Lecture six

Objectives

At the end of this lecture the student must know:

1-classification and parts of skeletal system.

2- classification of bones.

3- the boney landmarks.

Skeletal system

Osteology

and

Arthrology

1. Axial Skeleton
   a. Skull
      8 cranial bones
      frontal 1 — temporal 2
      parietal 2 — sphenoid 1
      occipital 1 — ethmoid 1
      14 facial bones
      maxilla 2 — lacrimal 2
      zygomatic 2 — nasal 2
      palatine 2 — vomer 1
      inferior nasal concha 2
      mandible 1 — 22 bones

   b. Middle ear bones
      malleus 2
      incus 2
      stapes 2 — 6 bones

   c. Hyoid
      hyoid bone 1 — 1 bone

   d. Vertebral column
      cervical vertebra 7
      thoracic vertebra 12
      lumbar vertebra 5
      sacrum 1
      coccyx 1 — 26 bones

   e. Thoracic cage
      rib 24
      sternum 1 — 25 bones

2. Appendicular Skeleton
   a. Pectoral girdle
      scapula 2
      clavicle 2 — 4 bones

   b. Upper limbs
      humerus 2
      radius 2
      ulna 2
      carpal 16
      metacarpal 10
      phalanx 28 — 60 bones

   c. Pelvic girdle
      hip bone 2 — 2 bones

   d. Lower limbs
      femur 2
      tibia 2
      fibula 2
      patella 2
      tarsal 14
      metatarsal 10
      phalanx 28 — 60 bones

