



Introduction

Introduction to Anatomy and Embryology

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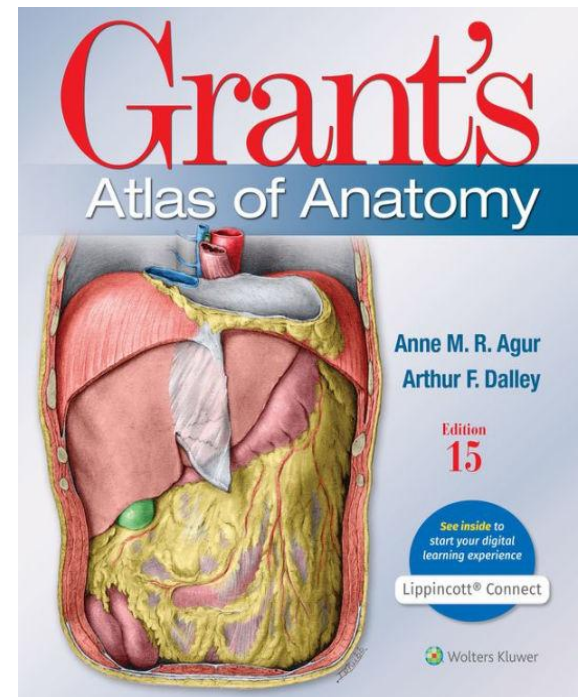
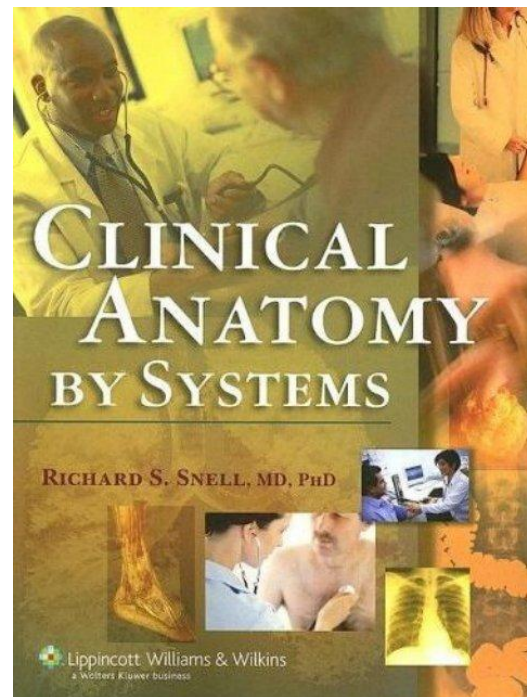
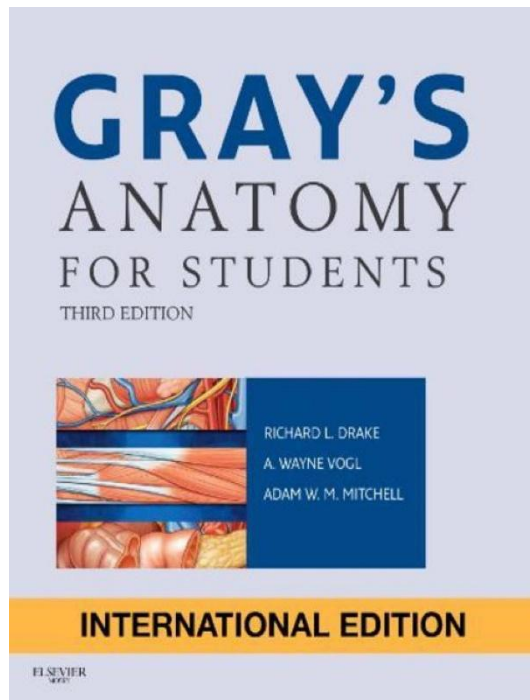


Recommended books

Gray, H. Gray's Anatomy: With original illustrations by Henry Carter. **ANY EDITION**

Snell, R. Clinical Anatomy by Systems. **ANY EDITION**

Agur and Dalley. Grant's Atlas of Anatomy. **ANY EDITION**



Anatomy

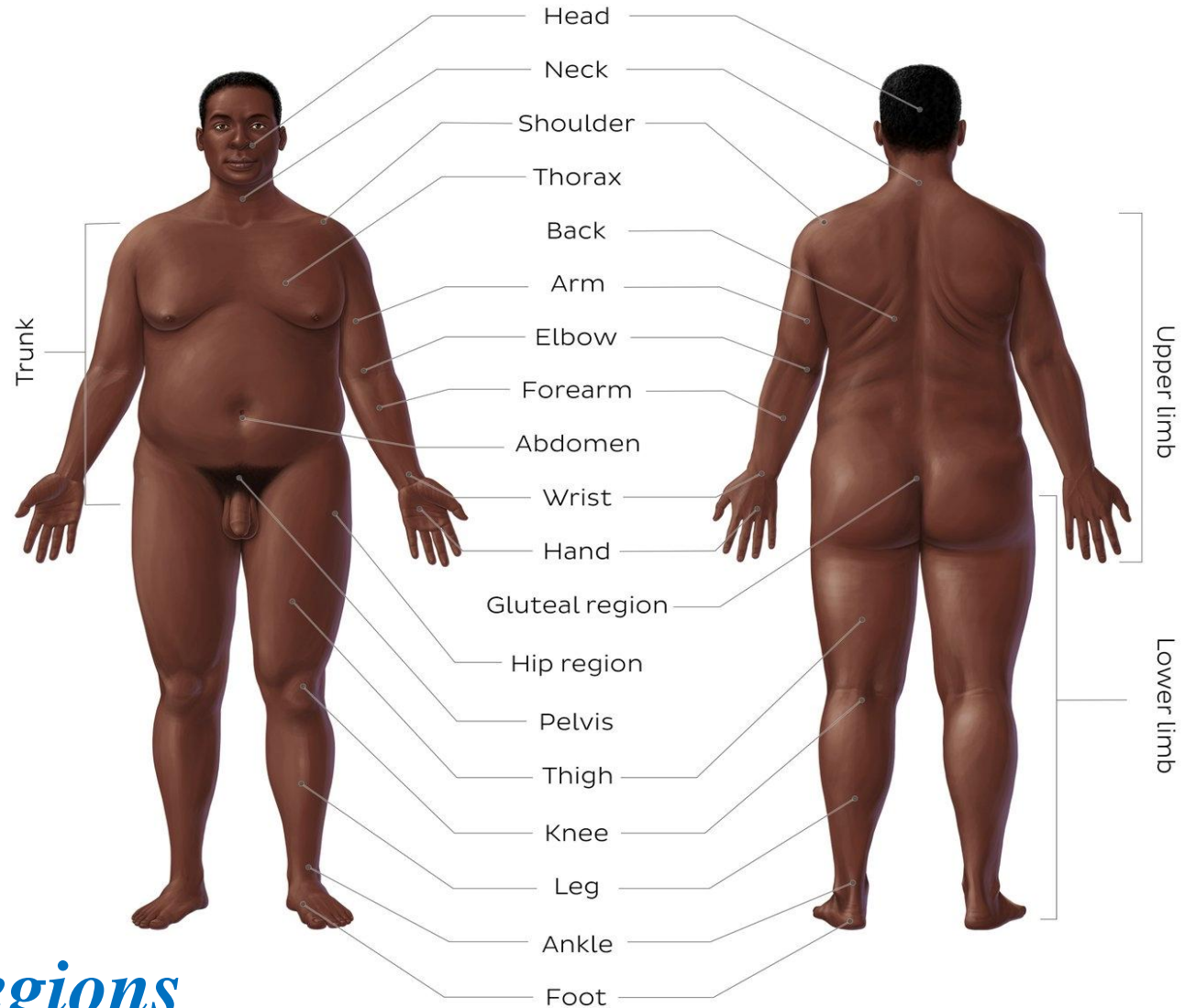
The term derives from the Greek verb “*anatomein*,” which means “*to cut open, to dissect*”

- **Basic anatomy** is the study of the macroscopic structure and function of the body.
- **Clinical anatomy** is the branch of anatomy that focuses on the application of anatomical knowledge to clinical practice, particularly in the diagnosis and treatment of patients. It bridges the gap between basic anatomical concepts and real-world medical situations, emphasizing the structures and functions of the human body that are most relevant to healthcare providers, such as doctors, surgeons, and physiotherapists.
- **Histology** is the study of the microscopic structures of cells and tissues.
- **Embryology** is the study of the formation and development of an embryo and fetus.



Regional Names

- **Head**
- **Neck**
- **Upper limb**
- **Lower limb**
- **Thorax**
- **Abdomen**
- **Pelvis**



Anatomy by Regions

1. **Musculoskeletal System and Skin**

2. **Digestive System**

3. **Endocrine System**

4. **Blood and Lymphoreticular System**

(Immune System)

5. **Cardiovascular System**

6. **Respiratory System**

7. **Neurosciences and Behaviour**

(Nervous System)

8. **Genitourinary System**

2nd year

3rd year

1. الجهاز الحركي والجلد

2. الجهاز الهضمي

3. الغدد الصم

4. الجهاز الليمفاوي والدم

5. الجهاز القلبي الوعائي

6. الجهاز التنفسي

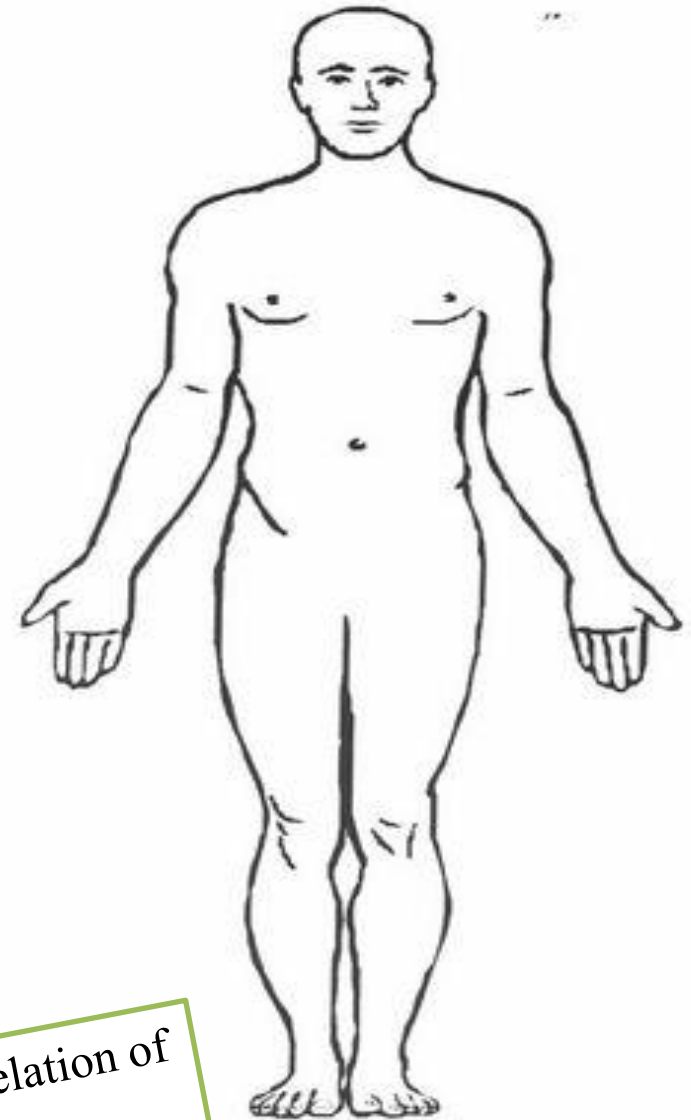
7. الجهاز العصبي المركزي وعلم السلوك

8. الجهاز البولي والتناسلي

Anatomy by Systems

Anatomical Position

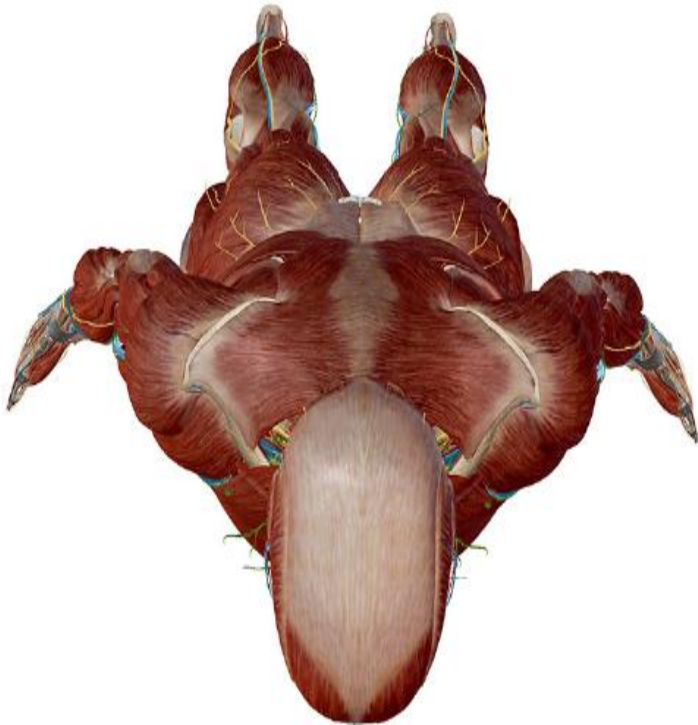
- 1- The person is standing erect
- 2- The face is directed forward
- 3- The feet are flat on the floor and directed forward
- 4- The upper limbs are at the sides with the palms facing forward
- 5- The thumb is directed laterally



used as a reference in describing the relation of body parts to one another

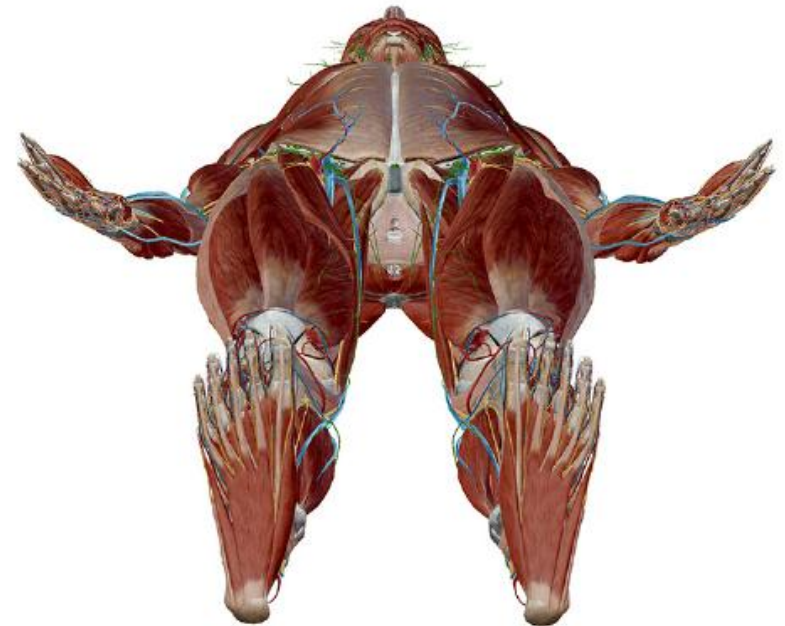
If the anatomical position is placed face-down, it is in the **prone position**

Prone: on belly



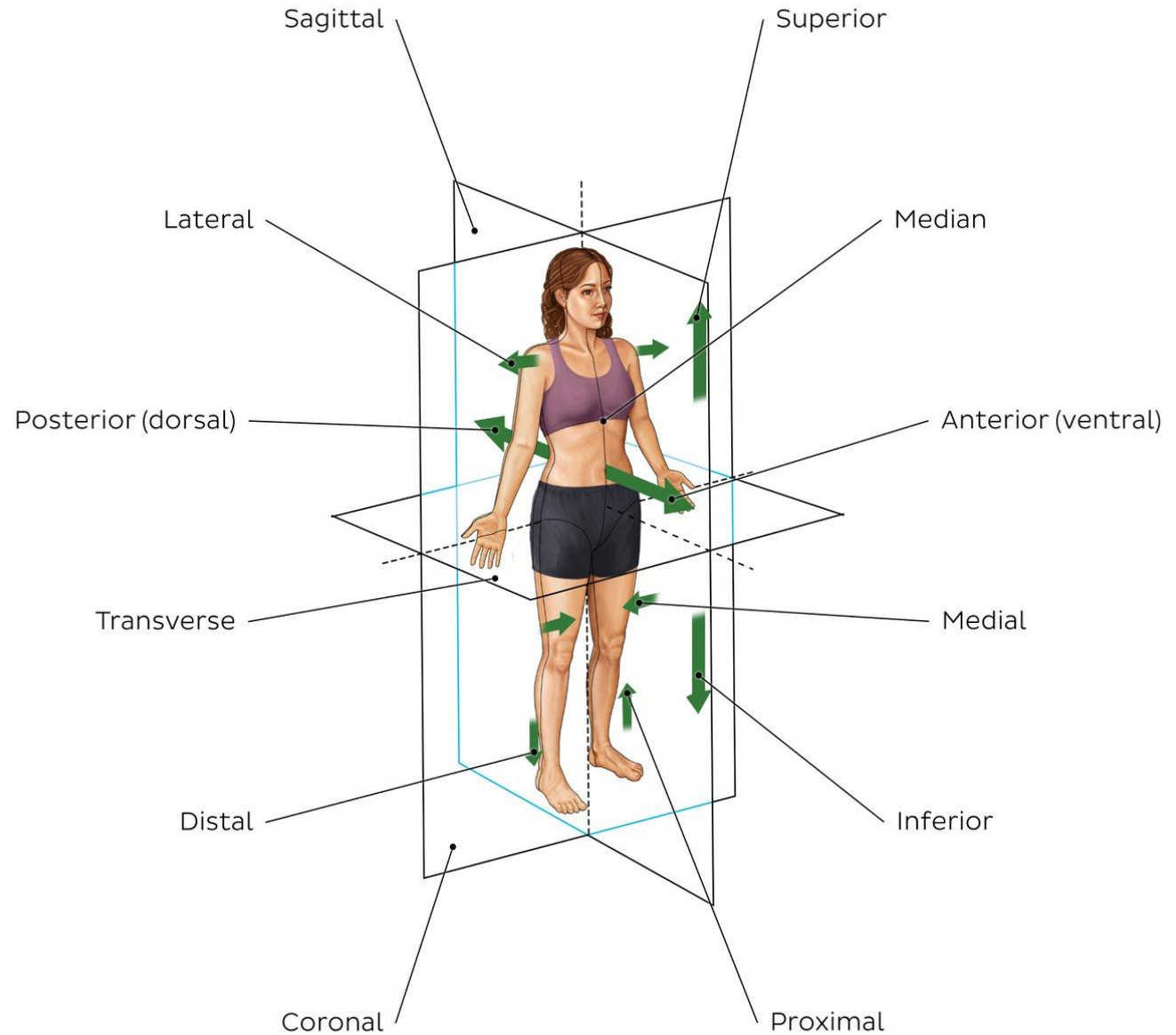
If the anatomical position is placed face-up, it is in the **supine position**

Supine: on back



Directional terms

Directional terms indicate the relationship of one part of the body to another.





Anterior (ventral):
At or near the front of the body

Ventral is often used in animals (stand on all four limbs)!!

The sternum (breastbone) is **anterior** to the heart



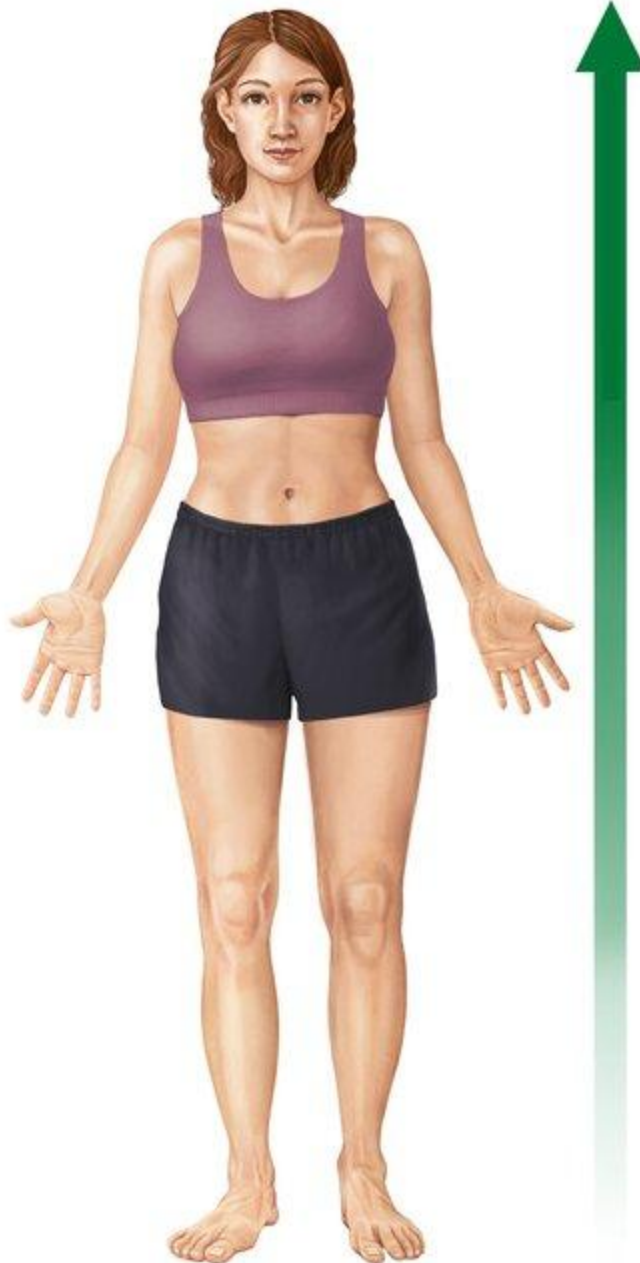
Dorsal is often used in animals (stand on all four limbs)!!

Posterior (dorsal):
At or near the back of the body

The esophagus (food tube) is **posterior** to the trachea (windpipe)

The kidneys are **dorsal** to the stomach.





Superior:

Toward the head/
upper part of a
structure

The heart is **superior** to the liver

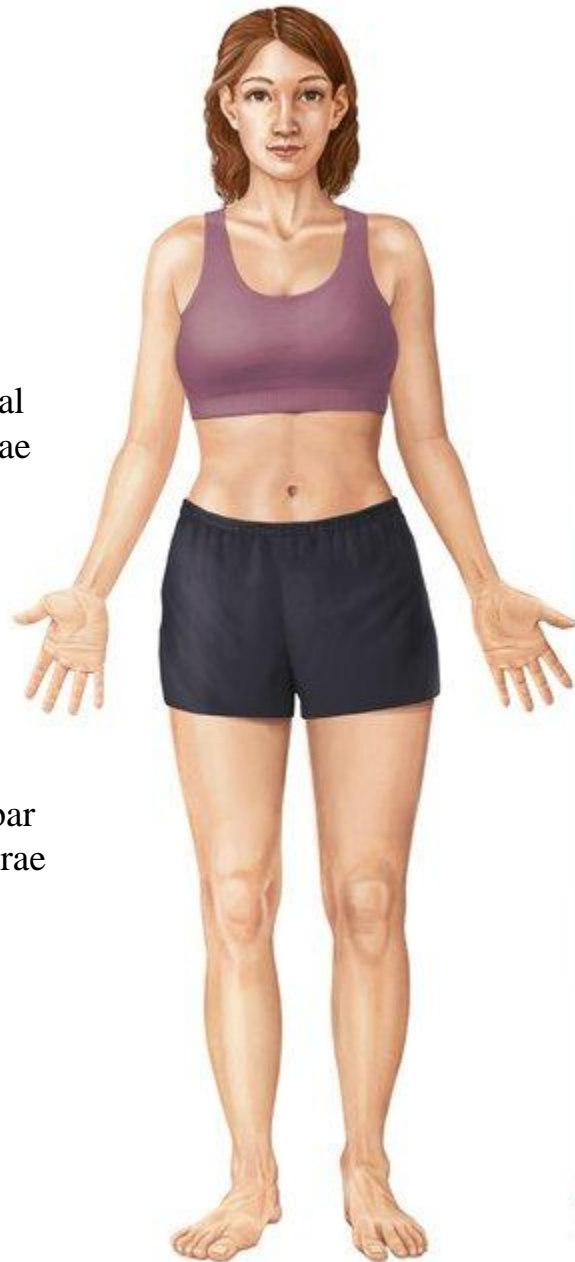
Cranial/ cephalic:

Relating to skull or head, toward the
head.

