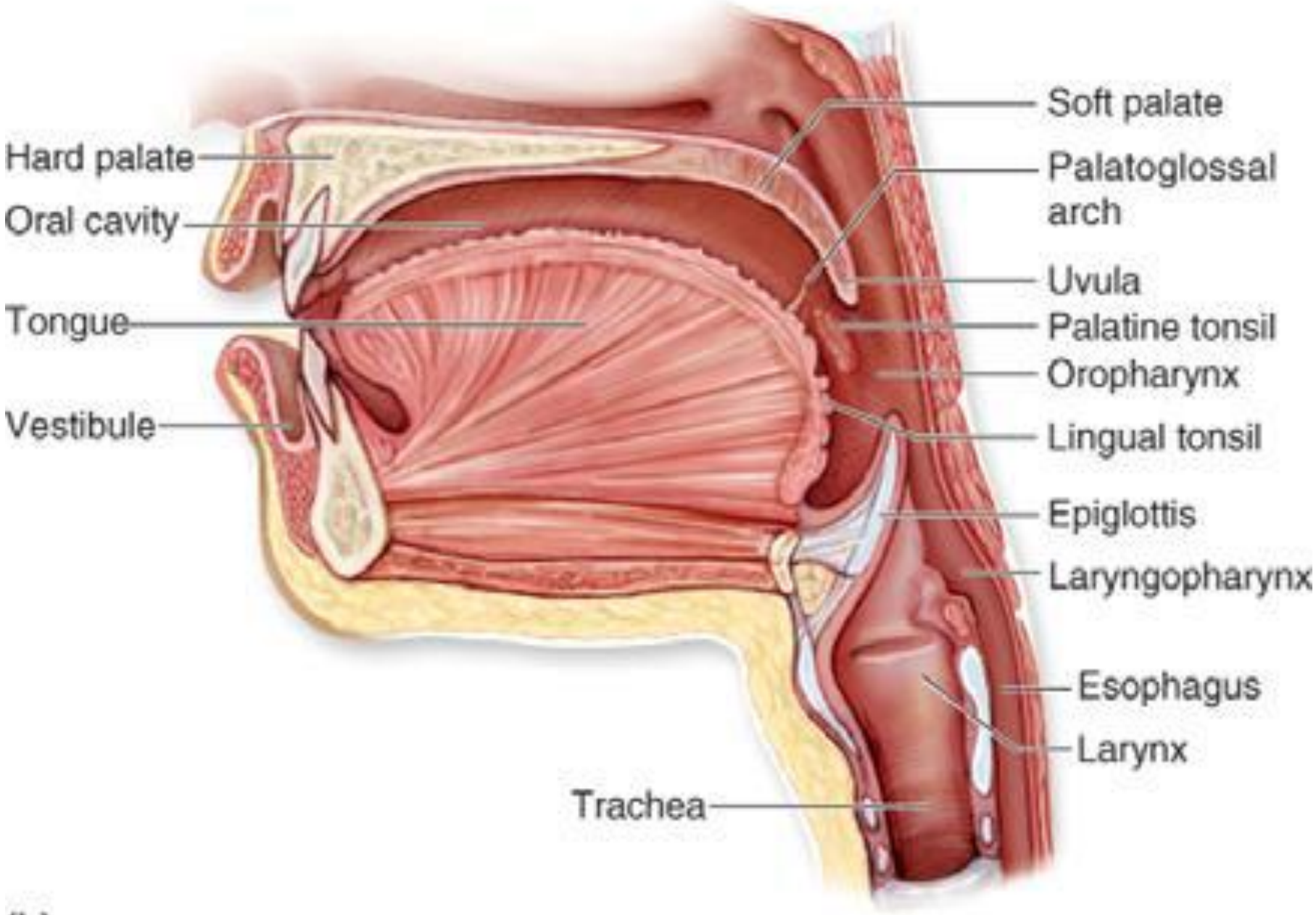
B

Pharynx:

- It is a muscular tube located posterior to the nose ,mouth , larynx.
- The length is **13** cm.
- Continue with beginning of esophagus.

For anatomical purpose it is divided into 3 parts:

1. **Nasopharynx** (Eustachian tube).
2. **Oropharynx** (tonsil).
3. **Laryngopharynx.**



(b)

Esophagus:

- ✓ It is muscular tube
- ✓ lined by mucus membrane .
- ✓ It extends from end of pharynx to cardiac orifice of stomach
- ✓ The length is 25 cm.
- ✓ It is the narrowest region of alimentary tract except vermiform appendix.
- ✓ Posterior to the trachea .
- ✓ Anterior to the vertebral column

It has 2 Sphincters

1. **Upper Esophageal Sphincter**: between pharynx & oesophagus.

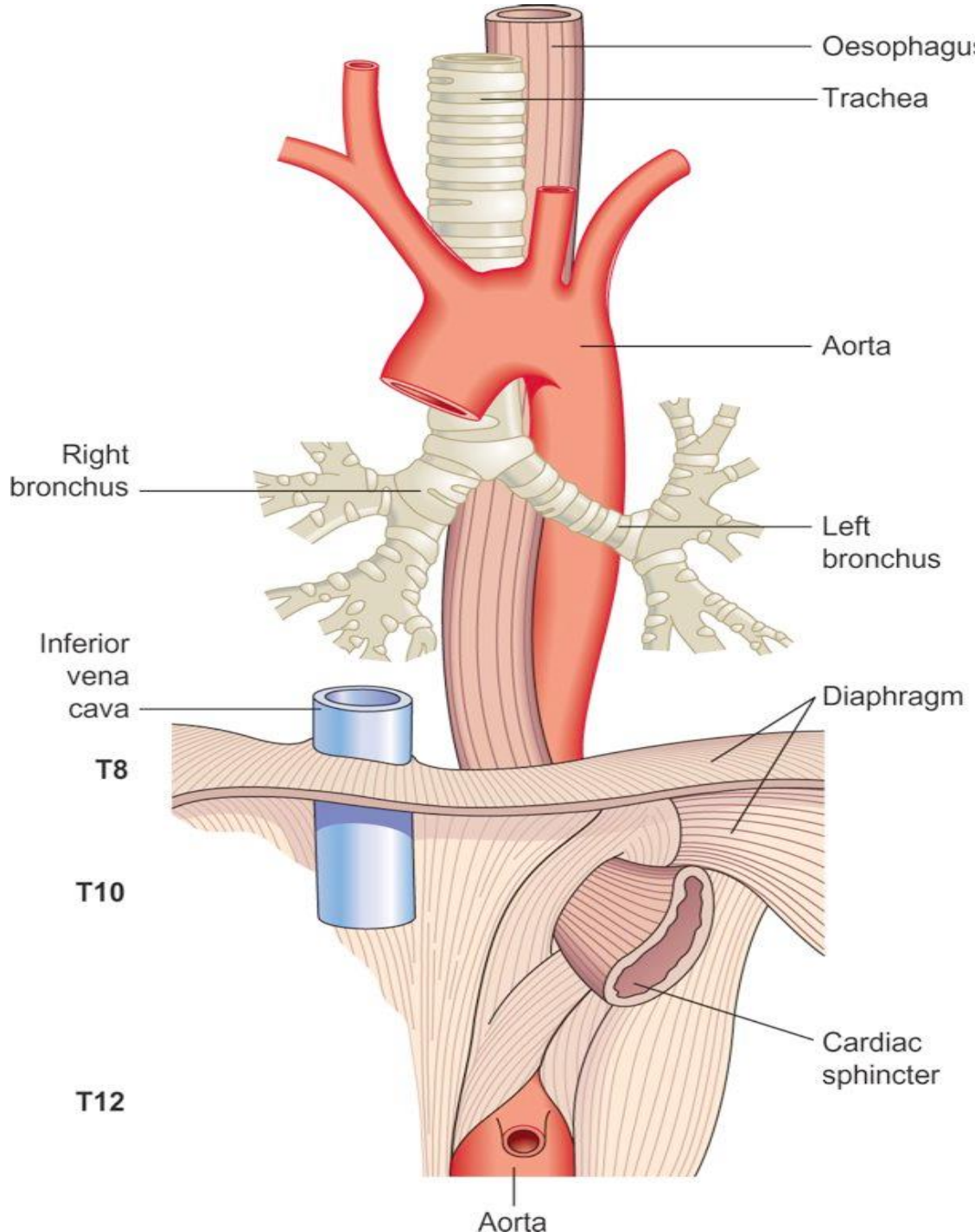
2. **Lower Esophageal Sphincter**: between the esophagus and stomach

It consist of 3 parts:

1. Cervical part

2. Thoracic part

3. Abdominal part.


Oesophagus
Trachea
Aorta
Right bronchus
Left bronchus
Inferior vena cava
Diaphragm
T8
T10
T12
Cardiac sphincter
Aorta

Anatomy of the cardiovascular

7nth lecture

The cardiovascular (cardio – heart, vascular – blood vessels) system is divided for descriptive purposes into two main parts:

1. The heart

2. The blood vessels

The heart pumps blood into two anatomically separate systems of blood vessels.

1. The pulmonary circulation

2. The systemic circulation.

Blood vessels

Blood vessels vary in structure, size and function, and there are several types: arteries, arterioles, capillaries, venules and veins.

Arteries and arterioles

These are the blood vessels that transport blood away from the heart.

Veins and venules

Veins are blood vessels that return blood at low pressure to the heart.

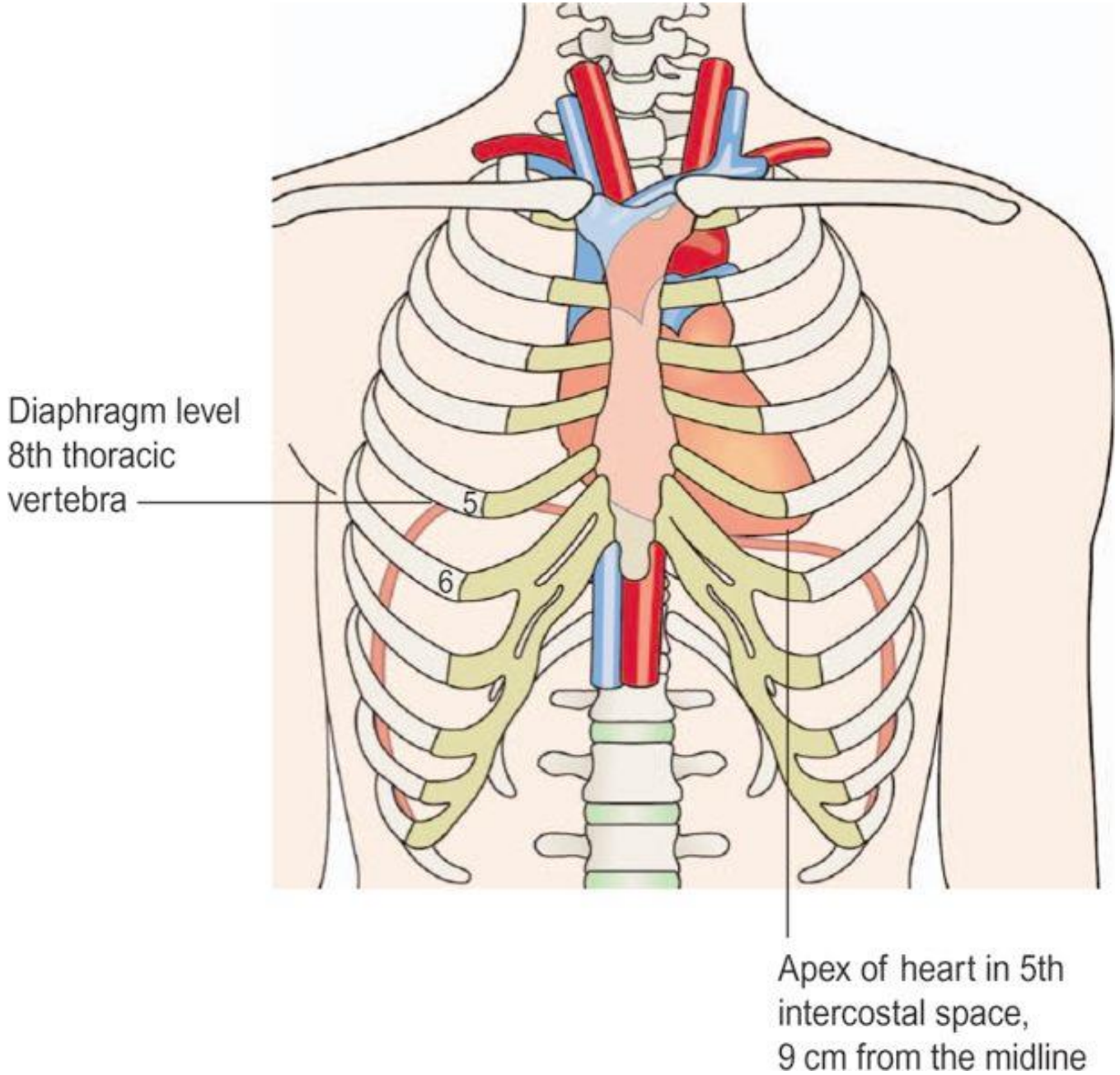
Heart

The heart is a roughly cone-shaped hollow muscular organ. It is about 10 cm long and is about the size of the owner's fist. It weighs about 225 g in women and is heavier in men (about 310 g).

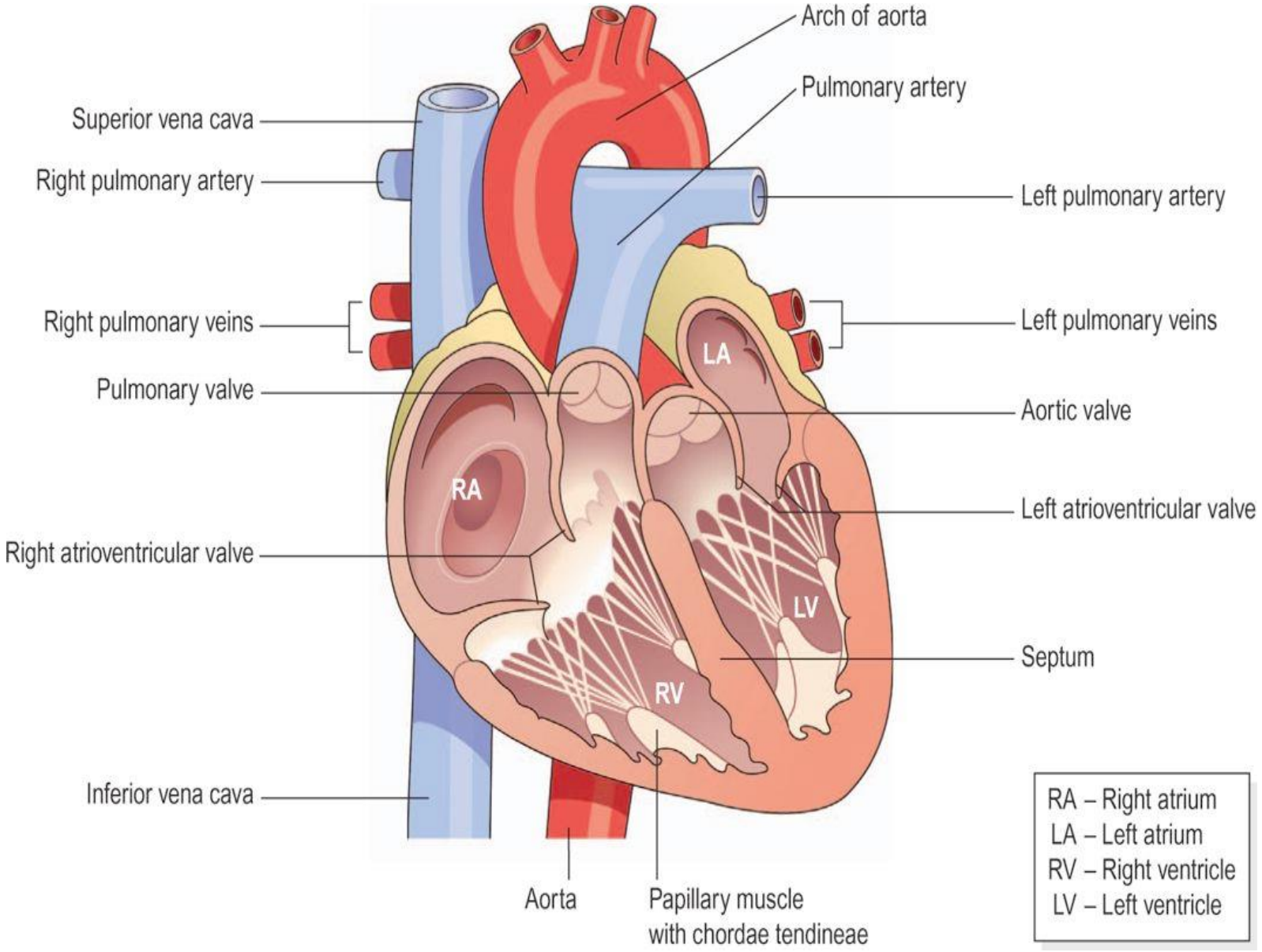
Position

The heart lies in the thoracic cavity in the mediastinum (the space between the lungs). It lies obliquely, a little more to the left than the right, and presents a base above, and an apex below.

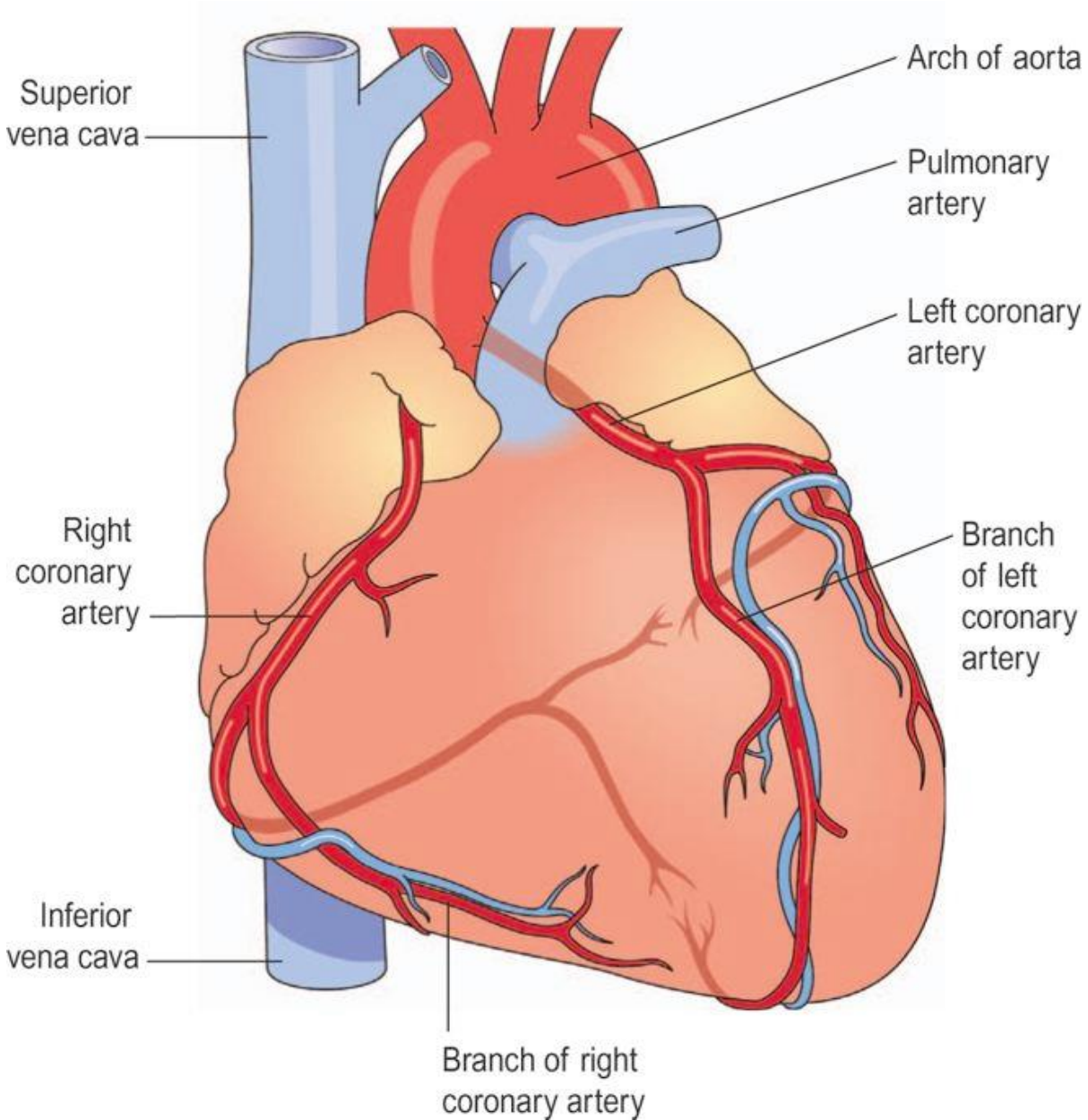
Position of the heart in the thorax



Interior of the heart



The coronary arteries

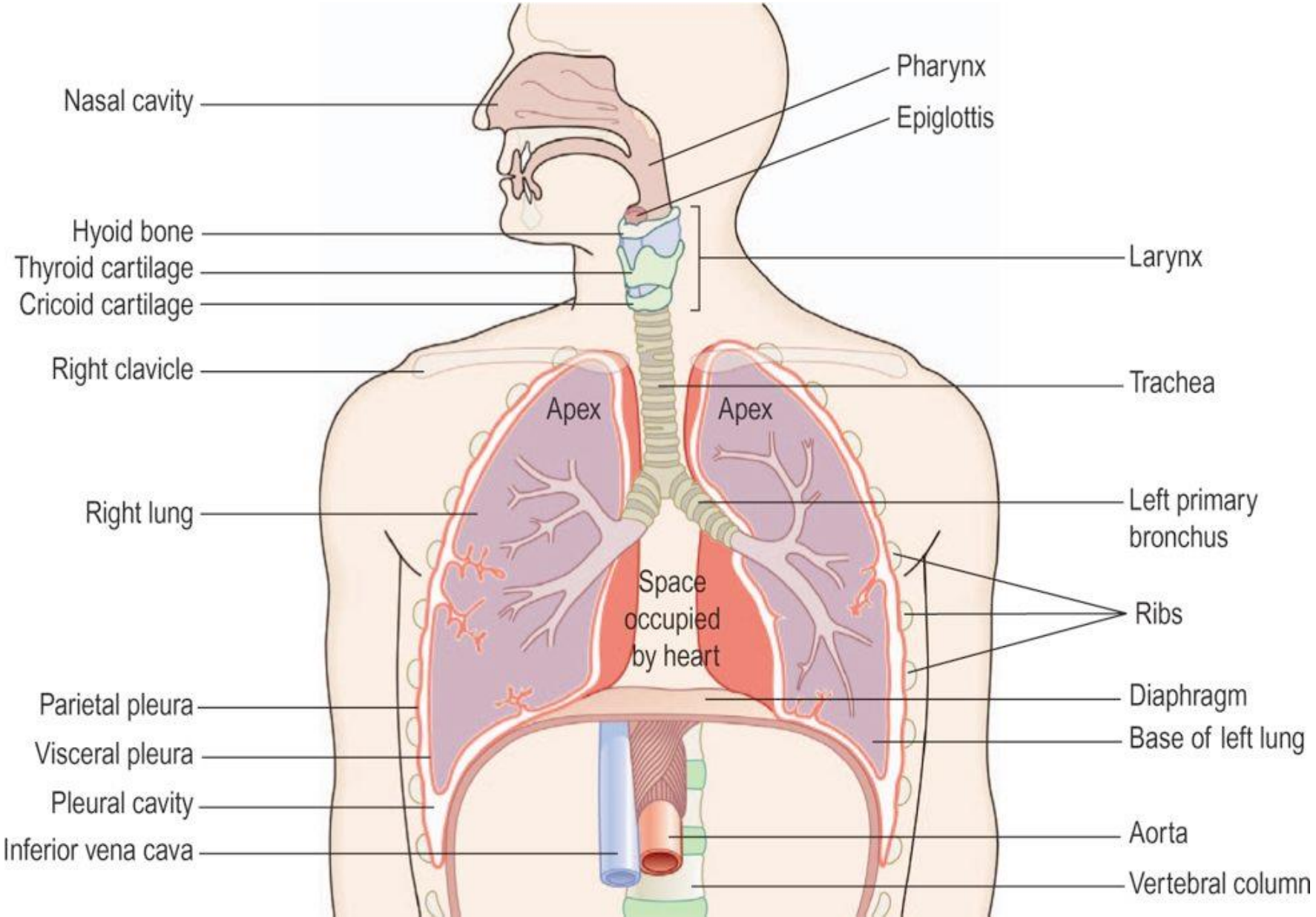


Anatomy of the respiratory system

The organs of the respiratory system are:

1. nose
2. pharynx
3. larynx
4. trachea
5. two bronchi (one bronchus to each lung)
6. bronchioles and smaller air passages
7. two lungs and their coverings, the pleura
8. muscles of breathing – the intercostal muscles and the diaphragm.

Structures associated with the respiratory system



Openings into the nasal cavity

The anterior nares, or nostrils, are the openings from the exterior into the nasal cavity. Nasal hairs are found here, coated in sticky mucus.

Pharynx

Position

The pharynx is a tube 12 to 14 cm long that extends from the base of the skull to the level of the 6th cervical vertebra.