Total — 206 bones

Divisions of the Skeletal System

TABLE 7.1

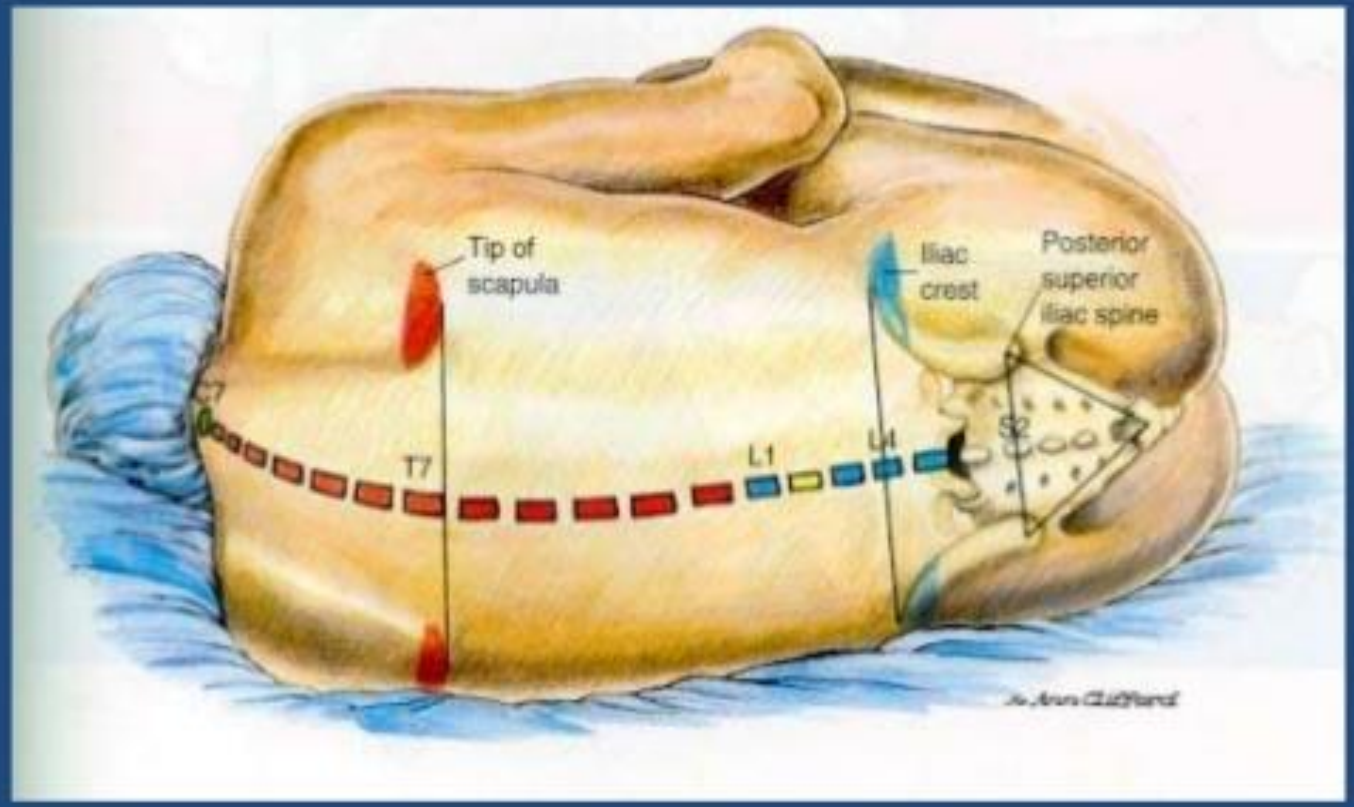
The Bones of the Adult Skeletal System

DIVISION OF THE SKELETON	STRUCTURE	NUMBER OF BONES
Axial Skeleton		
		
	Skull	
	Cranium	8
	Face	14
	Hyoid	1
	Auditory ossicles	6
	Vertebral column	26
	Thorax	
	Sternum	1
	Ribs	24
	Subtotal =	80

DIVISION OF THE SKELETON	STRUCTURE	NUMBER OF BONES
Appendicular Skeleton		
		
	Pectoral (shoulder) girdles	
	Clavicle	2
	Scapula	2
	Upper limbs	
	Humerus	2
	Ulna	2
	Radius	2
	Carpals	16
	Metacarpals	10
	Phalanges	28
	Pelvic (hip) girdle	
	Hip, pelvic, or coxal bone	2
	Lower limbs	
	Femur	2
	Patella	2
	Fibula	2
	Tibia	2
	Tarsals	14
	Metatarsals	10
	Phalanges	28
	Subtotal =	126
	Total in an adult skeleton =	**206**


Femur
Lateral Epicondyle
Lateral Femoral Condyle
Lateral Tibial Condyle
Head of Fibula
Fibula
Medial Epicondyle
Patella
Intercondylar Notch
Medial Femoral Condyle
Medial Tibial Condyle
Intercondylar Eminence
Tibia

EPIDURAL ANESTHESIA



Skeletal System Anatomy

The skeletal system in an adult body is made up of 206 individual bones. These bones are arranged into two major divisions : the *axial skeleton* and the *appendicular skeleton*.