*This is a more flexible term than
superior because it can be applied to all
animals, whether they stand upright on
two limbs or on all four limbs*

The stomach is more **cranial**
than urinary bladder





Inferior:

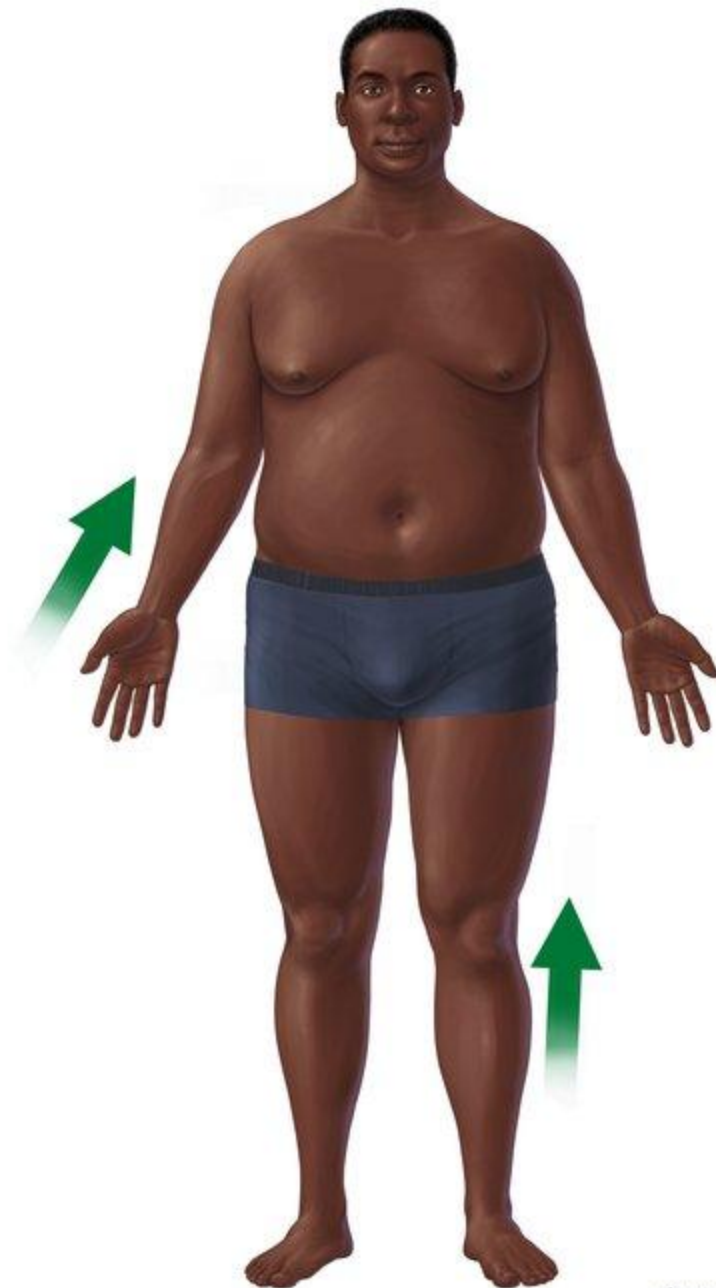
Away from the head/
lower part of a
structure

The stomach is **inferior** to the lungs

Caudal:

Relating to the tail, at or near the tail.

The lumbar vertebrae are **caudal** to the cervical vertebrae.



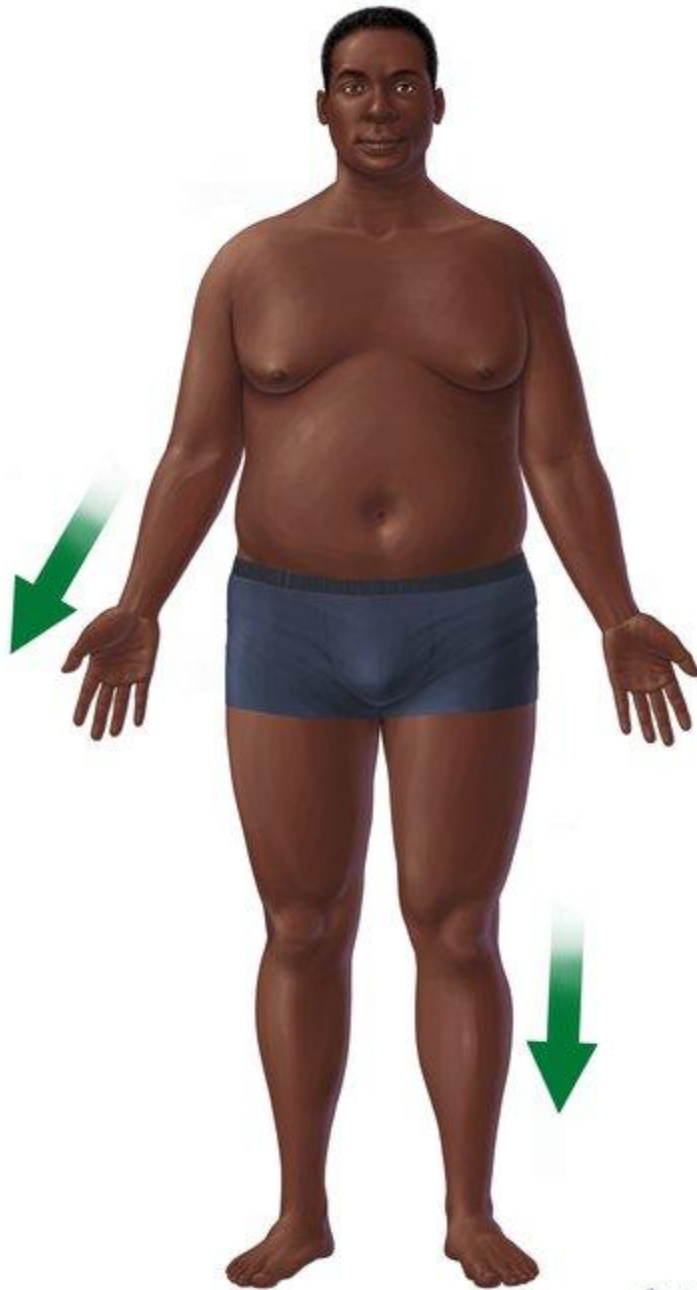
Proximal:

Nearer to the attachment of a limb to the trunk, nearer to the origination of a structure.

Proximal and distal both reference from where the **limb** attaches to the trunk

The arm is **proximal** to the forearm





Distal:

Farther from the attachment of a limb to the trunk, farther from the origination of a structure.

Proximal and distal
both reference from
where the **limb**
attaches to the trunk

The hand is **distal** to the forearm
A finger is **distal** to the wrist



Midline:

An imaginary vertical line that divides the body equally



Medial:
Nearer to midline

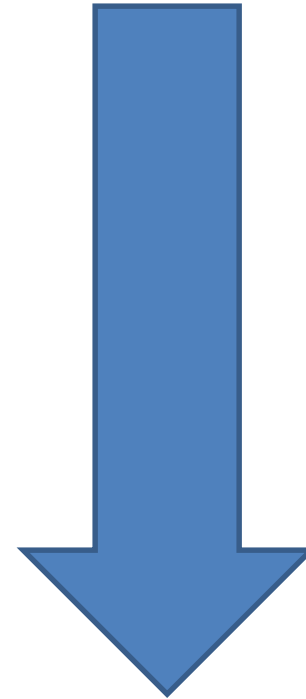
The nose is **medial** to the ears



Lateral:
Farther from midline

The lungs are **lateral** to the heart

Describe the anatomical location of the **NOSE** in relation to the **EYES**?



MEDIAL, ANTERIOR AND INFERIOR

Intermediate: between two structures.

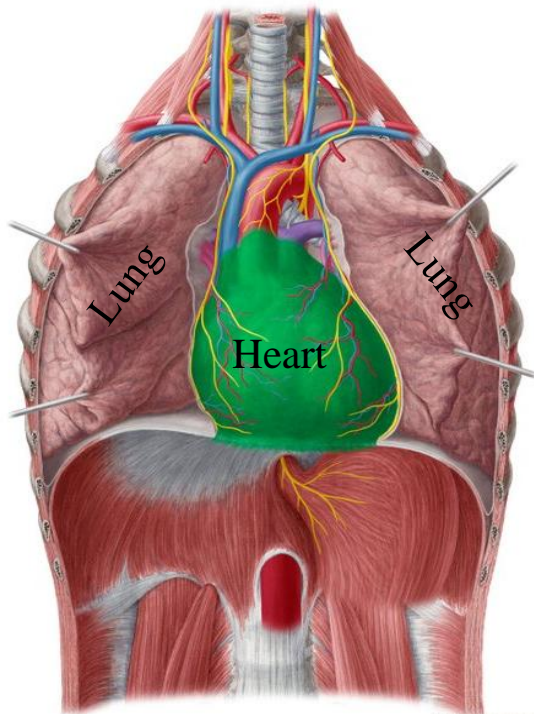
Ipsilateral: on the same side of the body's midline as another structure.

Contralateral: on the opposite side of the body's midline from another structure.

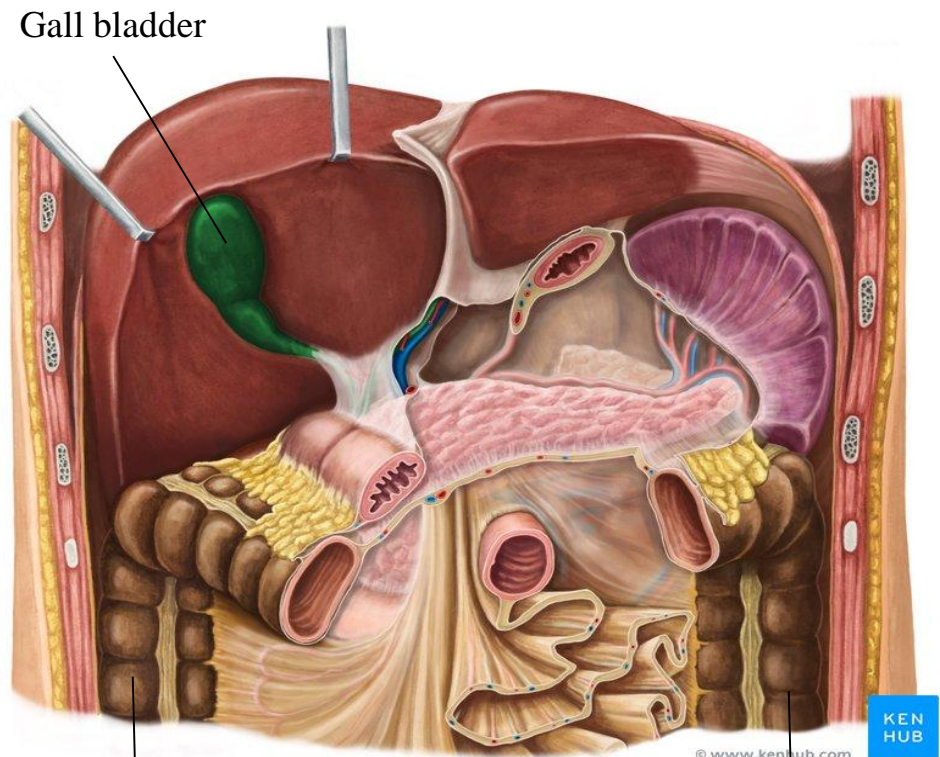
The heart is **intermediate** to the lungs

The gallbladder and ascending colon are **ipsilateral**

The ascending colon and descending colon are **contralateral**



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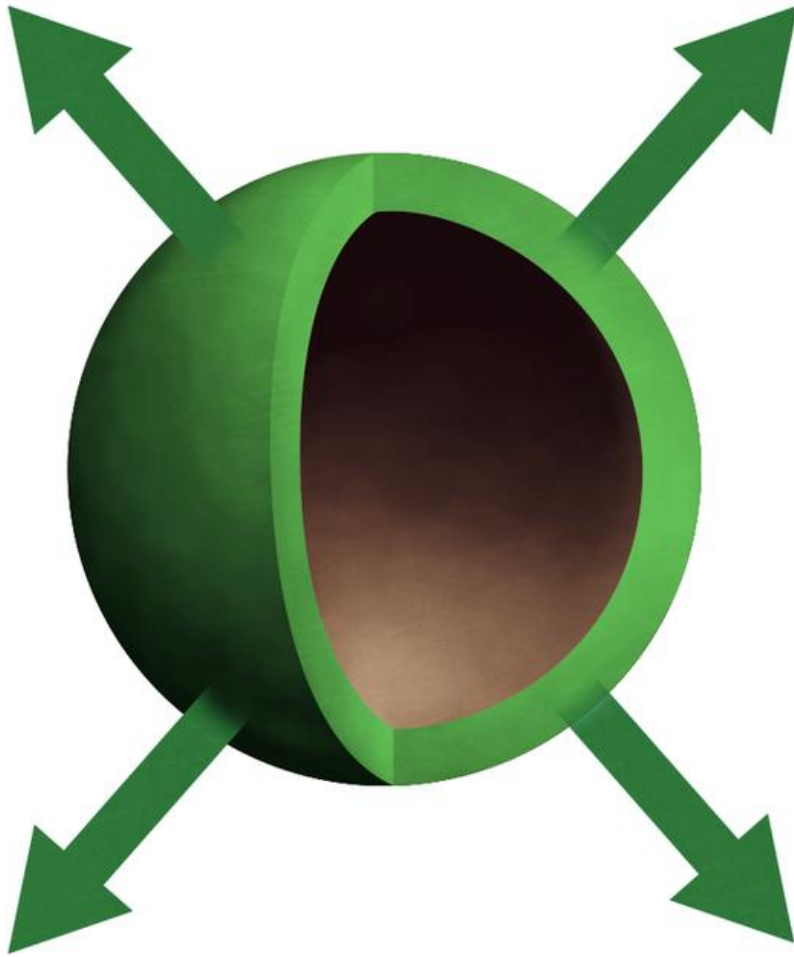


Ascending colon

Descending colon

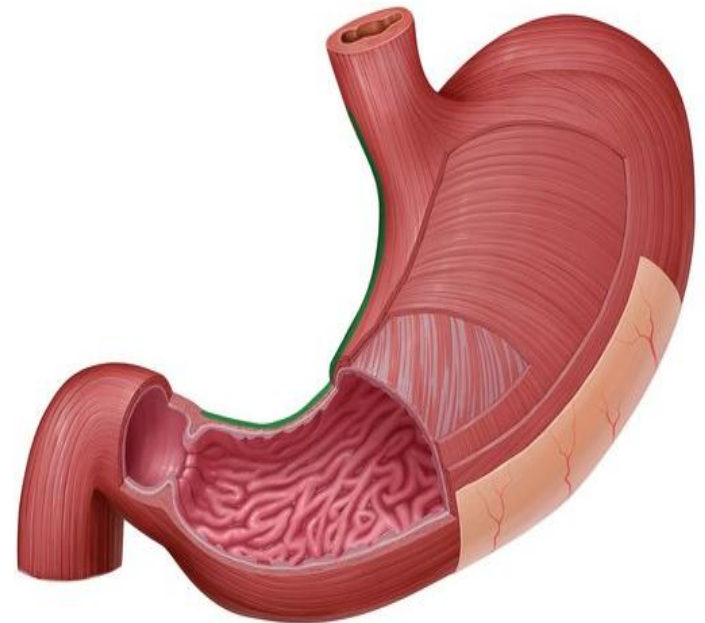
External: toward the outside of a structure.
Internal: toward the inside of a structure.

Is typically used when describing relationships of individual organs.



The visceral pleura is on the **external** surface of the lungs.

The mucosa forms the **internal** lining of the stomach.

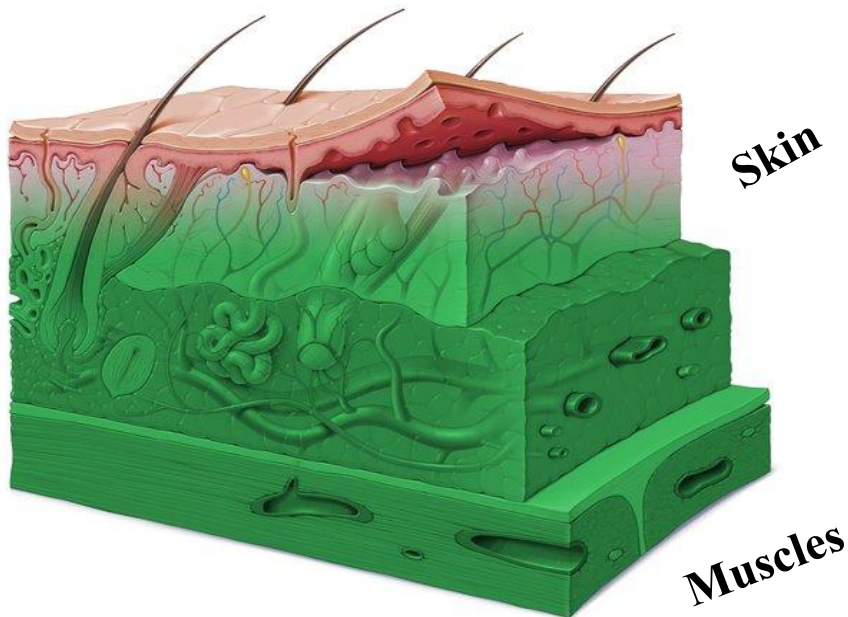


Superficial: toward the surface of the body

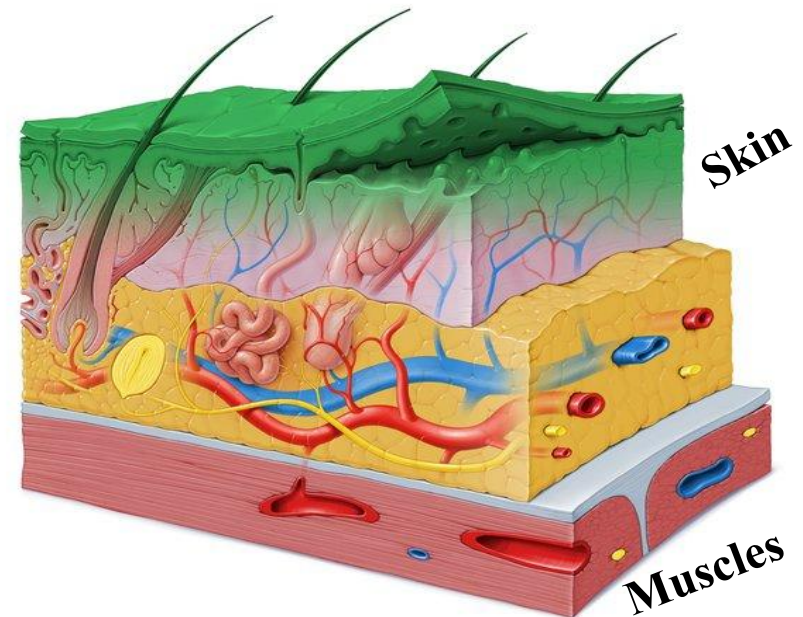
Deep: deep within the body

The skin is **superficial** to the muscles.
The ribs are **deep** to the skin of chest and back.