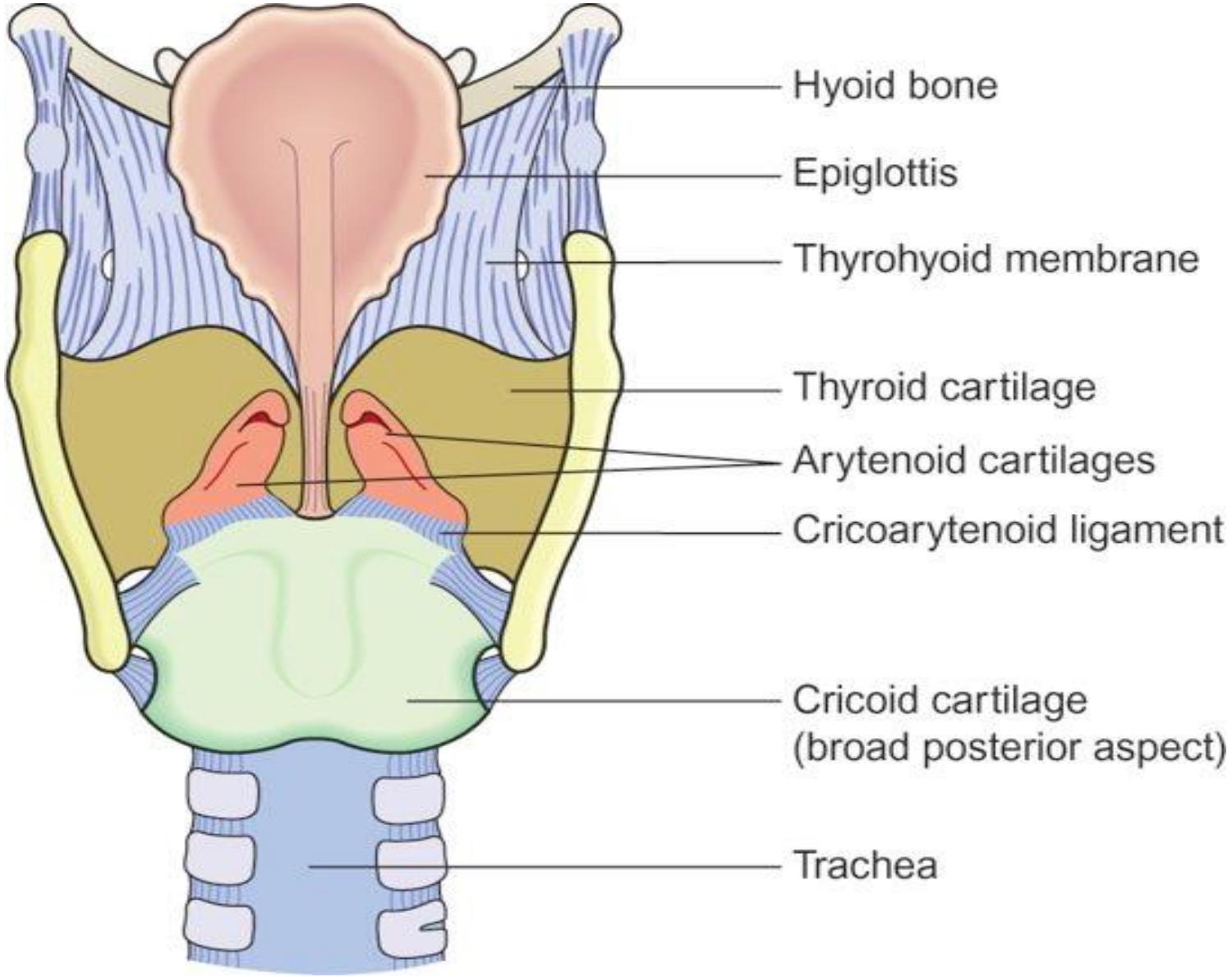
Larynx

Position

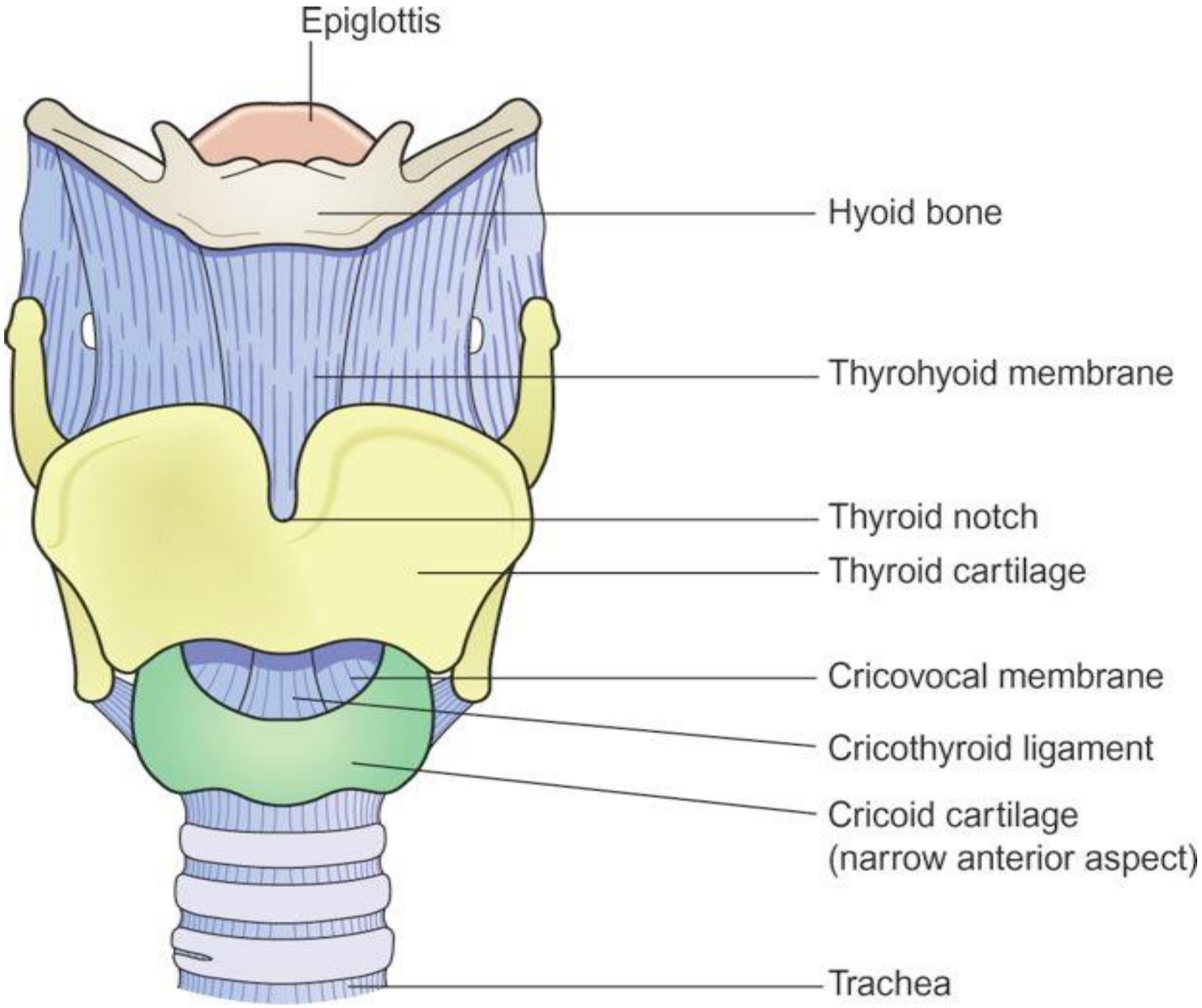
The larynx or ‘voice box’ links the laryngopharynx and the trachea.

It lies at the level of the 3rd, 4th, 5th and 6th cervical vertebrae.

Larynx – viewed from behind



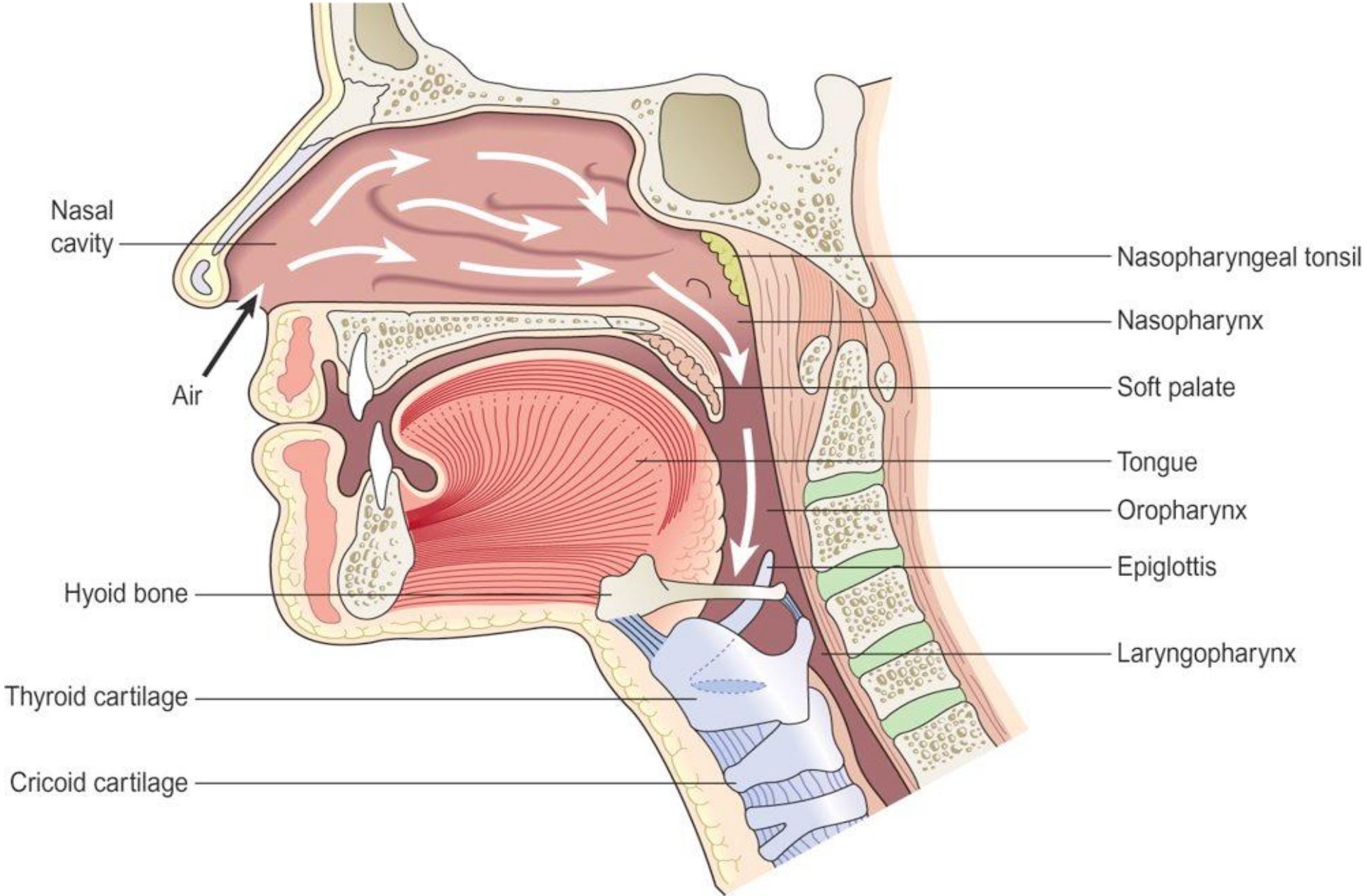
Larynx – viewed from the front



The epiglottis

This is a leaf-shaped fibroelastic cartilage it closes off the larynx during swallowing, protecting the lungs from accidental inhalation of foreign objects.

Epiglottis


Nasal cavity
Air
Hyoid bone
Thyroid cartilage
Cricoid cartilage
Nasopharyngeal tonsil
Nasopharynx
Soft palate
Tongue
Oropharynx
Epiglottis
Laryngopharynx

Trachea

Position

The trachea or windpipe is a continuation of the larynx and extends downwards to about the level of the 5th thoracic vertebra where it divides at the carina into the right and left primary bronchi, one bronchus going to each lung.

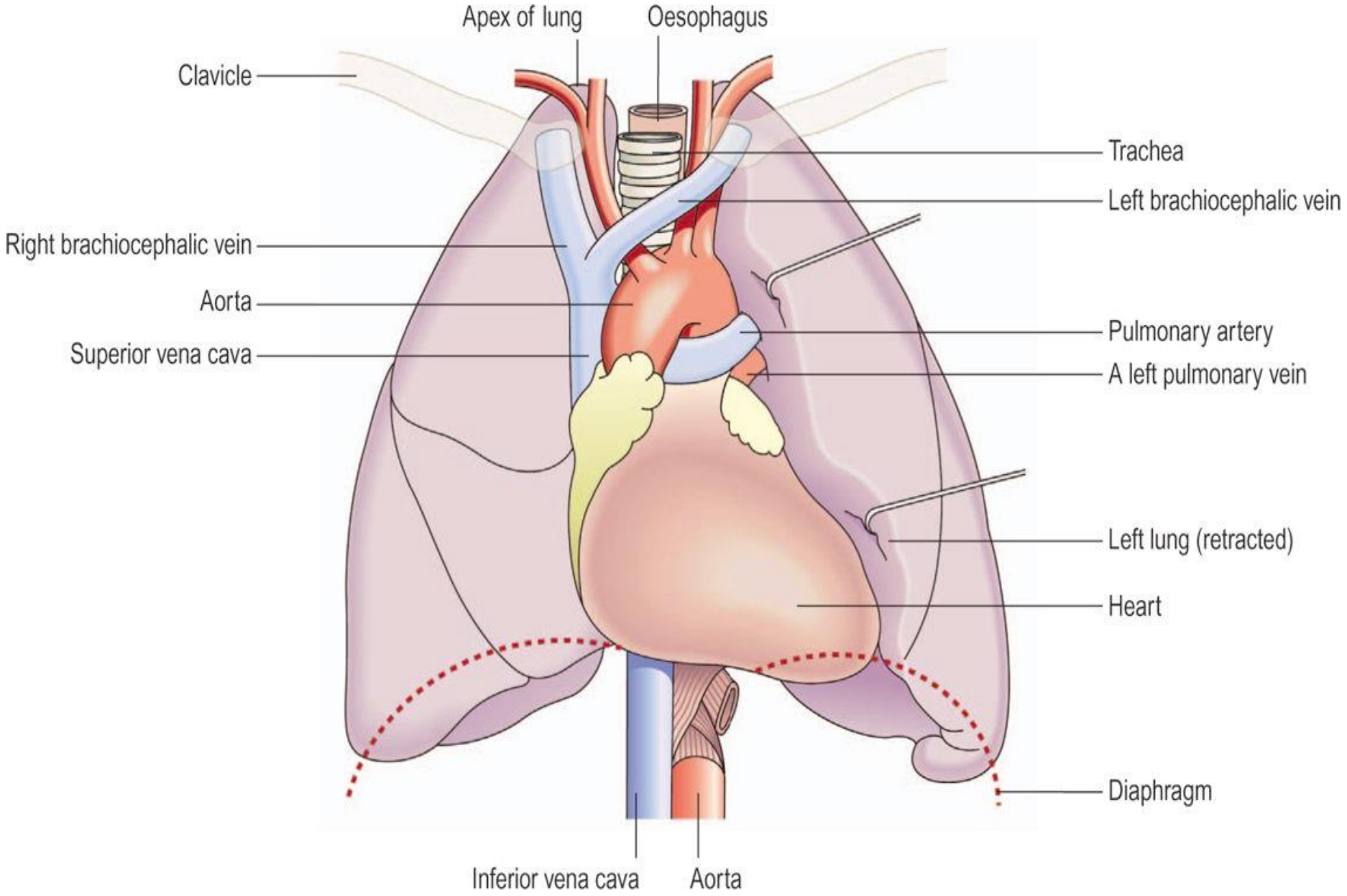
It is approximately 10 to 11 cm long and lies mainly in the median plane in front of the oesophagus.

Lungs

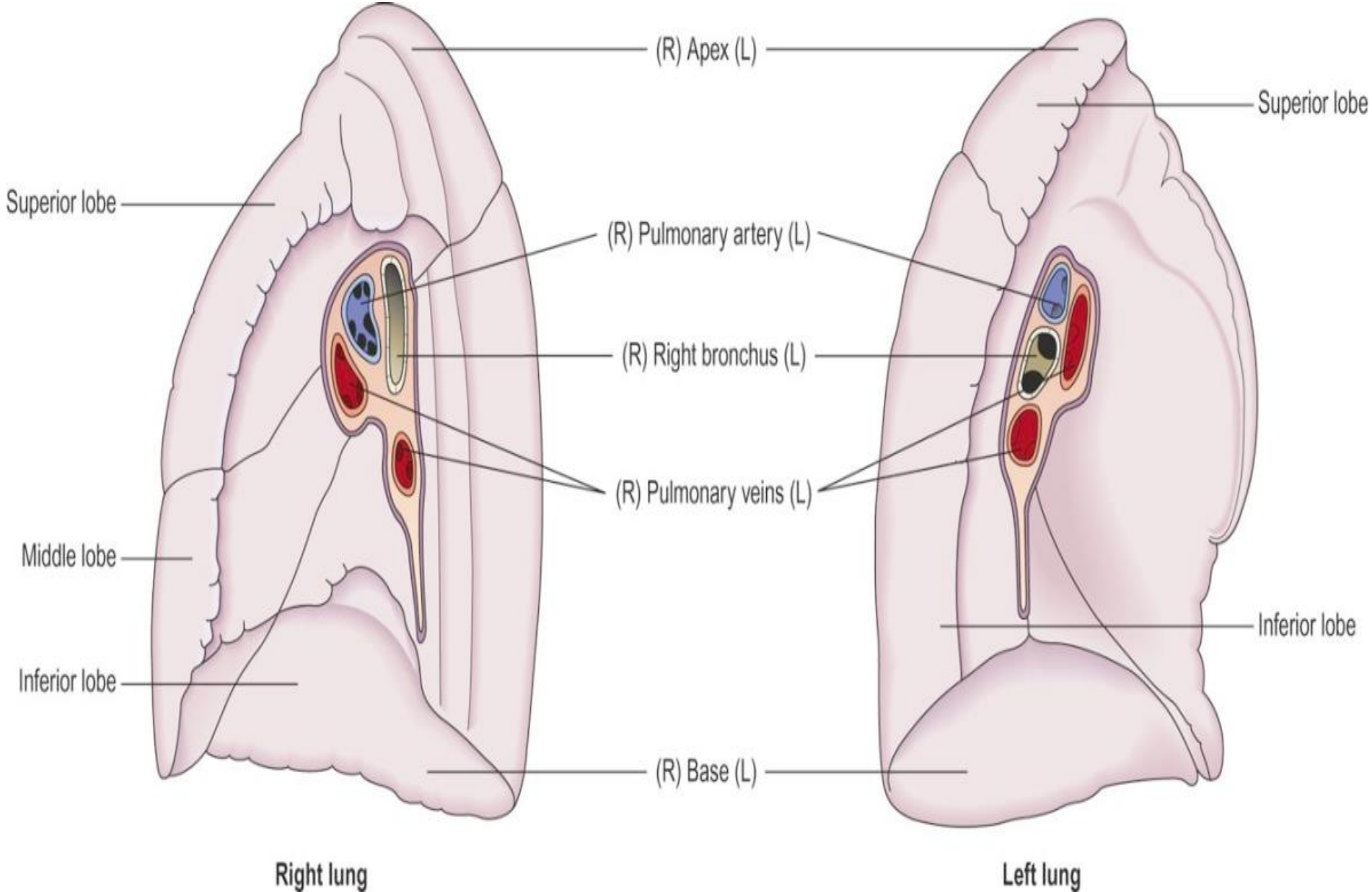
Position and gross structure

There are two lungs, one lying on each side of the midline in the thoracic cavity. They are cone-shaped and have an apex, a base, a tip, costal surface and medial surface.

Organs associated with the lungs



The lobes of the lungs and vessels/airways of each hilum – medial views



Anatomy of the urinary system

The urinary system is the main excretory system and consists of the following structures:

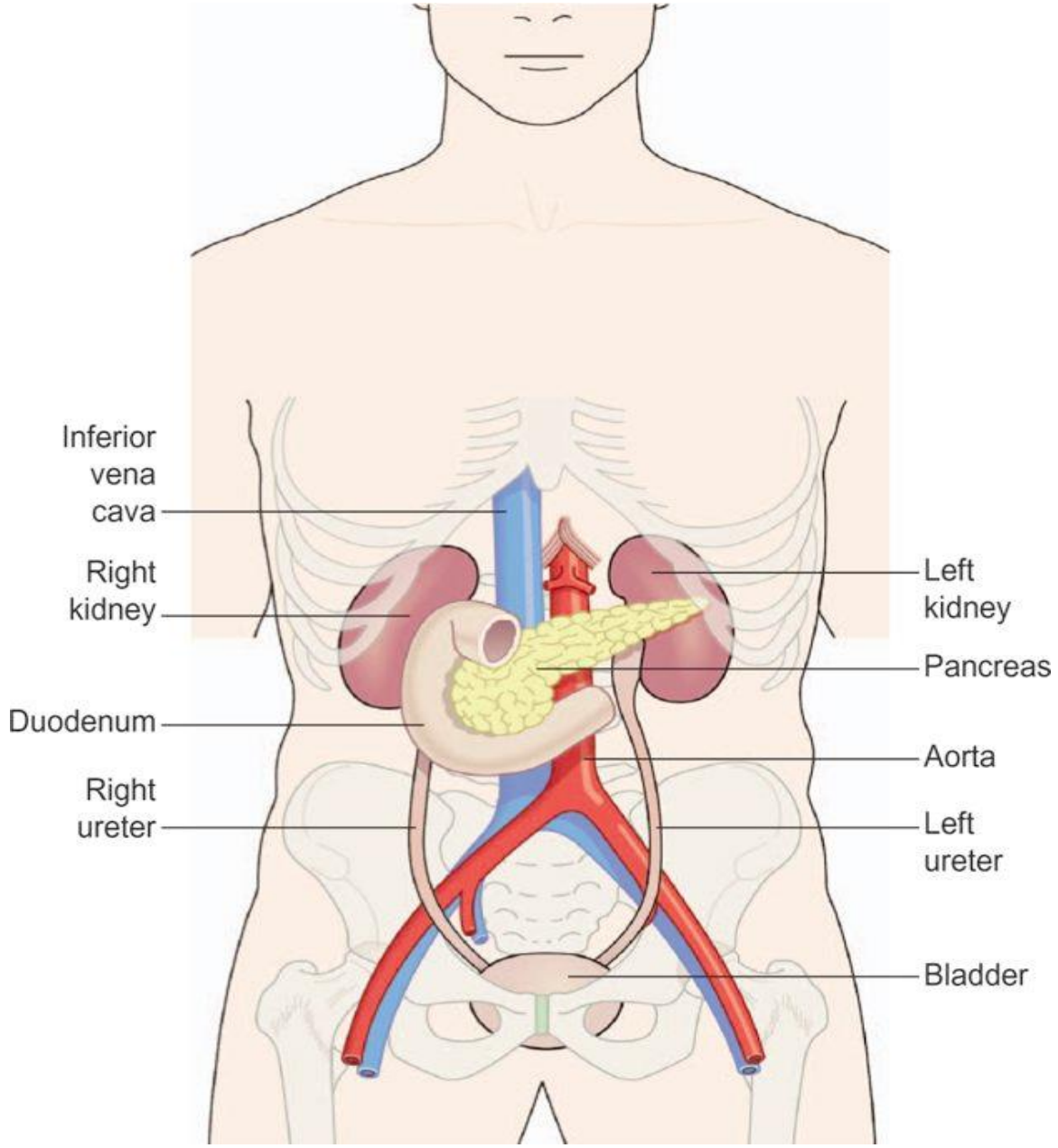
A. Two kidneys, which secrete urine

B. Two ureters, which convey the urine from the kidneys to the urinary bladder

C. The urinary bladder where urine collects and is temporarily stored

D. The urethra through which the urine passes from the urinary bladder to the exterior.

The parts of the urinary system (excluding the urethra) and some associated structures



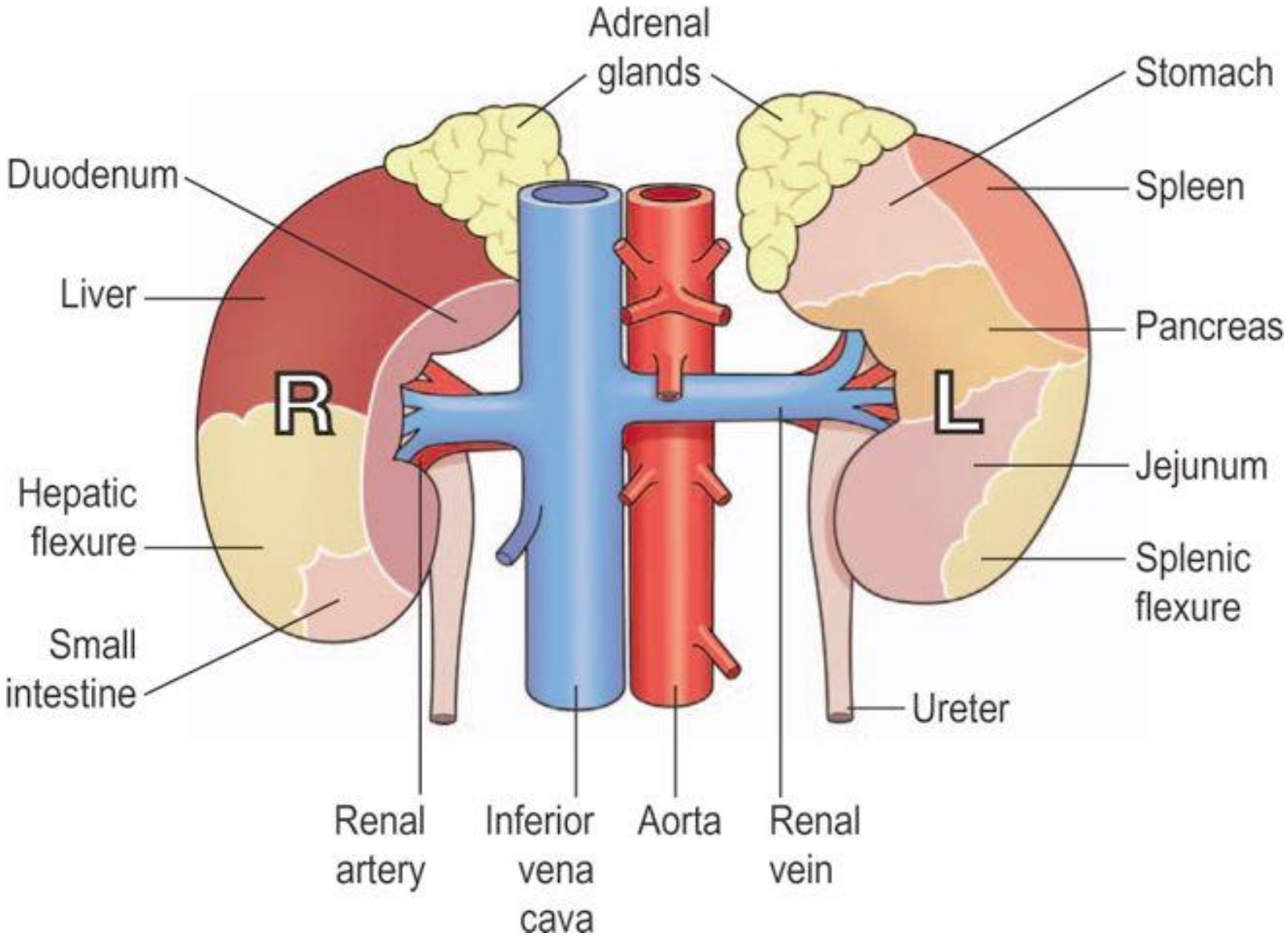
Kidneys

The kidneys lie on the posterior abdominal wall, one on each side of the vertebral column, behind the peritoneum and below the diaphragm.

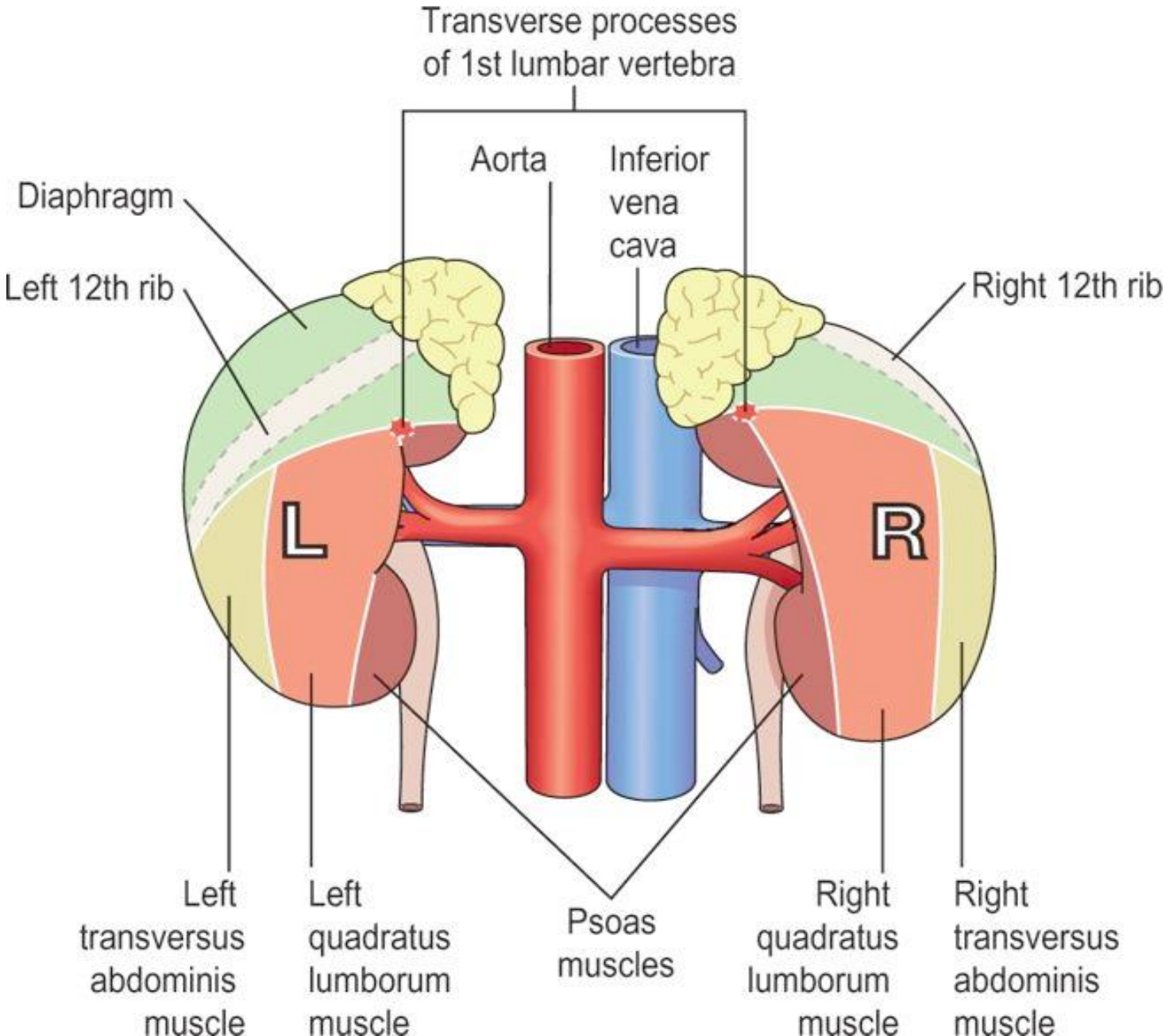
They extend from the level of the 12th thoracic vertebra to the 3rd lumbar vertebra.