Axial Skeleton

vs

Appendicular Skeleton

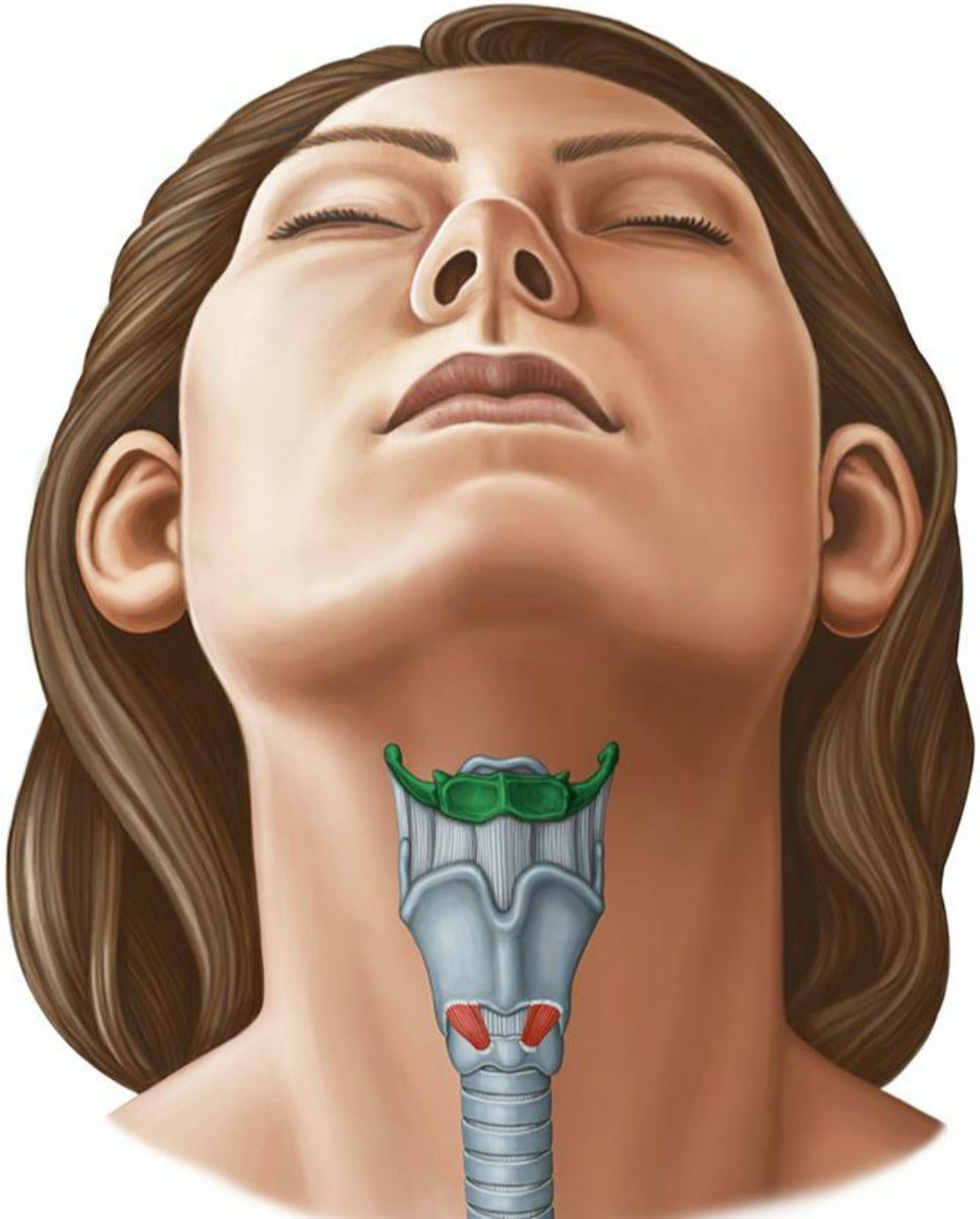
AXIAL SKELETON
VERSUS
APPENDICULAR SKELETON

AXIAL SKELETON	APPENDICULAR SKELETON
Part of the skeleton that consists of the bones of the head and trunk of a vertebrate	Portion of the skeleton of vertebrates consisting of the bones that support the appendages
Central axis of the human skeleton	Consists of appendages connected to the axial skeleton
Composed of skull, ossicles of the middle ear, vertebral column consisting of a total of 80 bones, hyoid, rib cage, and sternum	Composed of pectoral girdles, arms, forearms, hands, pelvis, legs, feet, and ankles
Made up of 80 bones	Made up of 126 bones
Supports the upright position and protects the internal organs	Aid in the movement of the body


Axial skeleton
Appendicular skeleton

The axial skeleton runs along the body's midline axis and is made up of 80 bones in the following regions:

Skull (cranium)
Hyoid
Auditory ossicles
Ribs
Sternum
Vertebral column



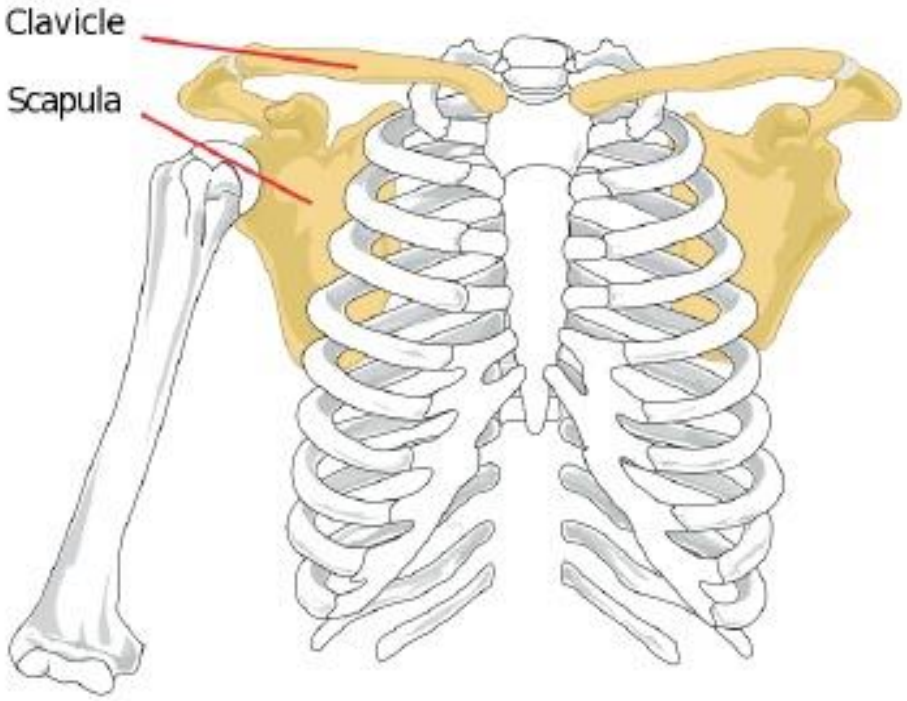
The appendicular skeleton

is made up of bones in the folowing regions:

Upper limbs
Lower limbs
Pelvic girdle
Shoulder (pectoral) girdle

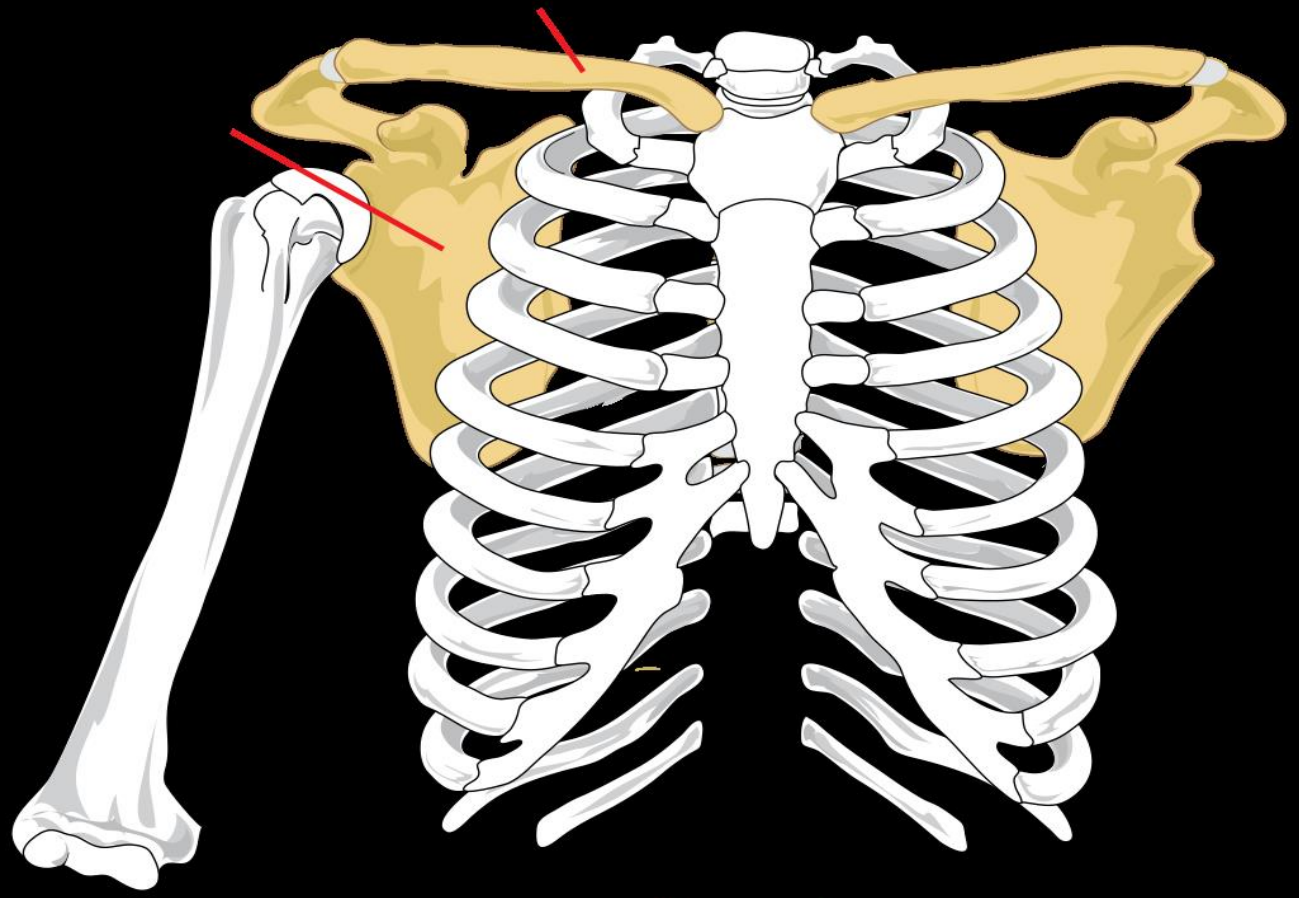
The Pectoral Girdle

Also called the "***shoulder girdle***," the ***pectoral girdle*** contains *four* (4) bones. It functions to ***anchor and support the upper extremities*** and serves as an important ***attachment site for a great number of muscles that help to move the arm***. The bones of the pectoral girdle are as follows:

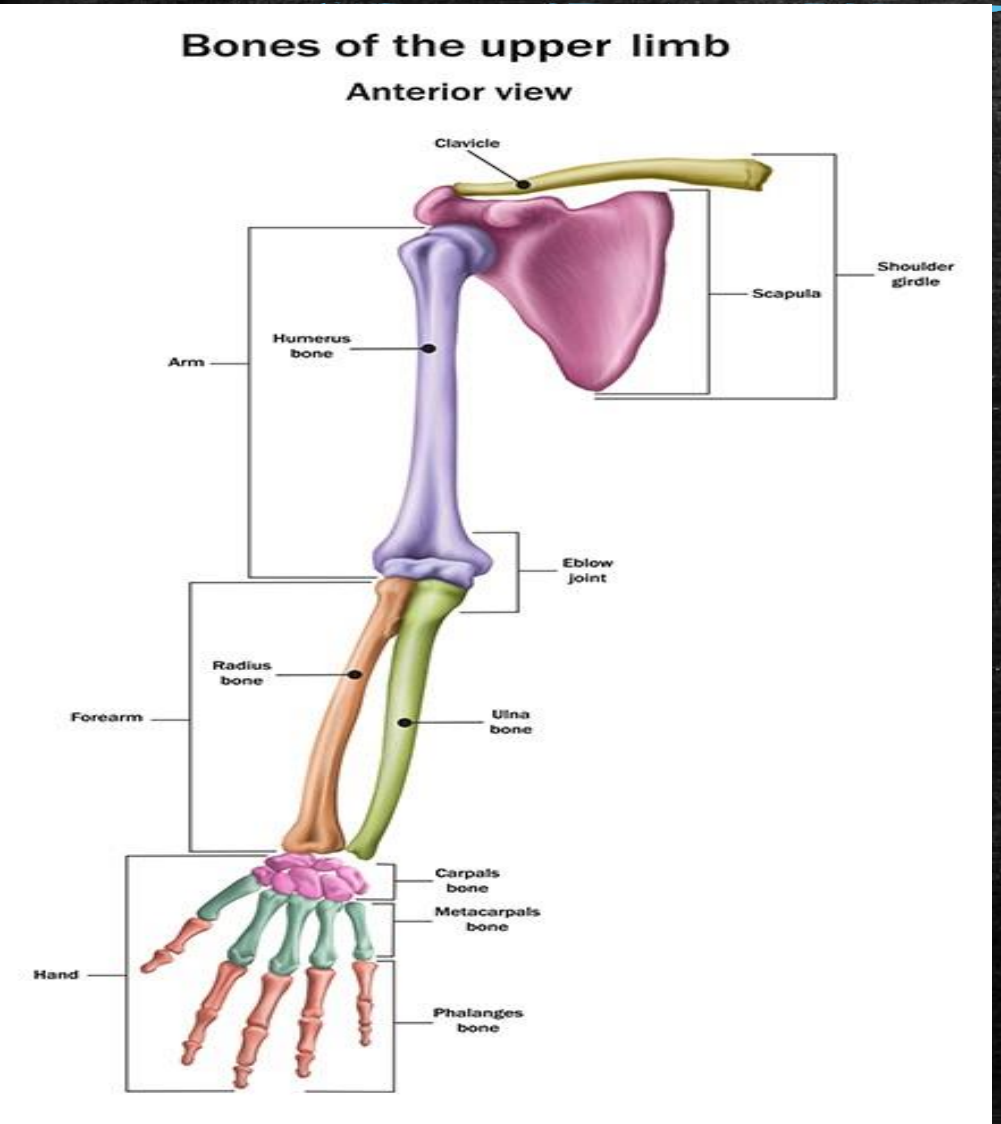


Front view

The girdle is the proximal part of each limb that is closely associated with the trunk