Deep

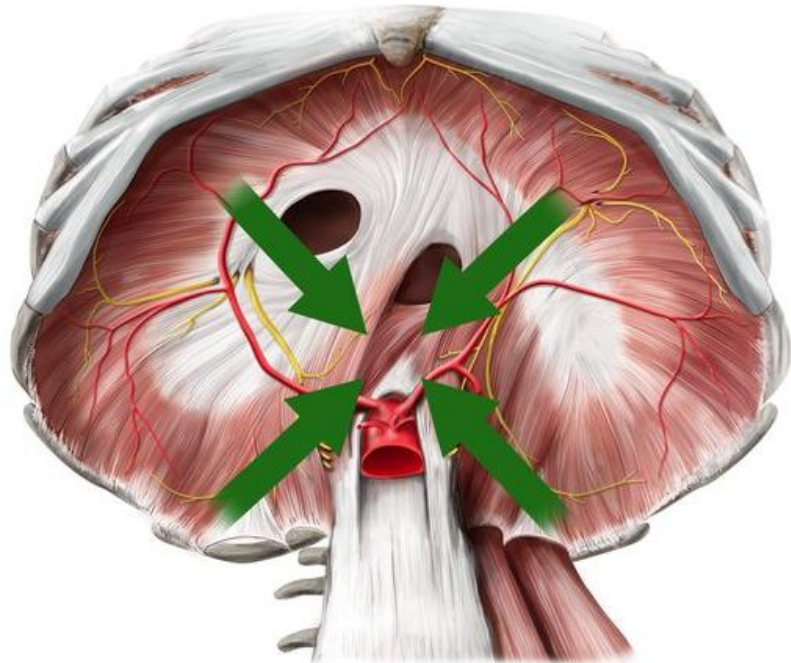


Superficial



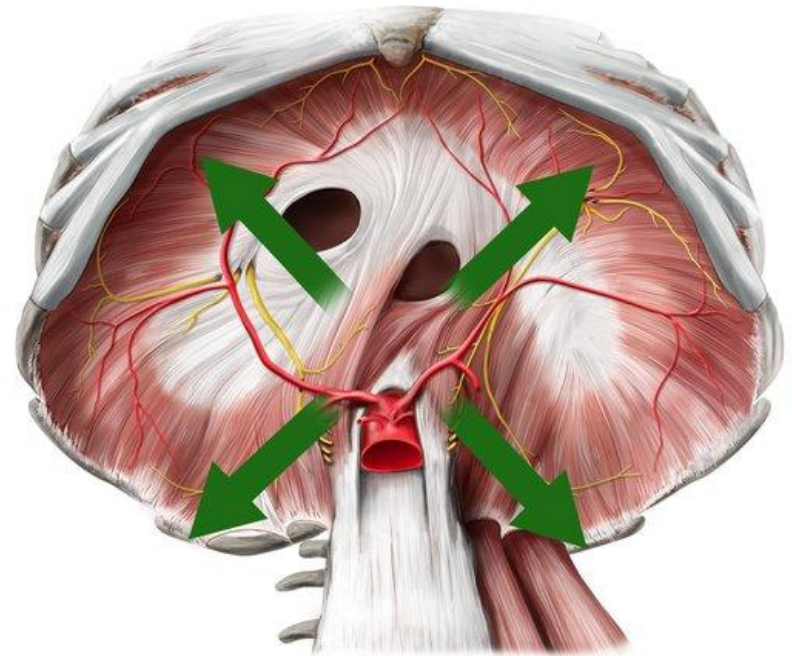
Central

Towards the center



Peripheral

Towards the periphery

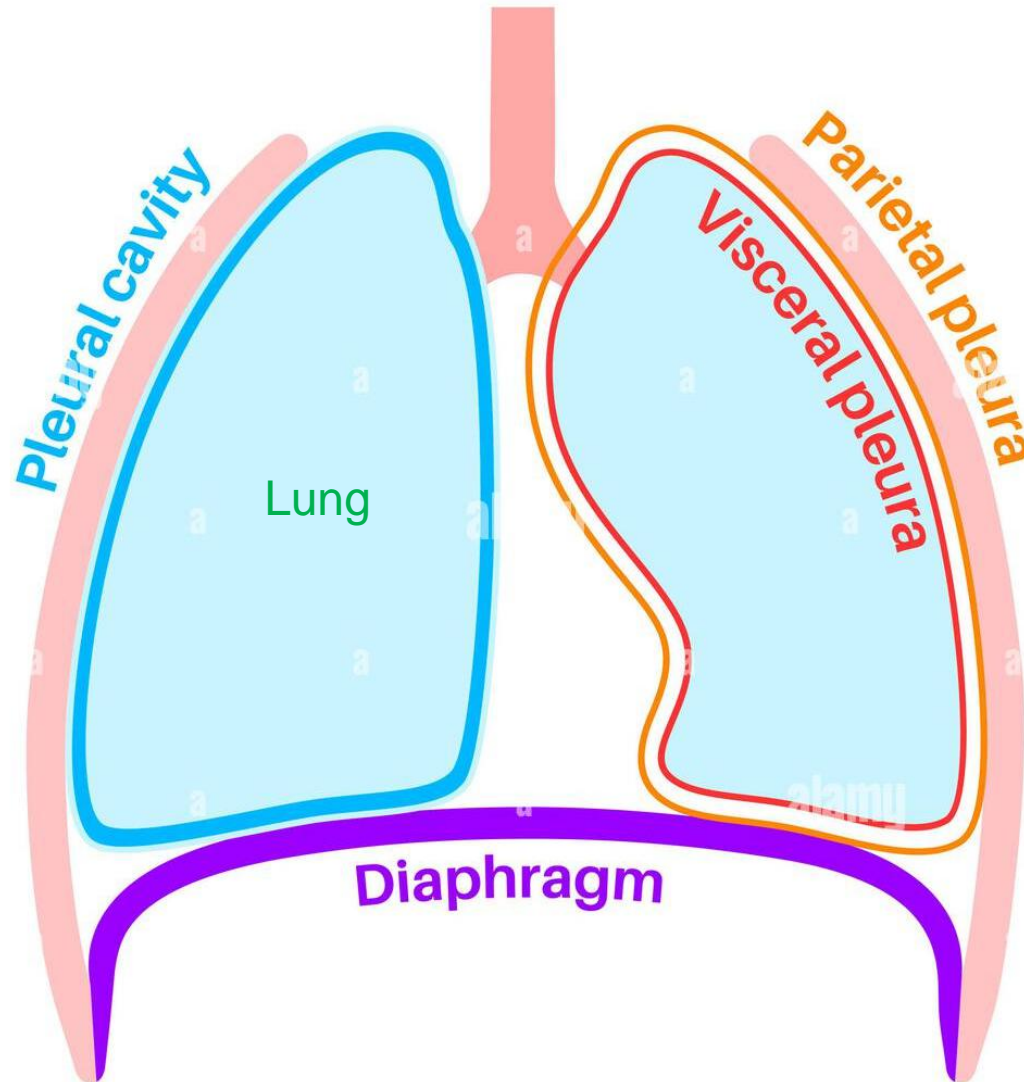


Parietal: lining the walls of a cavity

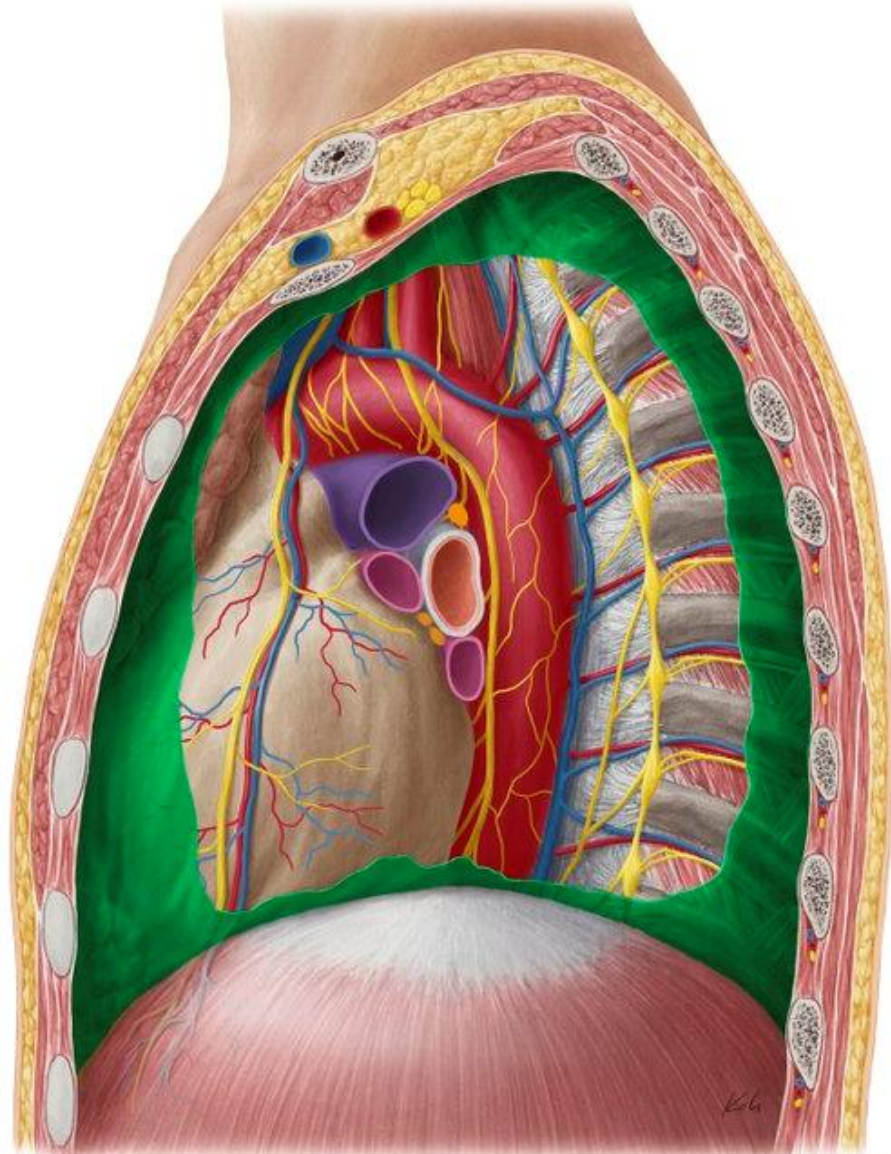
Visceral: covering of an organ

Example: parietal and visceral pleura

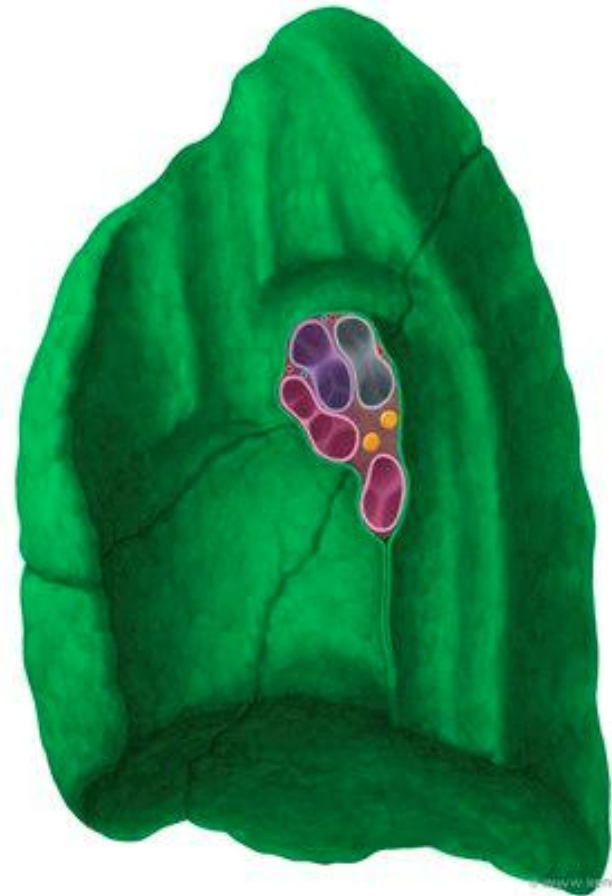
(viscera: internal organ)
أحشاء

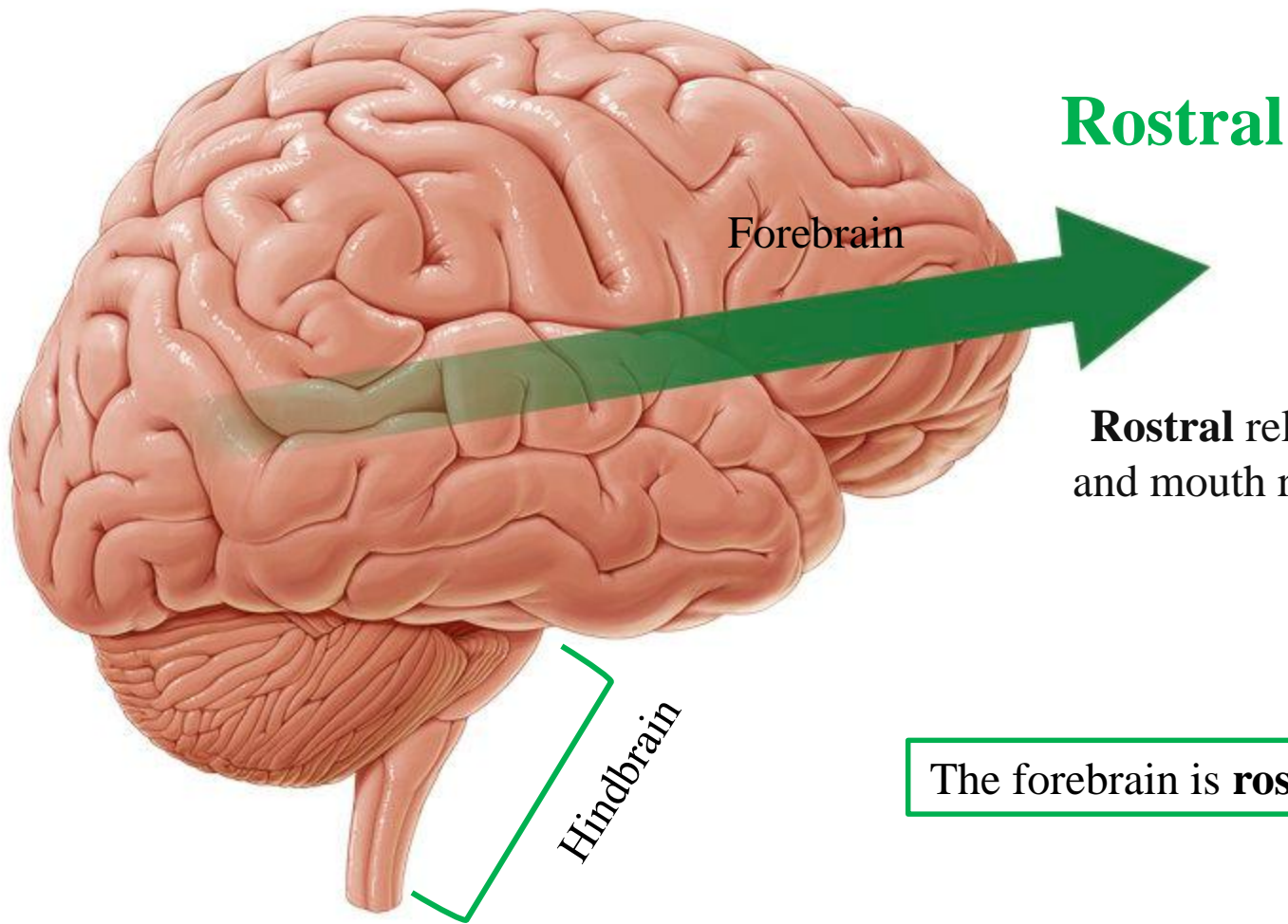


Parietal



Visceral





Rostral relating to the nose and mouth region, toward the face.

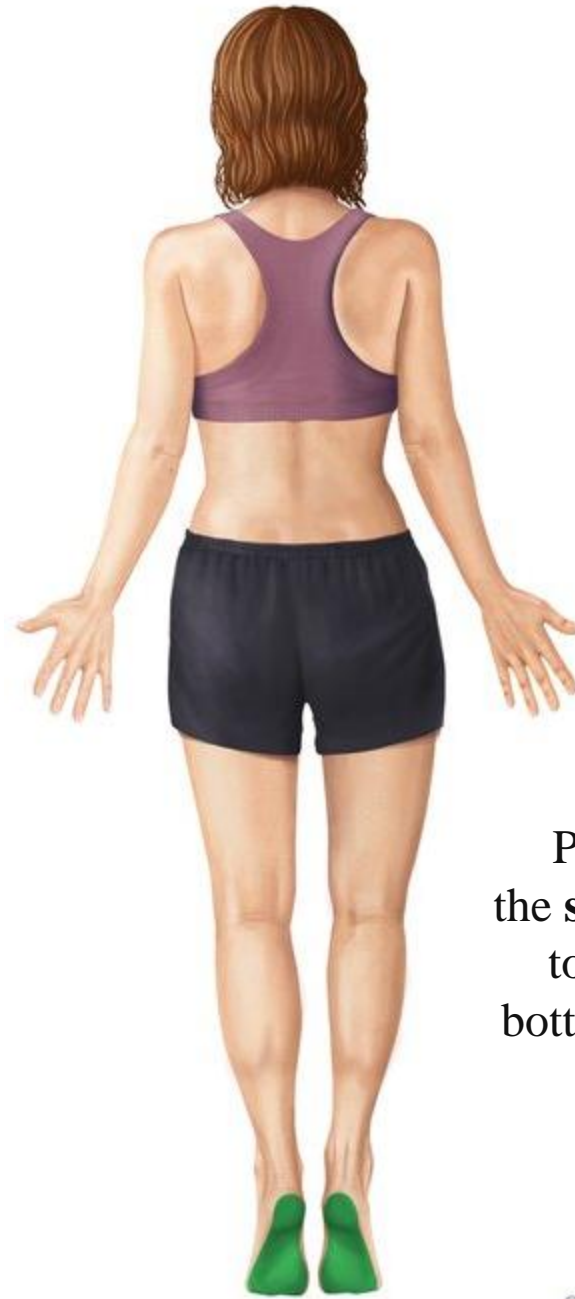
The forebrain is **rostral** to the hindbrain

Palmar



Palmar refers to the **palm** or the anterior surface of the hand.

Plantar



Plantar refers to the **sole of foot**, refers to the inferior or bottom surface of the foot



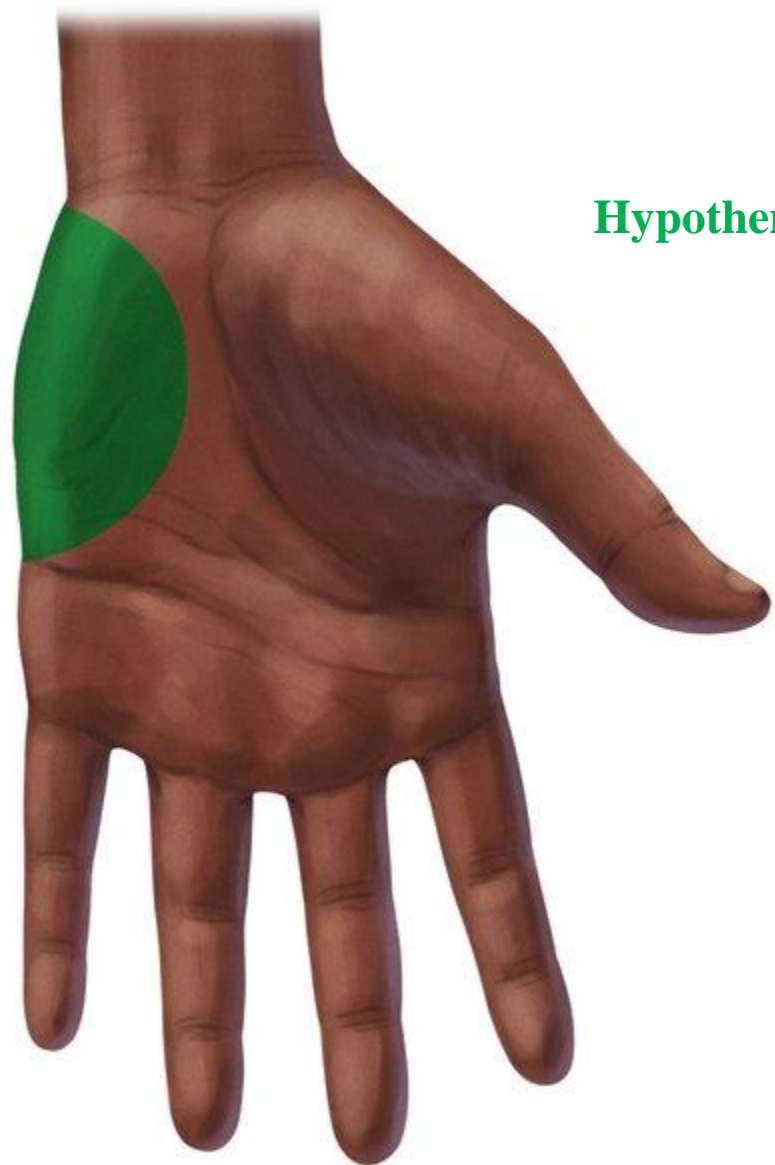
ULNAR (Medial)



RADIAL (Lateral)



Thenar



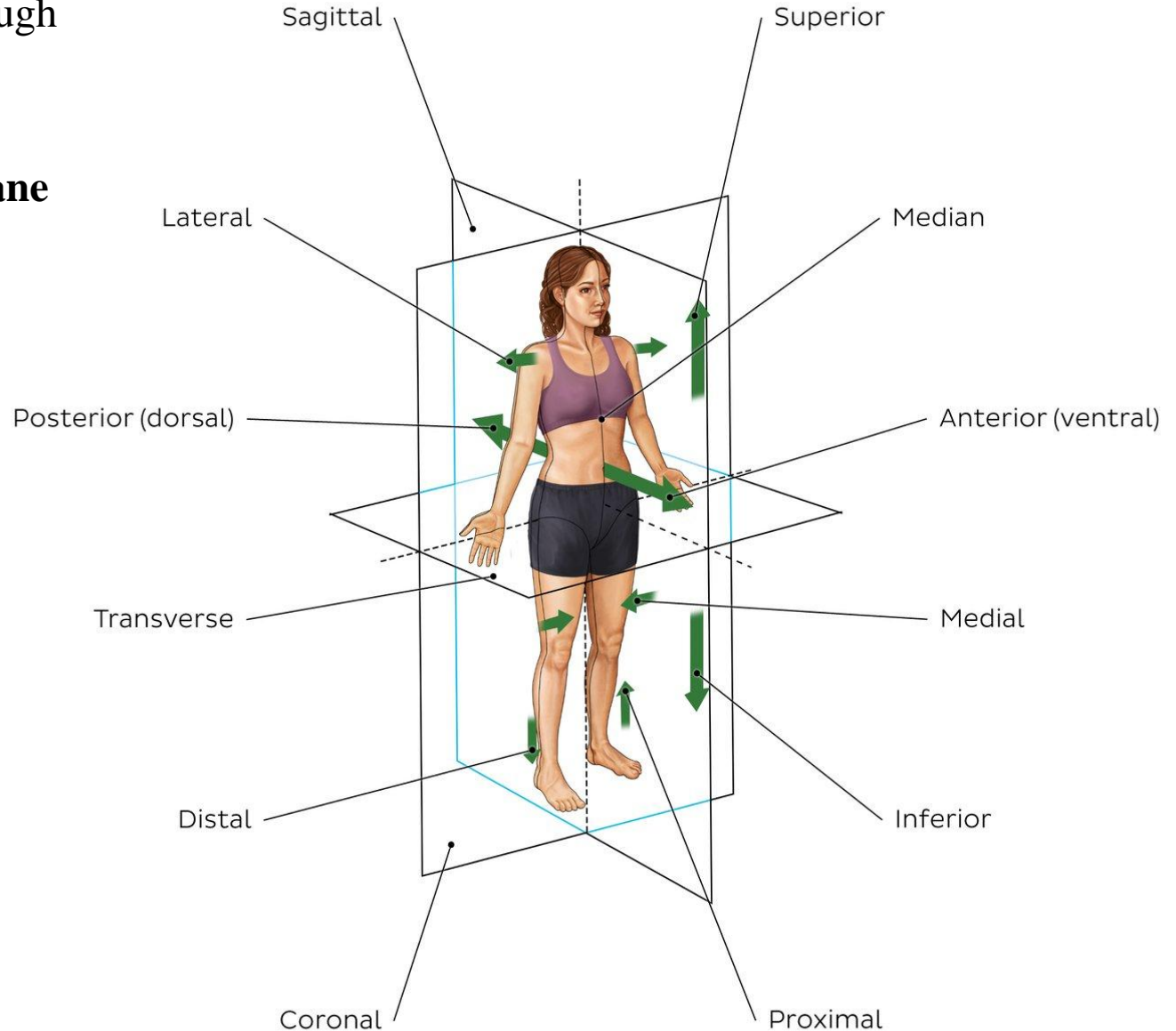
Hypothenar

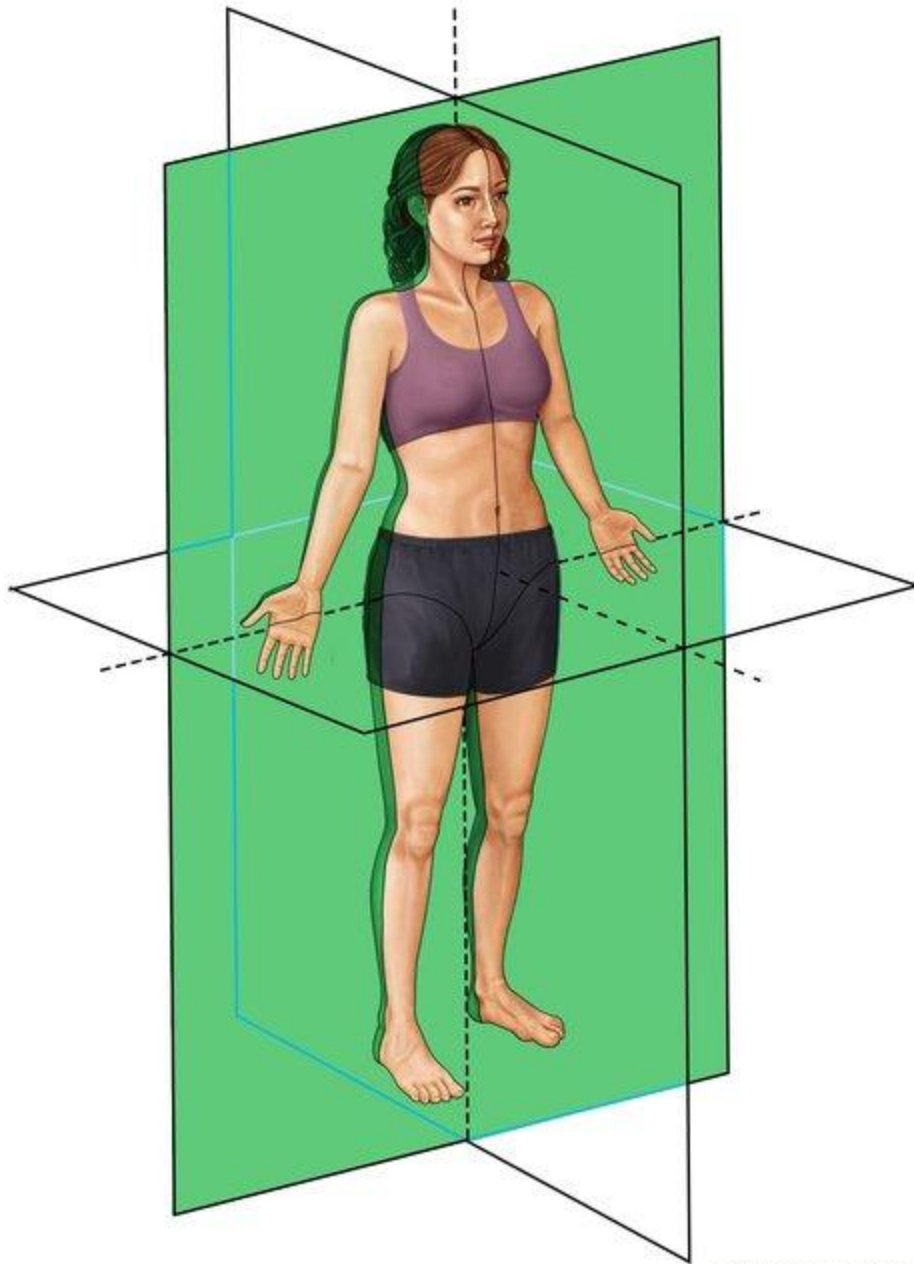
Planes are imaginary flat surfaces that pass through the body