Kidneys are bean-shaped organs, about 11 cm long, 6 cm wide, 3 cm thick and weigh 150 g.

Anterior view of the kidneys showing the areas of contact with associated structures



Posterior view of the kidneys showing the areas of contact with associated structures



Anatomy of the Nervous System

For descriptive purposes the parts of the nervous system are grouped as follows:

1-The central nervous system (CNS), consisting of the brain and the spinal cord

2-The peripheral nervous system (PNS) consisting of all the nerves outside the brain and spinal cord.

The PNS comprises paired cranial and sacral nerves — some of these are sensory (afferent), some are motor (efferent) and some mixed.

There are two functional parts within the PNS:

1. The sensory division
2. The motor division

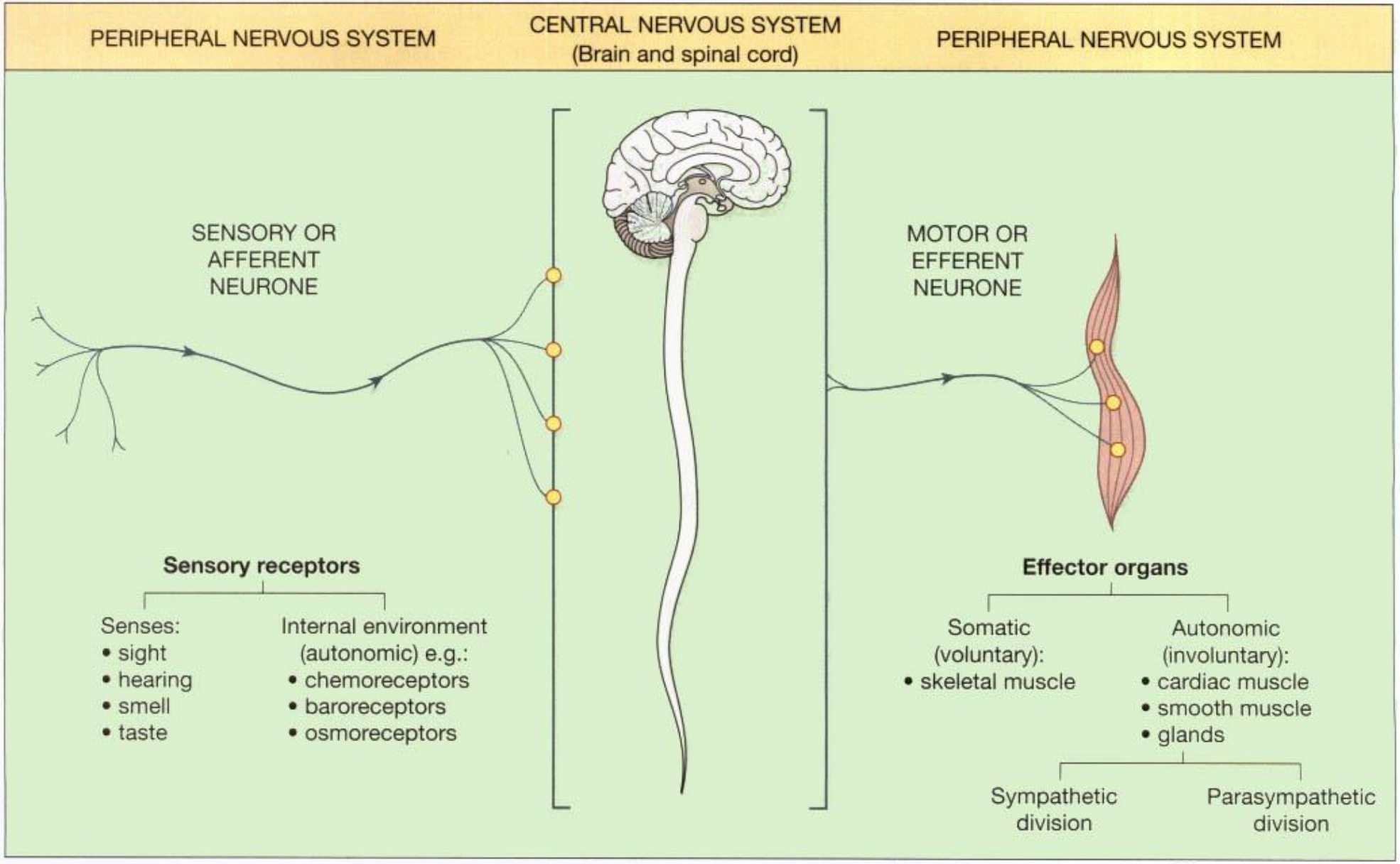
The motor division is involved in activities that are:

1-Voluntary —the somatic nervous system (movement of voluntary muscles)

2-Involuntary — the autonomic nervous system (functioning of smooth and cardiac muscle and glands).

The autonomic nervous system has two parts: sympathetic and parasympathetic.

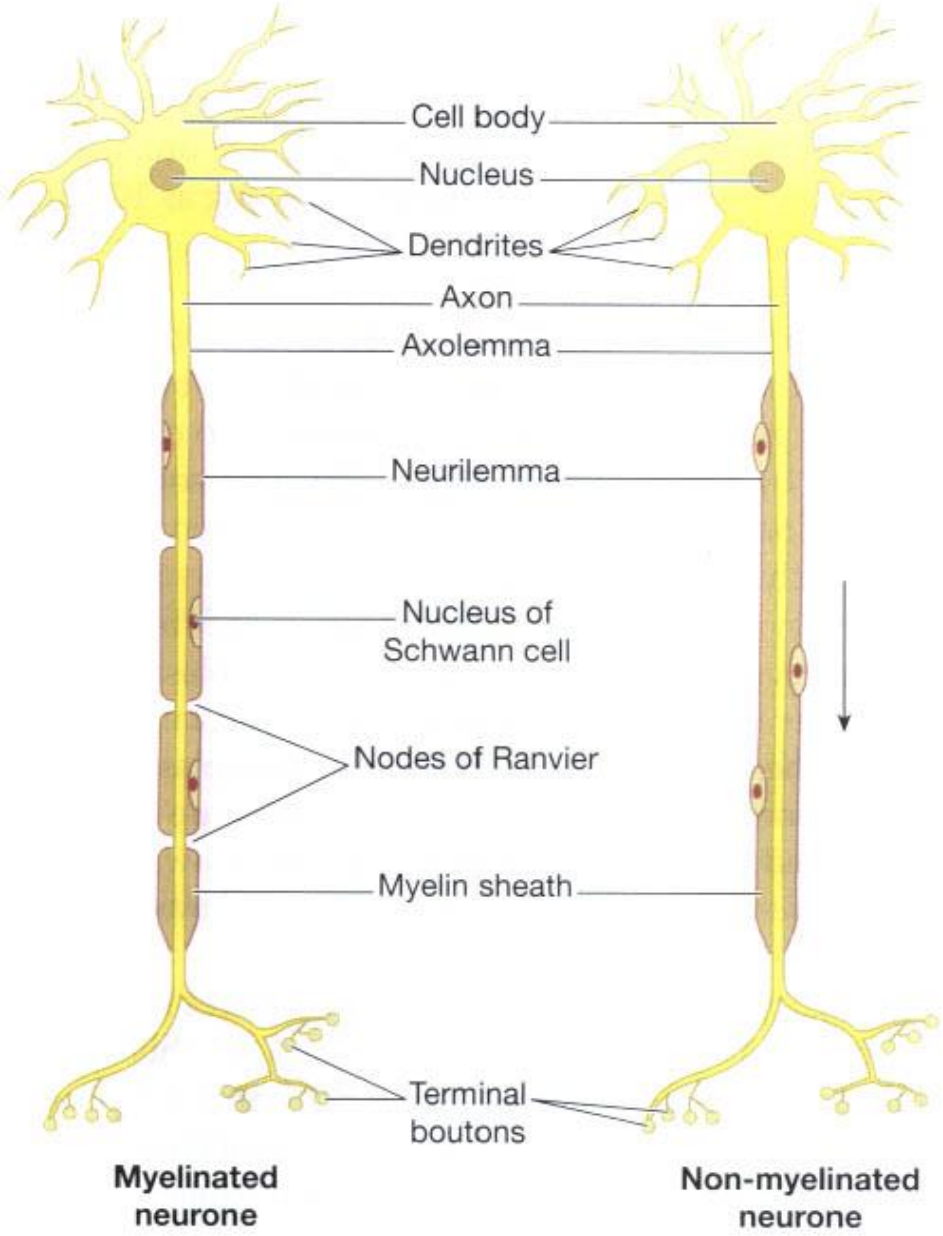
Functional components of the nervous system.



The nervous system consists of a vast number of cells called neurones supported by a special type of connective tissue, neuroglia.

Each neurone consists of a cell body and its processes, one axon and many dendrites.

The structure of neurones. (Arrow indicates direction of impulse conduction.)



Neurones are commonly referred to simply as nerve cells. Bundles of axons bound together are called nerves.

Neurones cannot divide and for survival they need a continuous supply of oxygen and glucose.

Unlike many other cells, neurones can synthesise chemical energy (ATP) only from glucose.

Properties of neurones

Neurones have the characteristics of irritability and conductivity.

Irritability is the ability to initiate nerve impulses in response to stimuli from:

1-Outside the body, e.g. touch, light waves

2-Inside the body, e.g. a change in the concentration of carbon dioxide in the blood alters respiration; a thought may result in voluntary movement.

Central nervous system

The central nervous system consists of the:

1. Brain
2. Spinal cord.

Membranes covering the brain and spinal cord (the meninges)

The brain and spinal cord are completely surrounded by three membranes, the meninges, lying between the skull and the brain and between the vertebrae and the spinal cord.

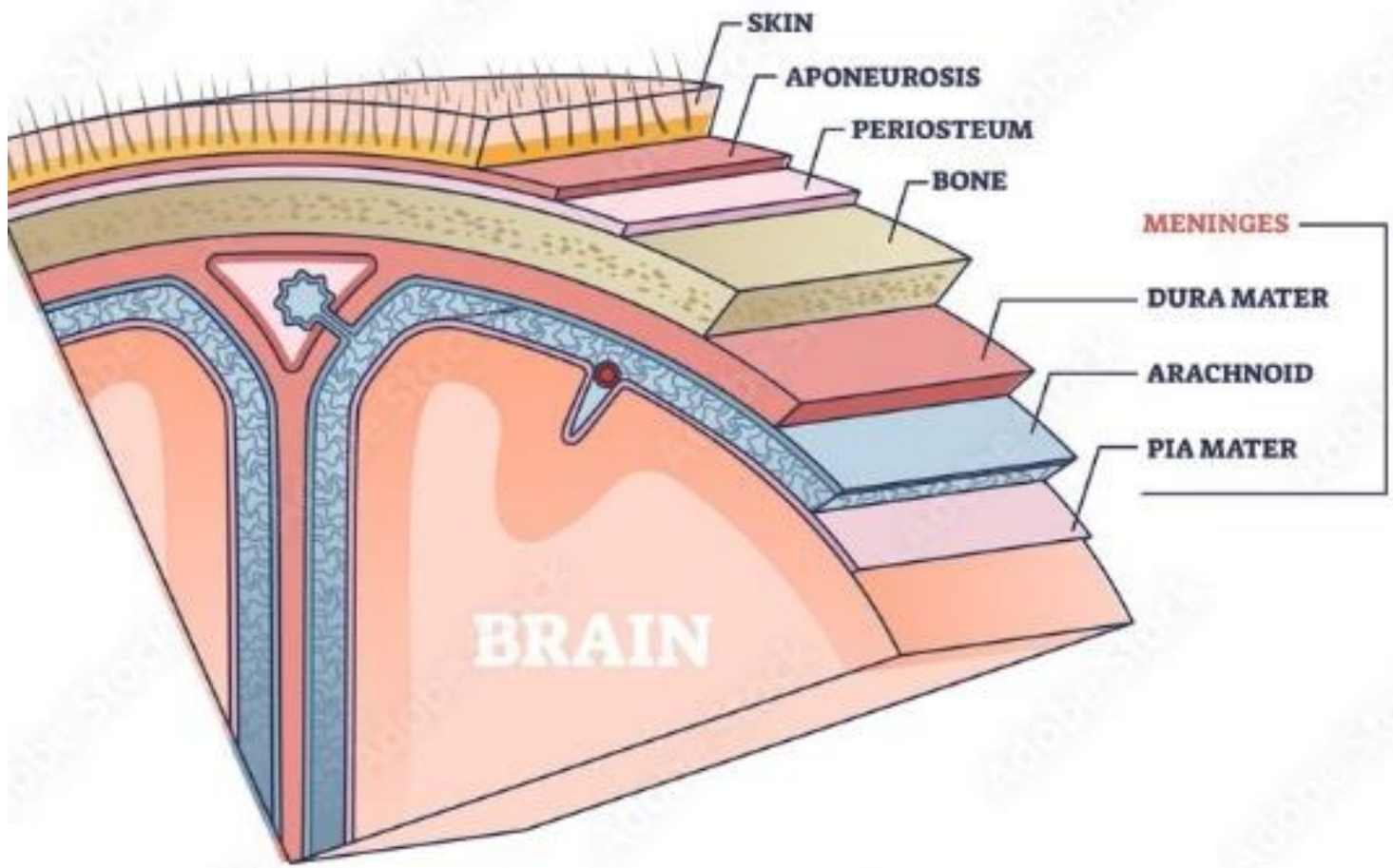
Named from outside inwards they are:

1. Dura mater
2. Arachnoid mater
3. Pia mater

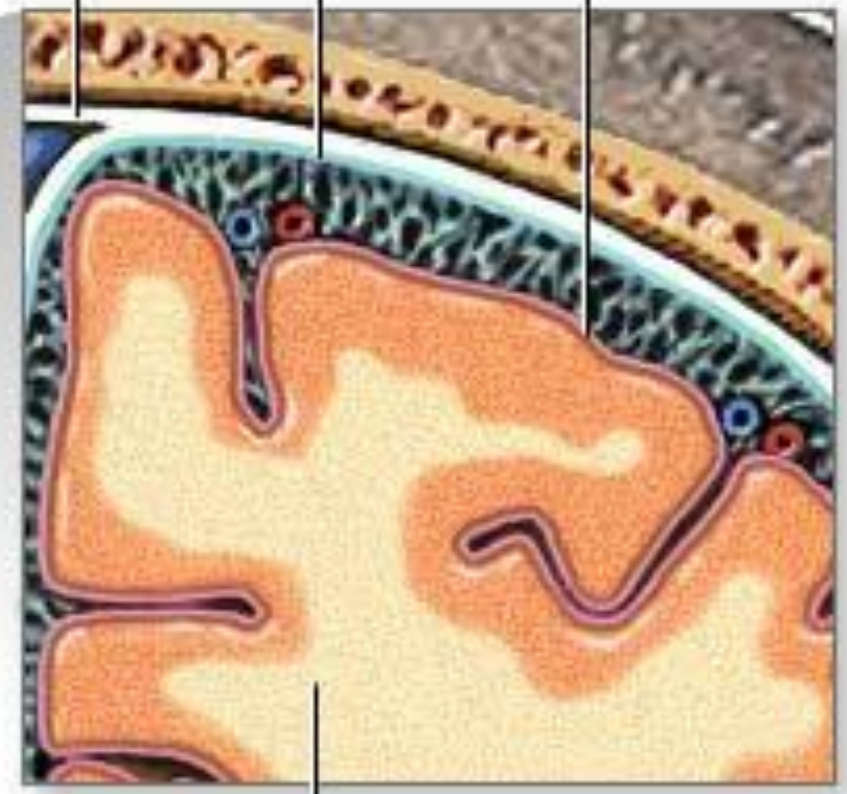
The dura and arachnoid maters are separated by a potential space, the subdural space.

The arachnoid and pia maters are separated by the subarachnoid space, containing cerebrospinal fluid.

MENINGES


SKIN
APONEUROSIS
PERIOSTEUM
BONE
MENINGES
DURA MATER
ARACHNOID
PIA MATER
BRAIN

The meninges are the membranes covering the brain and spinal cord



BRAIN

The brain constitutes about one-fiftieth of the body weight and lies within the cranial cavity. The parts are:

1-Cerebrum

2-Midbrain

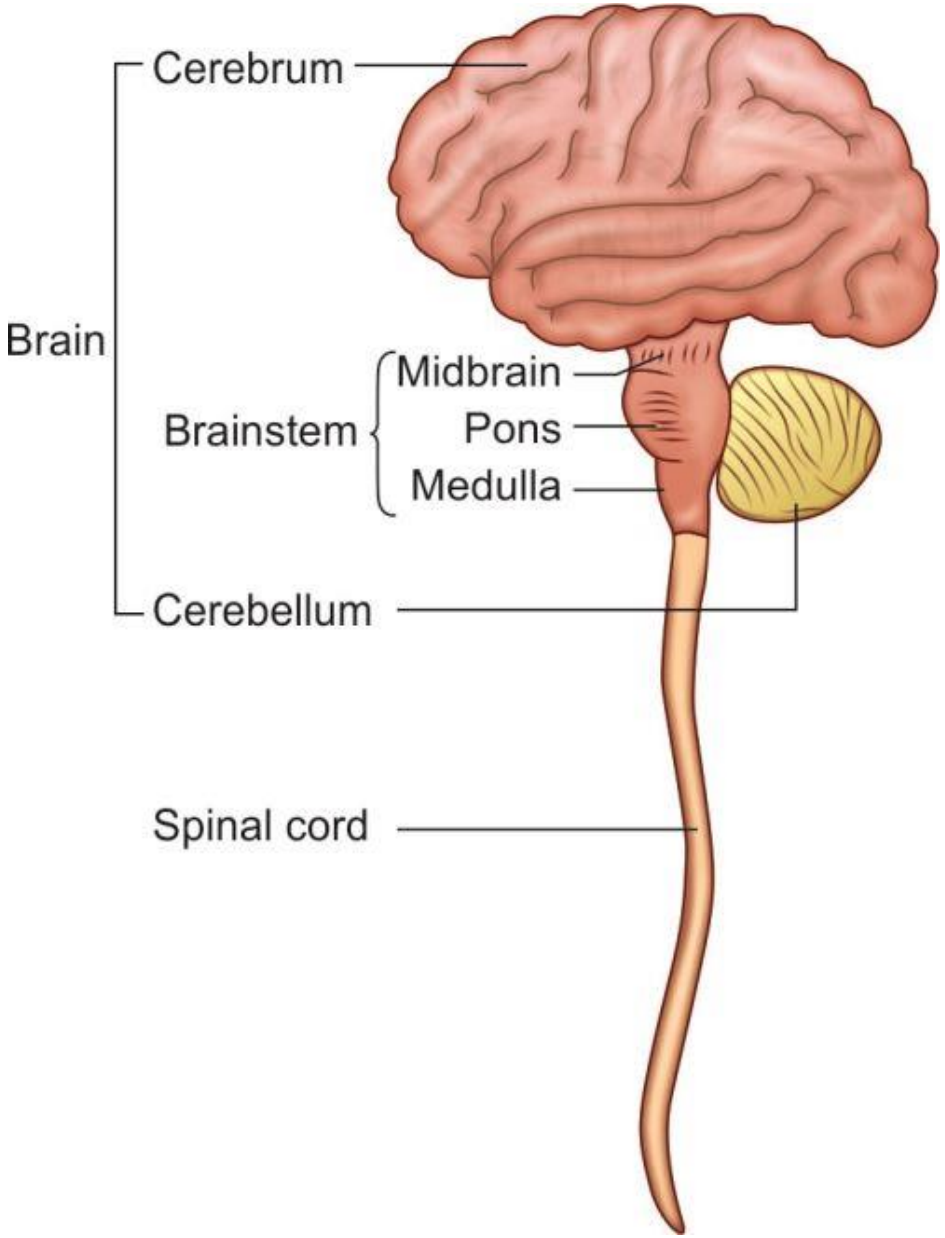
3-Pons

4-Medulla oblongata

The brain stem

5-Cerebellum.

Parts of the central nervous system



Anatomy of the cardiovascular and lymphatic system

8th lecture

The cardiovascular (cardio – heart, vascular – blood vessels) system is divided for descriptive purposes into two main parts:

1. The heart
2. The blood vessels

The heart pumps blood into two anatomically separate systems of blood vessels.

1. The pulmonary circulation
2. The systemic circulation.

Blood vessels

Blood vessels vary in structure, size and function, and there are several types: arteries, arterioles, capillaries, venules and veins.

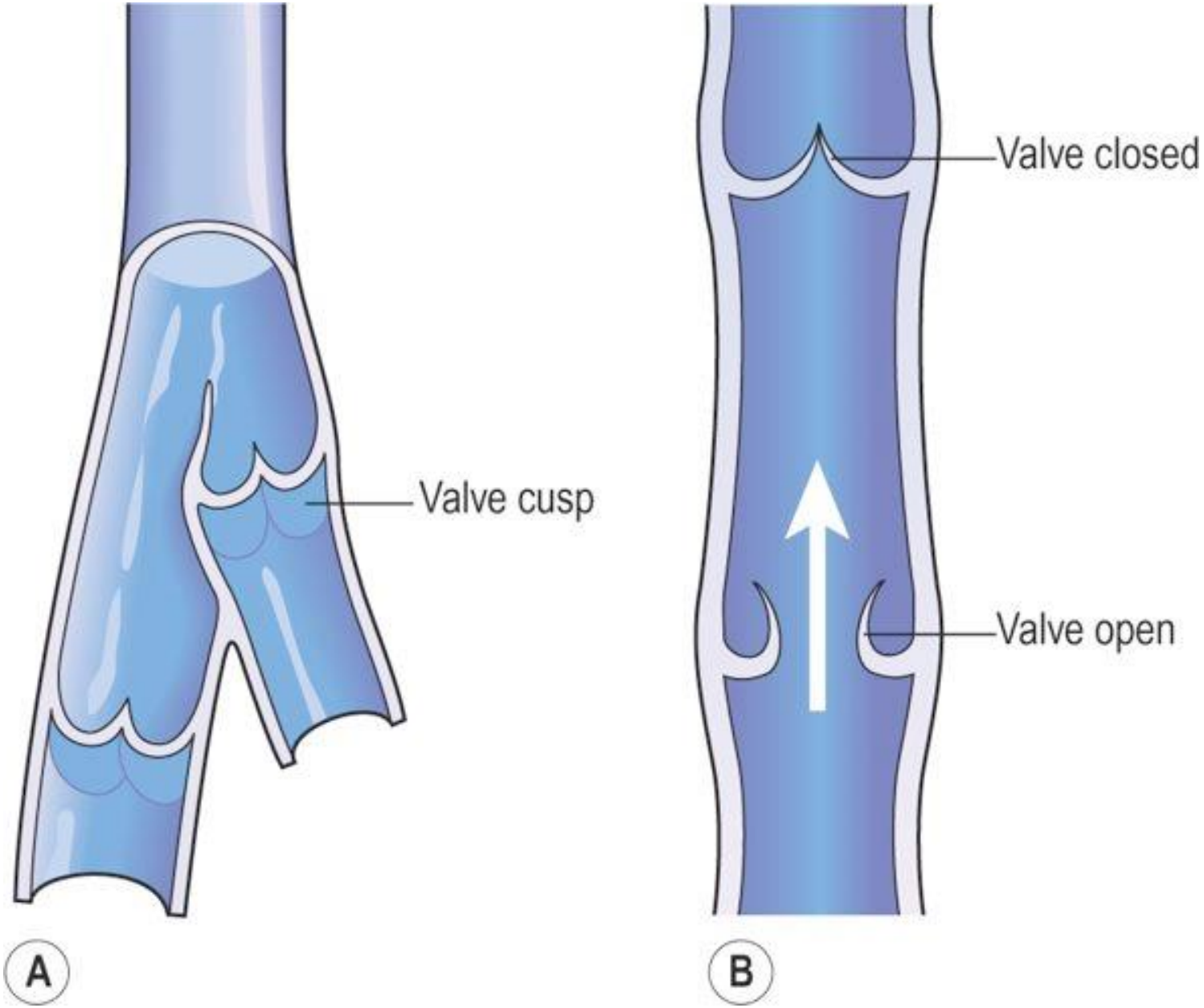
Arteries and arterioles

These are the blood vessels that transport blood away from the heart.

Veins and venules

Veins are blood vessels that return blood at low pressure to the heart.

Interior of a vein: A. The valves and cusps. **B.** The direction of blood flow through a valve.



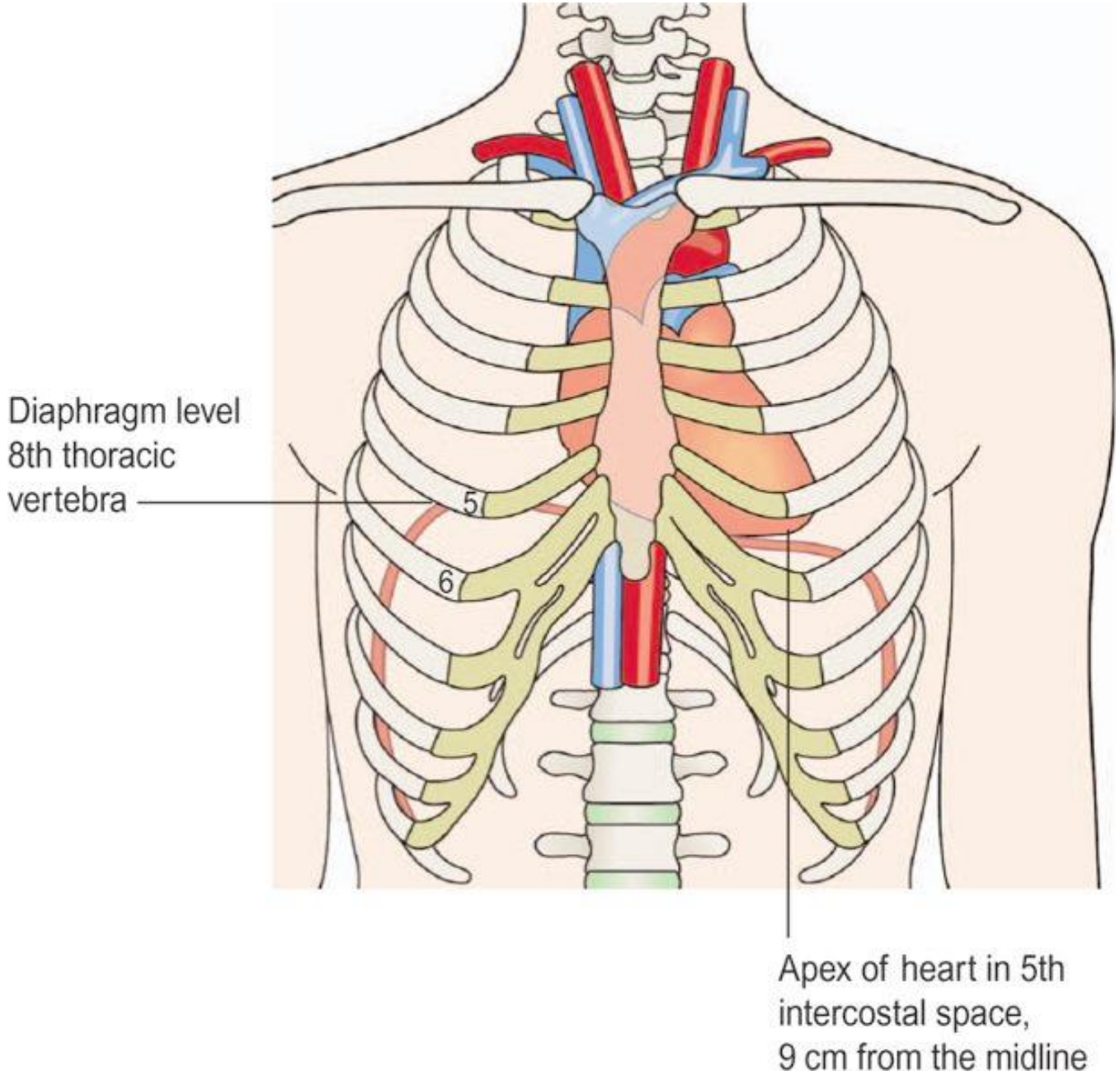
Heart

The heart is a roughly cone-shaped hollow muscular organ. It is about 10 cm long and is about the size of the owner's fist. It weighs about 225 g in women and is heavier in men (about 310 g).

Position

The heart lies in the thoracic cavity in the mediastinum (the space between the lungs). It lies obliquely, a little more to the left than the right, and presents a base above, and an apex below.