The distal part is free



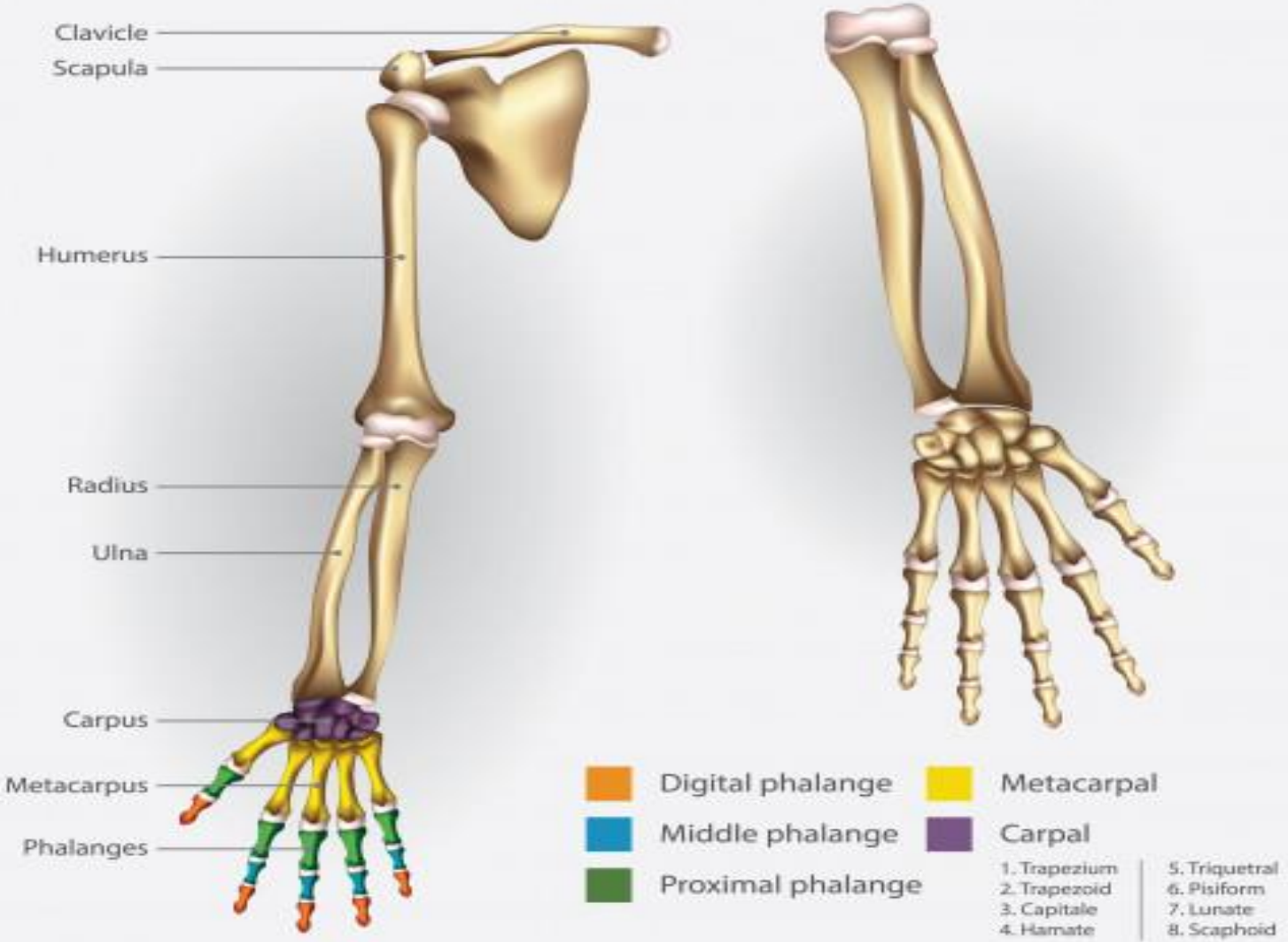
Pectoral Girdle

scapula

clavicle

Upper Extremities

Humerus ,radius , ulna ,carpal bones ,
metacarpal bones and phalanges .