1- **Sagittal plane**

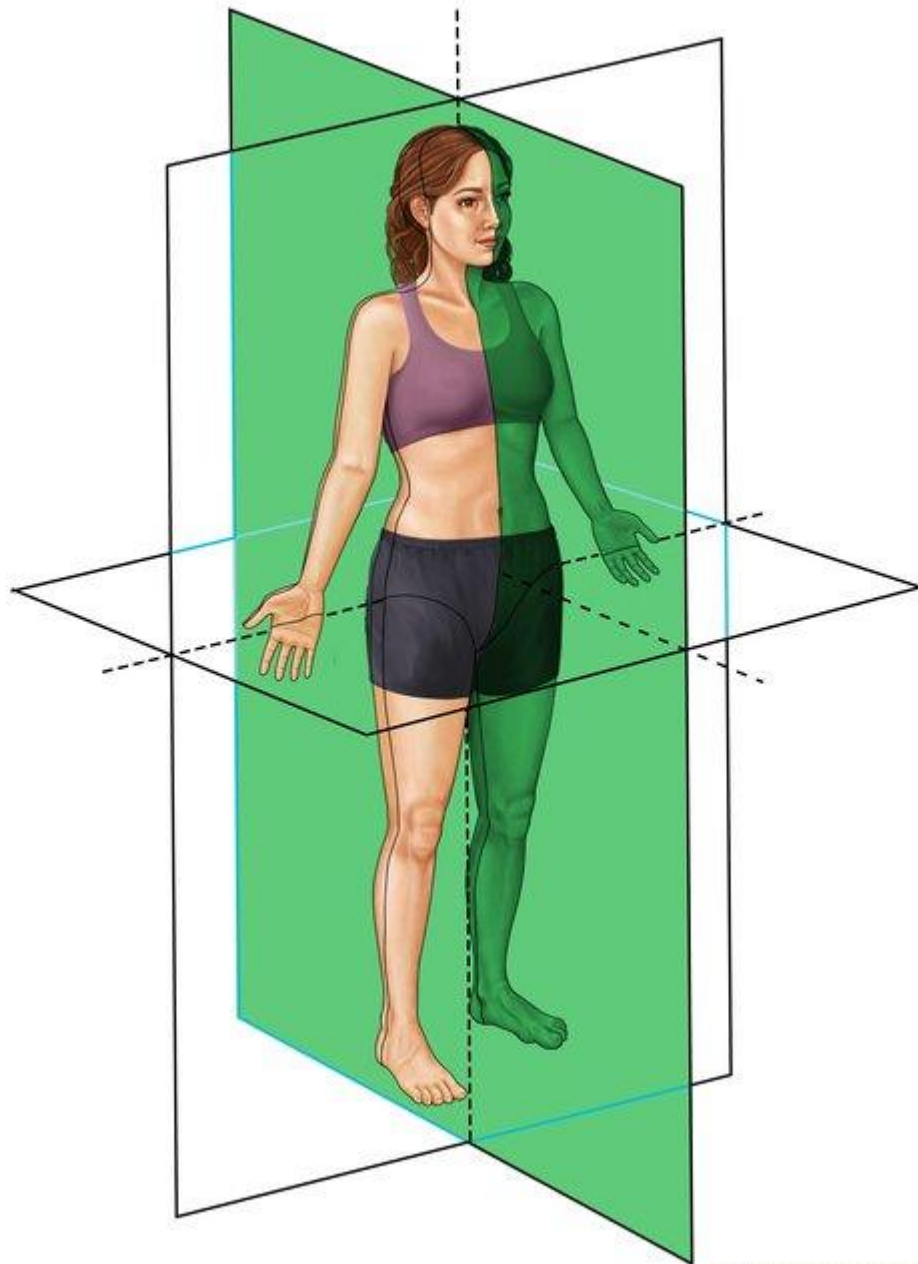
2- **Frontal or coronal, plane**

3- **Transverse plane**





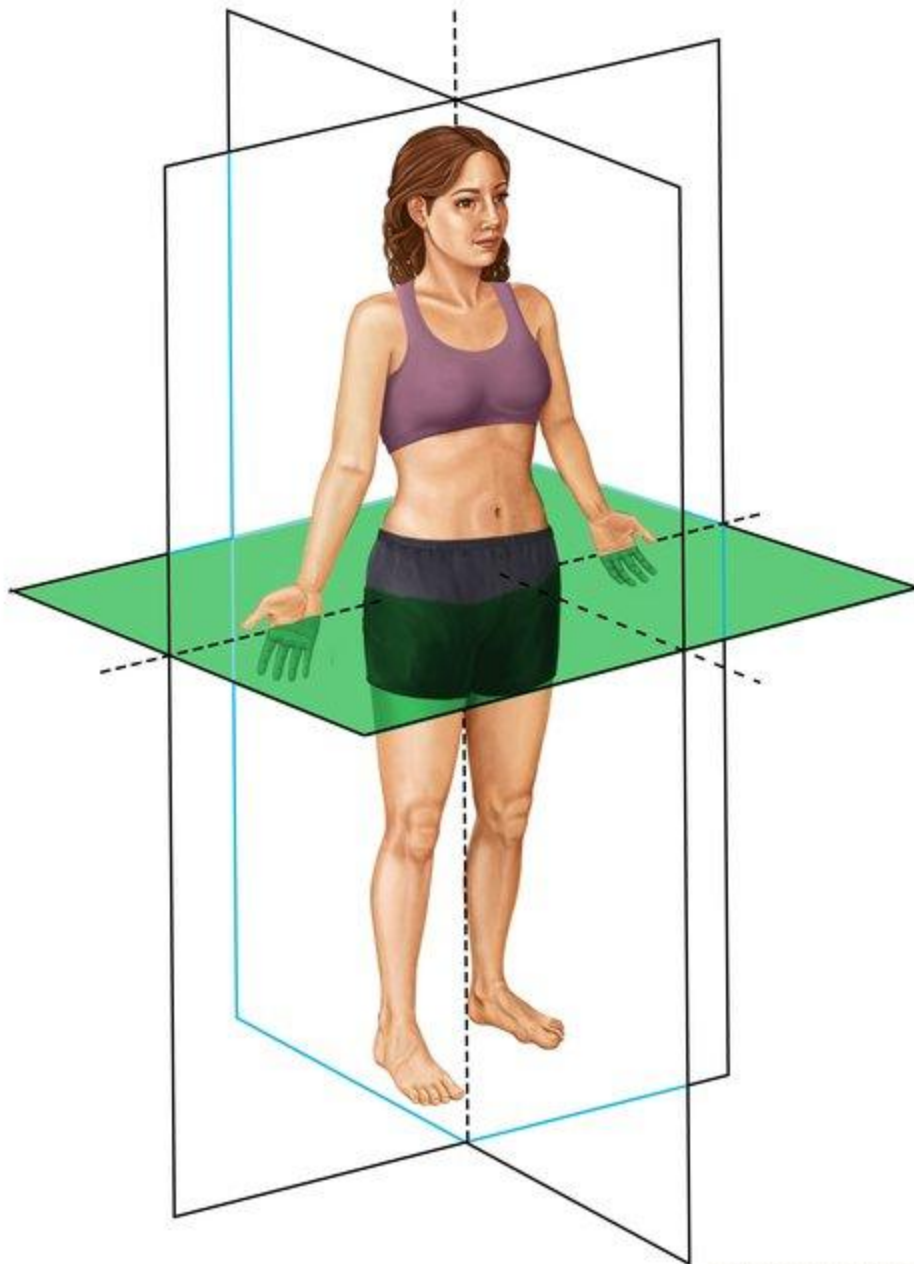
Frontal or coronal, plane divides the body or an organ into front (anterior) and back (posterior) portions.



Sagittal plane is a vertical plane that divides the body or organ into right and left sides

The midsagittal or median plane is a vertical plane that passes through the midline of the body and bisects the body into two symmetrical halves: right and left.

Parasagittal planes include any sagittal plane that does not run down the body's midline.



Transverse plane divides the body or an organ into upper (superior) and lower (inferior) portions.

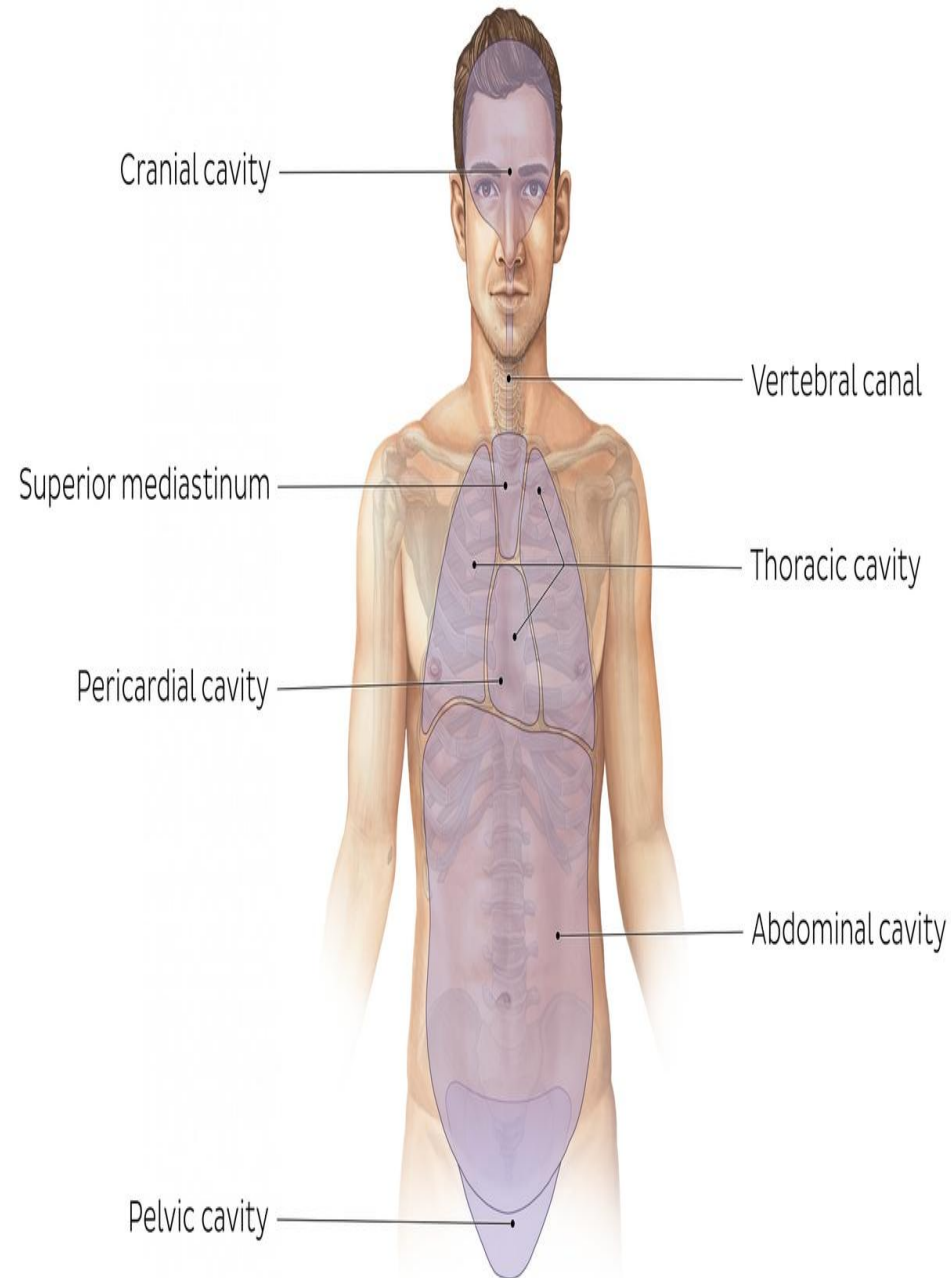
Major body cavities

Dorsal body cavity

- A. Cranial cavity
- B. Vertebral (spinal) cavity

Ventral body cavity

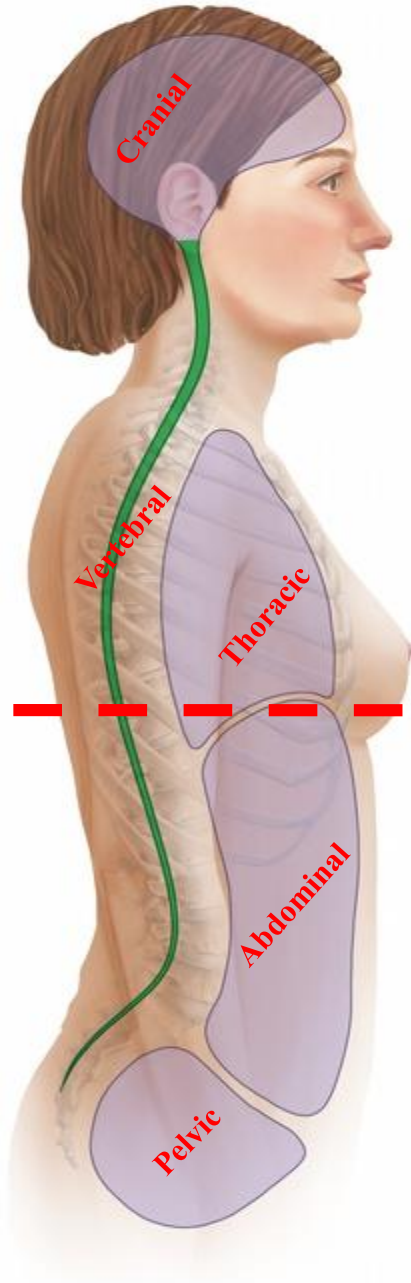
- A. Thoracic (pleural and pericardial) cavity
- B. Abdominal (peritoneal) cavity
- C. Pelvic cavity