Position of the heart in the thorax



Organs associated with the heart

Inferiorly – the apex rests on the central tendon of the diaphragm

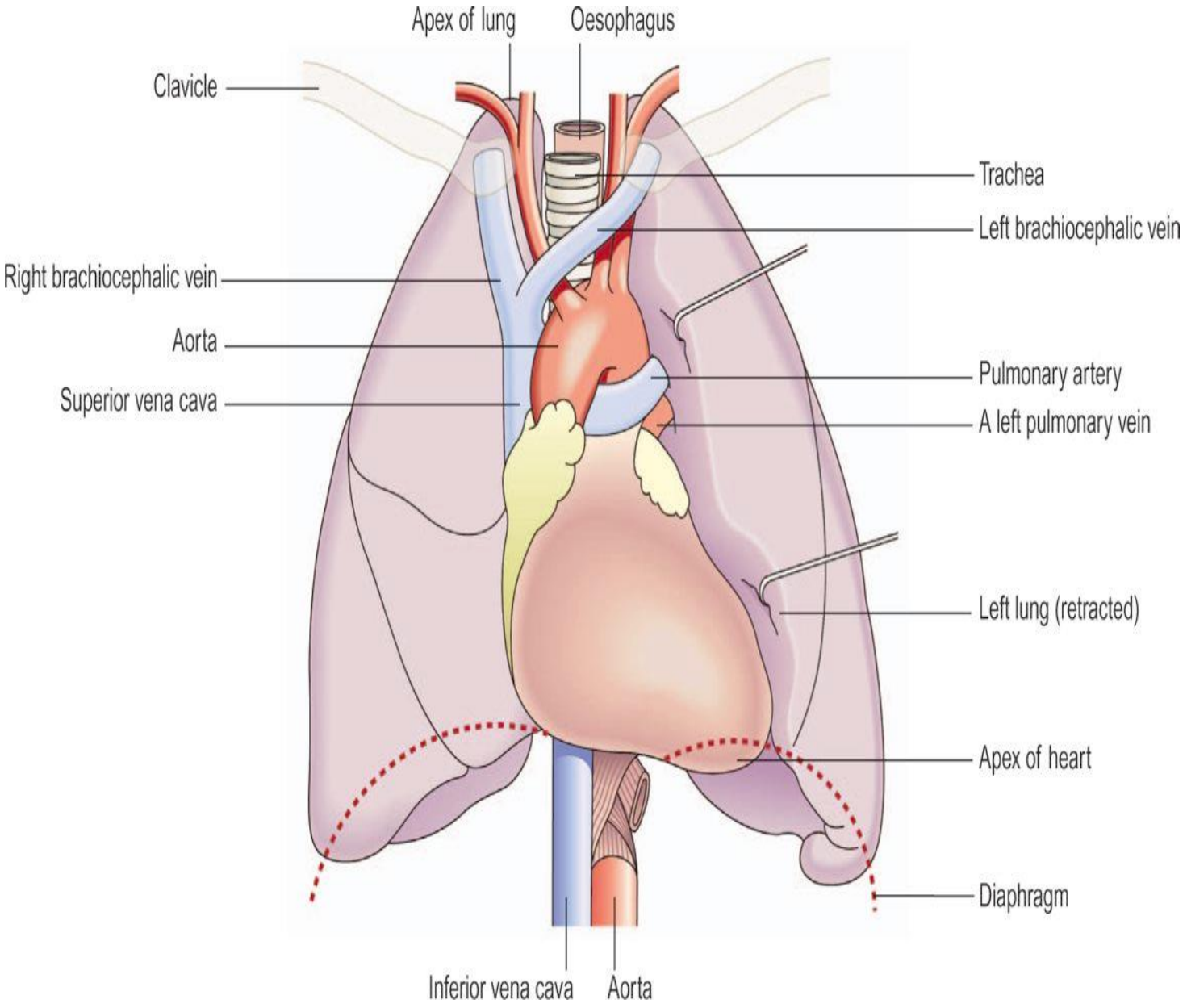
Superiorly – the great blood vessels, i.e. the aorta, superior vena cava, pulmonary artery and pulmonary veins

Posteriorly – the oesophagus, trachea, left and right bronchus, descending aorta, inferior vena cava and thoracic vertebrae

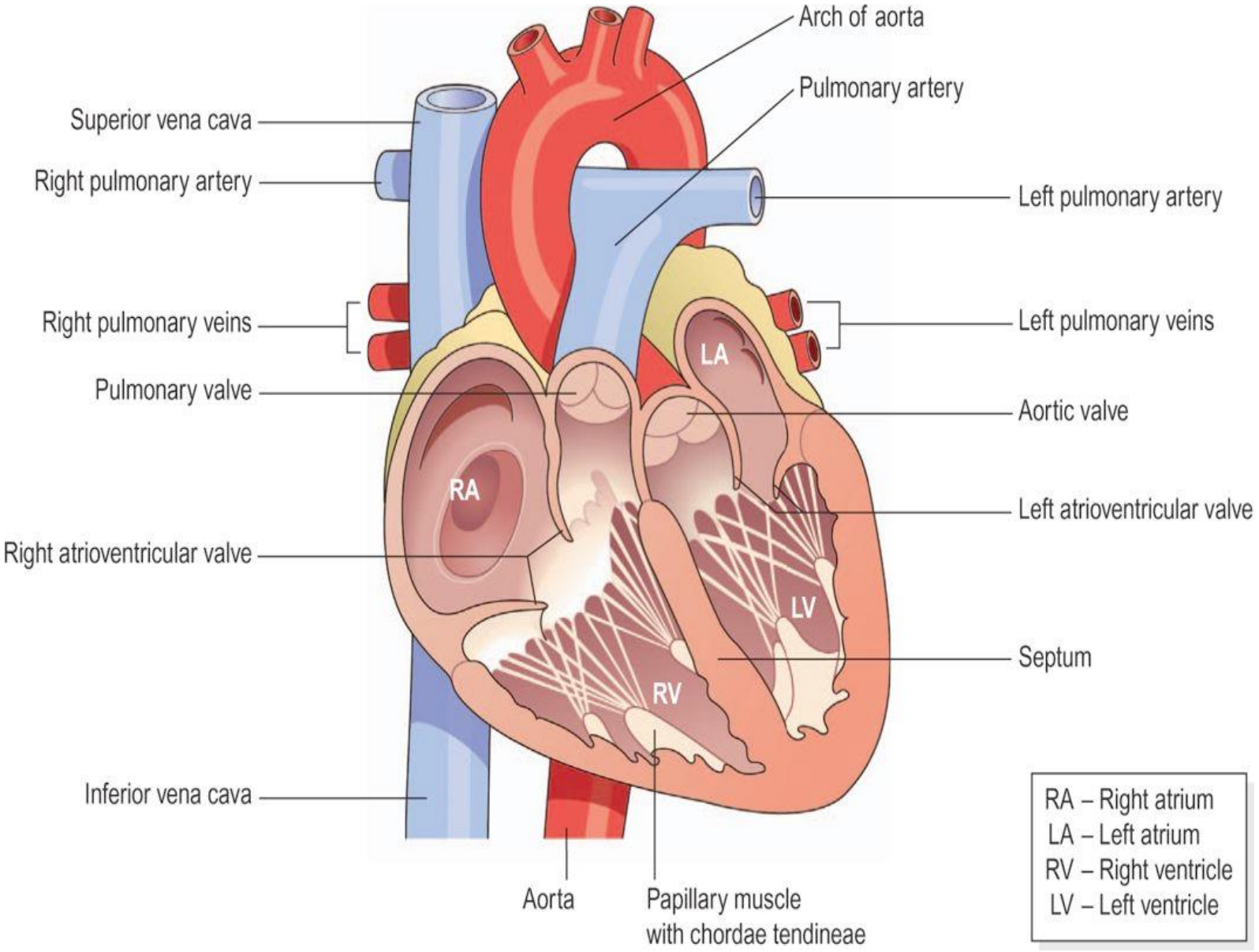
Laterally – the lungs – the left lung overlaps the left side of the heart

Anteriorly – the sternum, ribs and intercostal muscles.

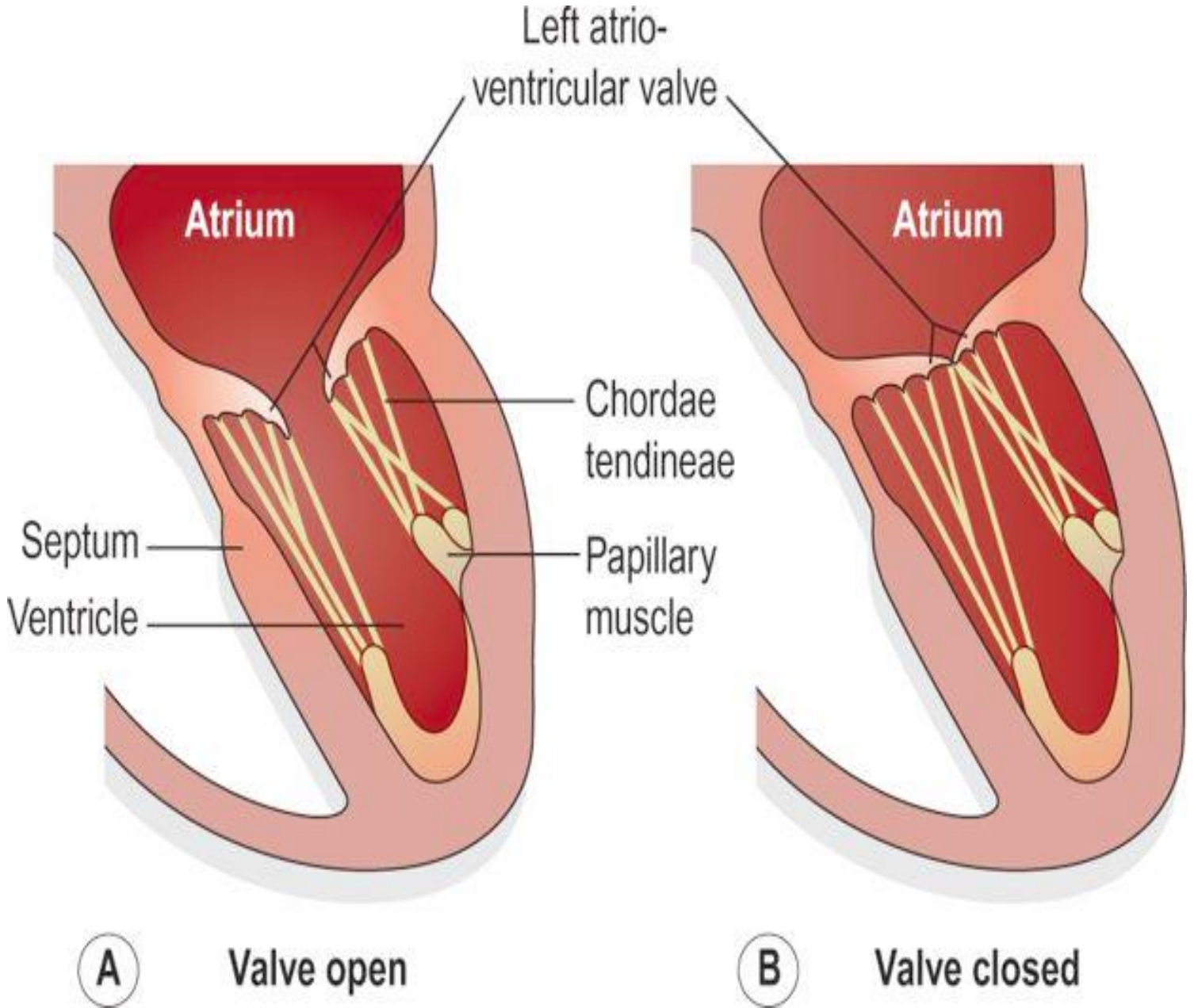
Organs associated with the heart



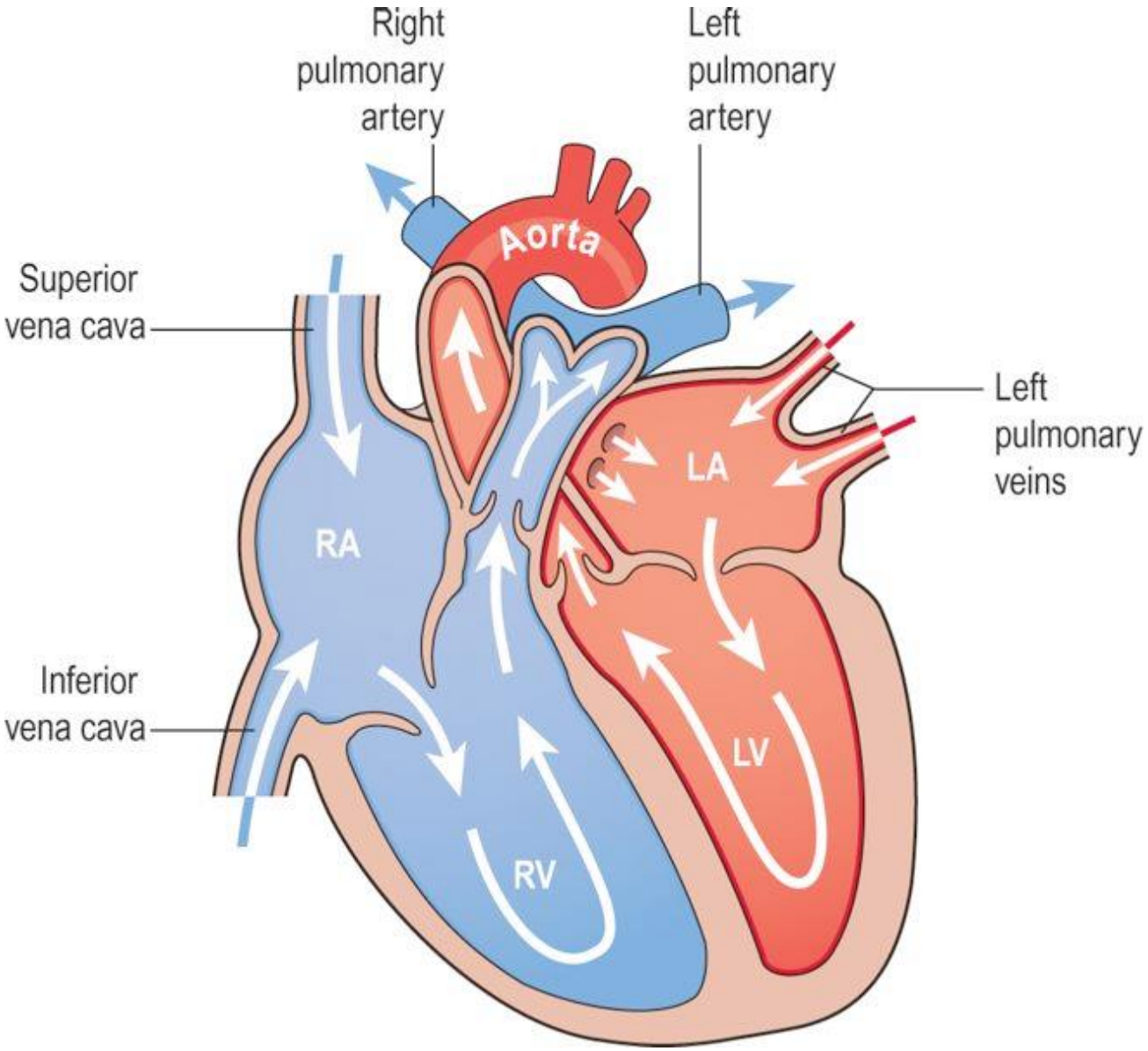
Interior of the heart



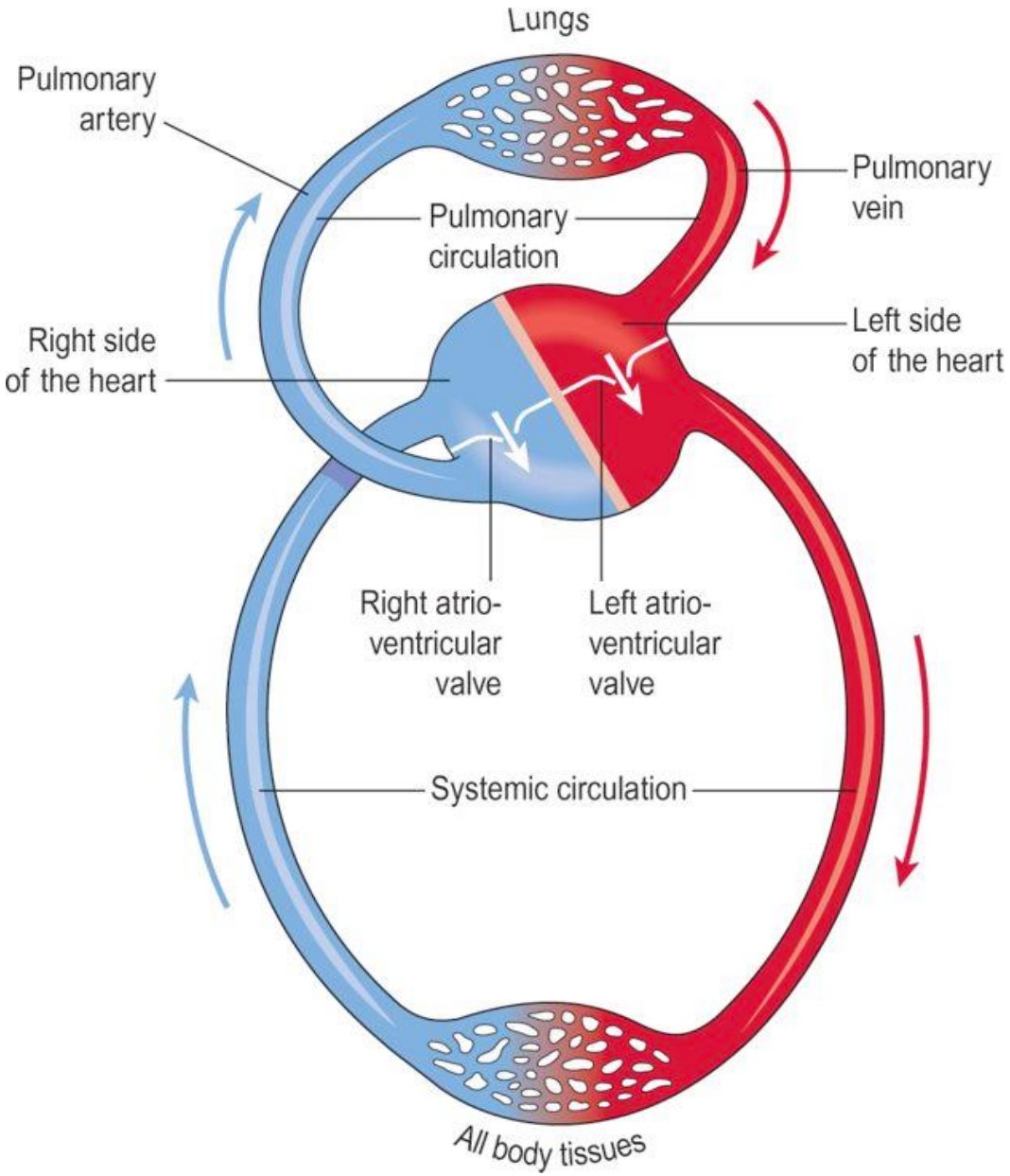
The left atrioventricular valve: A. Valve opens. B. Valve closed



Direction of blood flow through the heart



Circulation of blood through the heart and the pulmonary and systemic circulations.

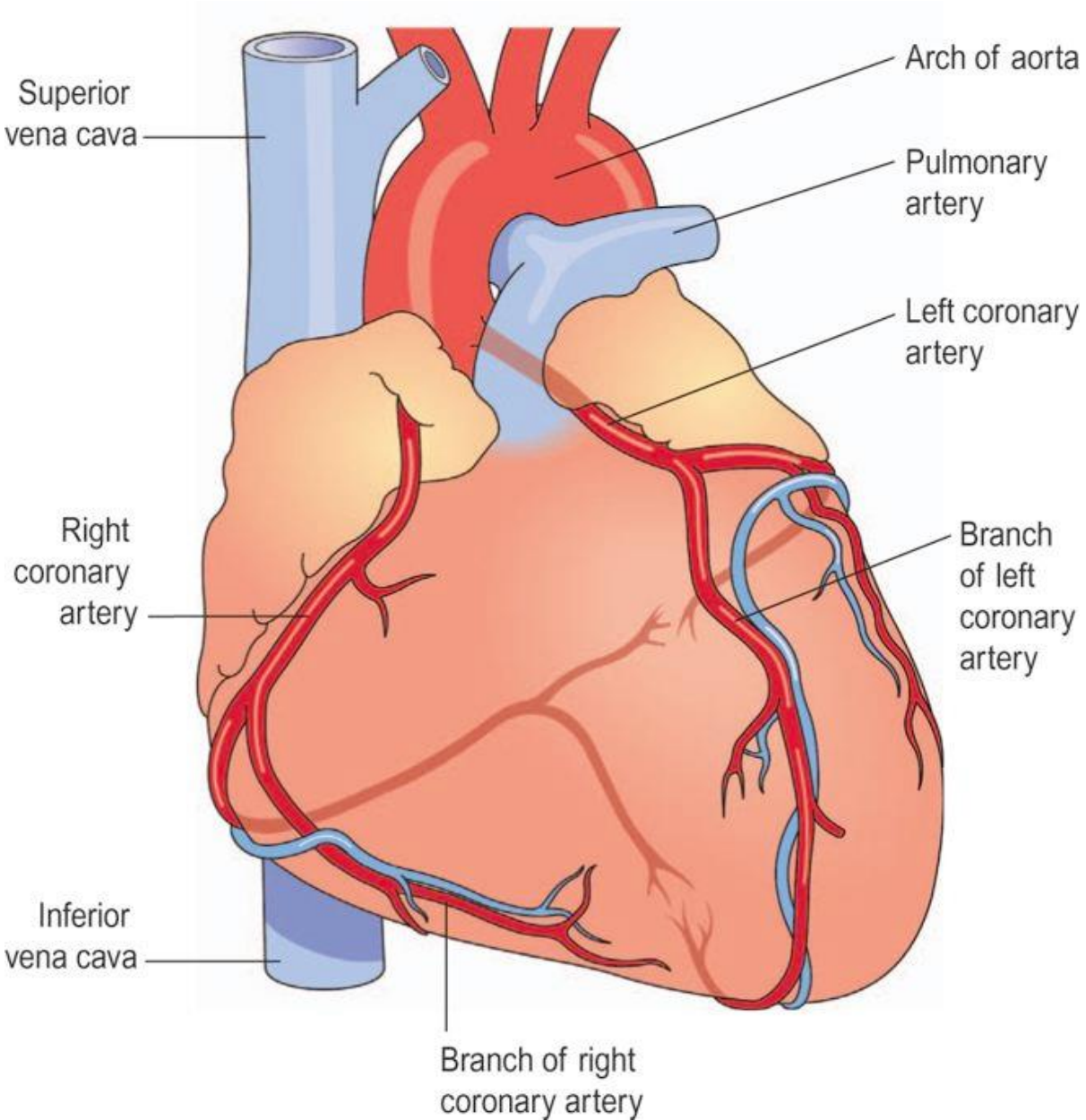


Blood supply to the heart (the coronary circulation)

Arterial supply: The heart is supplied with arterial blood by the right and left coronary arteries, which branch from the aorta immediately distal to the aortic valve.

Venous drainage: Most of the venous blood is collected into a number of cardiac veins that join to form the coronary sinus, which opens into the right atrium. The remainder passes directly into the heart chambers through little venous channels.

The coronary arteries



Conducting system of the heart

The heart possesses the property of autorhythmicity, which means it generates its own electrical impulses and beats independently of nervous or hormonal control.

However, it is supplied with both sympathetic and parasympathetic autonomic nerve fibres, which increase and decrease respectively the intrinsic heart rate. In addition, the heart responds to a number of circulating hormones, including adrenaline (epinephrine) and thyroxine.

Sinoatrial node (SA node)

This small mass of specialised cells lies in the wall of the right atrium near the opening of the superior vena cava.

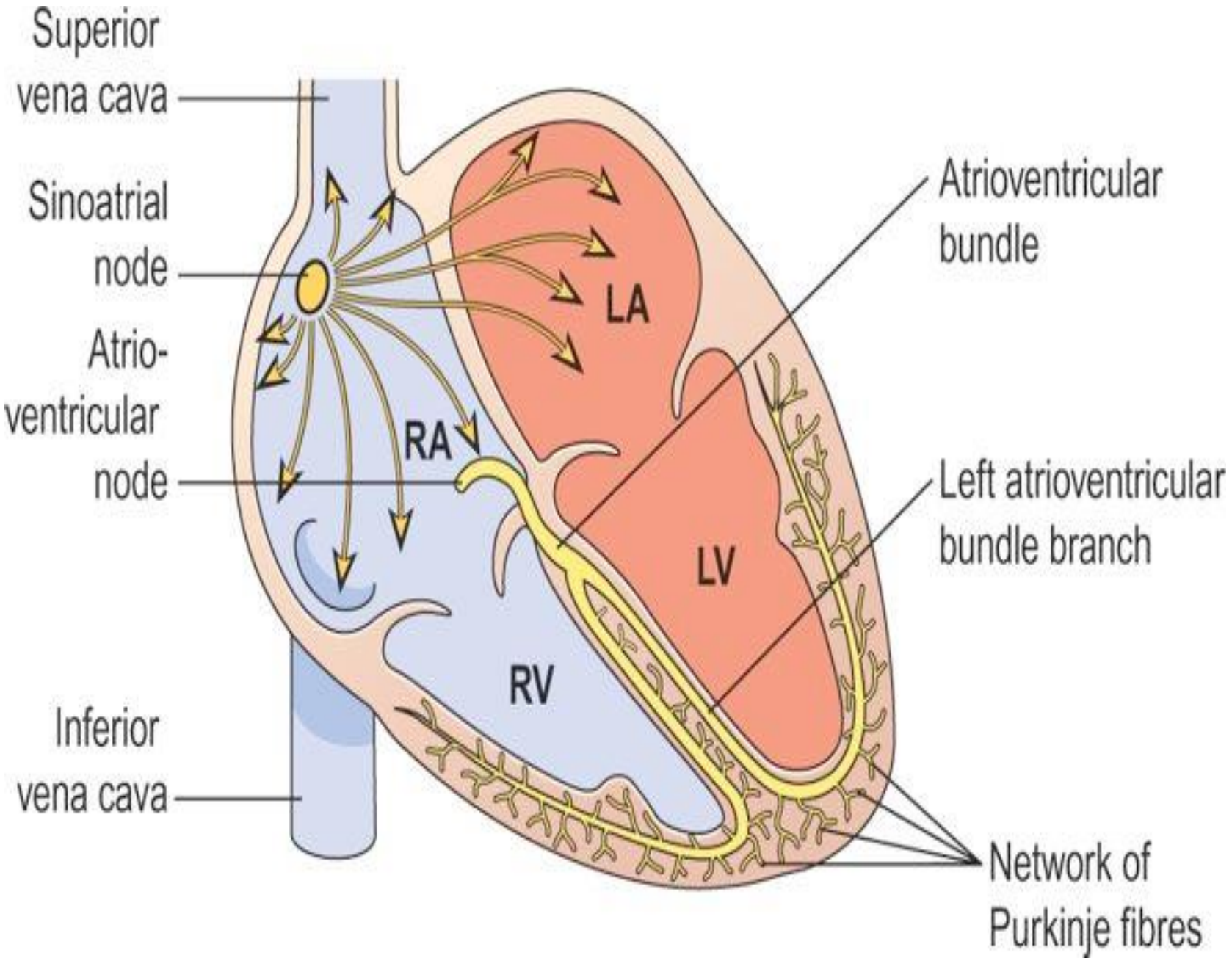
The sinoatrial cells generate these regular impulses because they are electrically unstable. This instability leads them to discharge (depolarise) regularly, usually between 60 and 80 times a minute.

Atrioventricular node (AV node)

This small mass of neuromuscular tissue is situated in the wall of the atrial septum near the atrioventricular valves.

The AV node transmits the electrical signals from the atria into the ventricles.