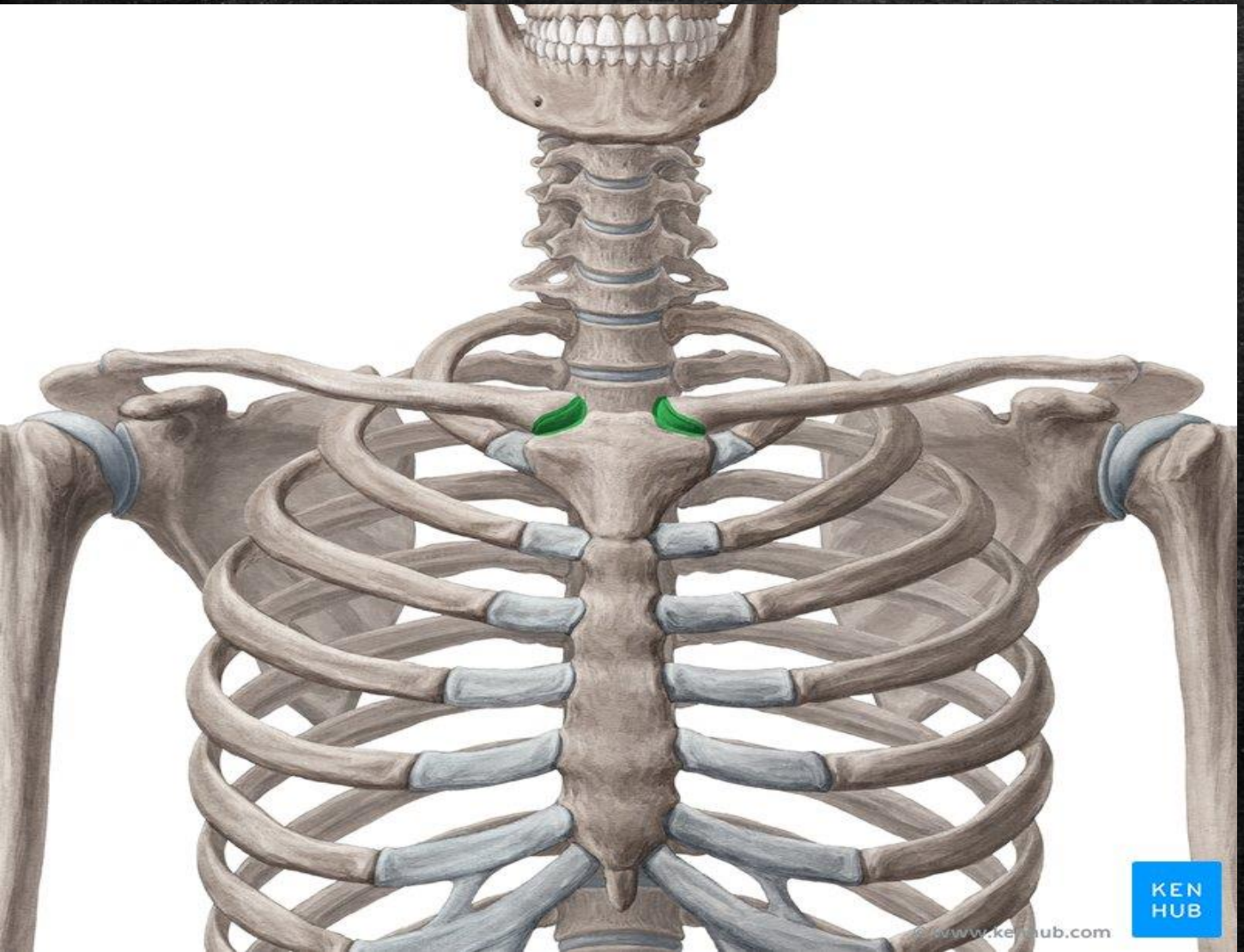
Digital phalange
Middle phalange
Proximal phalange
Metacarpal
Carpal