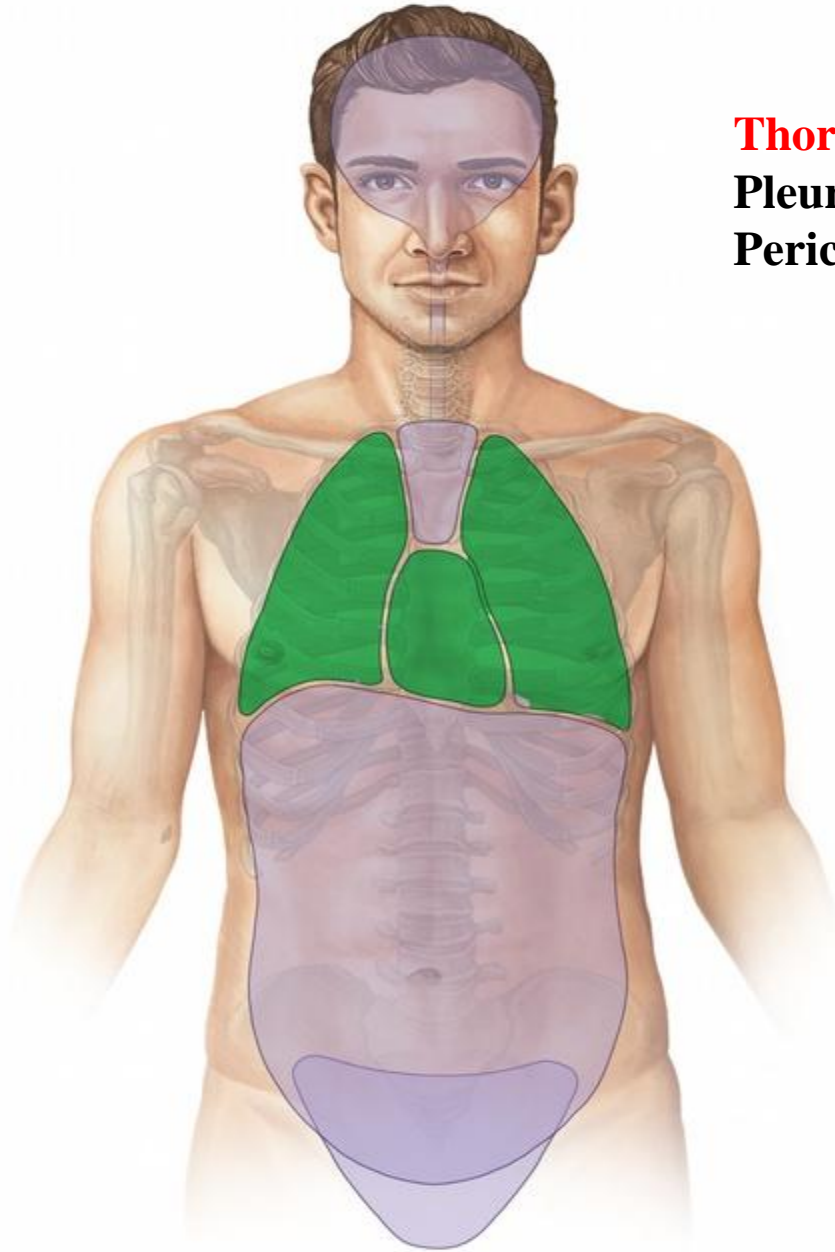


Dorsal body cavity

Ventral body cavity

----- Diaphragm muscle

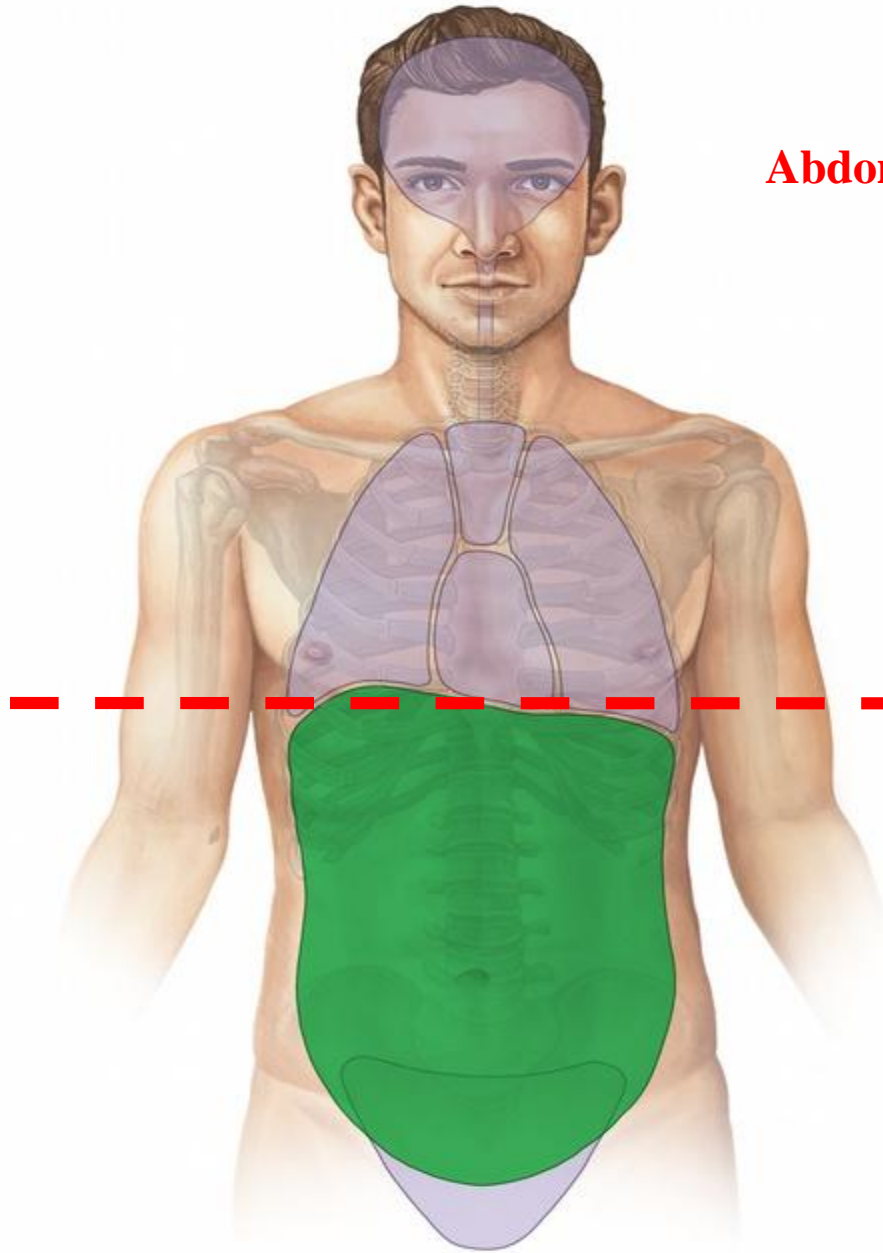




Thoracic cavity

Pleural cavity: contains the lungs

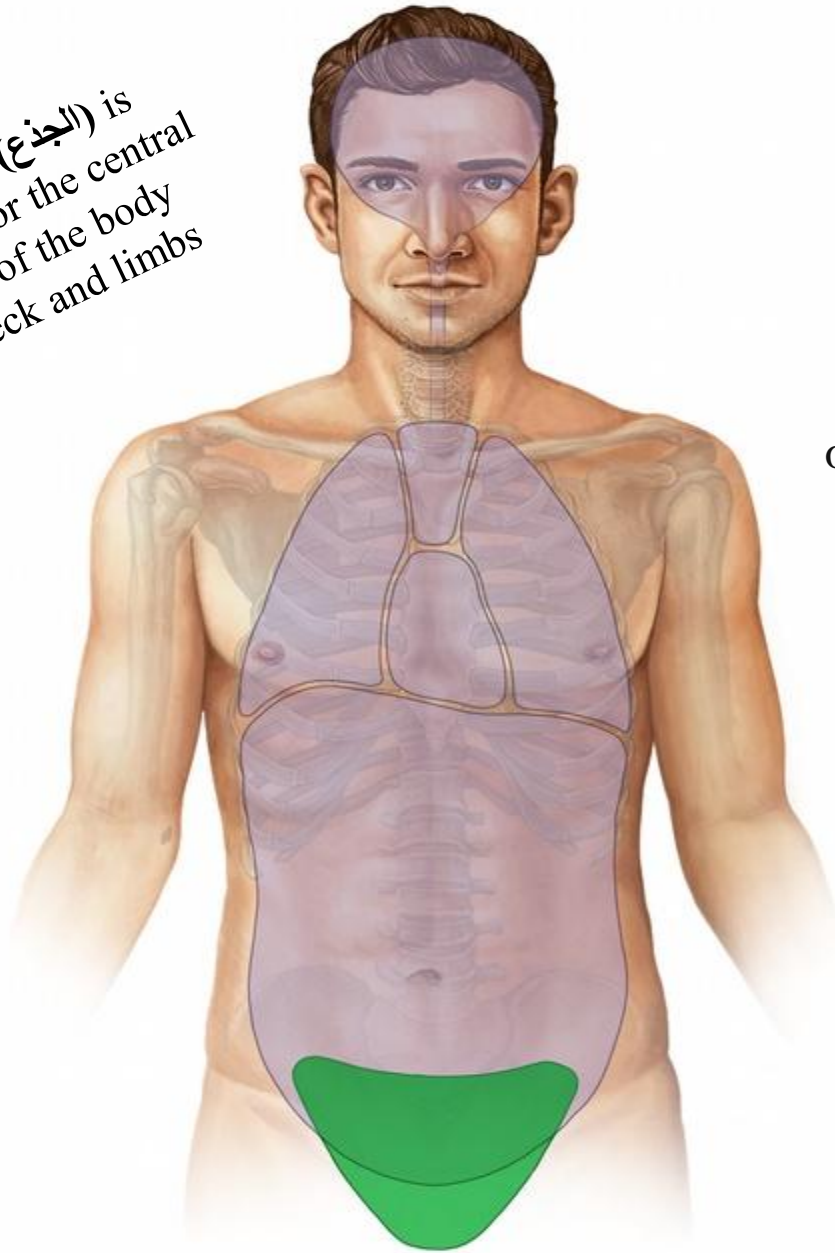
Pericardial cavity: contains the heart



Abdominal (peritoneal) cavity

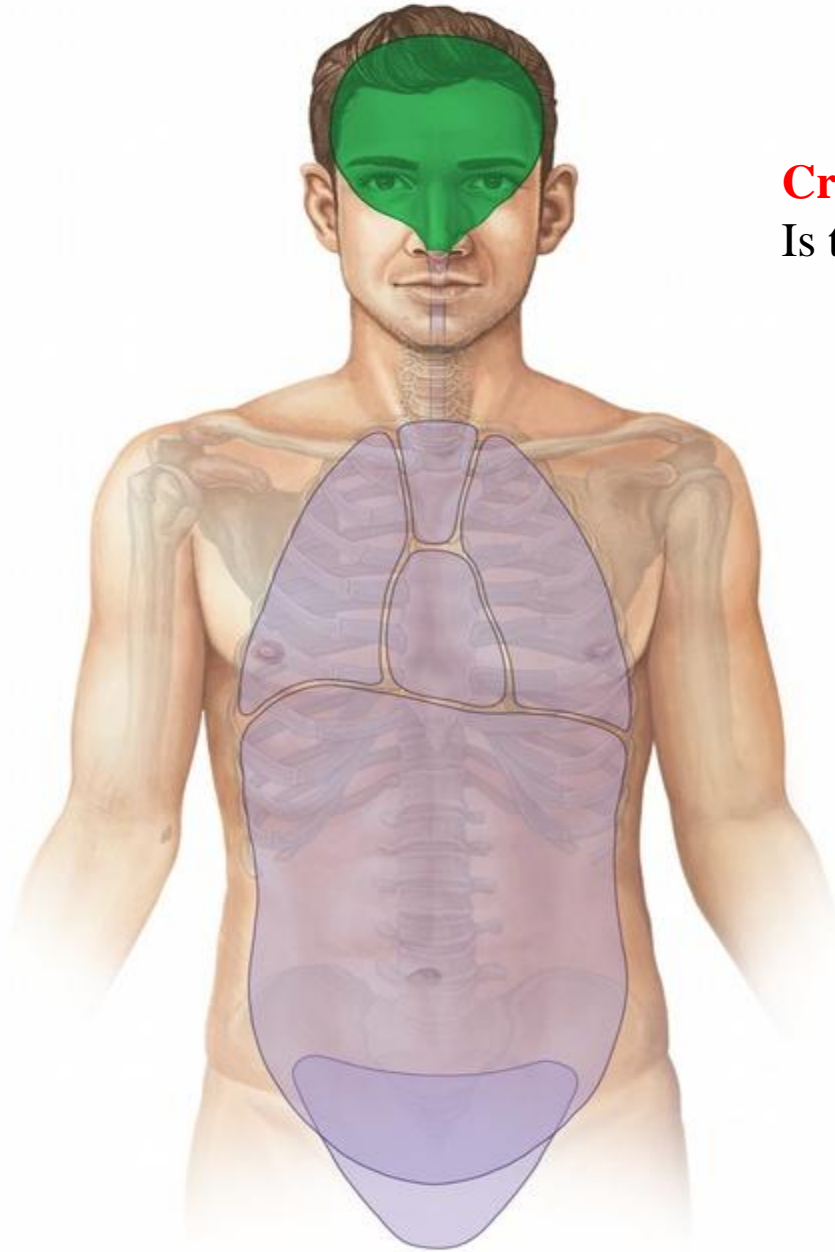
-Diaphragm muscle

The **torso** or **trunk** (البدن) is an anatomical term for the central part, or the core, of the body without head, neck and limbs



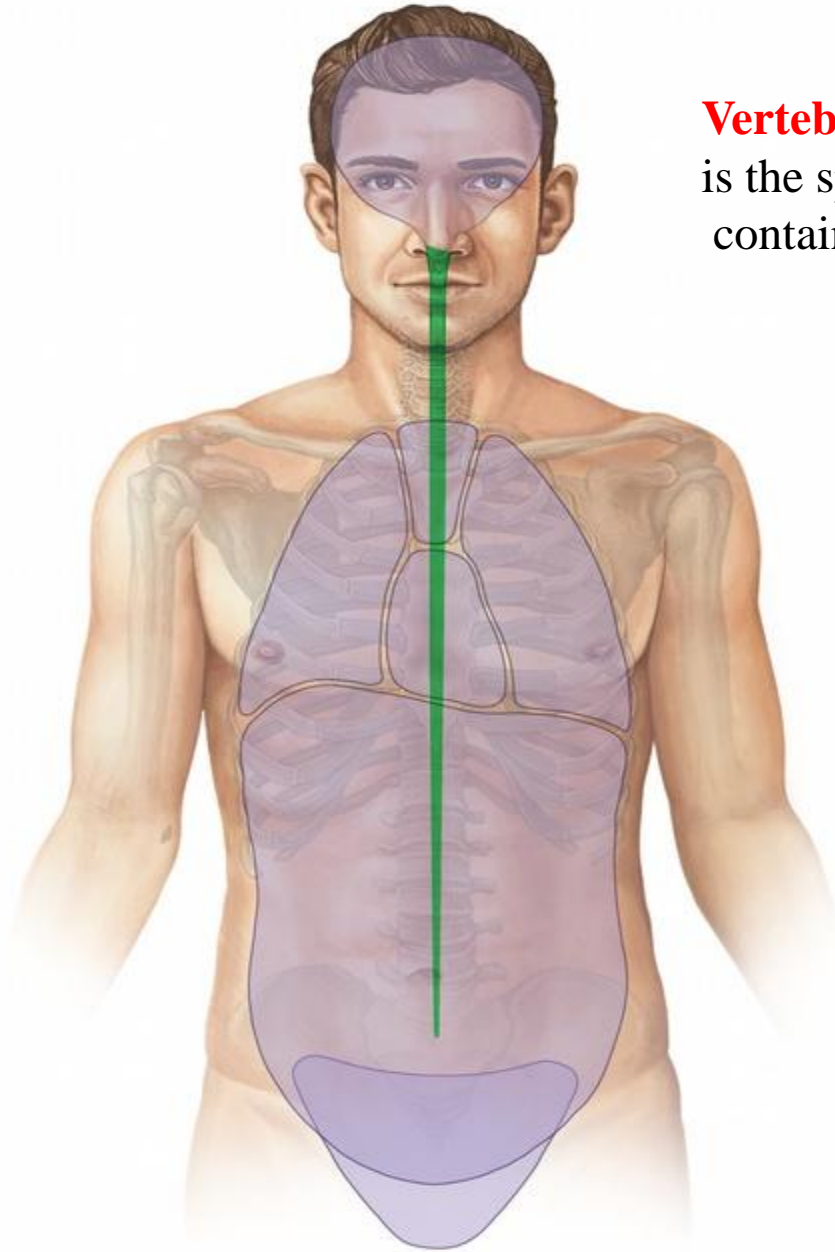
Pelvic cavity

Is a body cavity that houses several essential organs and structures within the lower part of the torso. It is enclosed by the pelvic bones and serves as a crucial compartment for the reproductive organs, urinary bladder, pelvic colon, and rectum.



Cranial cavity:

Is the space within the skull,
contains the brain.



Vertebral (spinal) cavity:

is the space within the vertebral column, contains the spinal cord.

Prefix	Meaning
abdomino	Abdomen
Acro	Extremity
Adeno	Gland
Angio	Vessel
Arthro	Joint
Cardio	Heart
Chondro	cartilage
Cysto	Bladder
Cyto	Cell
Dento	Tooth
Dermato	Skin
Osteo	Bone
Myo	Muscle
Gastro	Stomach
Hepato	Liver
Nephro	Kidney
Oto	Ear

Medical terminology

Suffix:
 oma: tumor
 itis: inflammation/ infection

Prefix	Meaning
Rhino	Nose
Pneumono	Lung
Patho	Disease
Neuro	Nerve
Laryngo	Larynx
Stomato	Mouth
Thoraco	Chest
Facial	Face
Buccal	Cheek
Cranial	Skull
Umbilical	Navel
Axillary	Armpit
Cephalic	Head
Orbital (ocular)	Eye
Cervical	Neck
Mammary	Breast
Gluteal	Buttock

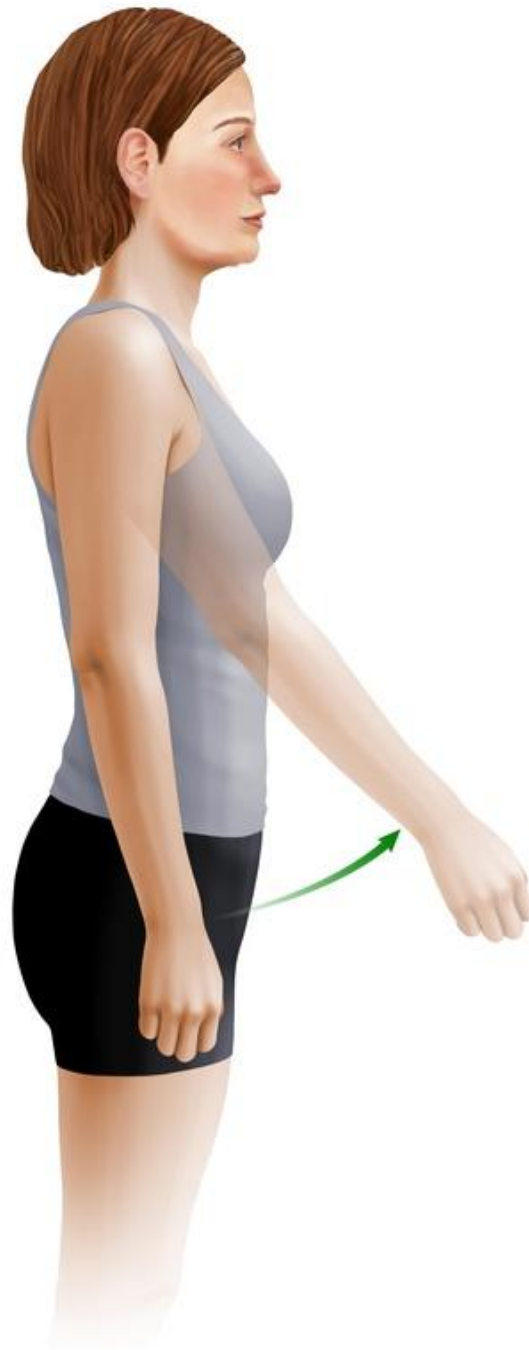
Terms Related to Movements

Movement	Definition
Flexion	A movement that decreases the angle between two body parts
Extension	A movement that increases the angle between two body parts
Abduction	A movement away from the midline
Adduction	A movement towards the midline
Medial (internal) rotation	A rotational movement towards the midline
Lateral (external) rotation	A rotational movement away from the midline
Elevation	A movement in a superior direction
Depression	A movement in an inferior direction
Protraction	Anterior movement of the jaw
Retraction	Posterior movement of the jaw
Opposition	The movement that involves grasping of the thumb and fingers

Describe movements of the mandible

Terms Related to Movements

Movement	Definition
Supination	A rotational movement where the forearm and palm are turned outwards
Pronation	A rotational movement where the forearm and palm are turned inwards
Dorsiflexion	Describe movements of the foot (at the ankle)
Plantarflexion	
Inversion	Describe movements of the foot
Eversion	
Circumduction	A conical movement of a body part. Circumduction is a combination of flexion, extension, adduction and abduction.



Flexion of shoulder

A movement that decreases the angle between two body parts.

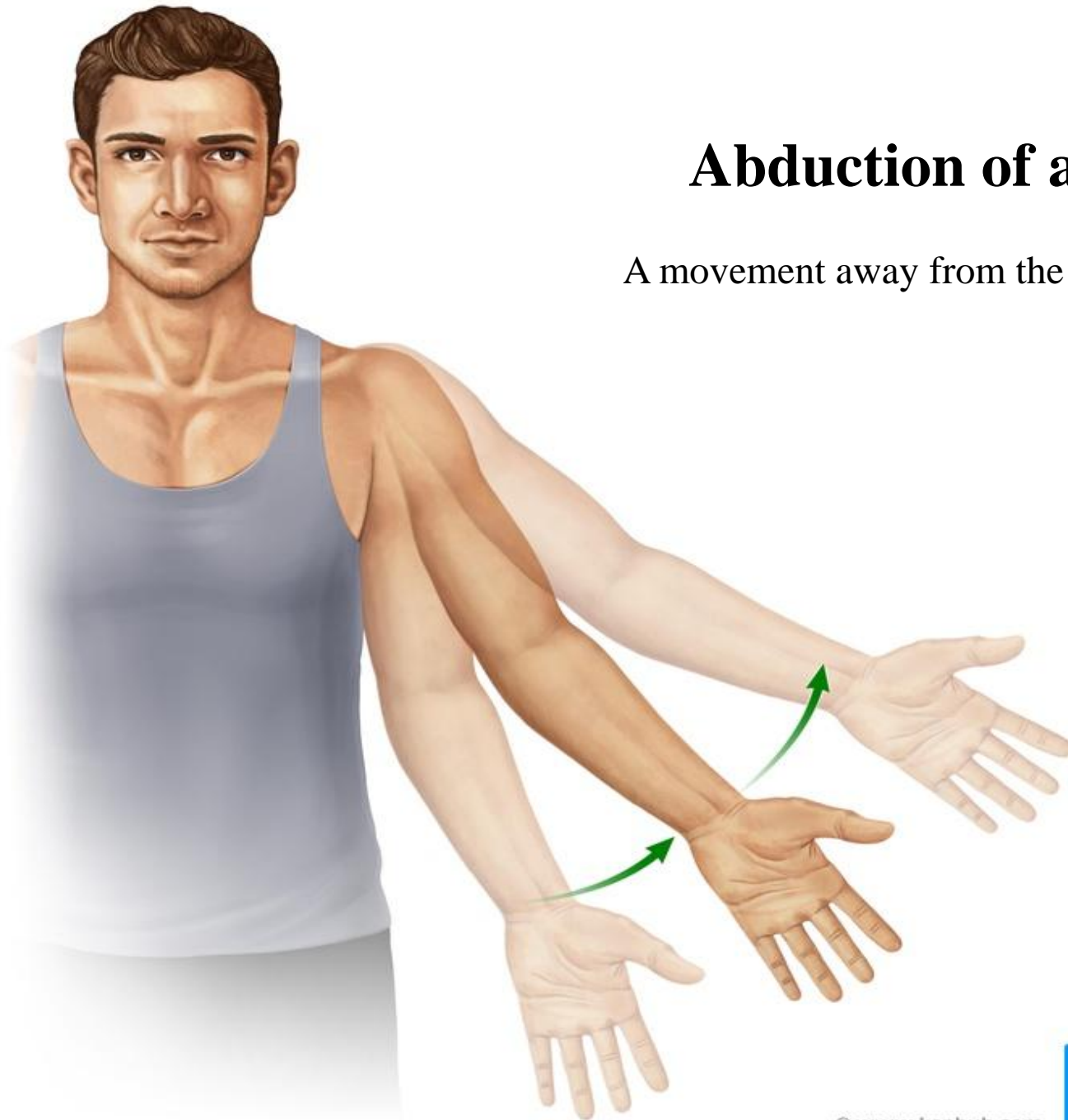


Extension of shoulder

A movement that increases the angle between two body parts.

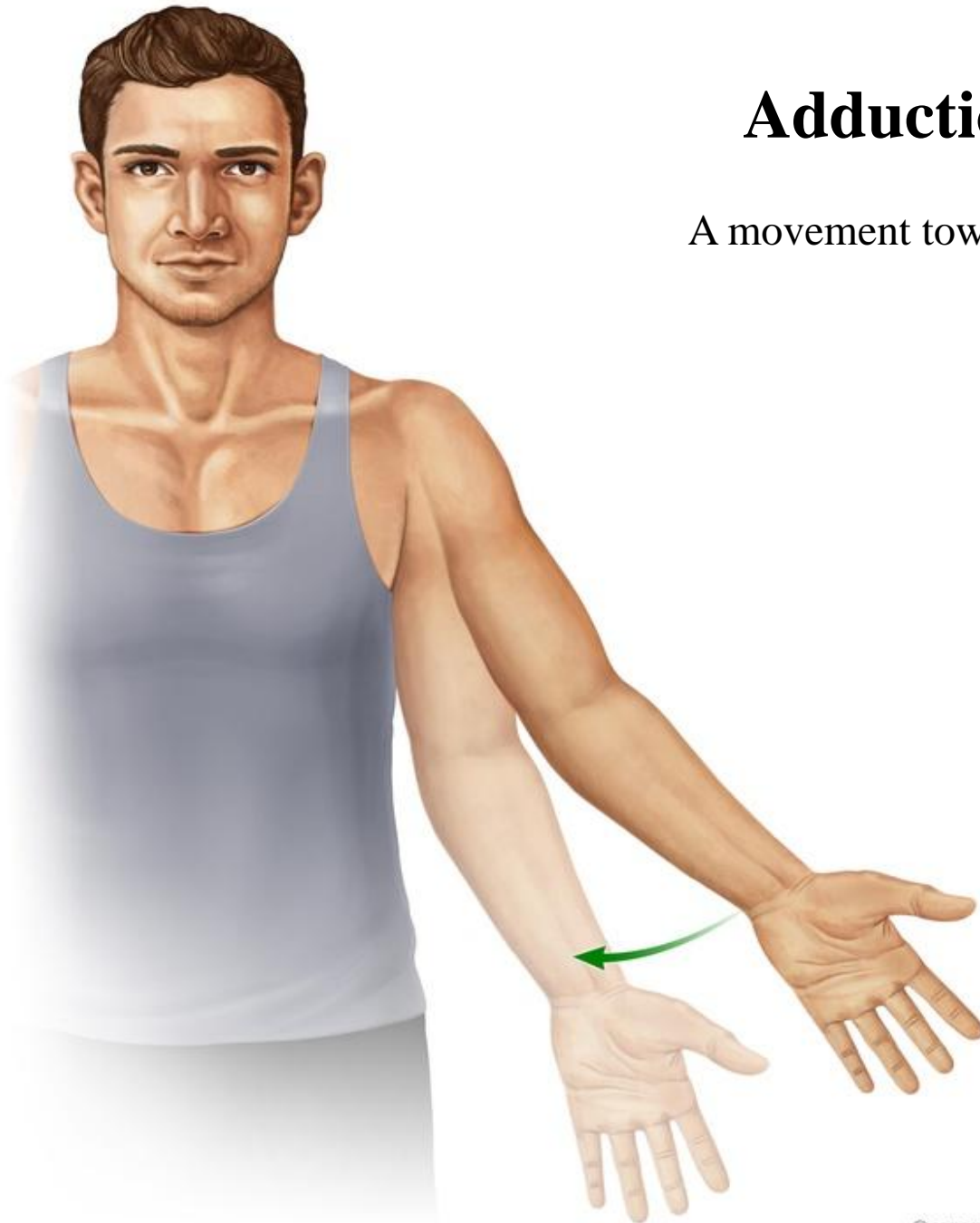
Abduction of arm

A movement away from the midline.



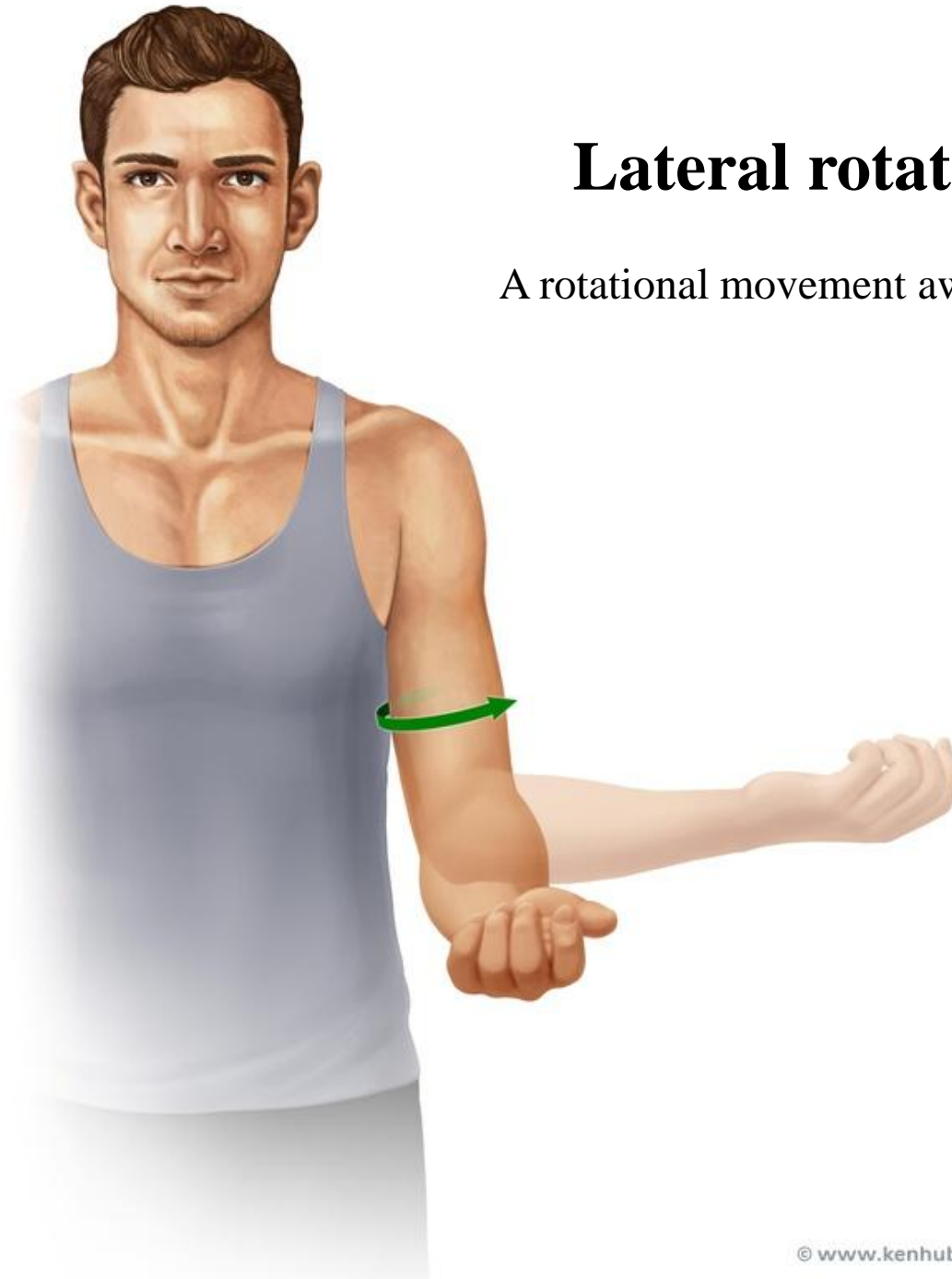
Adduction of arm

A movement towards the midline.



Lateral rotation of arm

A rotational movement away from the midline.