The conducting system of the heart

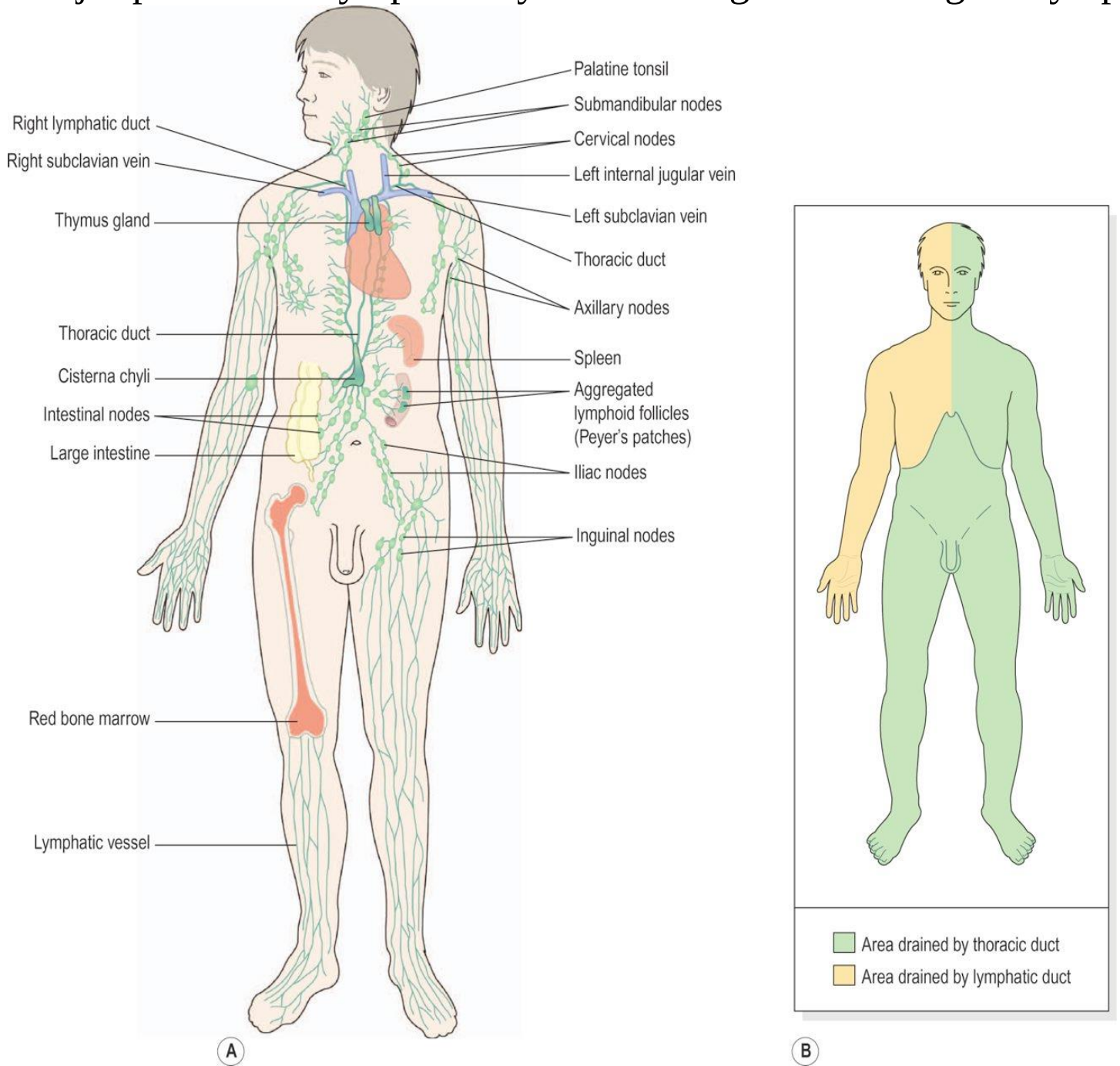


The lymphatic system

The lymphatic system consists of the followings:

1. Lymph
2. Lymph vessels
3. Lymph nodes
4. Lymph organs, e.g. spleen and thymus
5. Diffuse lymphoid tissue, e.g. tonsils
6. Bone marrow.

A. Major parts of the lymphatic system. **B.** Regional drainage of lymph.



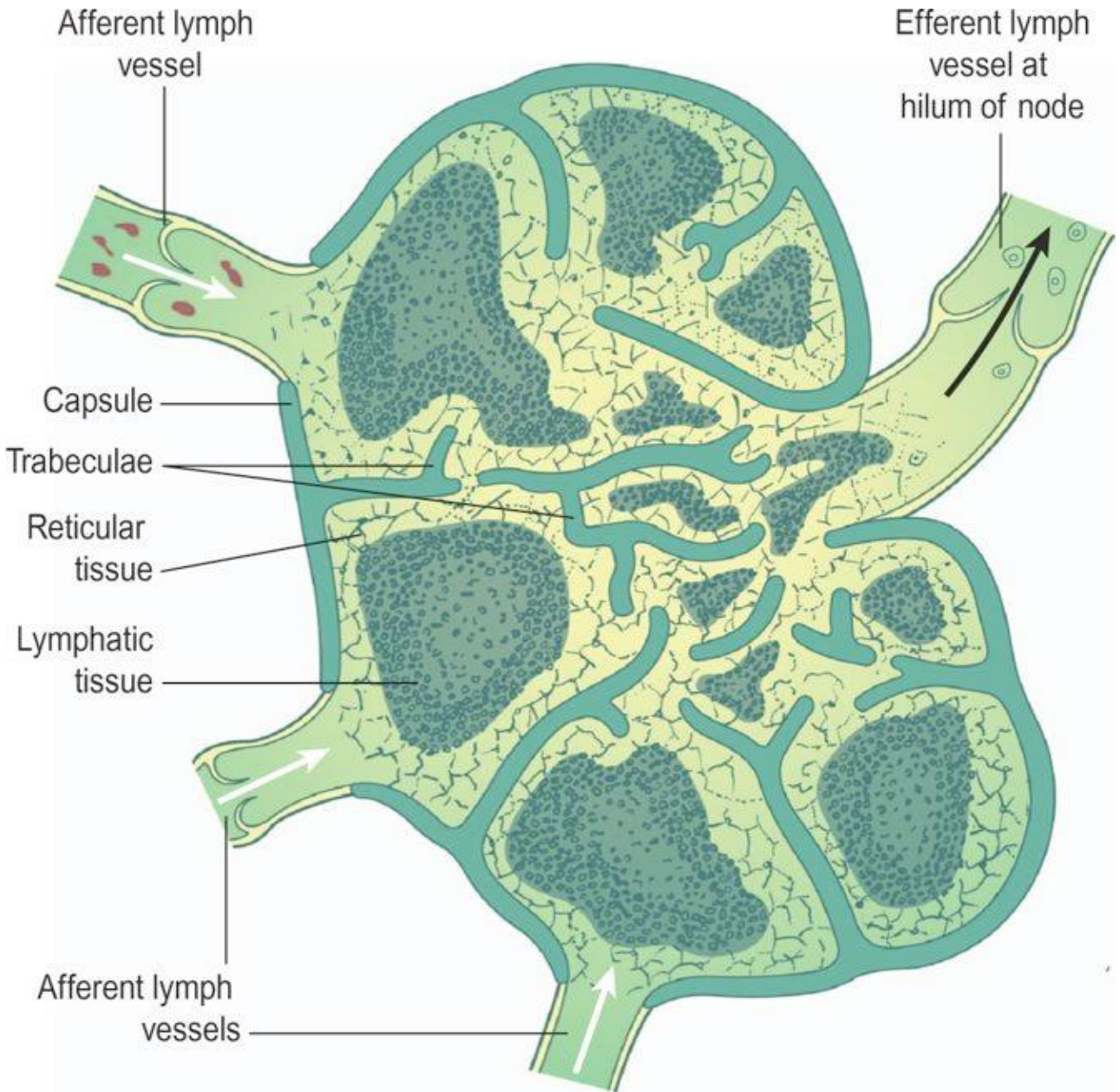
Lymphatic organs and tissues

Lymph nodes

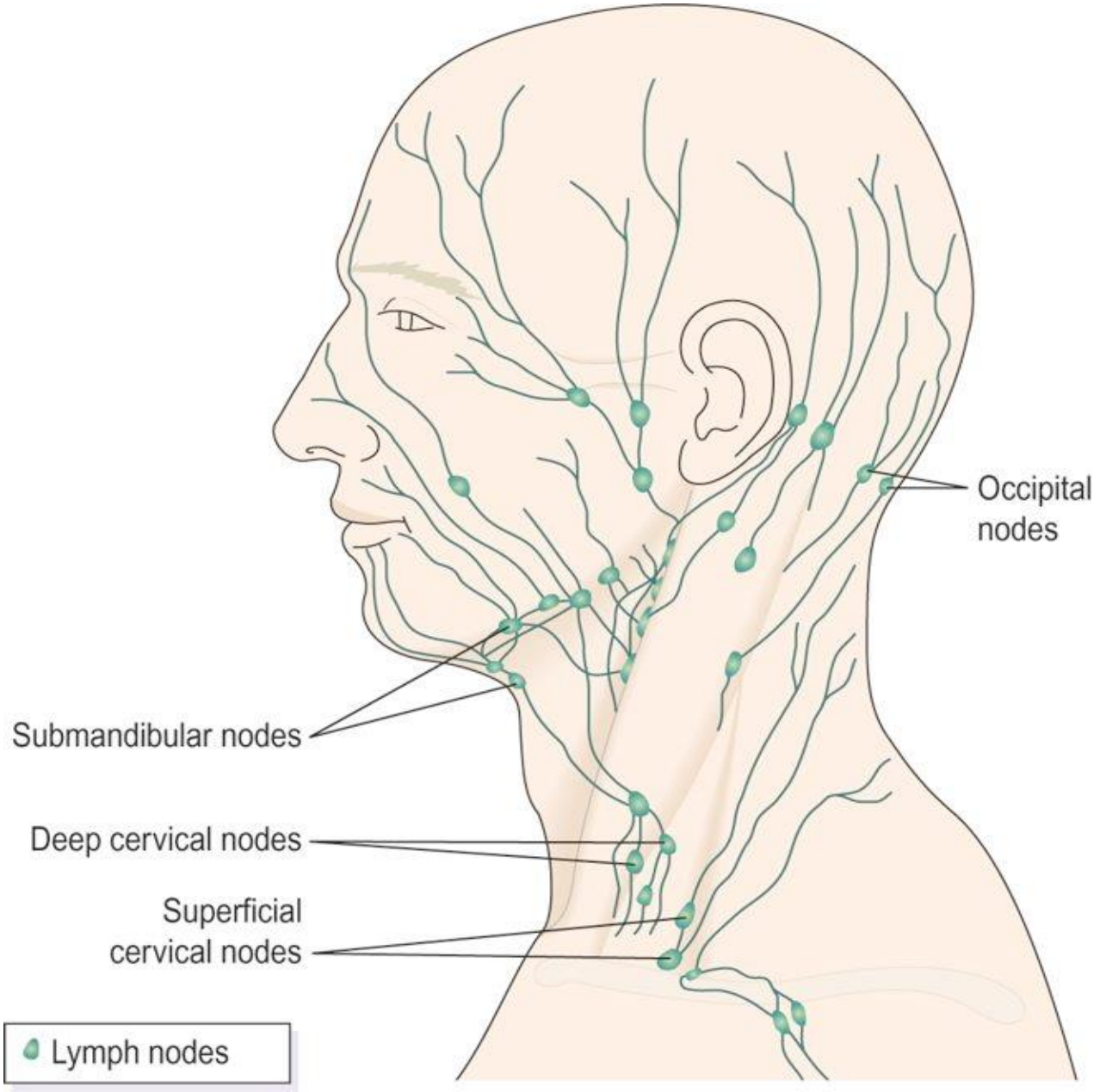
Lymph nodes are oval or bean-shaped organs that lie, often in groups, along the length of lymph vessels.

These nodes vary considerably in size: some are as small as a pin head and the largest are about the size of an almond.

Section through a lymph node. Arrows indicate the direction of lymph flow



Some lymph nodes of the face and neck

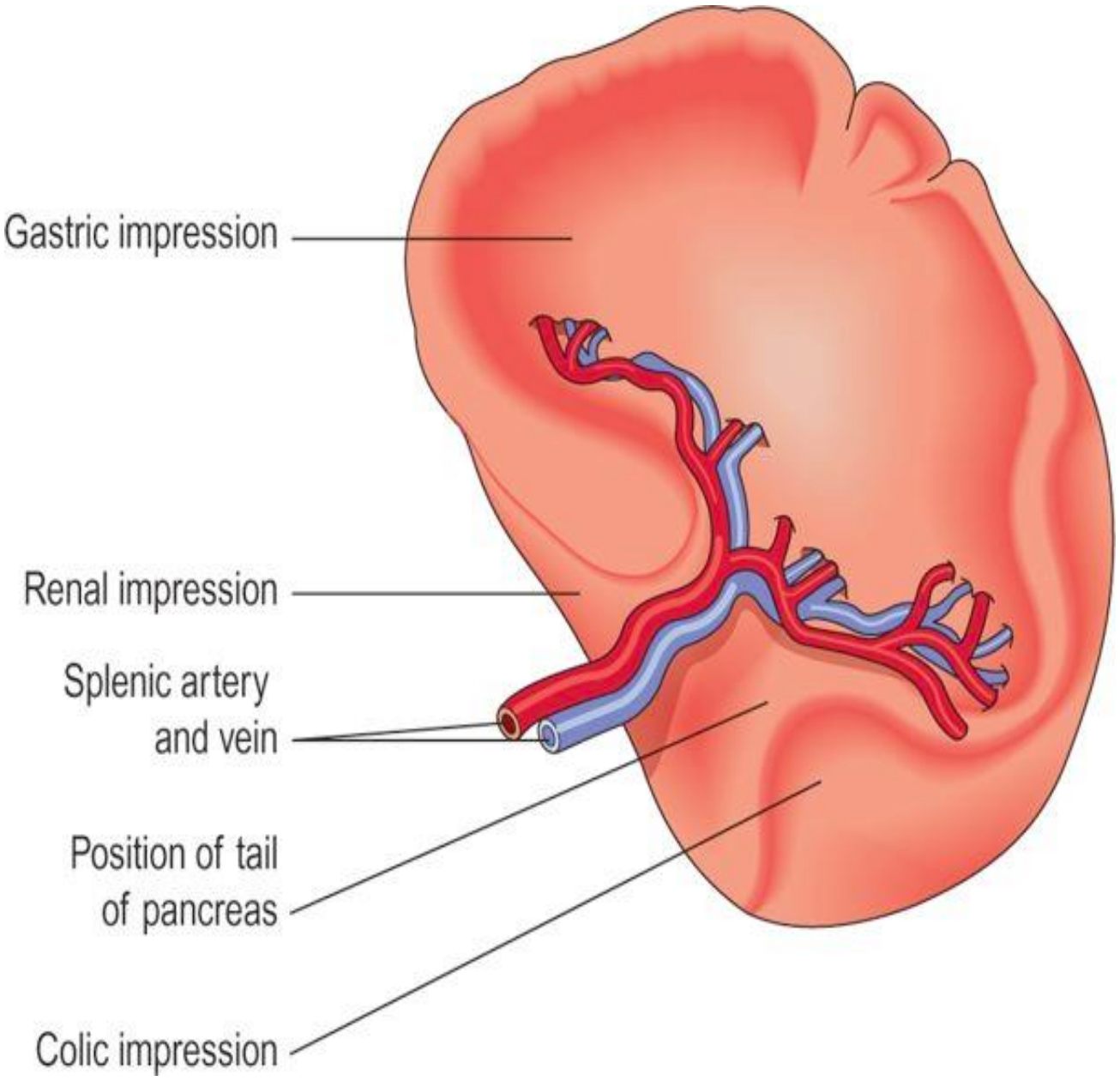


Spleen

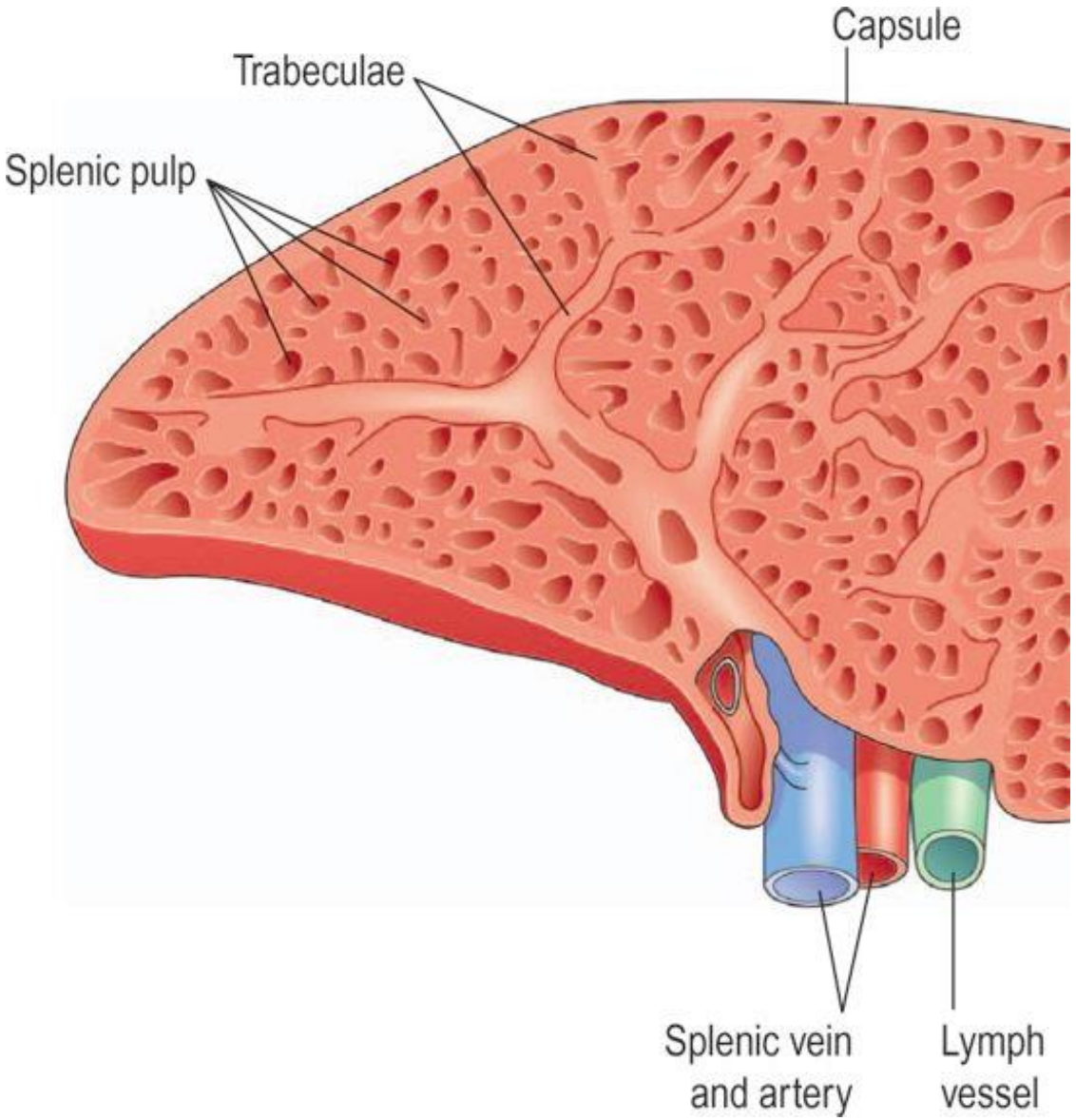
The spleen lies in the left hypochondriac region of the abdominal cavity between the fundus of the stomach and the diaphragm.

It is purplish in colour and varies in size in different individuals, but is usually about 12 cm long, 7 cm wide and 2.5 cm thick. It weighs about 200 g.

The spleen


Gastric impression
Renal impression
Splenic artery and vein
Position of tail of pancreas
Colic impression

A section through the spleen



Tonsils

These are located in the mouth and throat, and will therefore destroy swallowed and inhaled antigens.

Aggregated lymphoid follicles (Peyer's patches)

These large collections of lymphoid tissue are found in the small intestine, and intercept swallowed antigens.

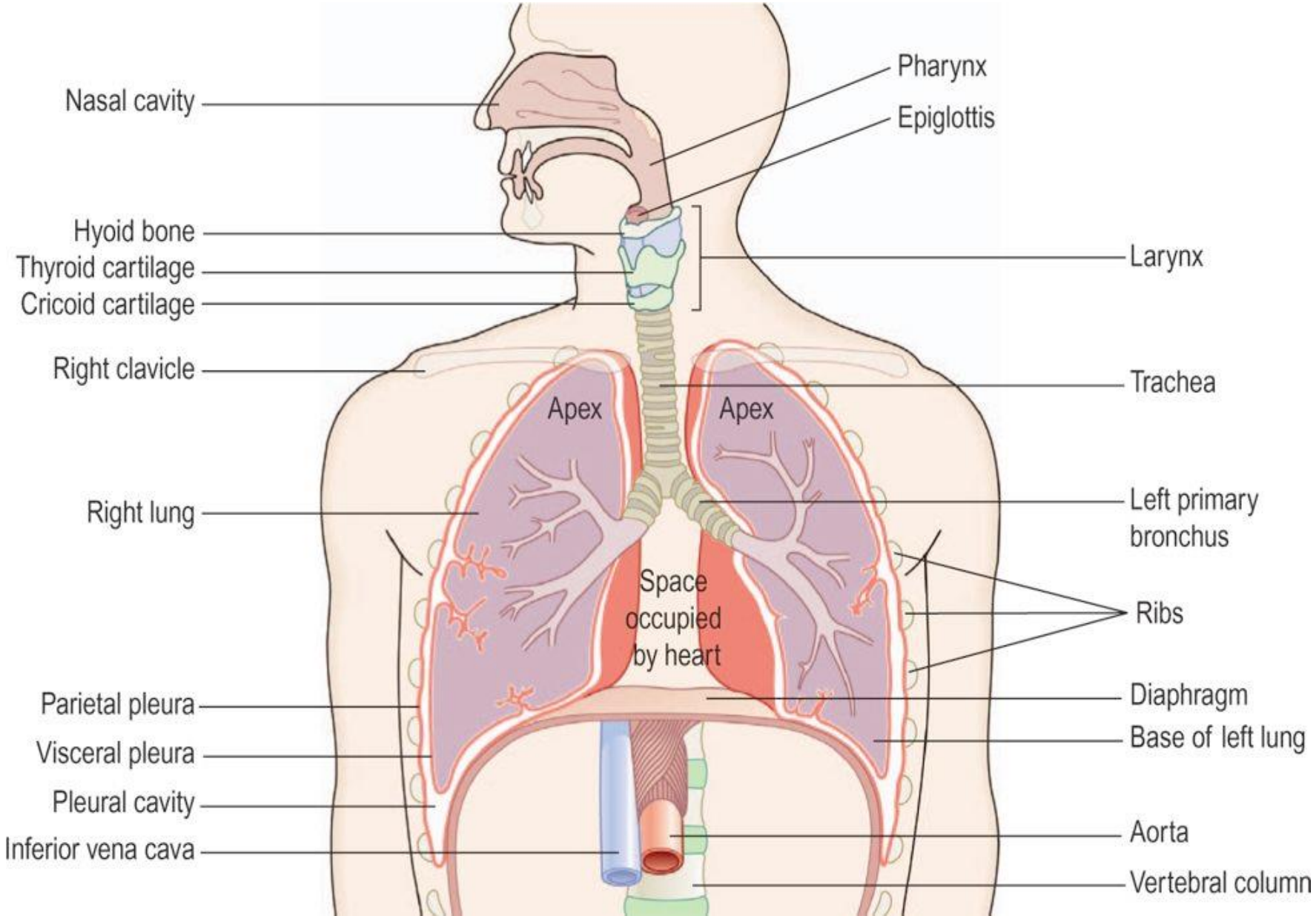
Anatomy of the respiratory system

9nth lecture

The organs of the respiratory system are:

- nose
- pharynx
- larynx
- trachea
- two bronchi (one bronchus to each lung)
- bronchioles and smaller air passages
- two lungs and their coverings, the pleura
- muscles of breathing – the intercostal muscles and the diaphragm.

Structures associated with the respiratory system



Openings into the nasal cavity

The anterior nares, or nostrils, are the openings from the exterior into the nasal cavity. Nasal hairs are found here, coated in sticky mucus.

Lining of the nose

The nose is lined with very vascular ciliated columnar epithelium (ciliated mucous membrane, respiratory mucosa) which contains mucus-secreting goblet cells.

Pharynx

Position

The pharynx is a tube 12 to 14 cm long that extends from the base of the skull to the level of the 6th cervical vertebra.

Structures associated with the pharynx

Superiorly – the inferior surface of the base of the skull

Inferiorly – it is continuous with the oesophagus

Anteriorly – the wall is incomplete because of the openings into the nose, mouth and larynx

Posteriorly – areolar tissue, involuntary muscle and the bodies of the first six cervical vertebrae.

Larynx

Position

The larynx or ‘voice box’ links the laryngopharynx and the trachea.

It lies at the level of the 3rd, 4th, 5th and 6th cervical vertebrae.

Structures associated with the larynx

Superiorly – the hyoid bone and the root of the tongue

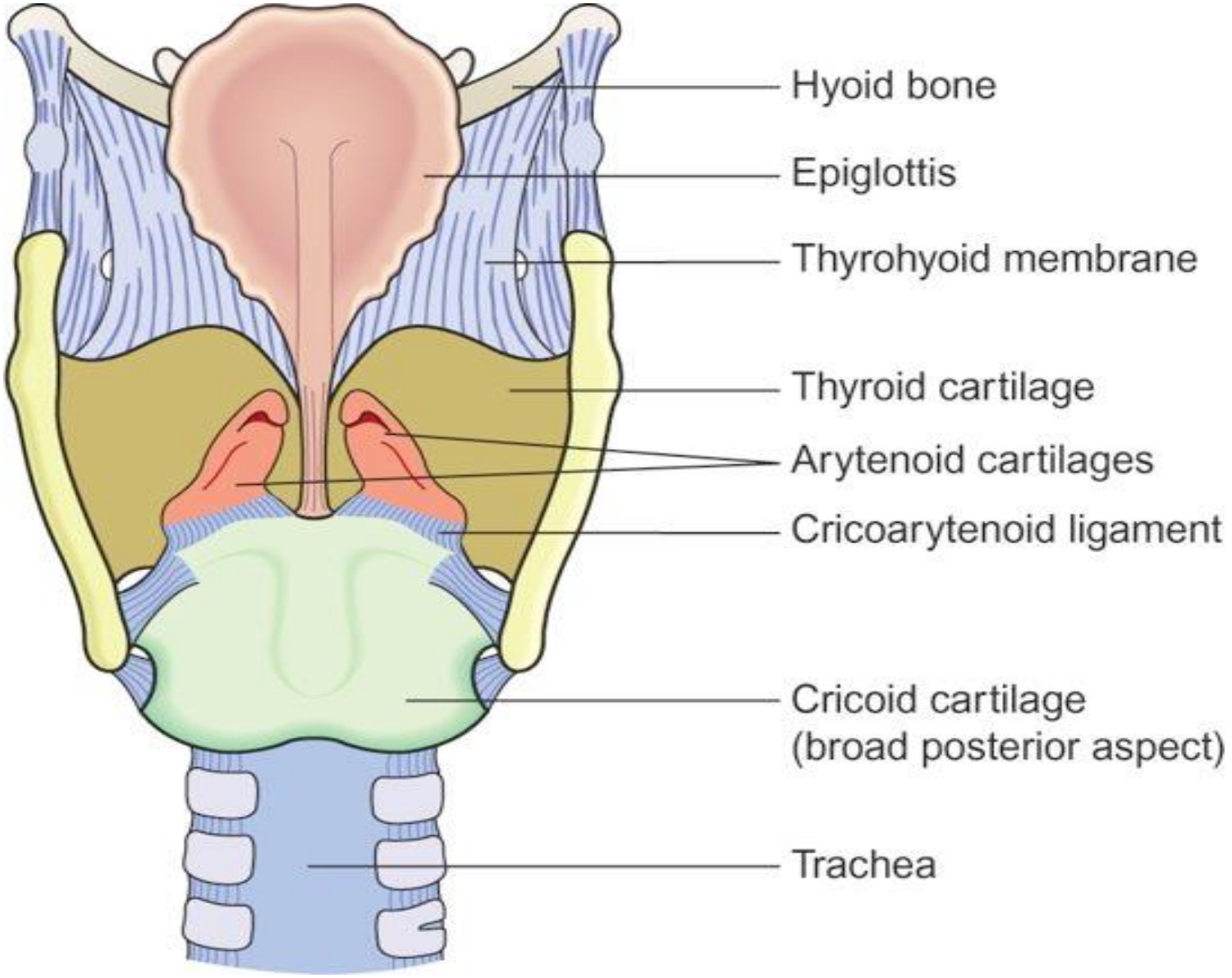
Inferiorly – it is continuous with the trachea

Anteriorly – the muscles attached to the hyoid bone and the muscles of the neck

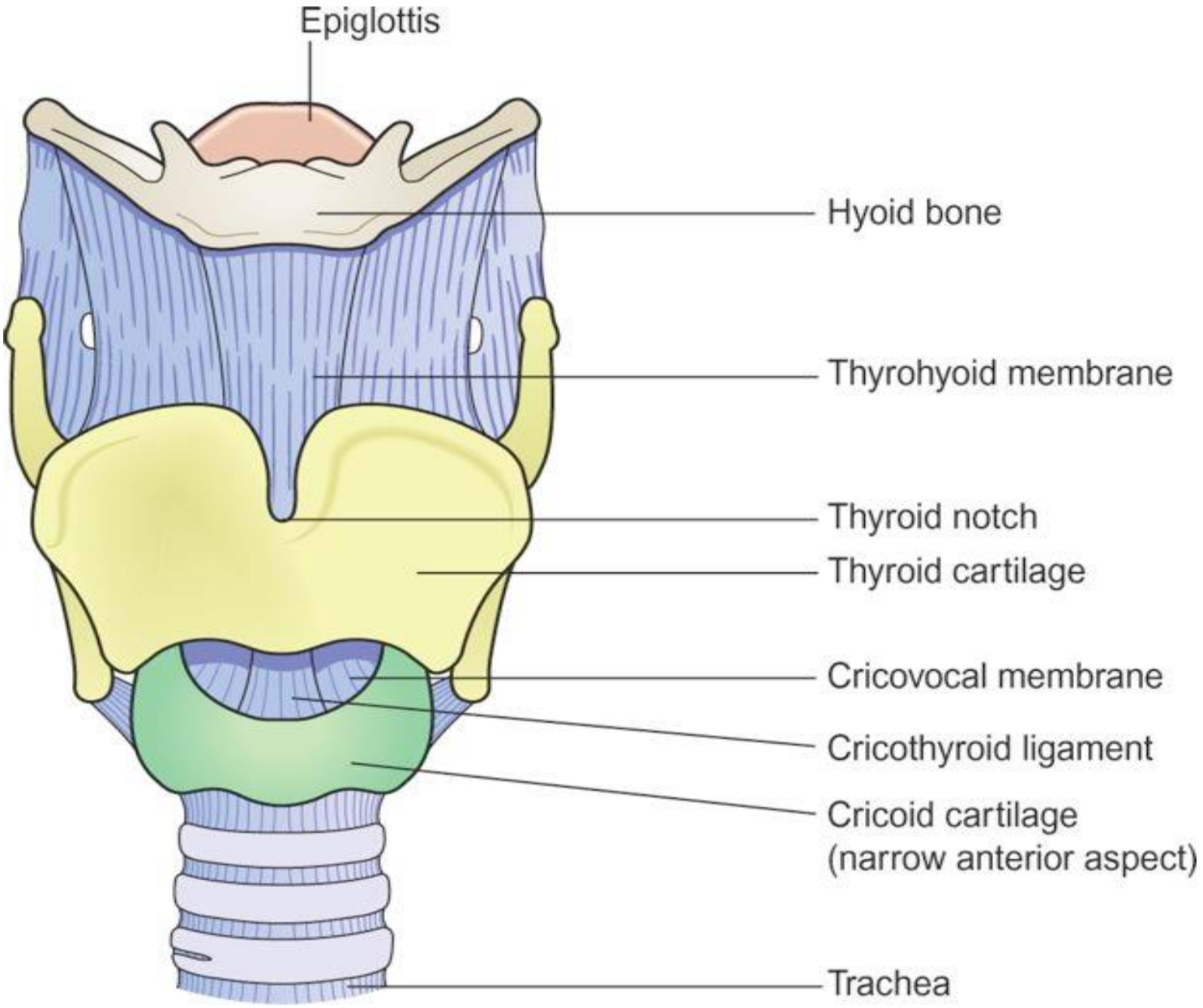
Posteriorly – the laryngopharynx and 3rd to 6th cervical vertebrae

Laterally – the lobes of the thyroid gland.

Larynx – viewed from behind



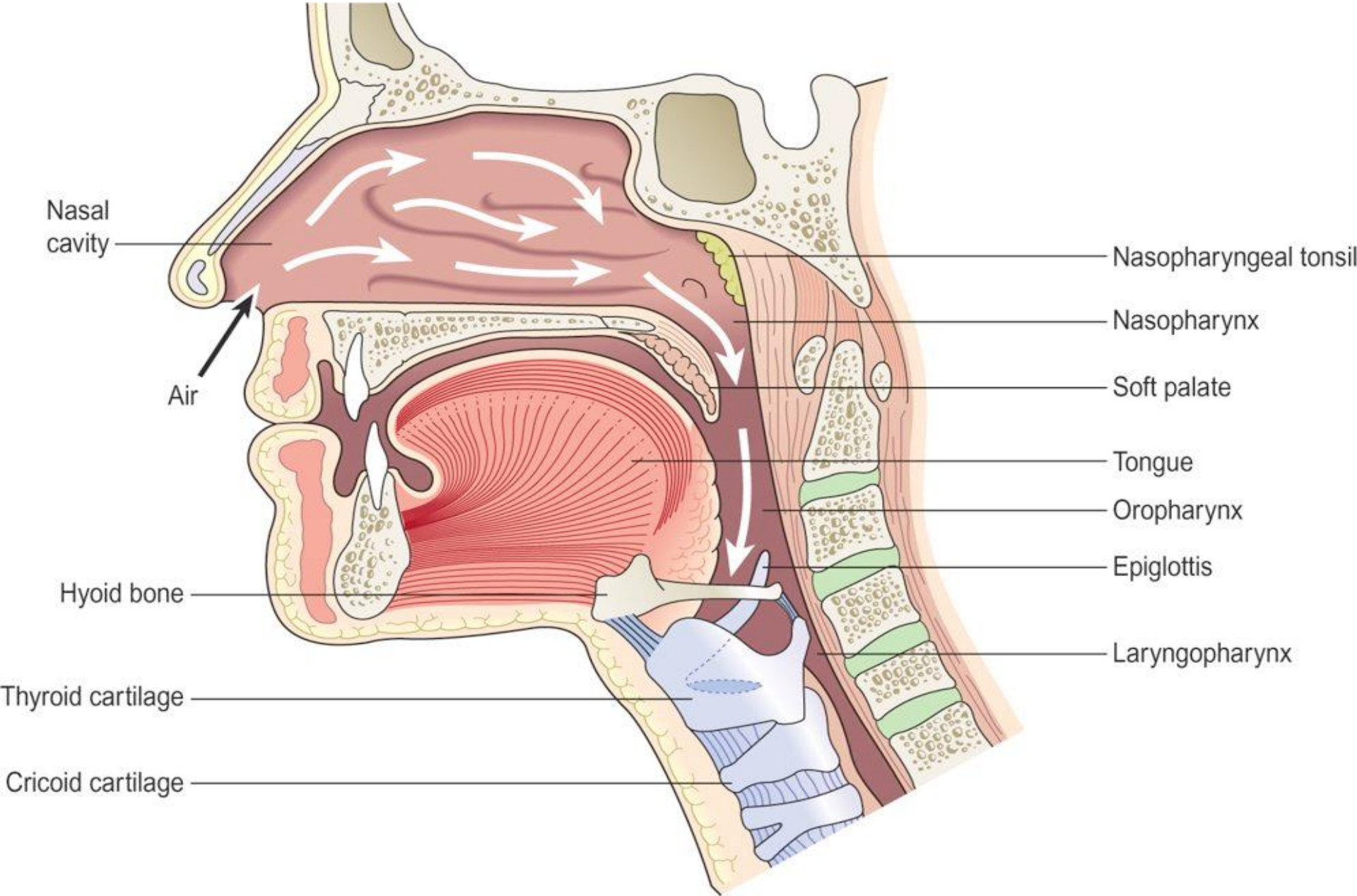
Larynx – viewed from the front



The epiglottis

This is a leaf-shaped fibroelastic cartilage it closes off the larynx during swallowing, protecting the lungs from accidental inhalation of foreign objects.

Epiglottis


Nasal cavity
Air
Hyoid bone
Thyroid cartilage
Cricoid cartilage
Nasopharyngeal tonsil
Nasopharynx
Soft palate
Tongue
Oropharynx
Epiglottis
Laryngopharynx

Trachea

Position

The trachea or windpipe is a continuation of the larynx and extends downwards to about the level of the 5th thoracic vertebra where it divides at the carina into the right and left primary bronchi, one bronchus going to each lung.

It is approximately 10 to 11 cm long and lies mainly in the median plane in front of the oesophagus.

Structures associated with the trachea

Superiorly – the larynx

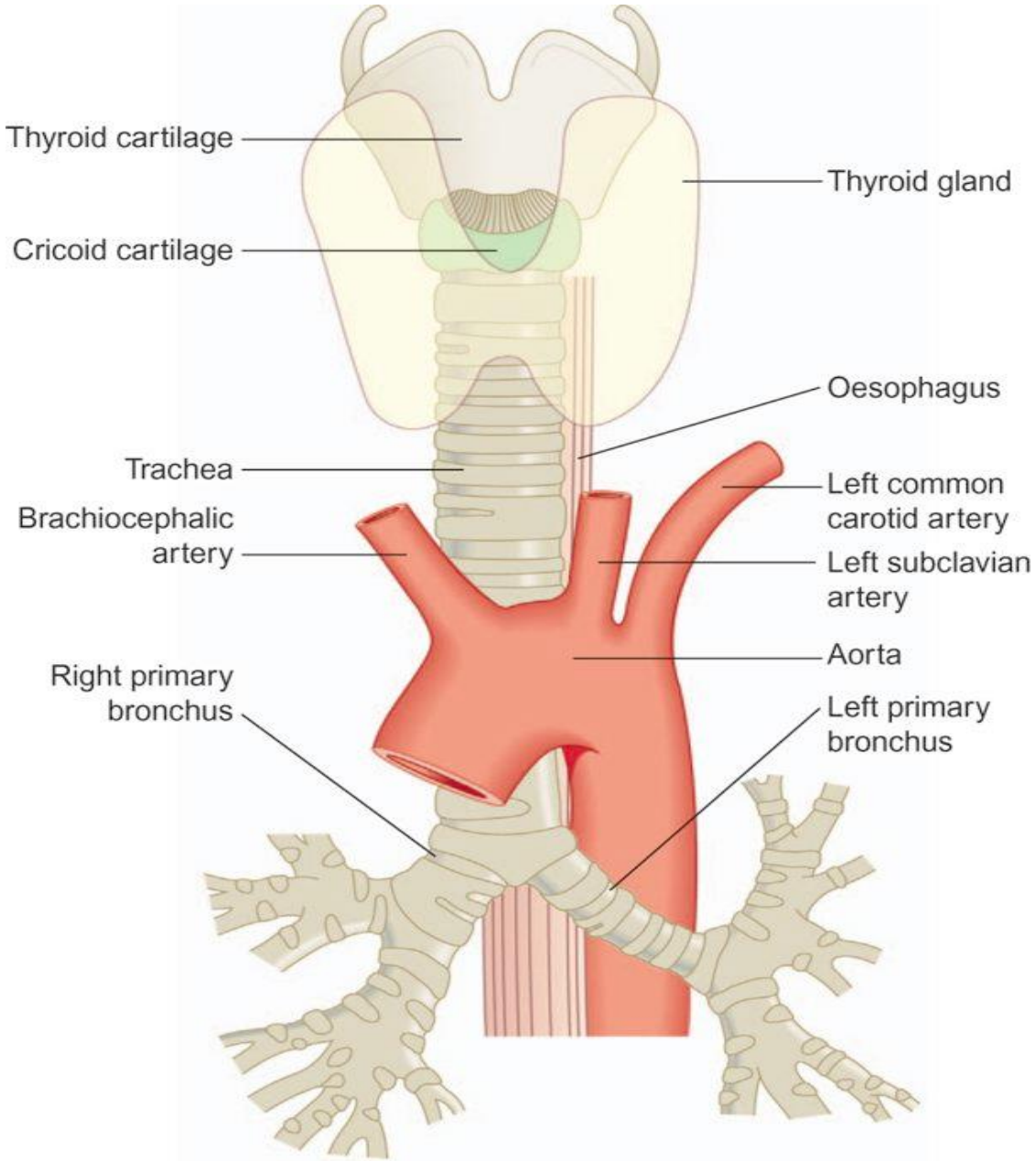
Inferiorly – the right and left bronchi

Anteriorly – upper part: the isthmus of the thyroid gland; lower part: the arch of the aorta and the sternum

Posteriorly – the oesophagus separates the trachea from the vertebral column

Laterally – the lungs and the lobes of the thyroid gland.

The trachea and some of its related structures

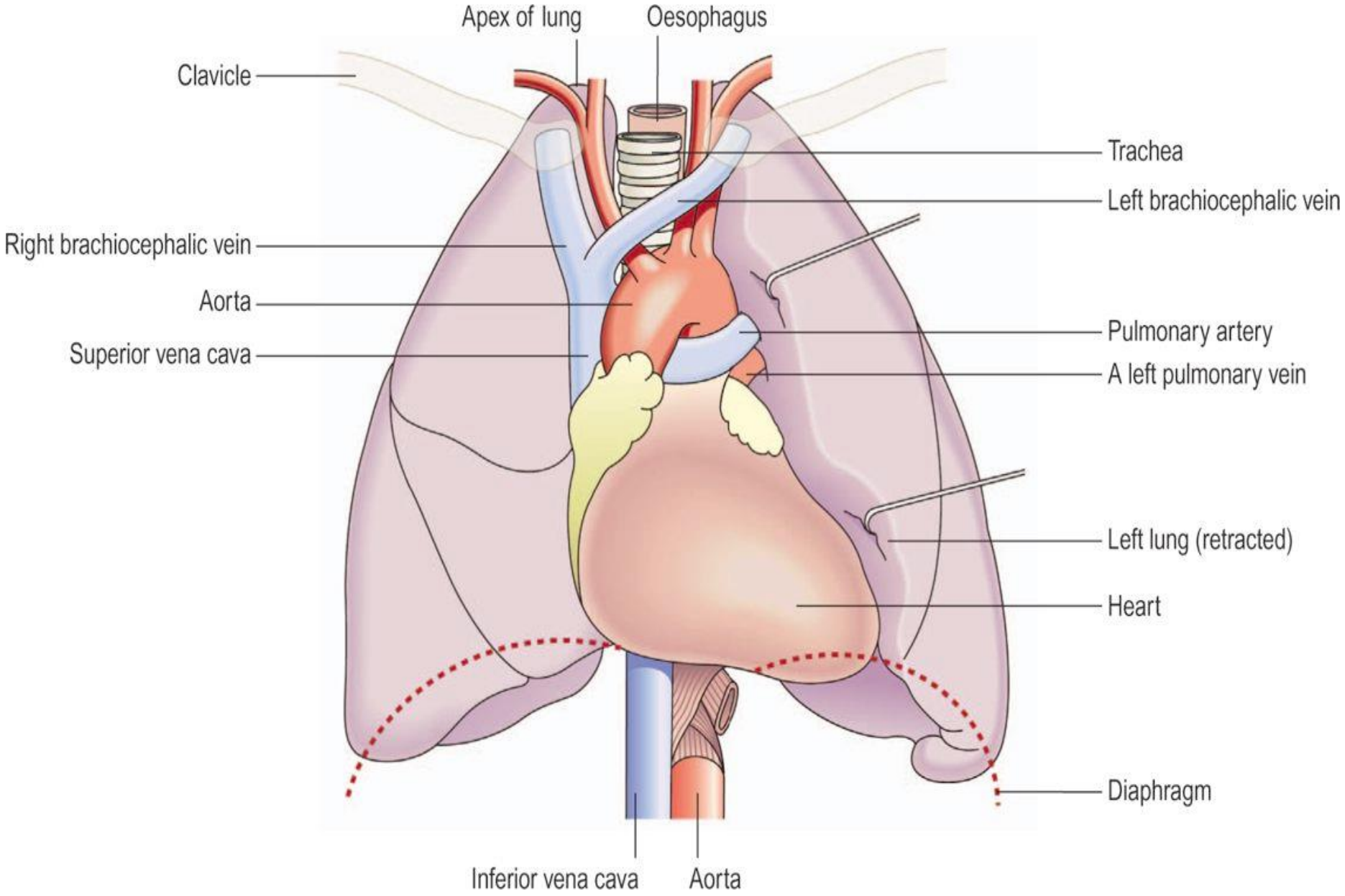


Lungs

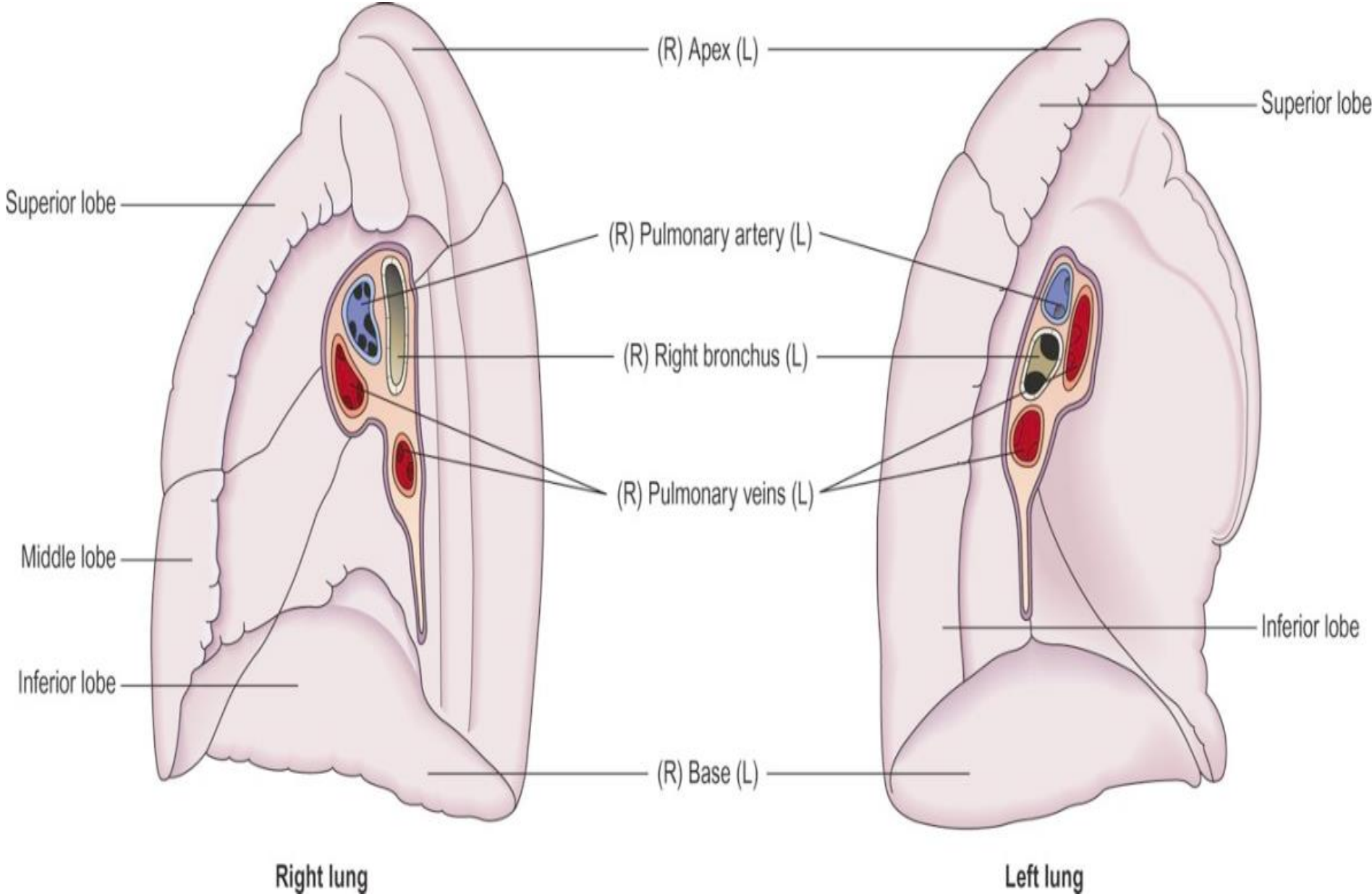
Position and gross structure

There are two lungs, one lying on each side of the midline in the thoracic cavity. They are cone-shaped and have an apex, a base, a tip, costal surface and medial surface.

Organs associated with the lungs



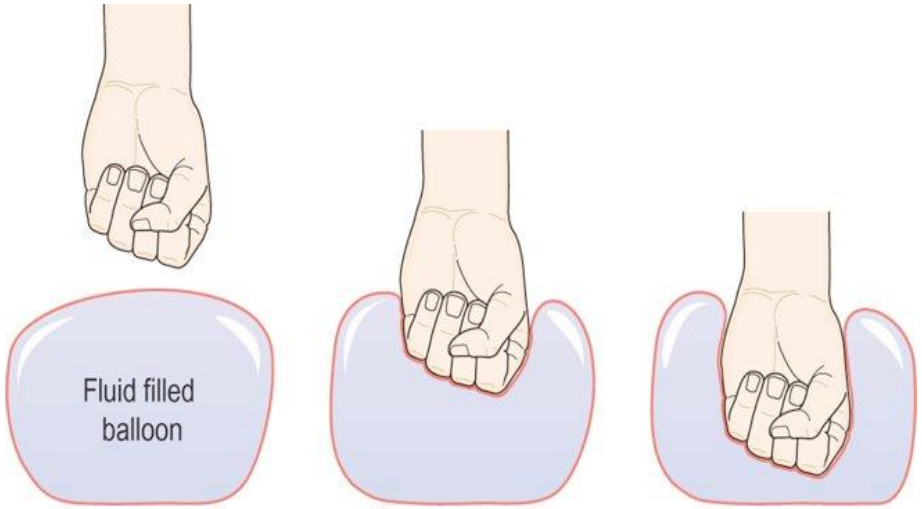
The lobes of the lungs and vessels/airways of each hilum – medial views

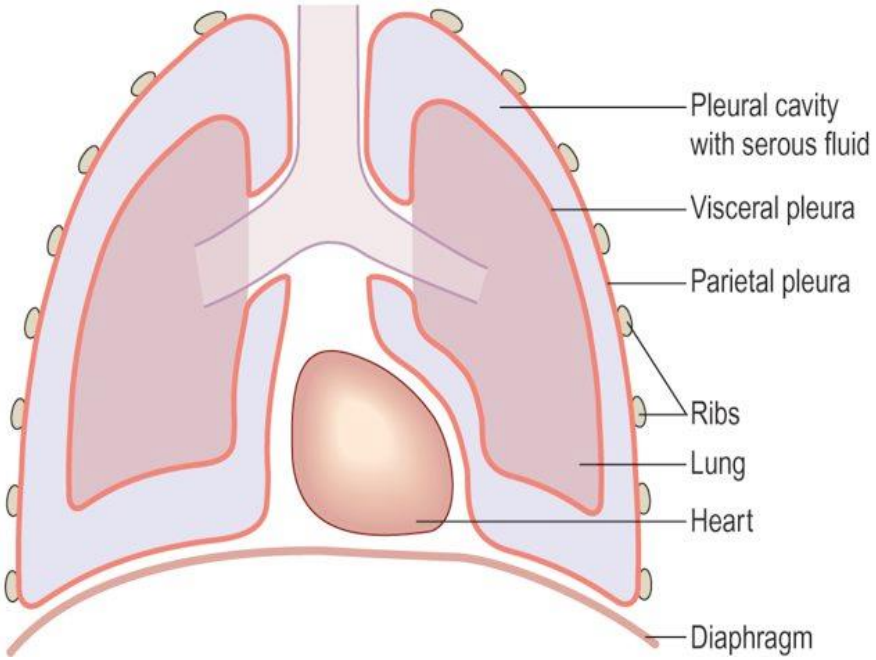


Pleura and pleural cavity

The pleura consists of a closed sac of serous membrane (one for each lung) which contains a small amount of serous fluid.

The relationship of the pleura to the lungs

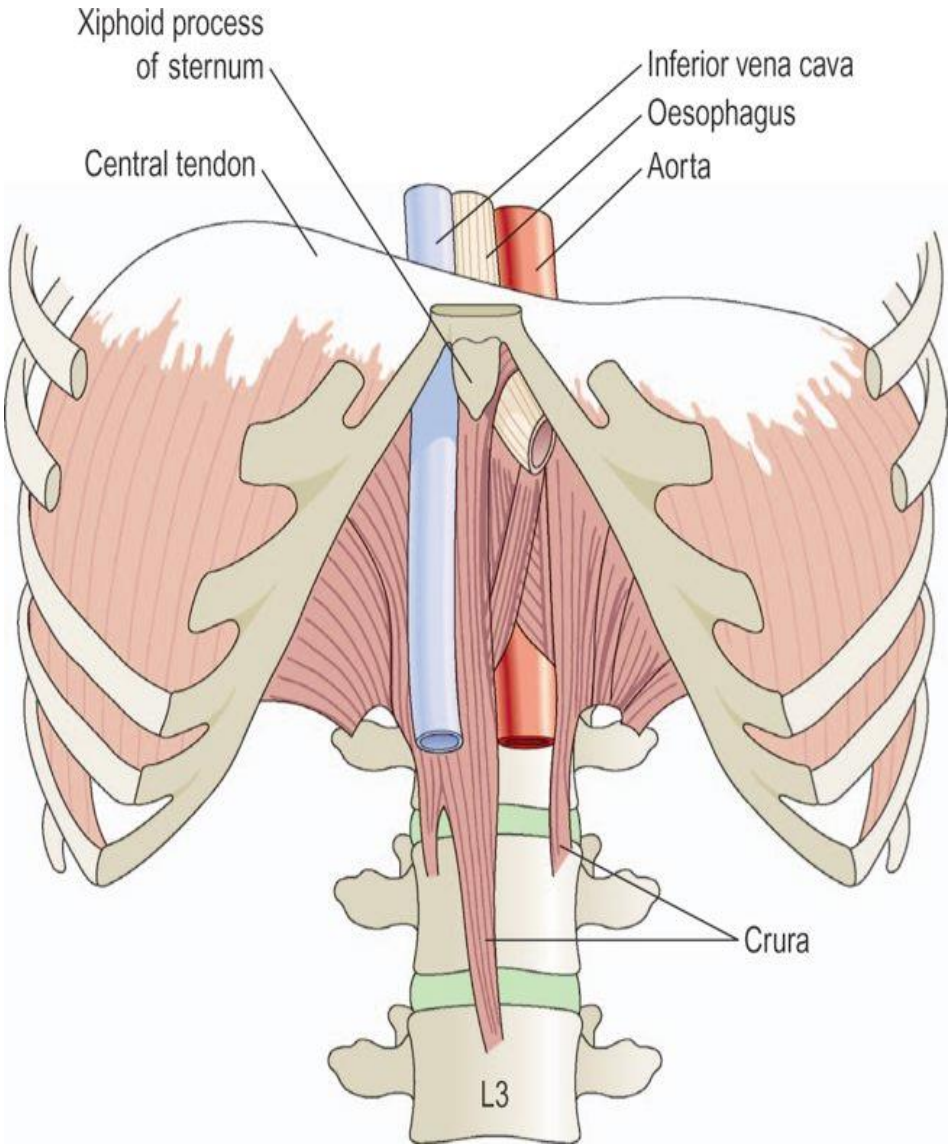




Diaphragm

The diaphragm is a dome-shaped muscular structure separating the thoracic and abdominal cavities.