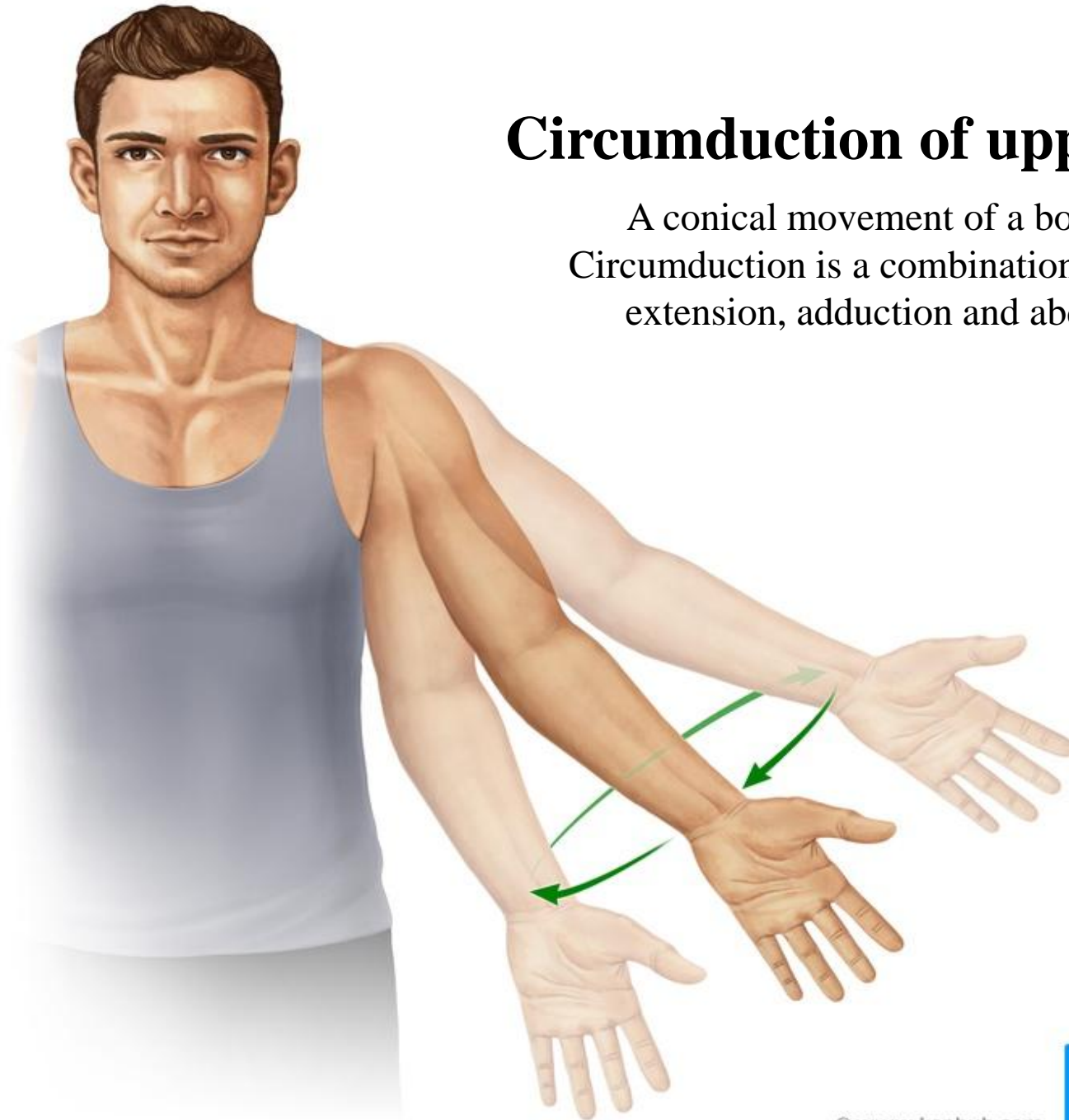


Medial rotation of arm

A rotational movement towards the midline.

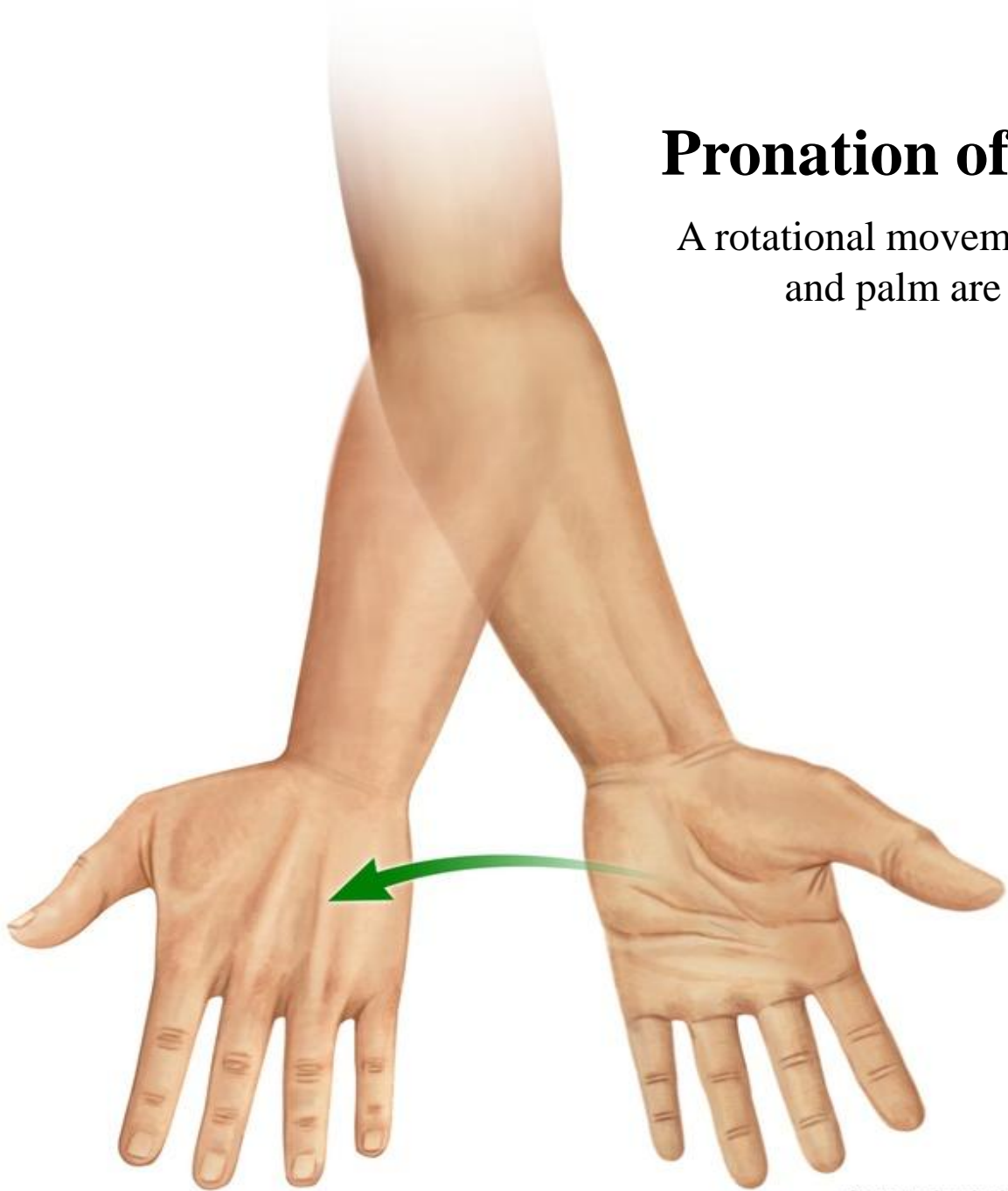
Circumduction of upper limb

A conical movement of a body part.
Circumduction is a combination of flexion,
extension, adduction and abduction.



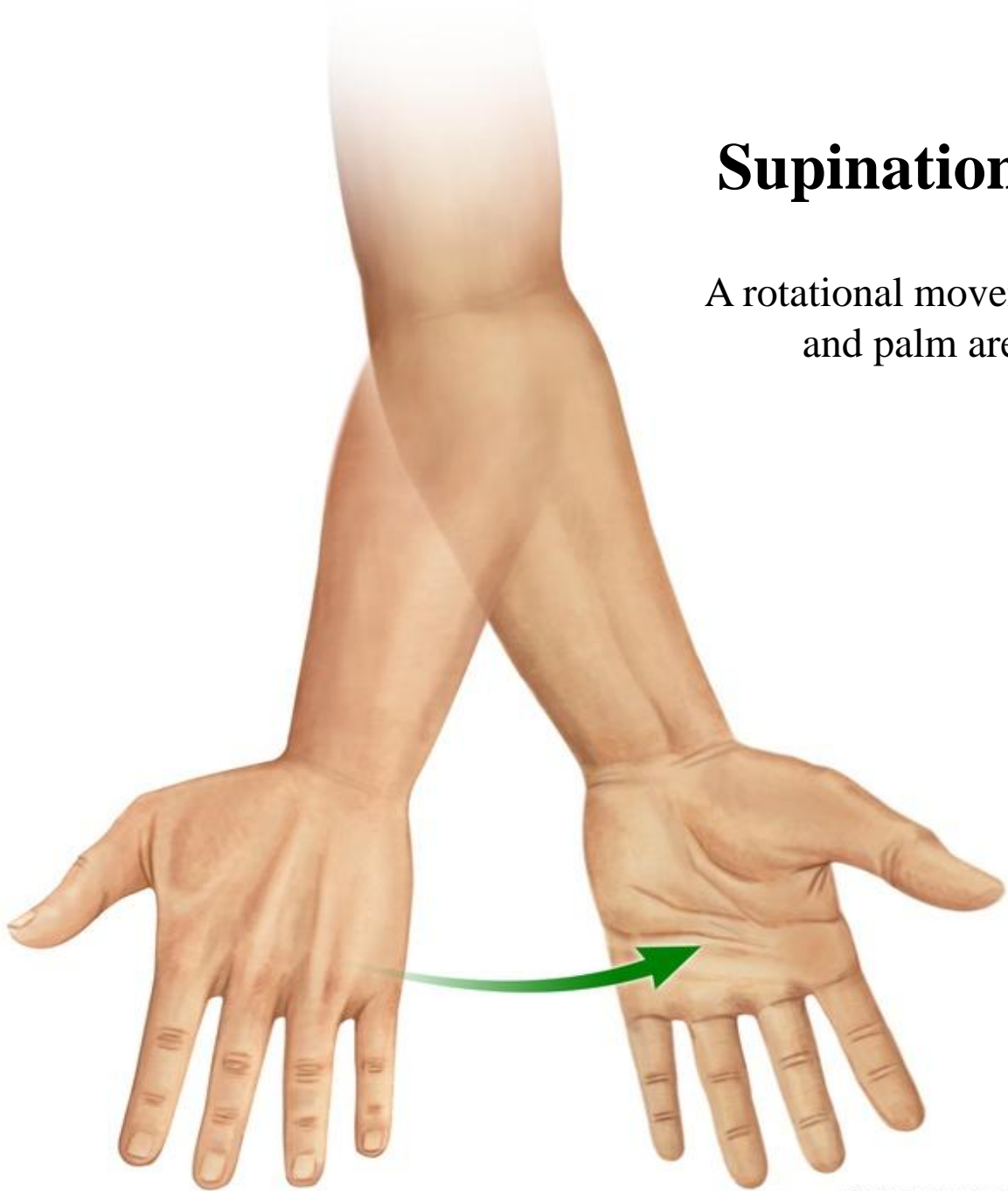
Pronation of forearm

A rotational movement where the forearm and palm are turned inwards.



Supination of forearm

A rotational movement where the forearm and palm are turned outwards.



Abduction of fingers

Moving away from the midline of the hand, which is the middle digit.



Adduction of fingers





Opposition of thumb

The movement that involves grasping of the thumb and fingers.

Abduction of thigh



Adduction of thigh





Lateral (external) rotation of thigh



Medial (internal) rotation of thigh

Flexion of knee



Extension of knee



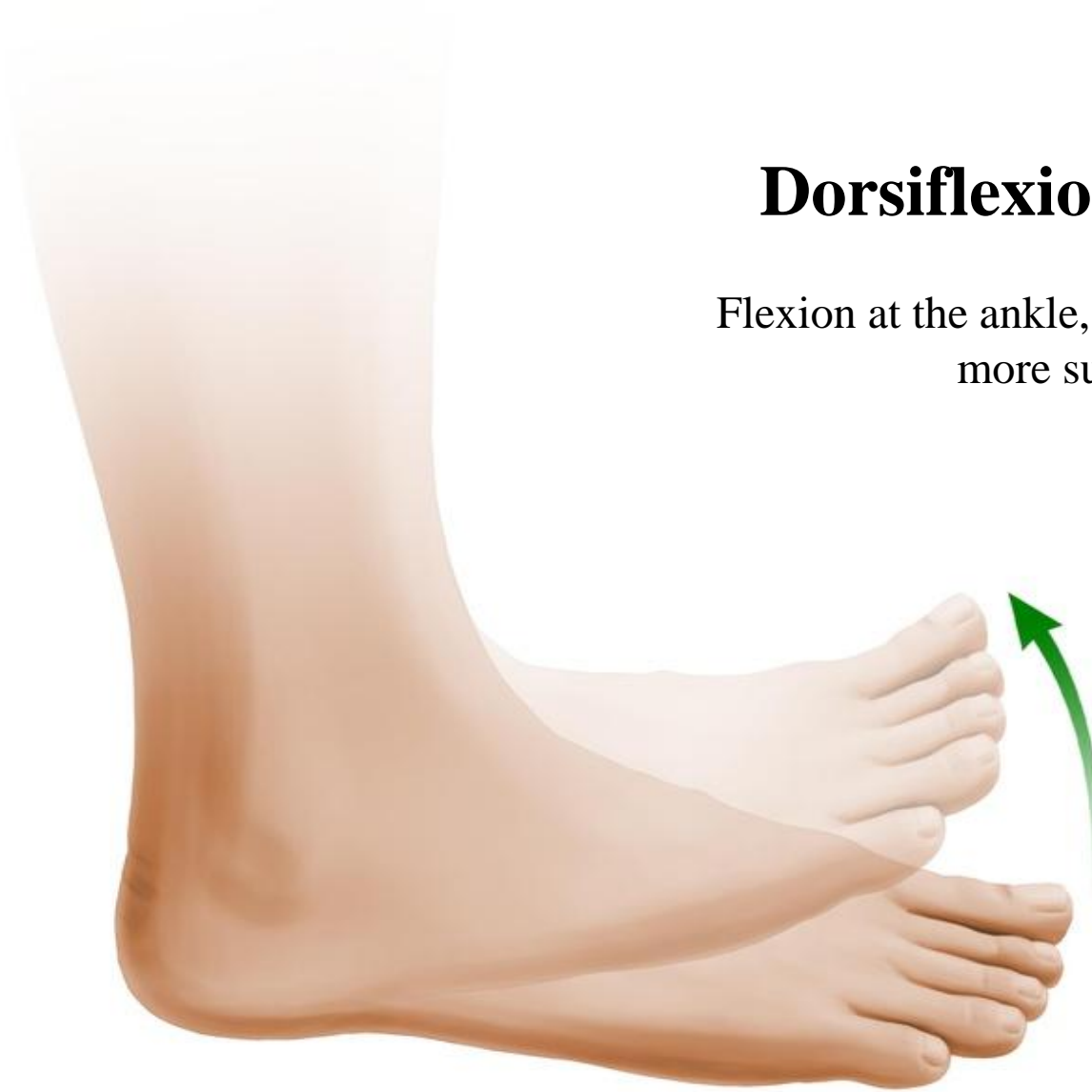
Plantarflexion of foot

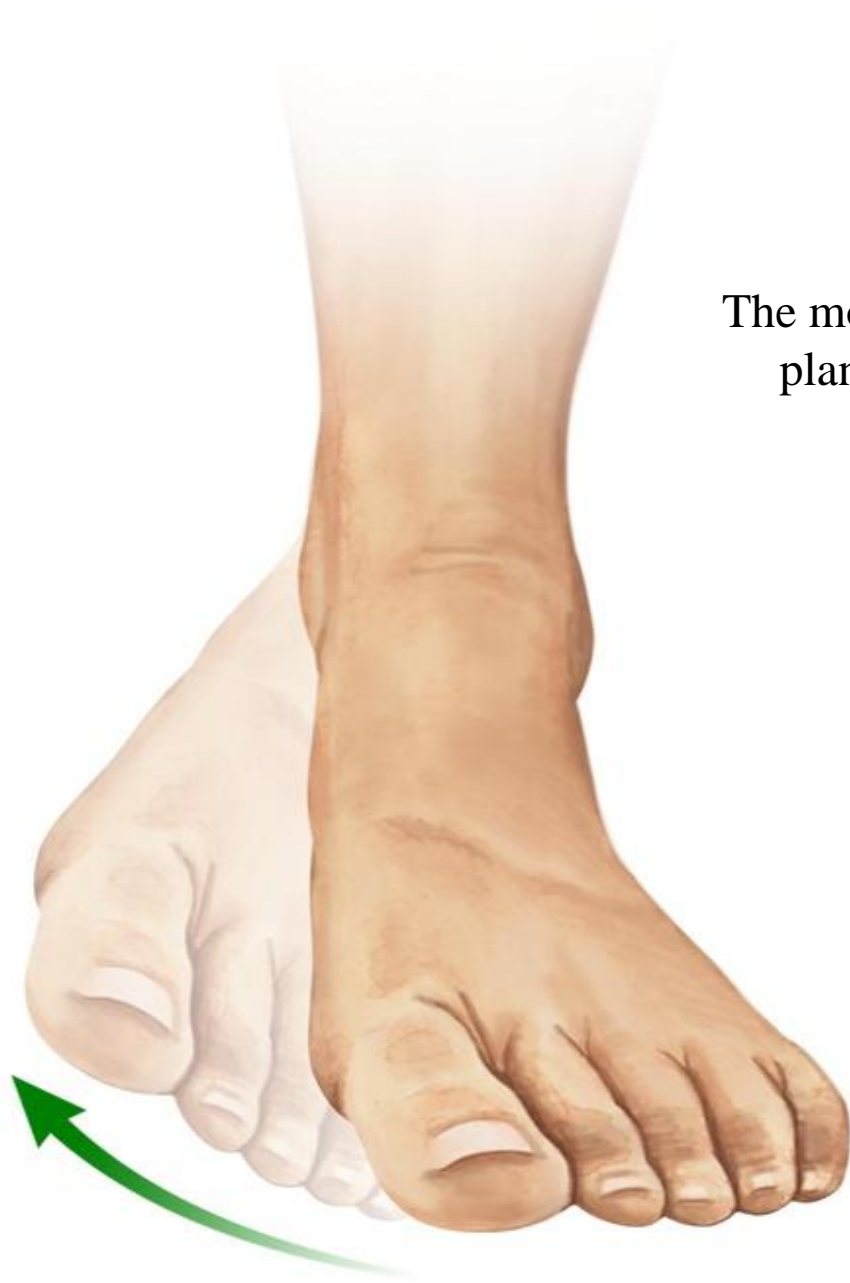
Extension at the ankle, so that the foot points inferiorly.



Dorsiflexion of foot

Flexion at the ankle, so that the foot points more superiorly.



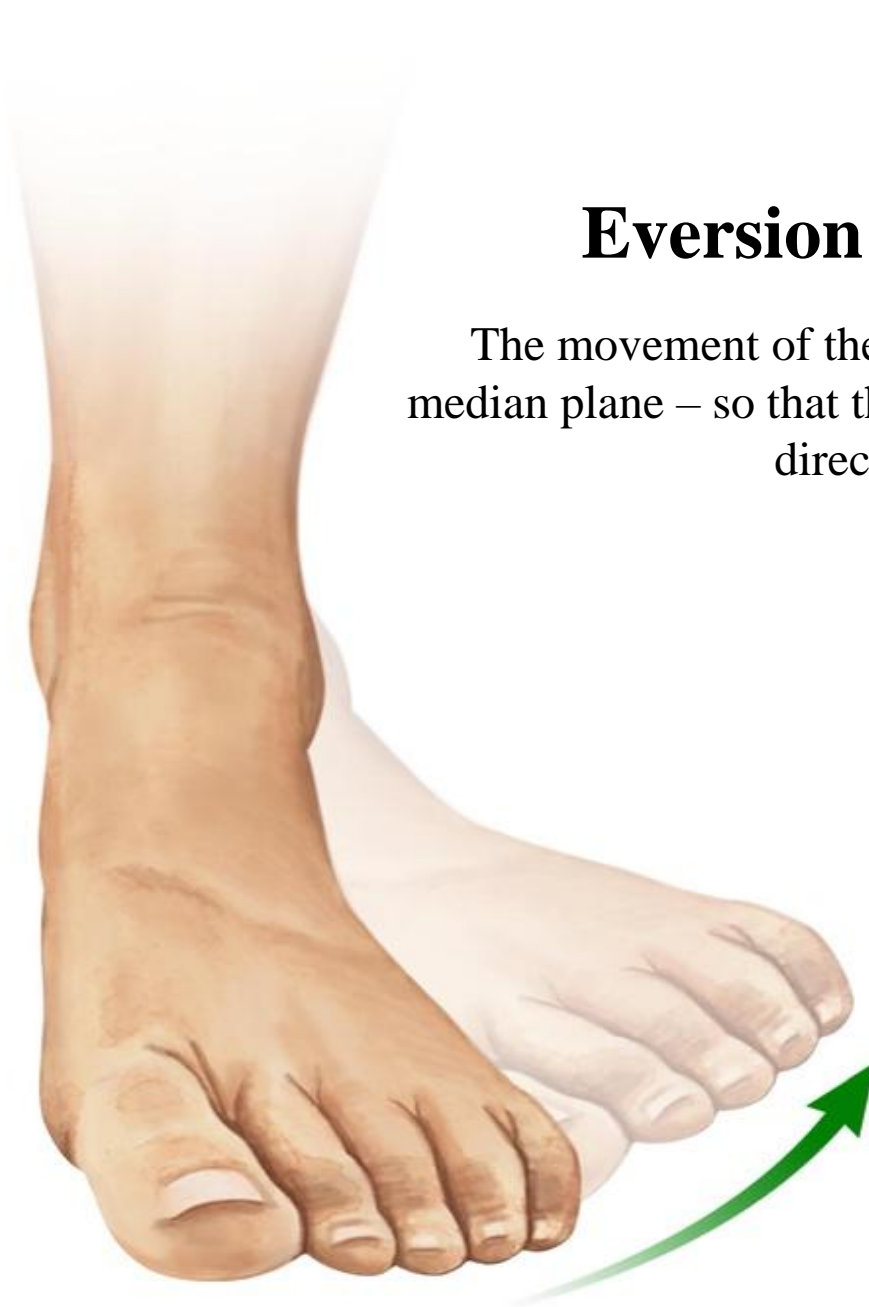


Inversion of foot

The movement of the sole towards the median plane – so that the sole faces in a medial direction.

Eversion of foot

The movement of the sole away from the median plane – so that the sole faces in a lateral direction.