The diaphragm



Anatomy of the urinary system

The urinary system is the main excretory system and consists of the following structures:

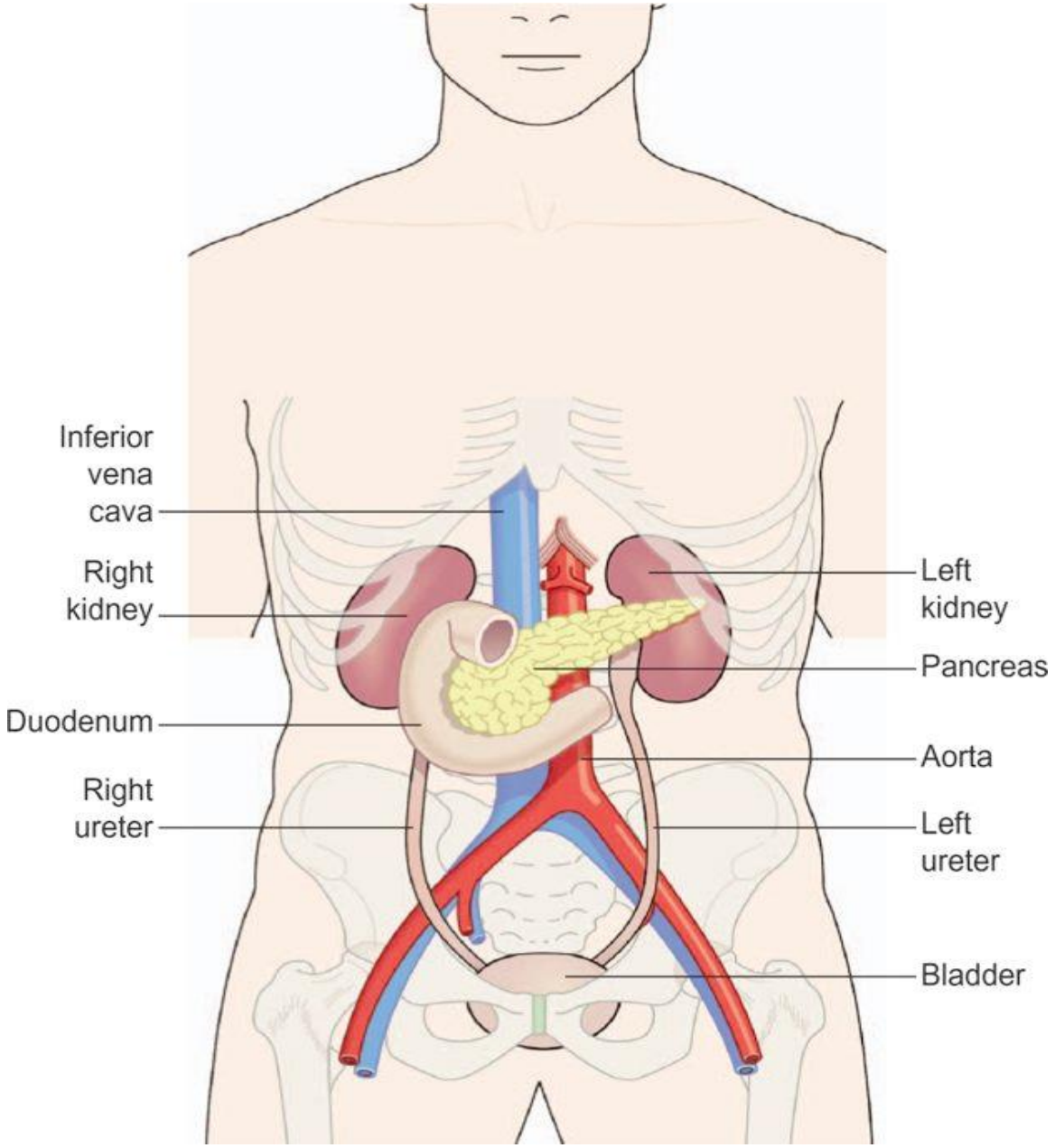
A.Two kidneys, which secrete urine

B.Two ureters, which convey the urine from the kidneys to the urinary bladder

C.The urinary bladder where urine collects and is temporarily stored

D.The urethra through which the urine passes from the urinary bladder to the exterior.

The parts of the urinary system (excluding the urethra) and some associated structures



The urinary system plays a vital part in maintaining homeostasis of water and electrolyte concentrations within the body.

The kidneys produce urine that contains metabolic waste products, including the nitrogenous compounds urea and uric acid, excess ions and some drugs.

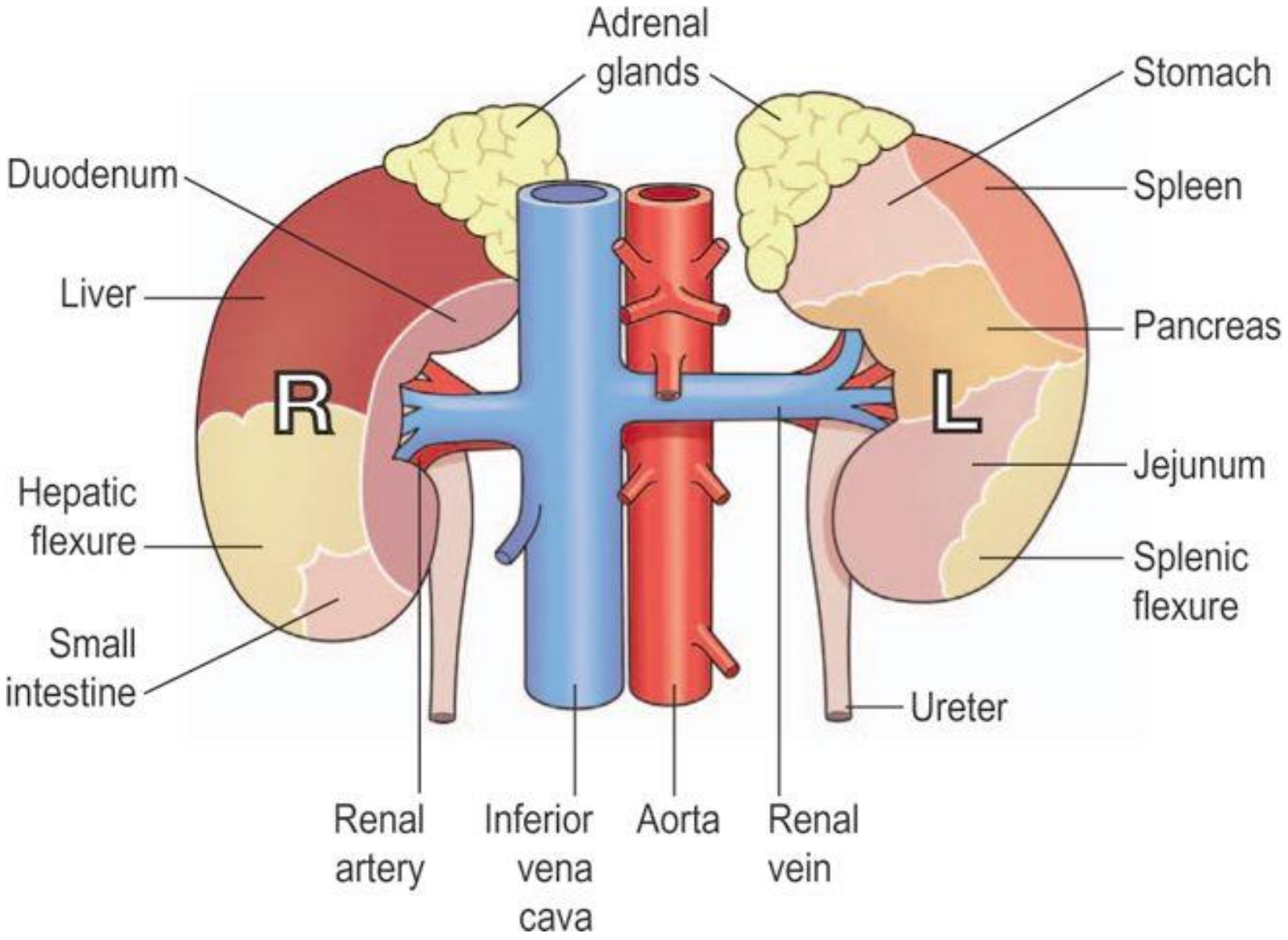
Kidneys

The kidneys lie on the posterior abdominal wall, one on each side of the vertebral column, behind the peritoneum and below the diaphragm.

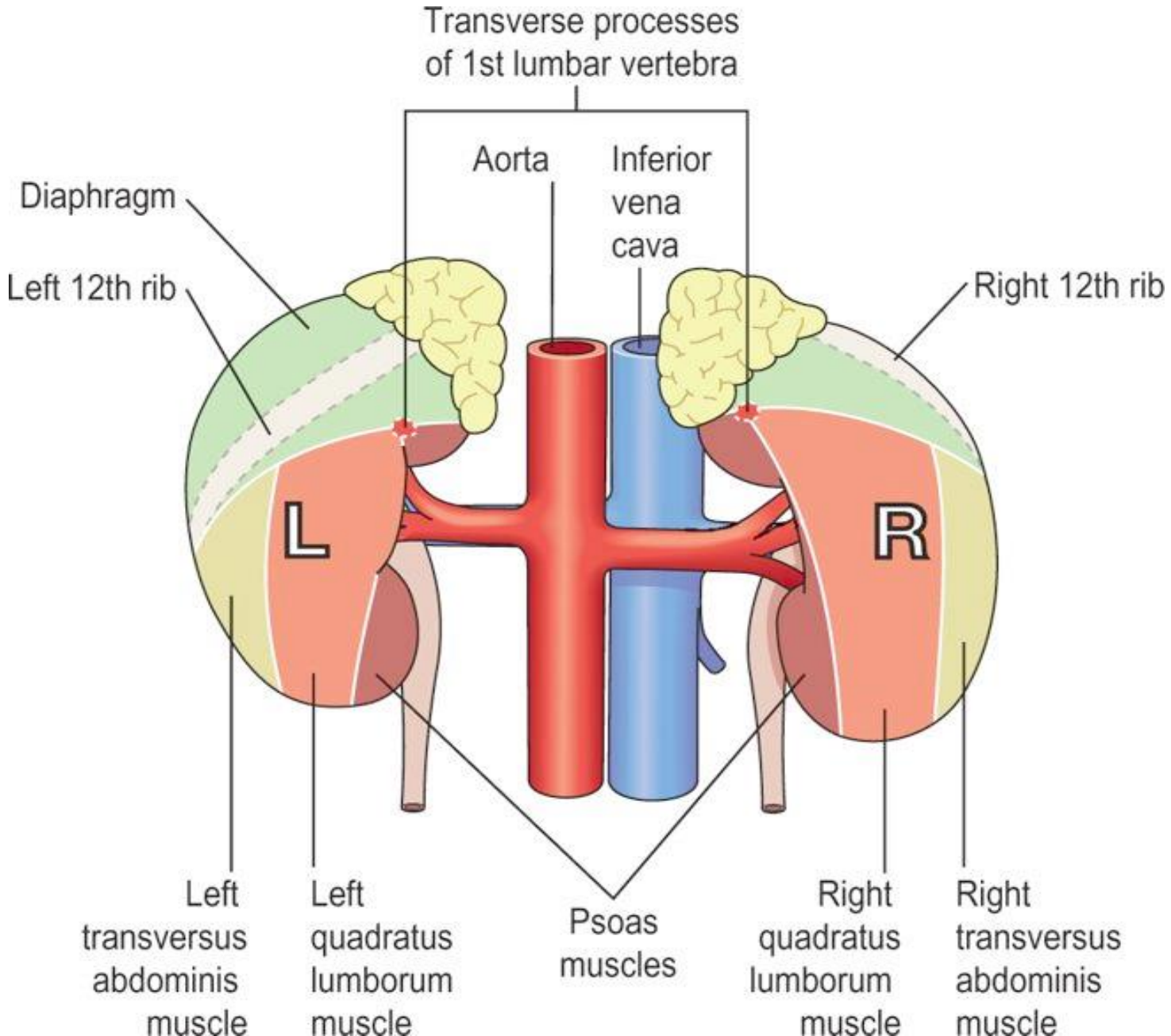
They extend from the level of the 12th thoracic vertebra to the 3rd lumbar vertebra.

Kidneys are bean-shaped organs, about 11 cm long, 6 cm wide, 3 cm thick and weigh 150 g.

Anterior view of the kidneys showing the areas of contact with associated structures



Posterior view of the kidneys showing the areas of contact with associated structures



Organs associated with the kidneys

Right kidney

Superiorly — the right adrenal gland

Anteriorly —the right lobe of the liver, the duodenum and the hepatic flexure of the colon

Posteriorly —the diaphragm, and muscles of the posterior abdominal wall

Left kidney

Superiorly — the left adrenal gland

Anteriorly —the spleen, stomach, pancreas, jejunum and splenic flexure of the colon

Posteriorly —the diaphragm and muscles of the posterior abdominal wall

Microscopic structure of the kidney

The kidney is composed of about 1–2 million functional units, the nephrons, and a smaller number of collecting ducts.

The collecting ducts transport urine through the pyramids to the calyces and renal pelvis, giving the pyramids their striped appearance.

Gross structure of the kidney

There are three areas of tissue which can be distinguished when a longitudinal section of the kidney is viewed with the naked eye:

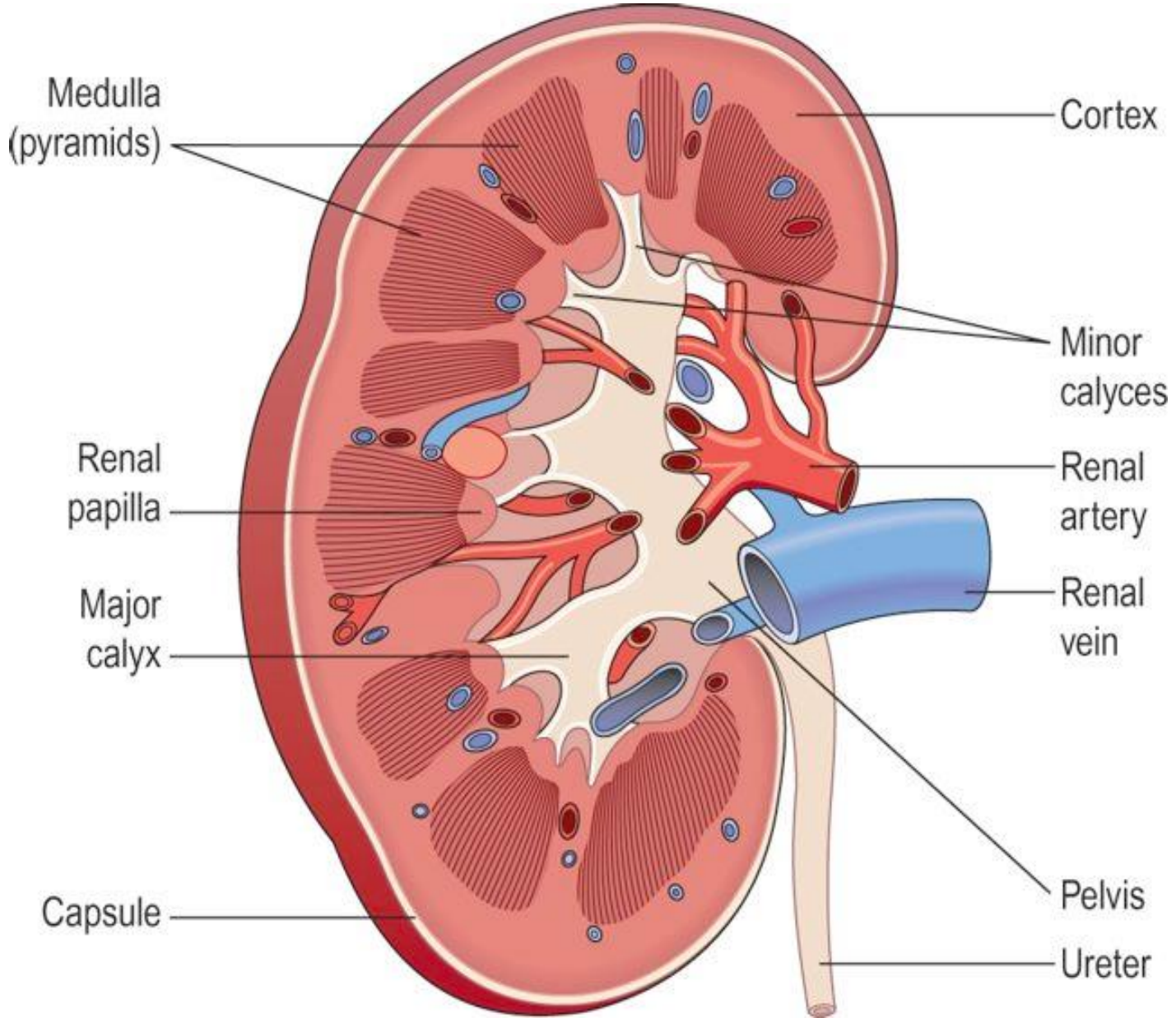
1-A fibrous capsule: surrounding the kidney

2-The cortex: a reddish-brown layer of tissue immediately below the capsule and outside the pyramids.

3-The medulla: the innermost layer, consisting of pale conical-shaped striations, the renal pyramids.

- **The hilum**: is the concave medial border of the kidney where the renal blood and lymph vessels, the ureter and nerves enter.

A longitudinal section of the right kidney (Gross structure)



The nephron

The nephron consists of a tubule closed at one end, the other end opening into a collecting tubule. The closed or blind end is indented to form the cup-shaped glomerular capsule (Bowman's capsule).

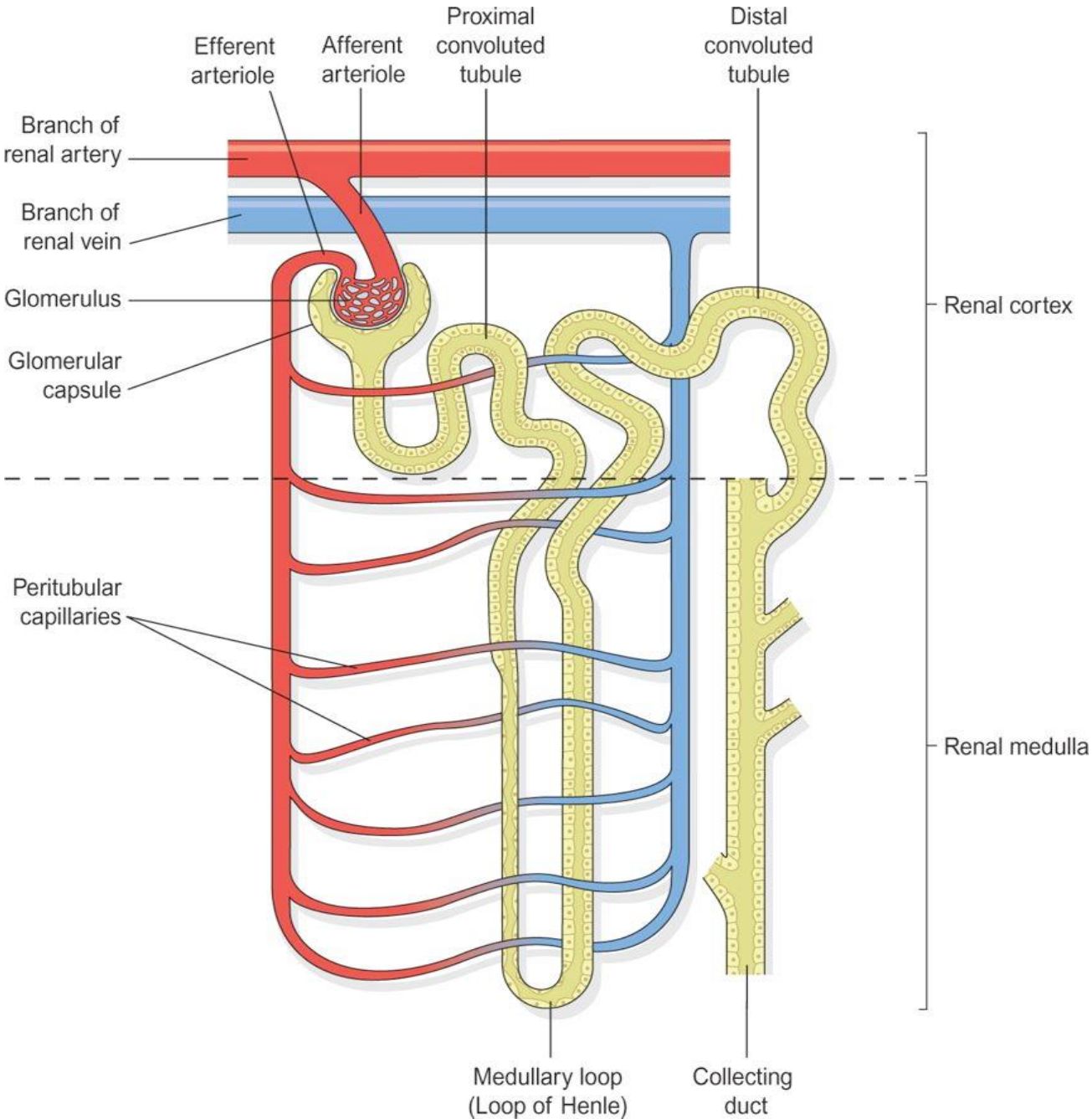
Continuing from the glomerular capsule, the remainder of the nephron is about 3 cm long and is described in three parts:

1. The proximal convoluted tubule
2. The medullary loop (loop of Henle)
3. The distal convoluted tubule, leading into a collecting duct.

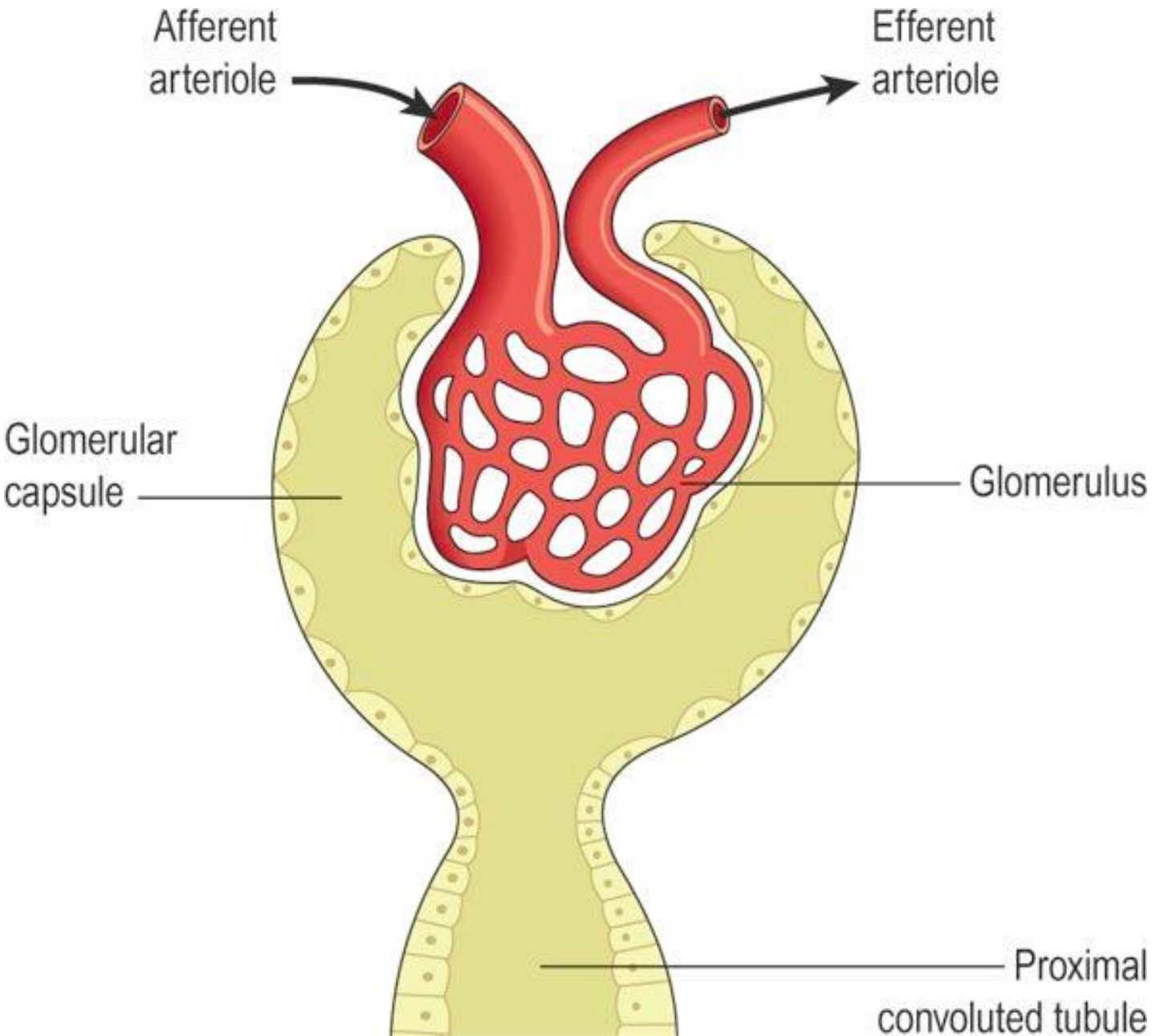
The blood vessels of the kidney are supplied by both sympathetic and parasympathetic nerves.

The presence of both branches of the autonomic nervous system controls renal blood vessel diameter and renal blood flow independently of autoregulation.

A nephron and associated blood vessels



The glomerulus and glomerular capsule



Ureters

The ureters are the tubes that carry urine from the kidneys to the urinary bladder. They are about 25 to 30 cm long with a diameter of about 3 mm.

The ureter is continuous with the funnel-shaped renal pelvis. It passes downwards through the abdominal cavity.

When urine accumulates and the pressure in the bladder rises, the ureters are compressed and the openings occluded. This prevents reflux of urine into the ureters (towards the kidneys) as the bladder fills and during micturition, when pressure increases as the muscular bladder wall contracts.

Structure

The ureters consist of three layers of tissue:

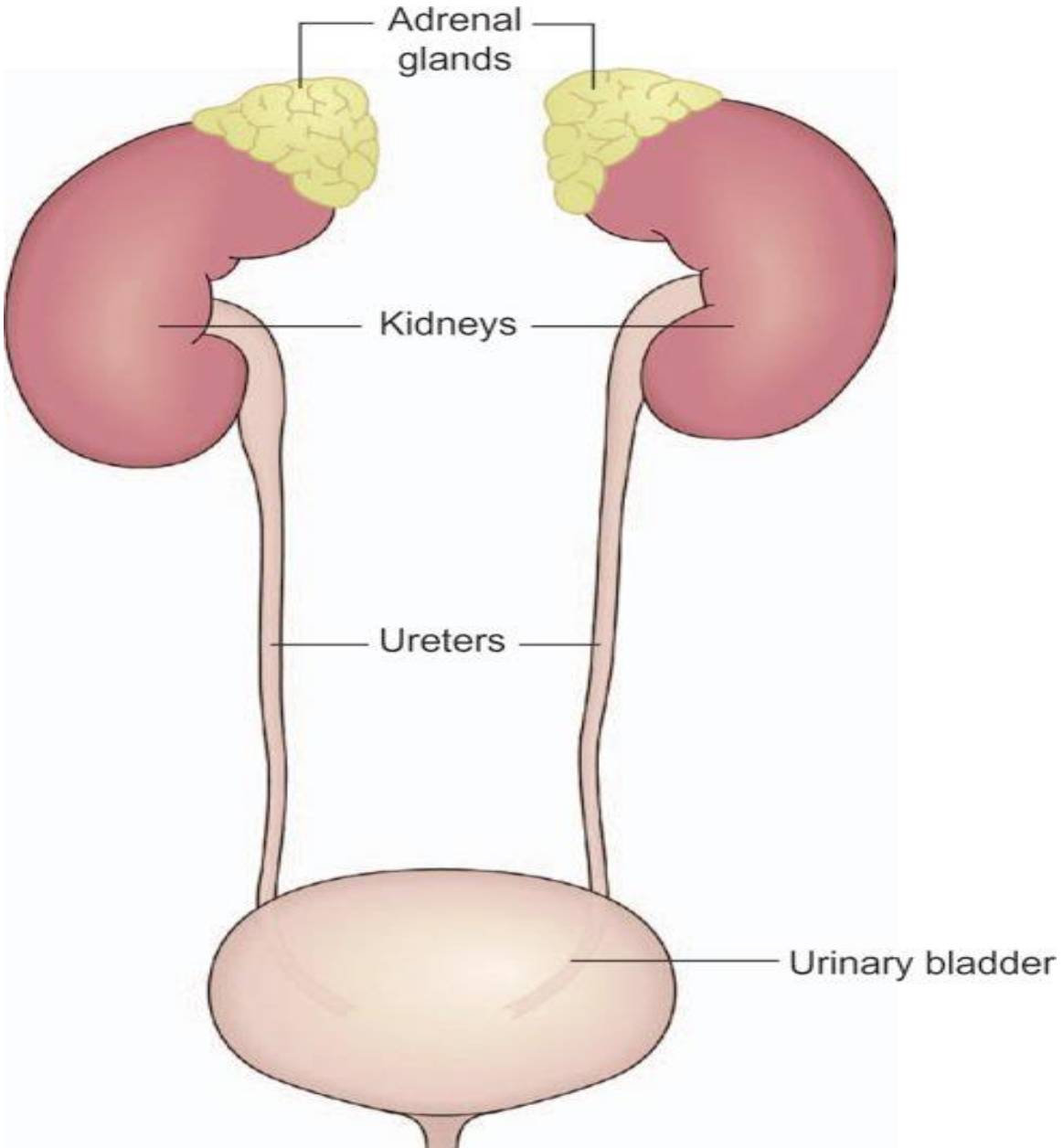
1-An outer covering of fibrous tissue, continuous with

the fibrous capsule of the kidney

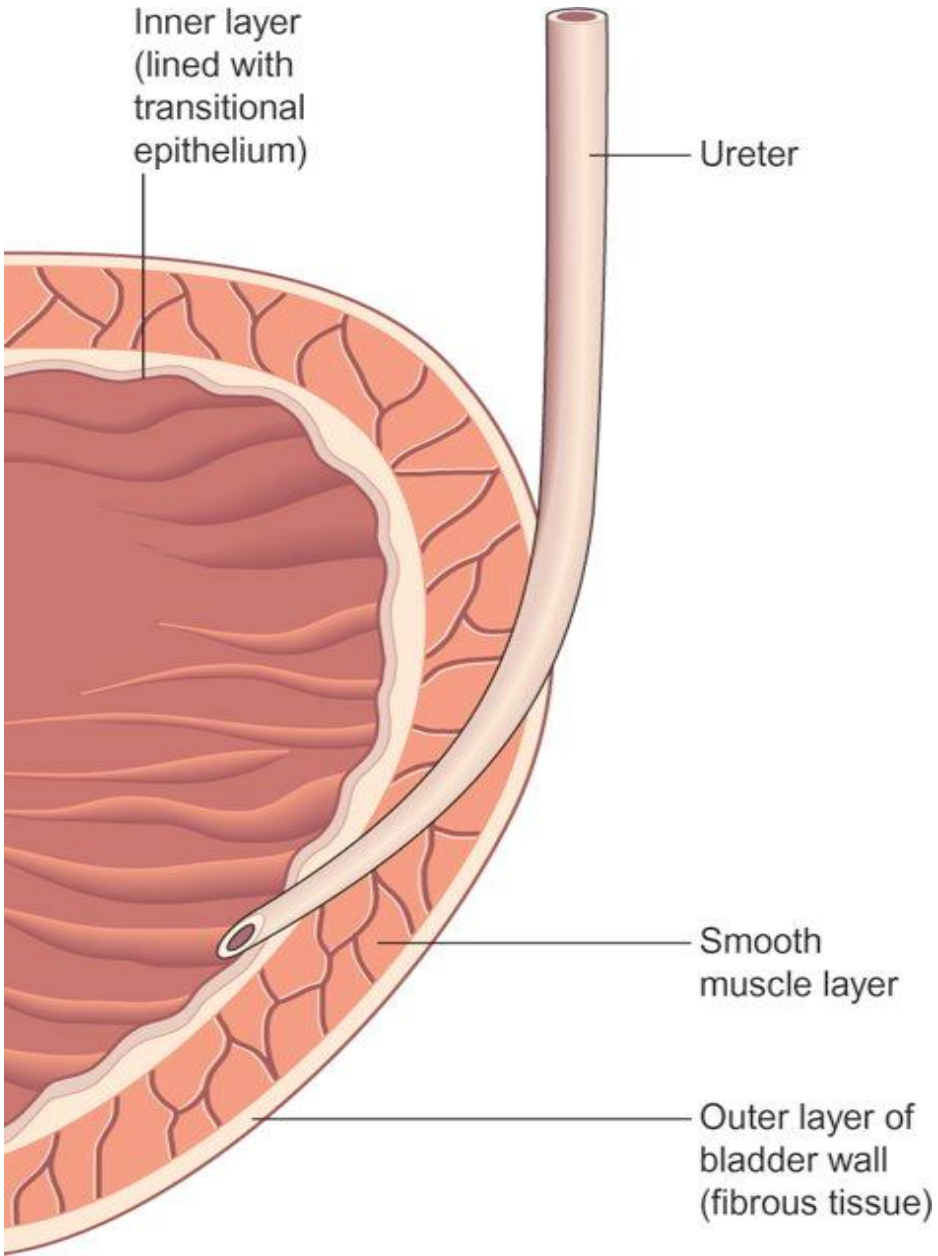
2-A middle muscular layer consisting of interlacing smooth muscle fibres that form a syncytium spiralling round the ureter, some in clockwise and some in anticlockwise directions and an additional outer longitudinal layer in the lower third.

3-An inner layer, the mucosa, lined with transitional epithelium.

The ureters and their relationship to the kidneys and bladder



The position of the ureter where it passes through the bladder wall



Urinary bladder

The urinary bladder is a reservoir for urine. It lies in the pelvic cavity and its size and position vary, depending on the volume of urine it contains. When distended, the bladder rises into the abdominal cavity.

Structure

The bladder is roughly pear-shaped, but becomes more oval as it fills with urine.

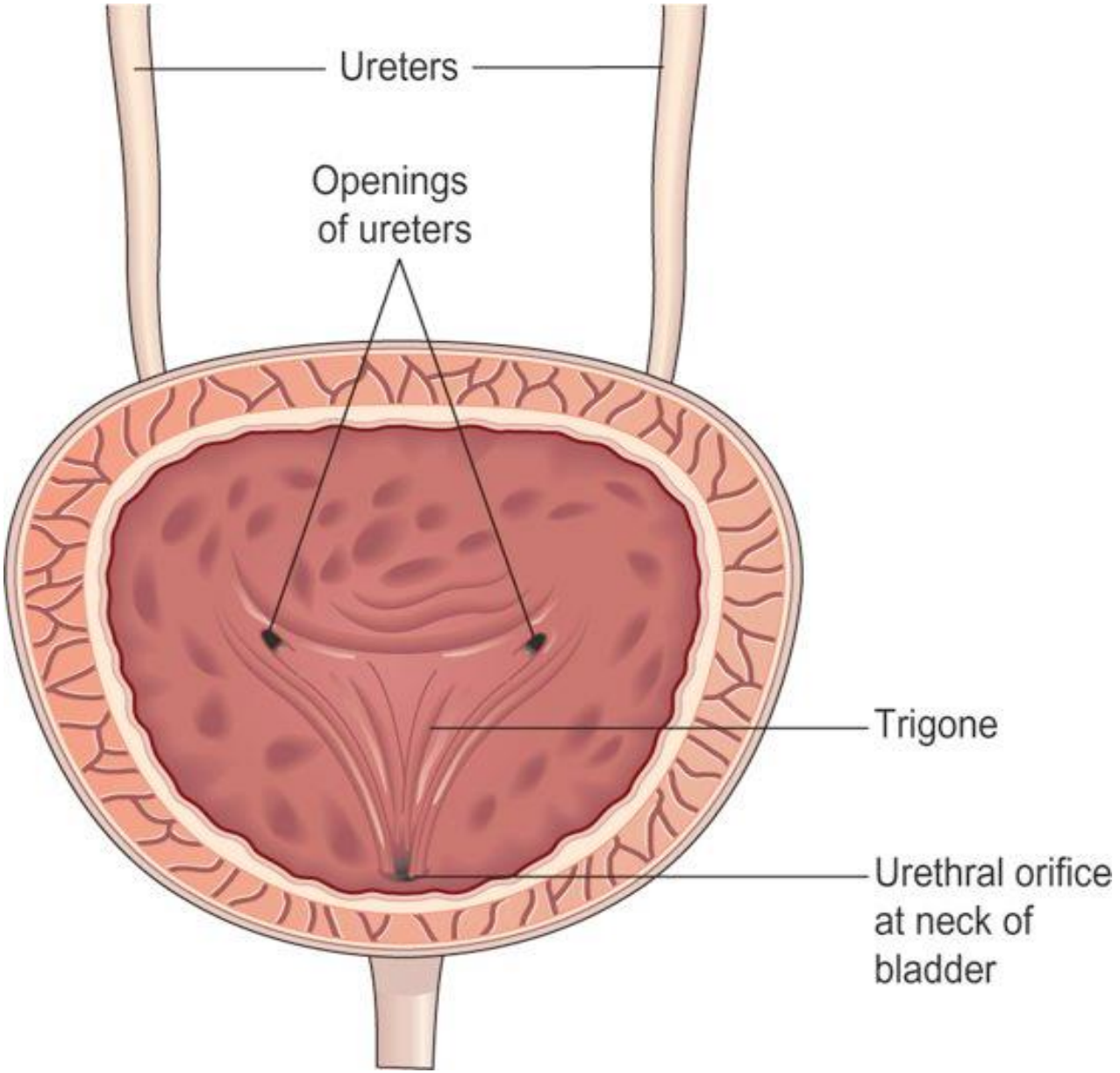
The bladder wall is composed of three layers:

1-The outer layer of loose connective tissue

2-The middle layer, smooth muscle fibres and elastic tissue.

3-The mucosa, lined with transitional epithelium.

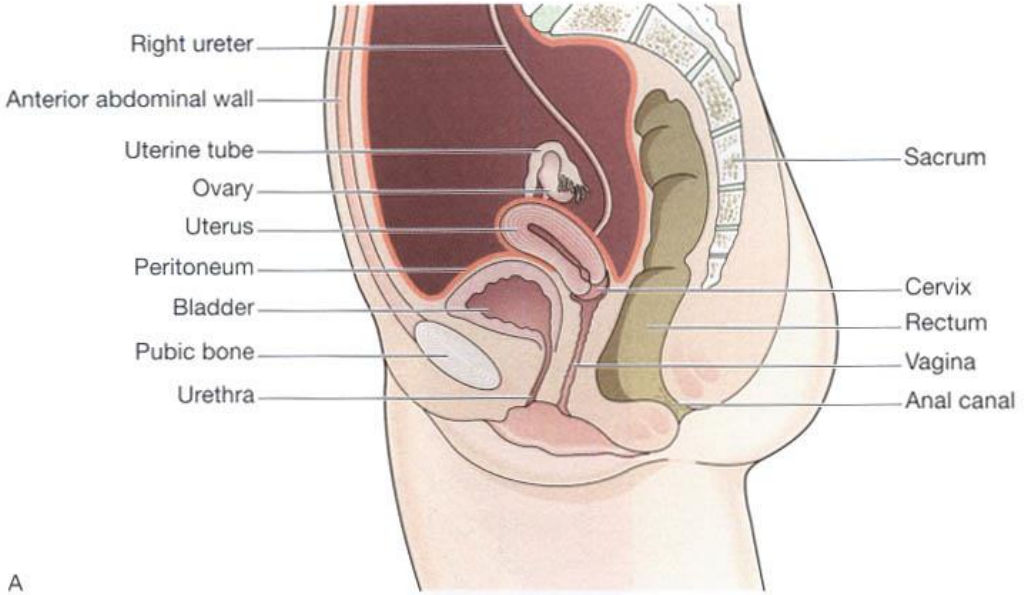
Section of the bladder showing the trigone



Urethra

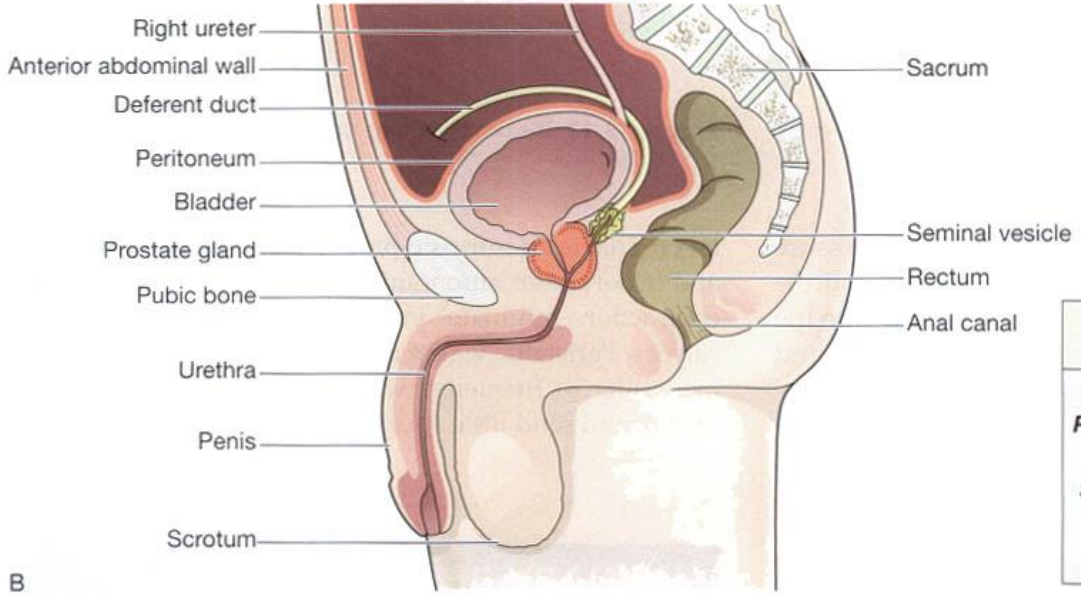
The urethra is a canal extending from the neck of the bladder to the exterior, at the external urethral orifice. It is longer in the male than in the female.

The external urethral orifice is guarded by the external urethral sphincter, which is under voluntary control.



A

Organs associated with the bladder in the female	
Anteriorly	— the symphysis pubis
Posteriorly	— the uterus and upper part of the vagina
Superiorly	— the small intestine
Inferiorly	— the urethra and the muscles forming the pelvic floor



B

Organs associated with the bladder in the male	
Anteriorly	— the symphysis pubis
Posteriorly	— the rectum and seminal vesicles
Superiorly	— the small intestine
Inferiorly	— the urethra and prostate gland

Anatomy of the Nervous System

11nth lecture

For descriptive purposes the parts of the nervous system are grouped as follows:

1-The central nervous system (CNS), consisting of the brain and the spinal cord

2-The peripheral nervous system (PNS) consisting of all the nerves outside the brain and spinal cord.

The PNS comprises paired cranial and sacral nerves — some of these are sensory (afferent), some are motor (efferent) and some mixed.

There are two functional parts within the PNS:

1. The sensory division
2. The motor division

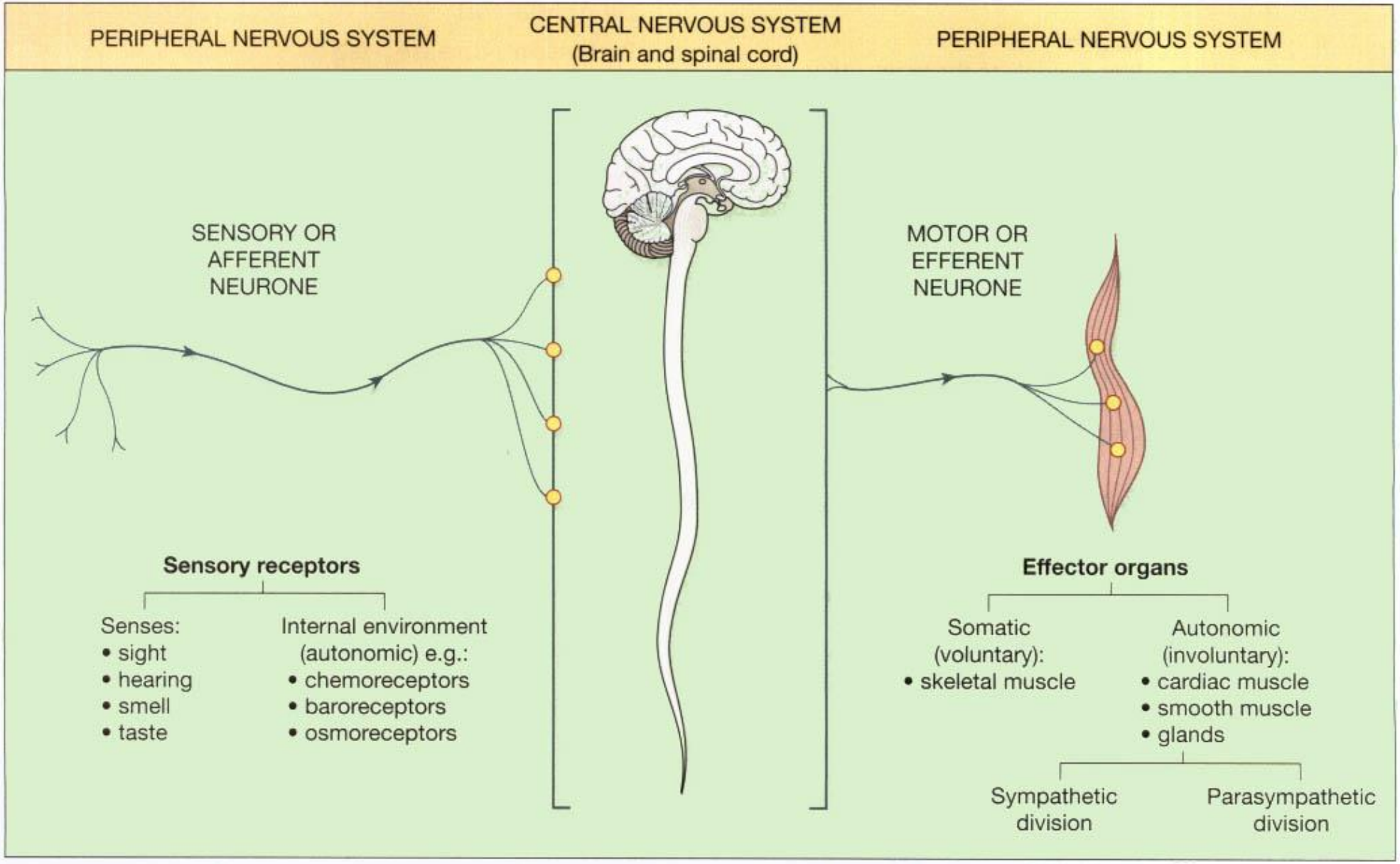
The motor division is involved in activities that are:

1-Voluntary —the somatic nervous system (movement of voluntary muscles)

2-Involuntary — the autonomic nervous system (functioning of smooth and cardiac muscle and glands).

The autonomic nervous system has two parts: sympathetic and parasympathetic.

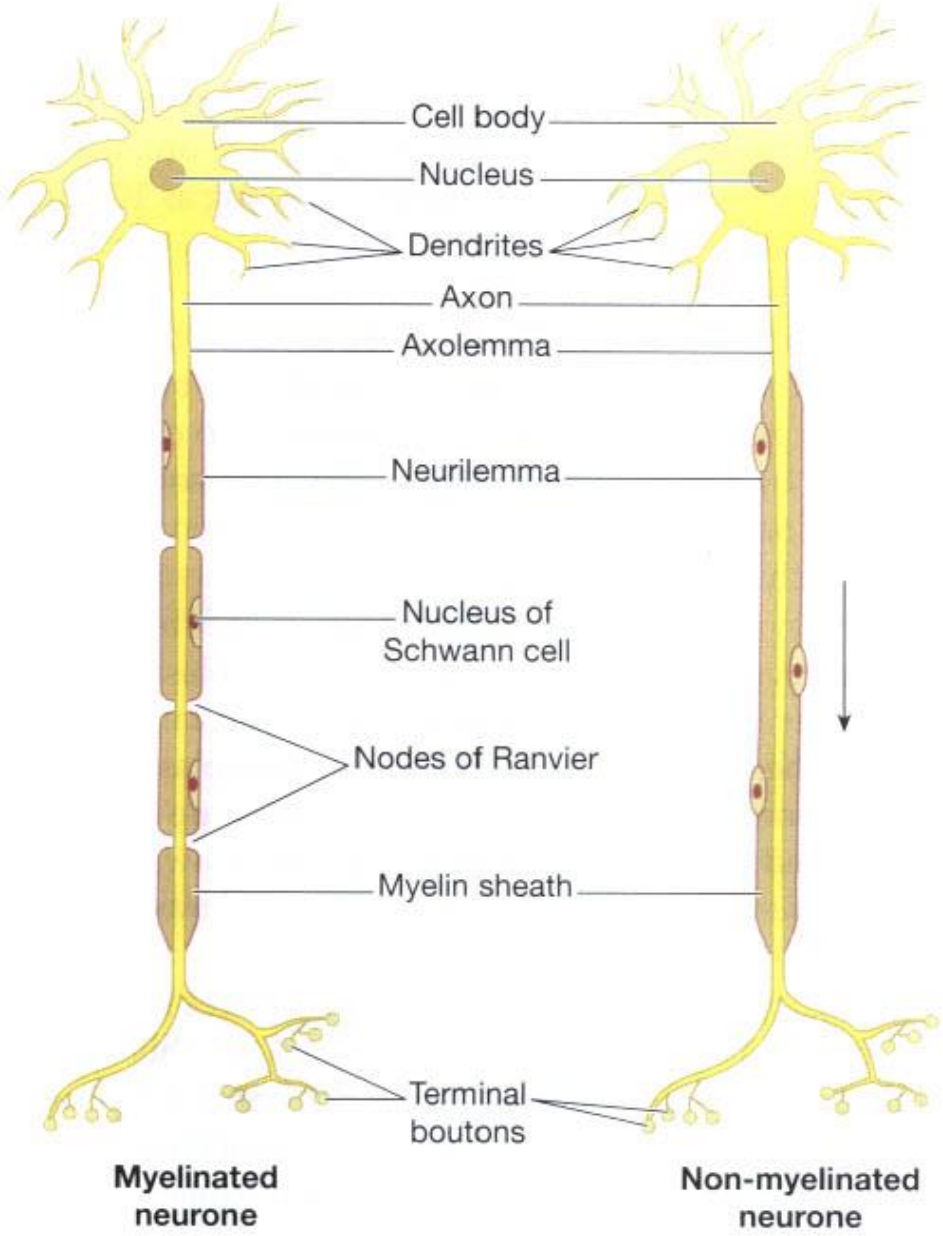
Functional components of the nervous system.



The nervous system consists of a vast number of cells called neurones supported by a special type of connective tissue, neuroglia.

Each neurone consists of a cell body and its processes, one axon and many dendrites.

The structure of neurones. (Arrow indicates direction of impulse conduction.)



Neurones are commonly referred to simply as nerve cells. Bundles of axons bound together are called nerves.

Neurones cannot divide and for survival they need a continuous supply of oxygen and glucose.

Unlike many other cells, neurones can synthesise chemical energy (ATP) only from glucose.

Properties of neurones

Neurones have the characteristics of irritability and conductivity.

Irritability is the ability to initiate nerve impulses in response to stimuli from:

1-Outside the body, e.g. touch, light waves

2-Inside the body, e.g. a change in the concentration of carbon dioxide in the blood alters respiration; a thought may result in voluntary movement.

Central nervous system

The central nervous system consists of the:

1. Brain
2. Spinal cord.

Membranes covering the brain and spinal cord (the meninges)

The brain and spinal cord are completely surrounded by three membranes, the meninges, lying between the skull and the brain and between the vertebrae and the spinal cord.

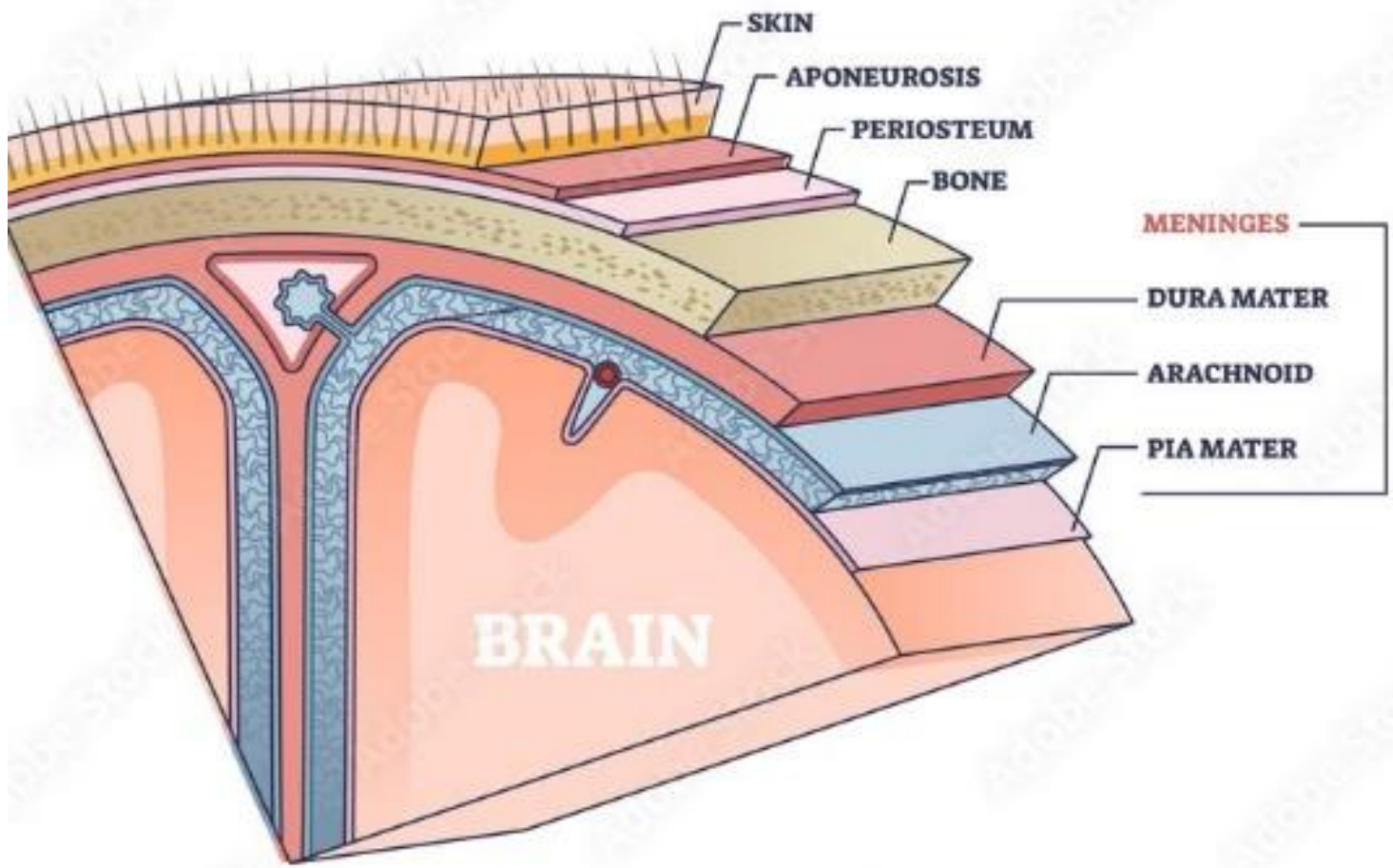
Named from outside inwards they are:

1. Dura mater
2. Arachnoid mater
3. Pia mater

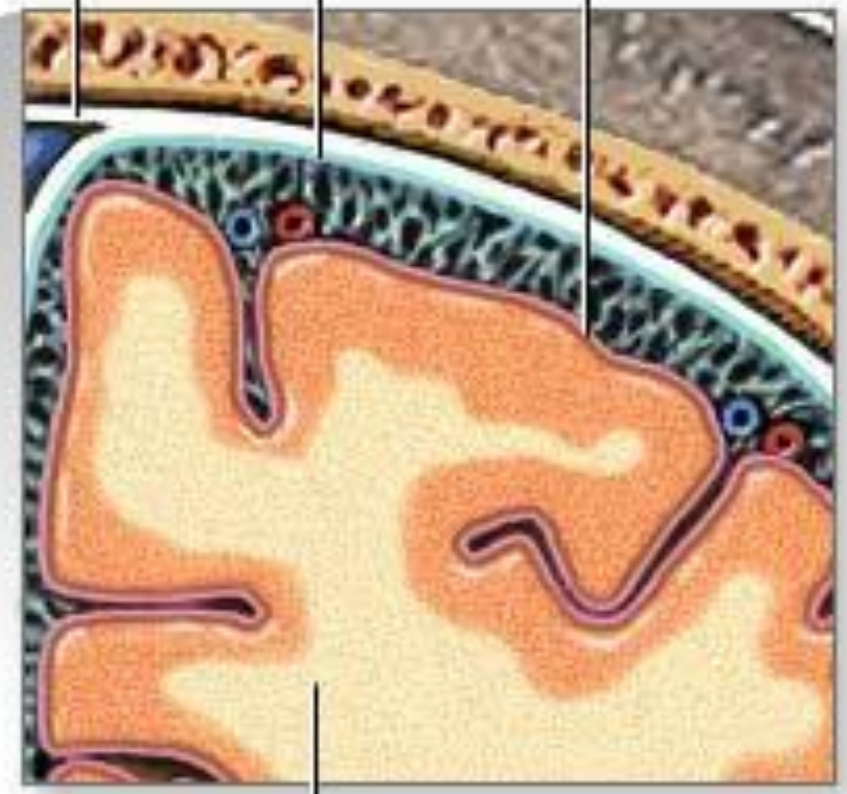
The dura and arachnoid maters are separated by a potential space, the subdural space.

The arachnoid and pia maters are separated by the subarachnoid space, containing cerebrospinal fluid.

MENINGES


SKIN
APONEUROSIS
PERIOSTEUM
BONE
MENINGES
DURA MATER
ARACHNOID
PIA MATER
BRAIN

The meninges are the membranes covering the brain and spinal cord



BRAIN

The brain constitutes about one-fiftieth of the body weight and lies within the cranial cavity. The parts are:

1-Cerebrum

2-Midbrain

3-Pons

4-Medulla oblongata

5-Cerebellum.

The brain stem

Parts of the central nervous system