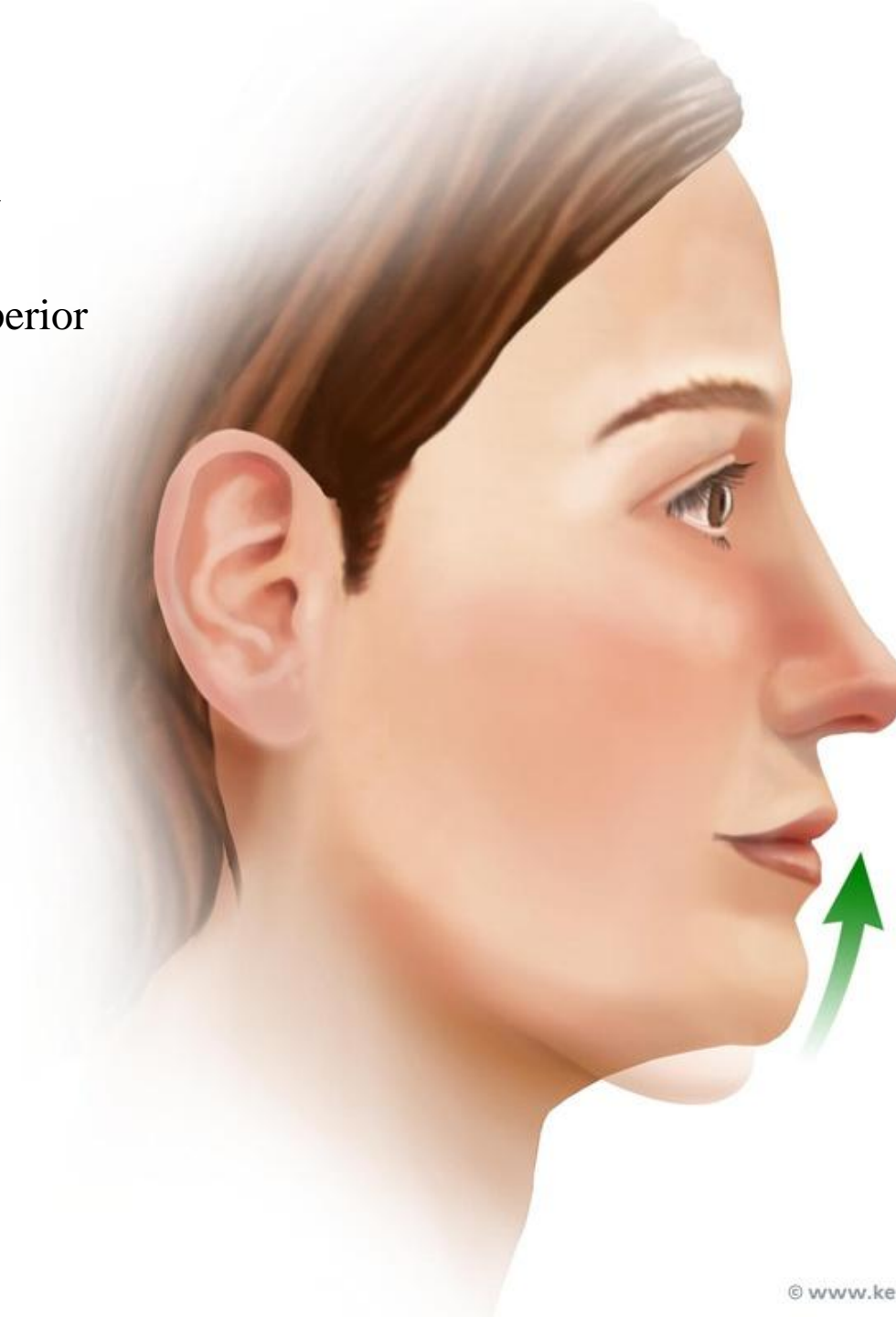
Depression

A movement in an inferior direction.



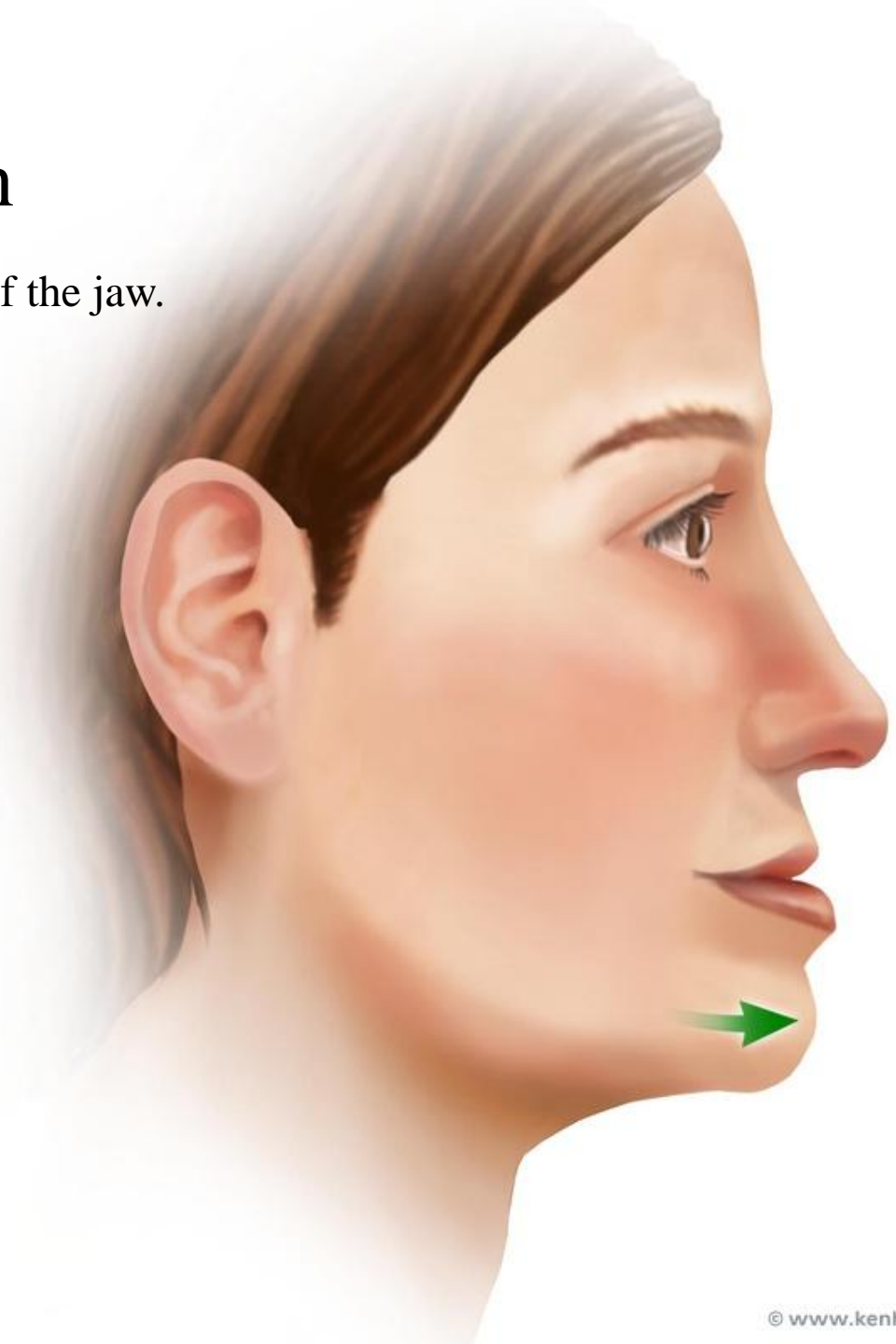
Elevation

A movement in a superior direction.



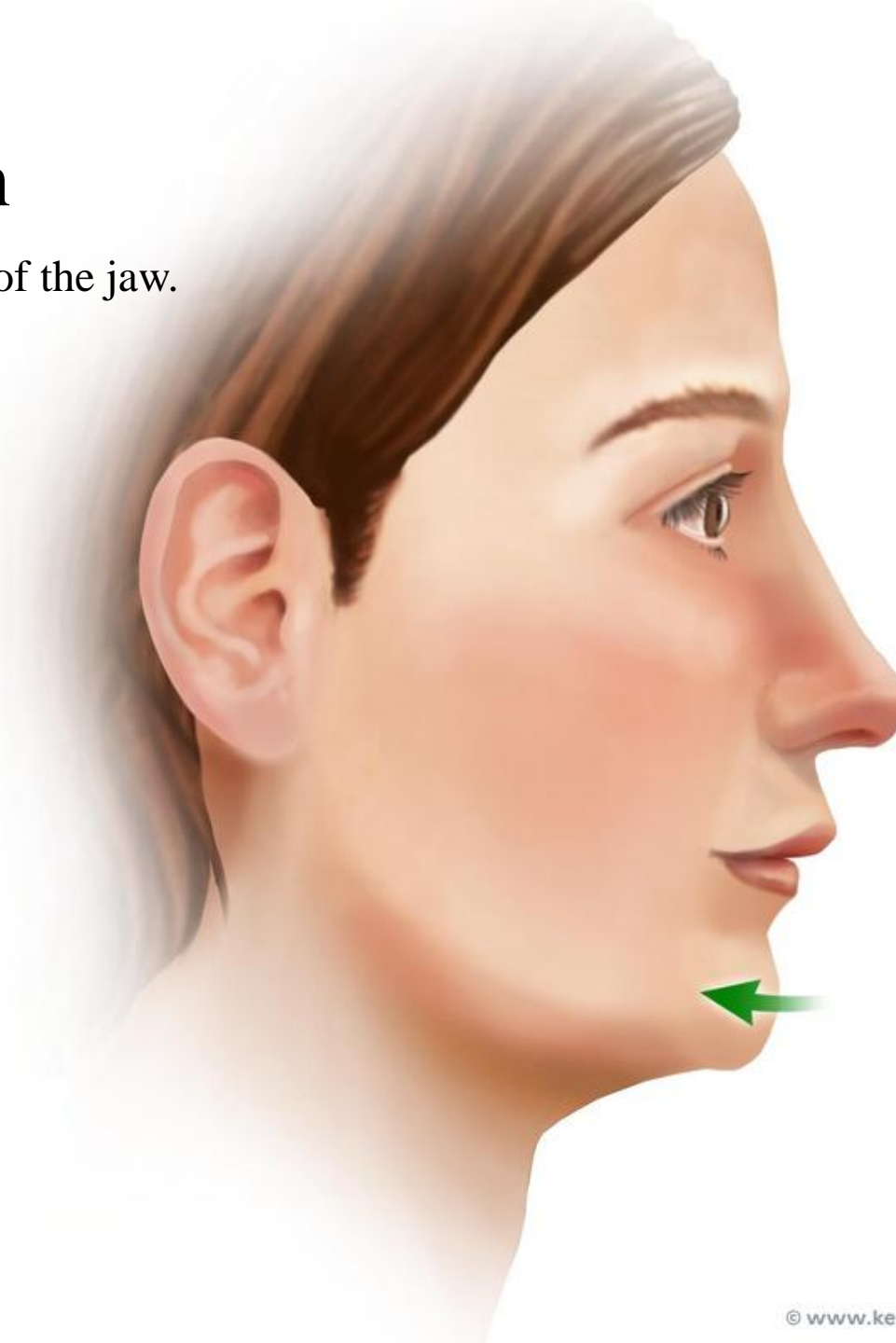
Protraction

Anterior movement of the jaw.



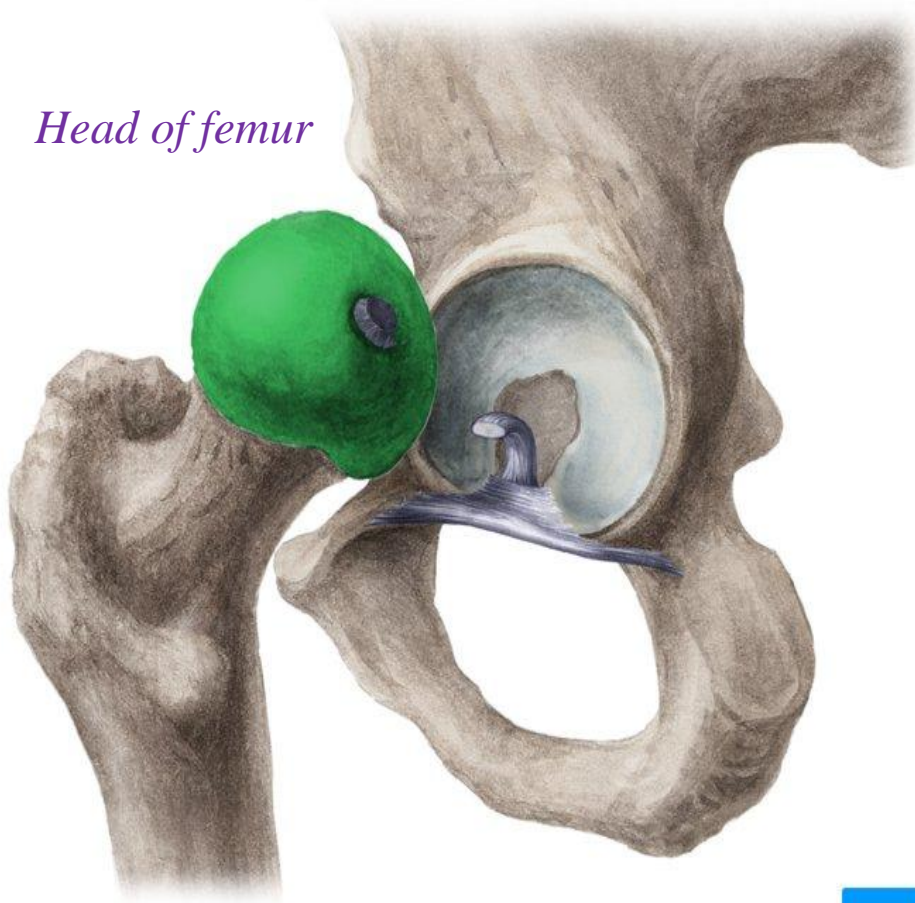
Retraction

Posterior movement of the jaw.



Anatomical terms of bone

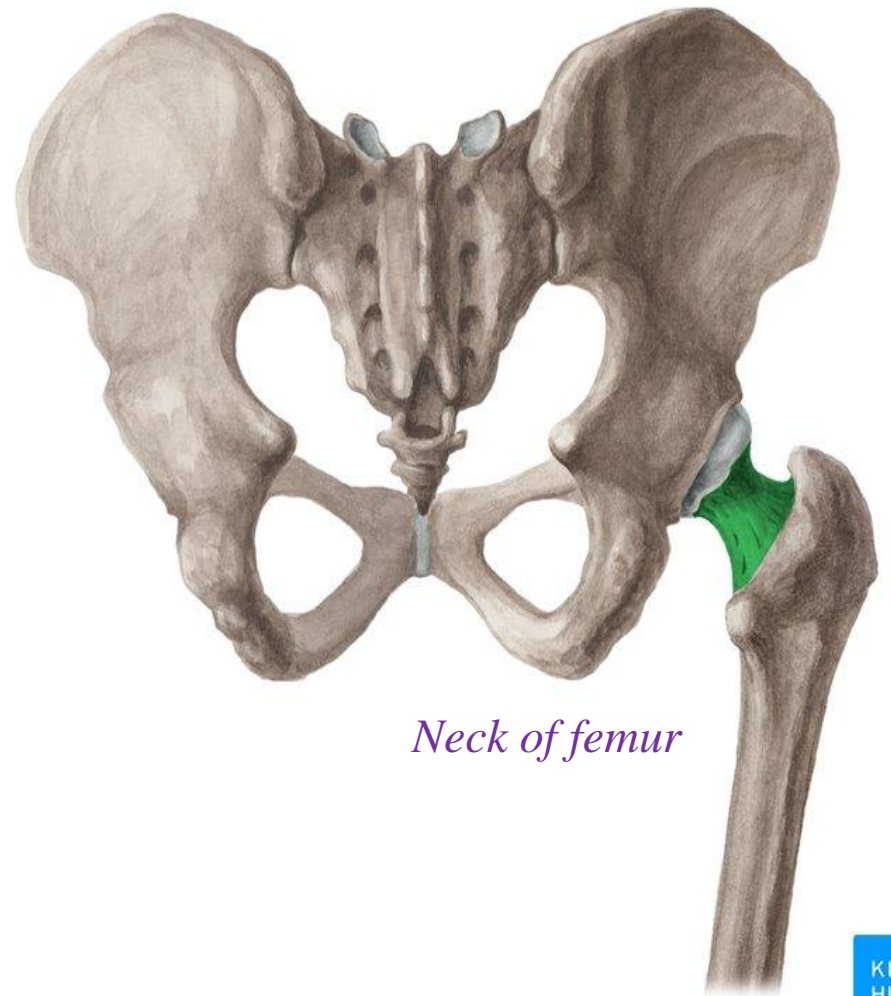
Head of femur



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Head: is a **rounded** articular surface that typically fits into a socket or cavity of another bone, allowing for movement.



Neck of femur

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Neck: **Constricted** bone follows the head

Head



Condyle



Epicondyle



A **condyle** is a **rounded, knuckle-like** protuberance at the end of a bone, forming part of a joint..

An **epicondyle** is a **bony prominence** located above or on the condyle, typically serving as a site for muscle attachment.

Greater trochanter



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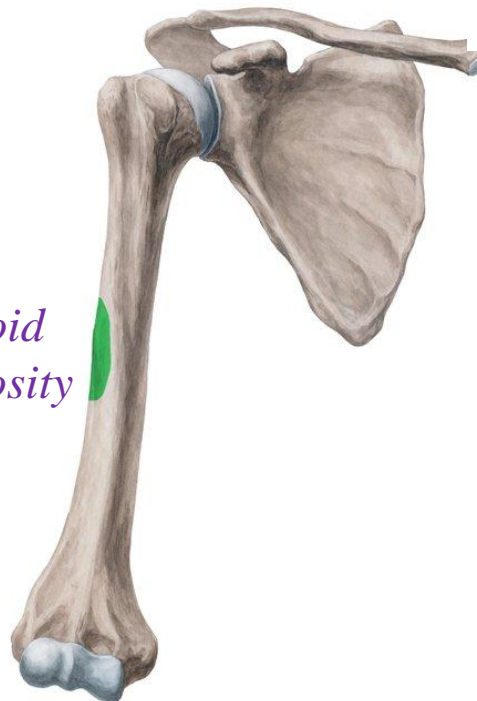
Adductor tubercle



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Deltoid tuberosity



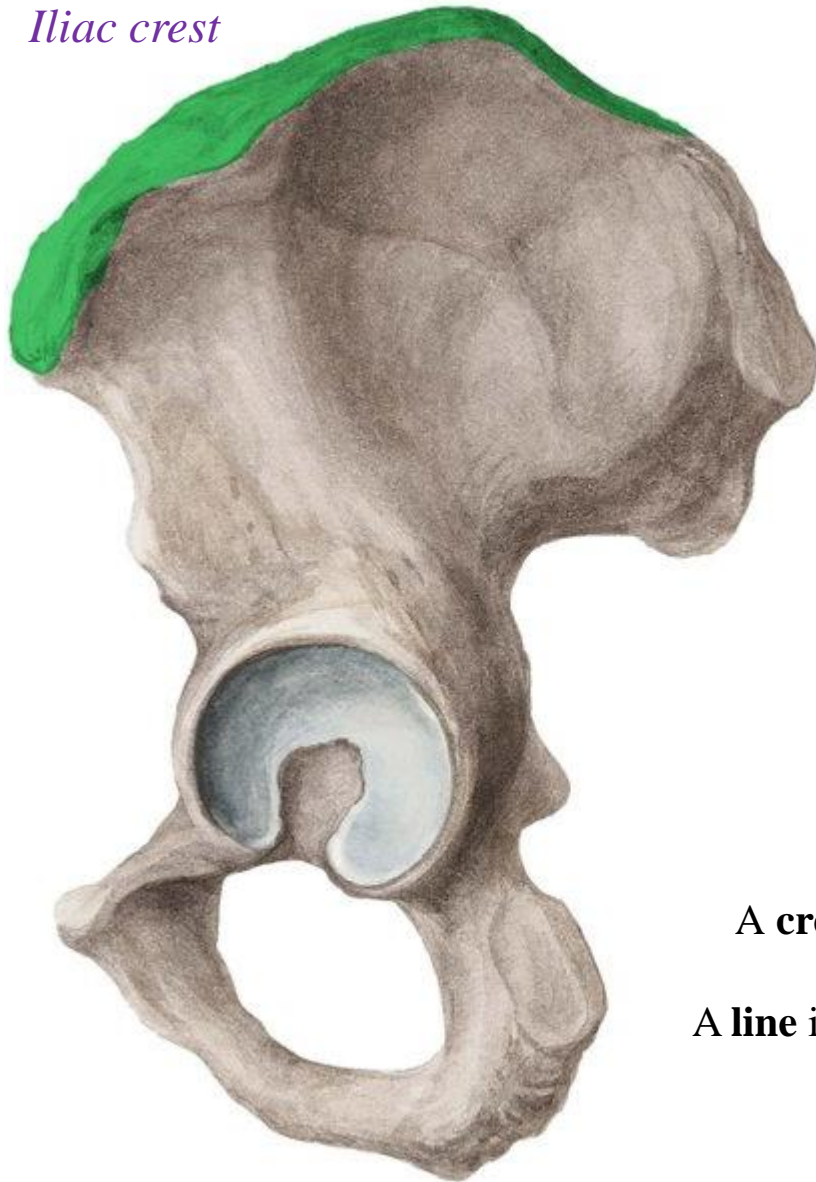
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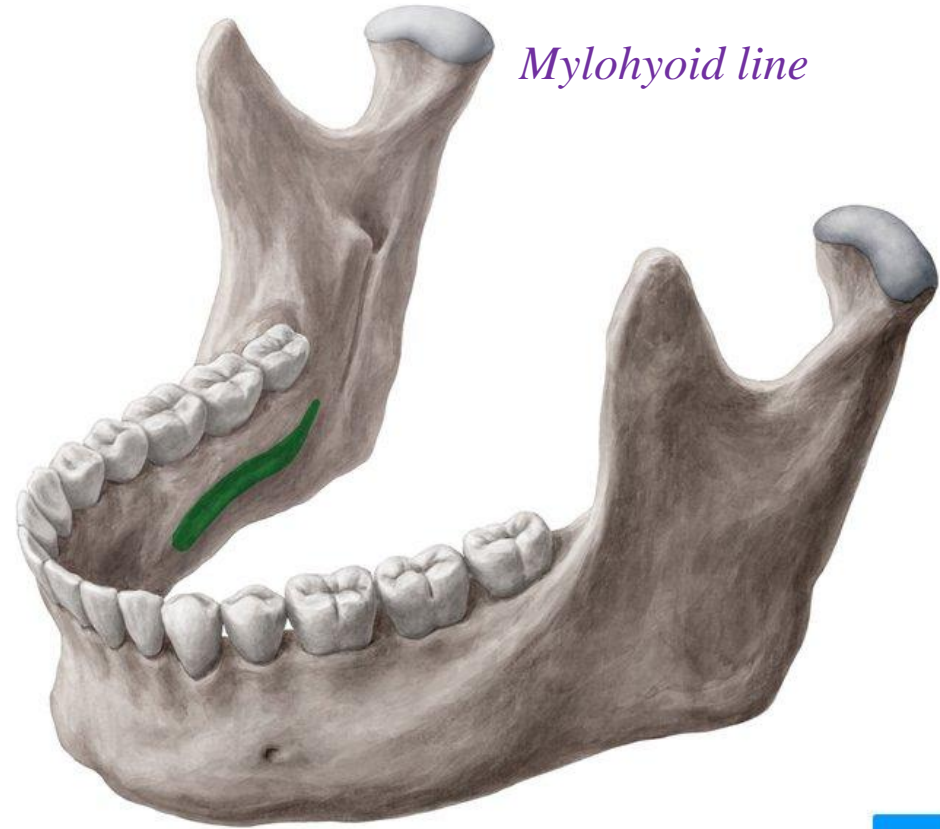
Tubercle, tuberosity and trochanter: They are localized rounded elevations.

The tubercle is the smallest while the trochanter is biggest and tuberosity is medium-sized.

Iliac crest



Mylohyoid line



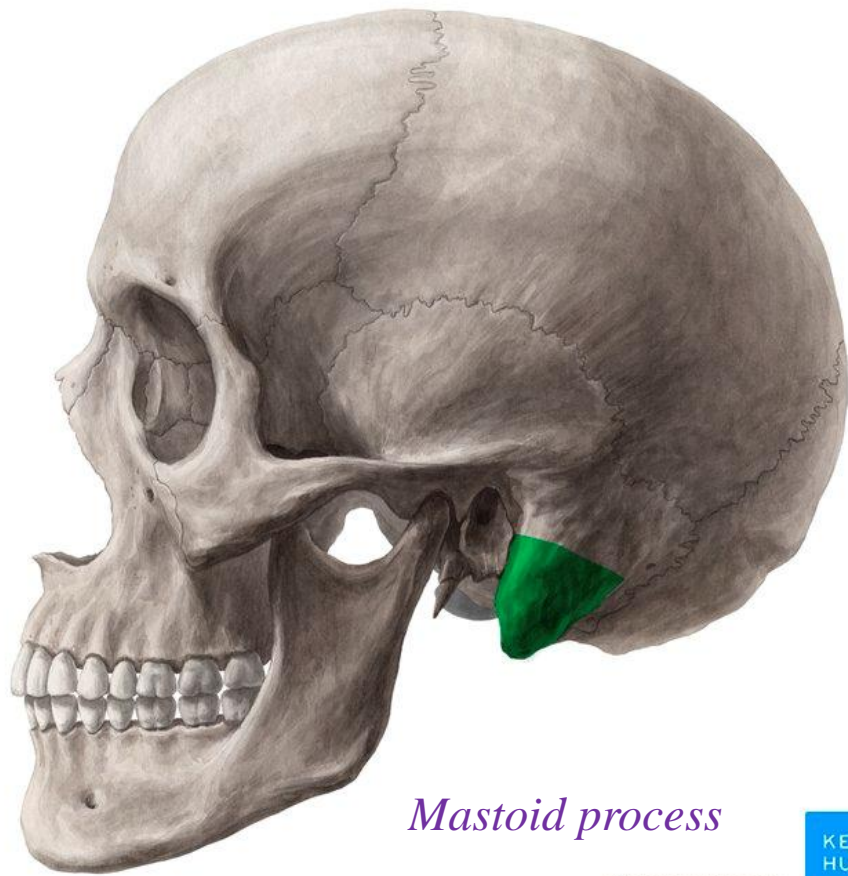
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A **crest** is a **prominent, narrow ridge** or raised area on a bone, typically more pronounced and larger than a line.
A **line** is a **less pronounced, linear** ridge or mark on the surface of a bone, usually finer and thinner than a crest.

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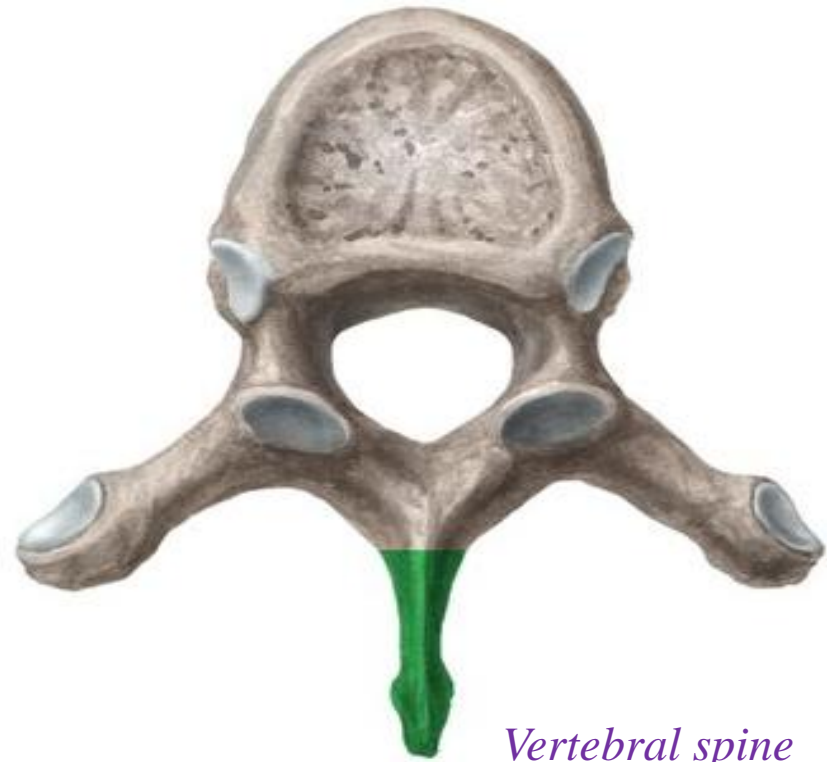


Mastoid process

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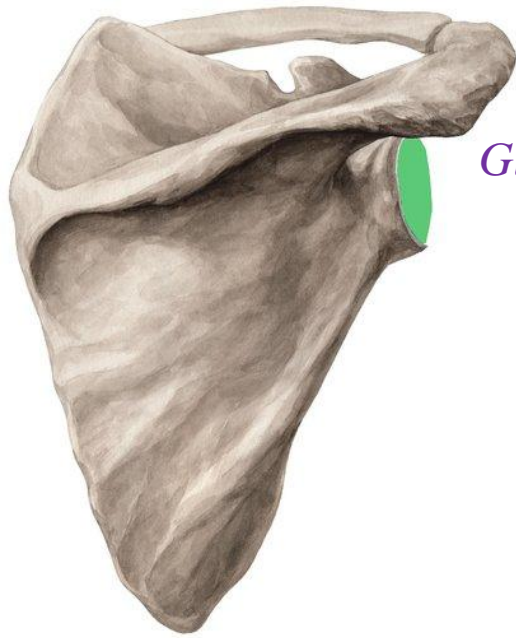


Process: It is an elongated projection with a **blunt** end.

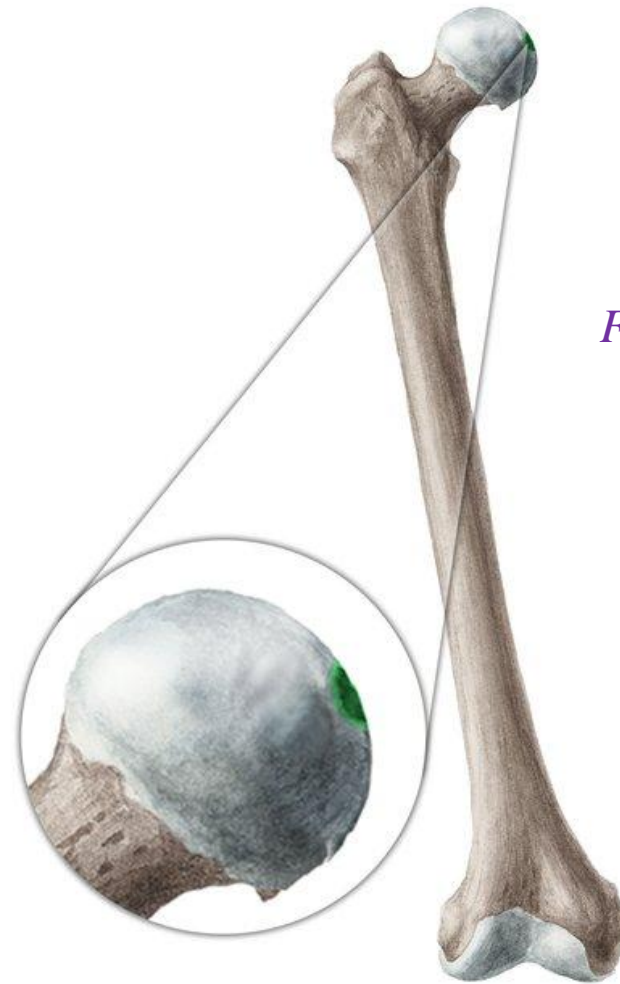


Vertebral spine

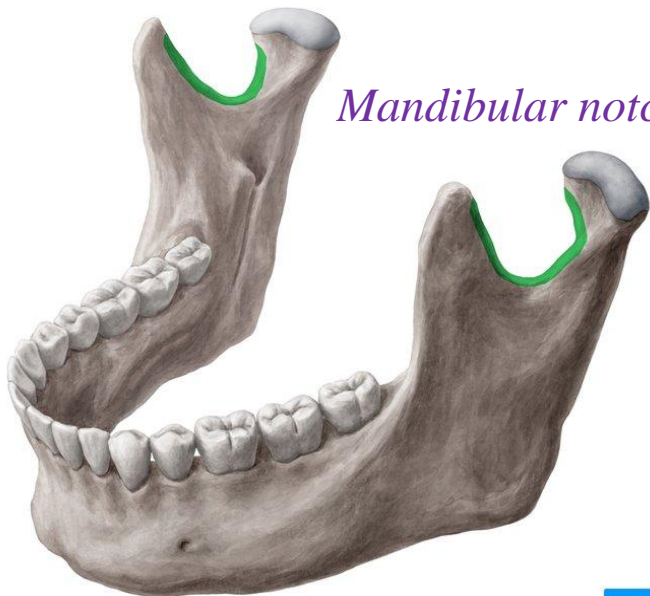
Spine: It is an elongated projection with a **pointed** tip.



Glenoid fossa



Fovea capitis

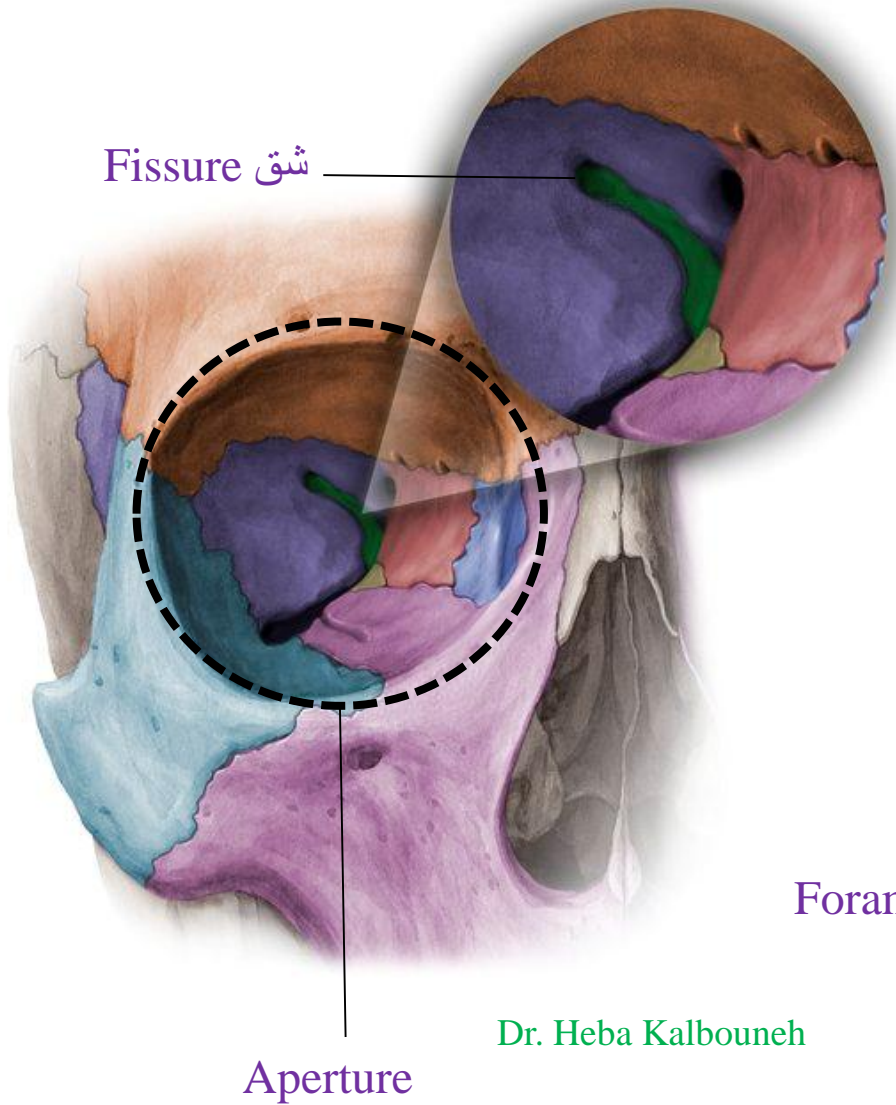


Mandibular notch

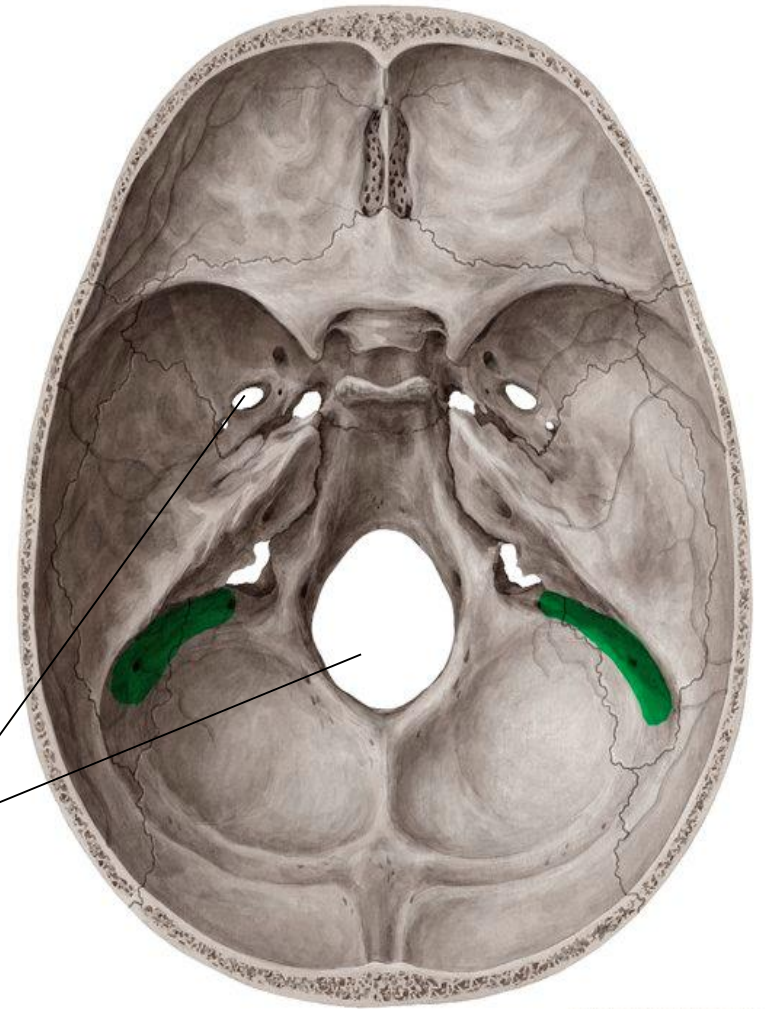
Fossa (حُفْرَة): A depression on a surface.

Fovea: a small pit, usually on the head of a bone.

Notch: a cut-out or indentation, usually along a bone's edge, for structures to pass through..



Foramen

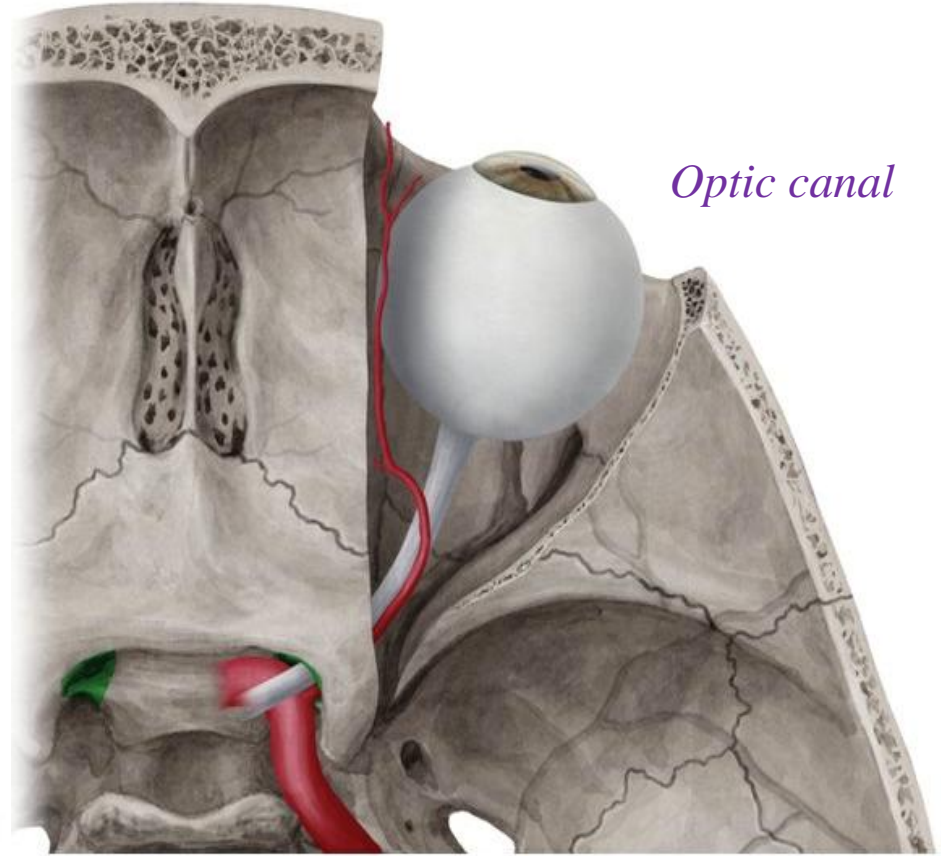


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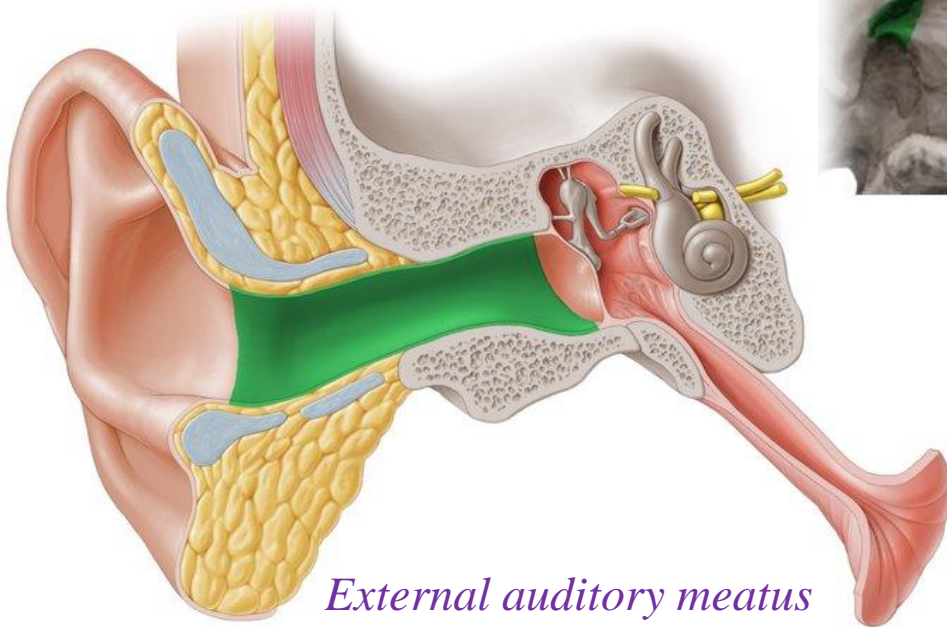


Foramen: It is a small hole through a bone.
Aperture: It is a large hole

A **fissure** is a **elongated split** or **cleft** in the surface of an organ or bone.
 A **sulcus** is a **shallow groove**, typically narrower and less deep than a fissure.



Optic canal



External auditory meatus

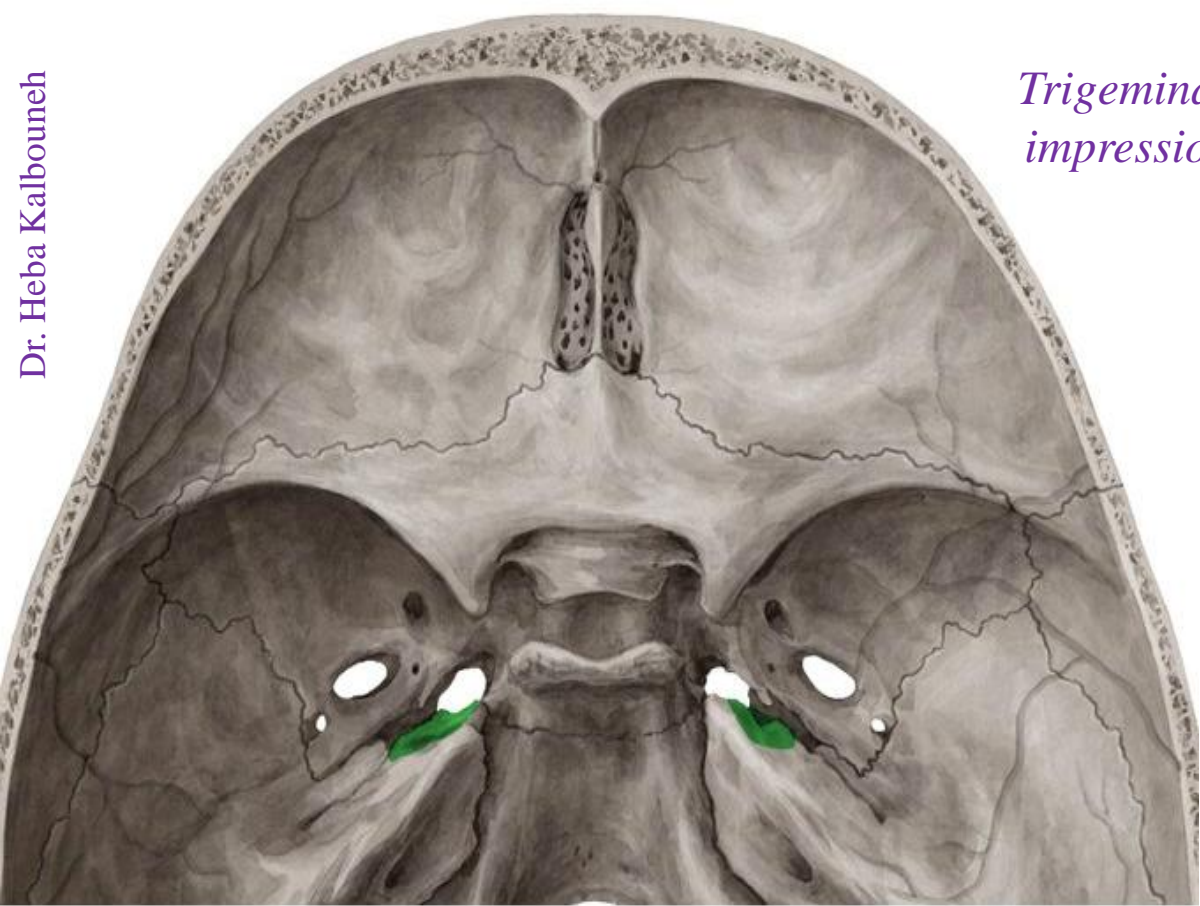
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Canal: It is a track of some length in a bone having 2 open ends.

Meatus: A bony canal having one closed end.

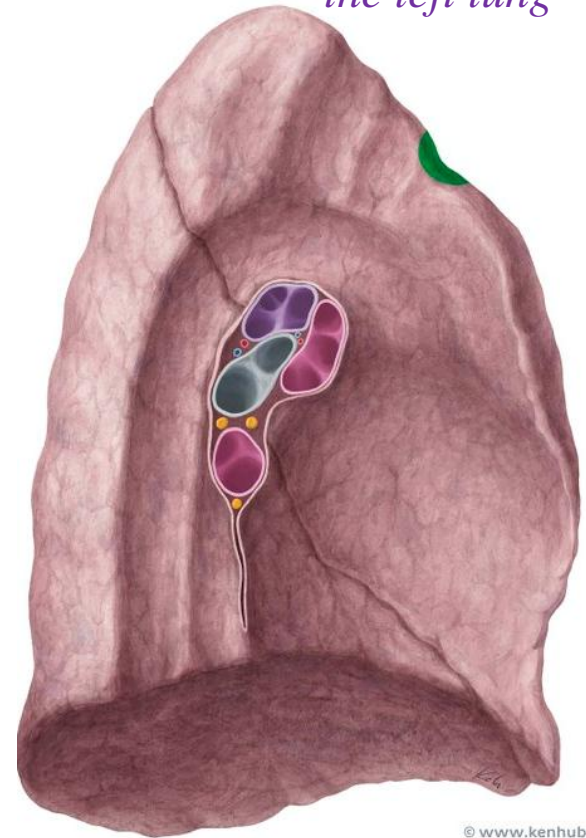




Trigeminal impression

Impressions are typically less deep than other depressions like fossae

Impression of 1st rib on the left lung



Impression: a shallow depression or mark made on the surface of a bone or organ. It is often created by a neighboring structure that presses against the bone or organ, leaving a mark or depression.