1. Trapezium
2. Trapezoid
3. Capitale
4. Hamate
5. Triquetral
6. Pisiform
7. Lunate
8. Scaphoid

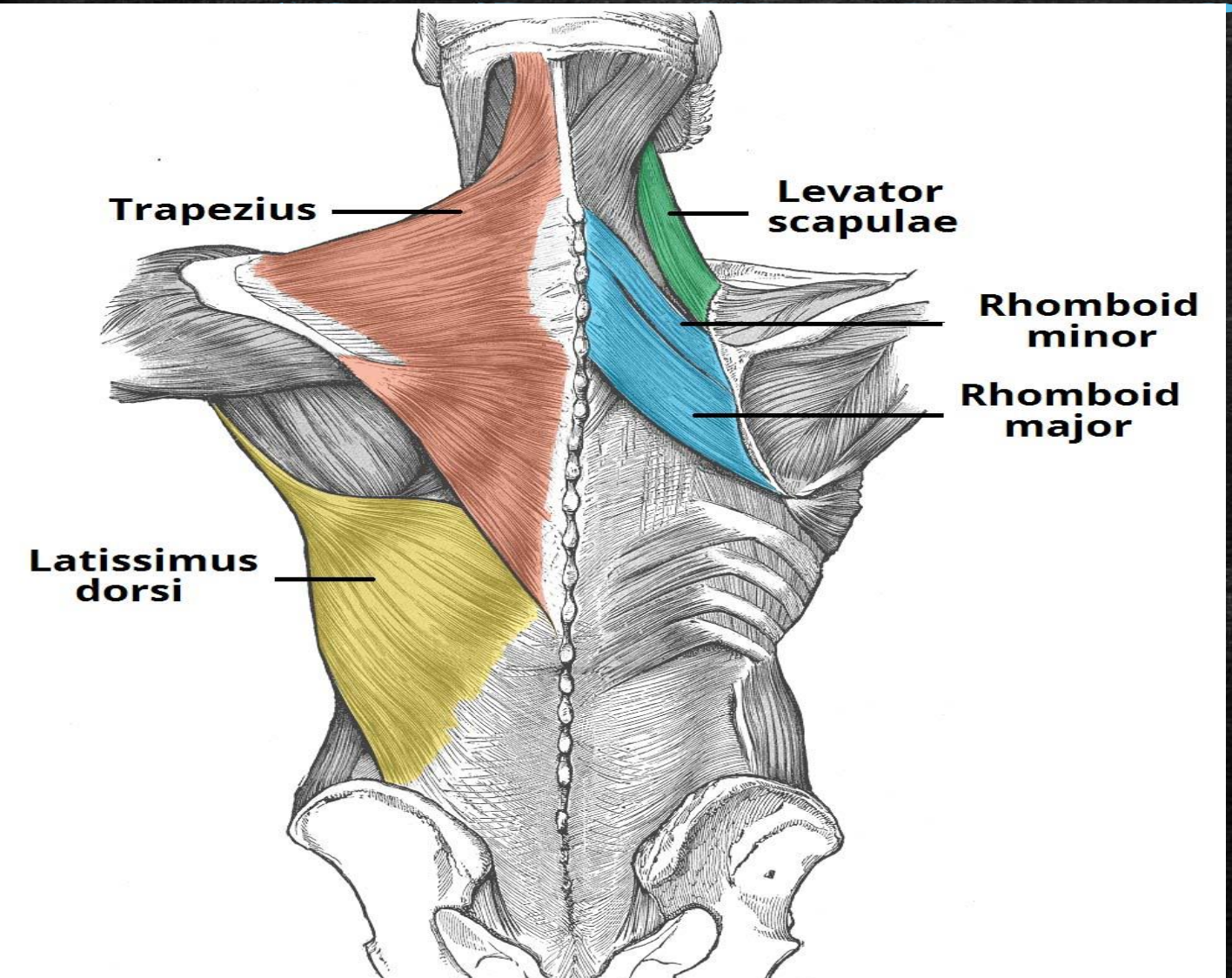
HAND BONE

Lorem ipsum dolor sit amet, consectetur elit, tempor incididunt labore et dolore.

Clavicle attached to the axial skeleton by a movable joint



Scapula attached to the axial skeleton by muscles only



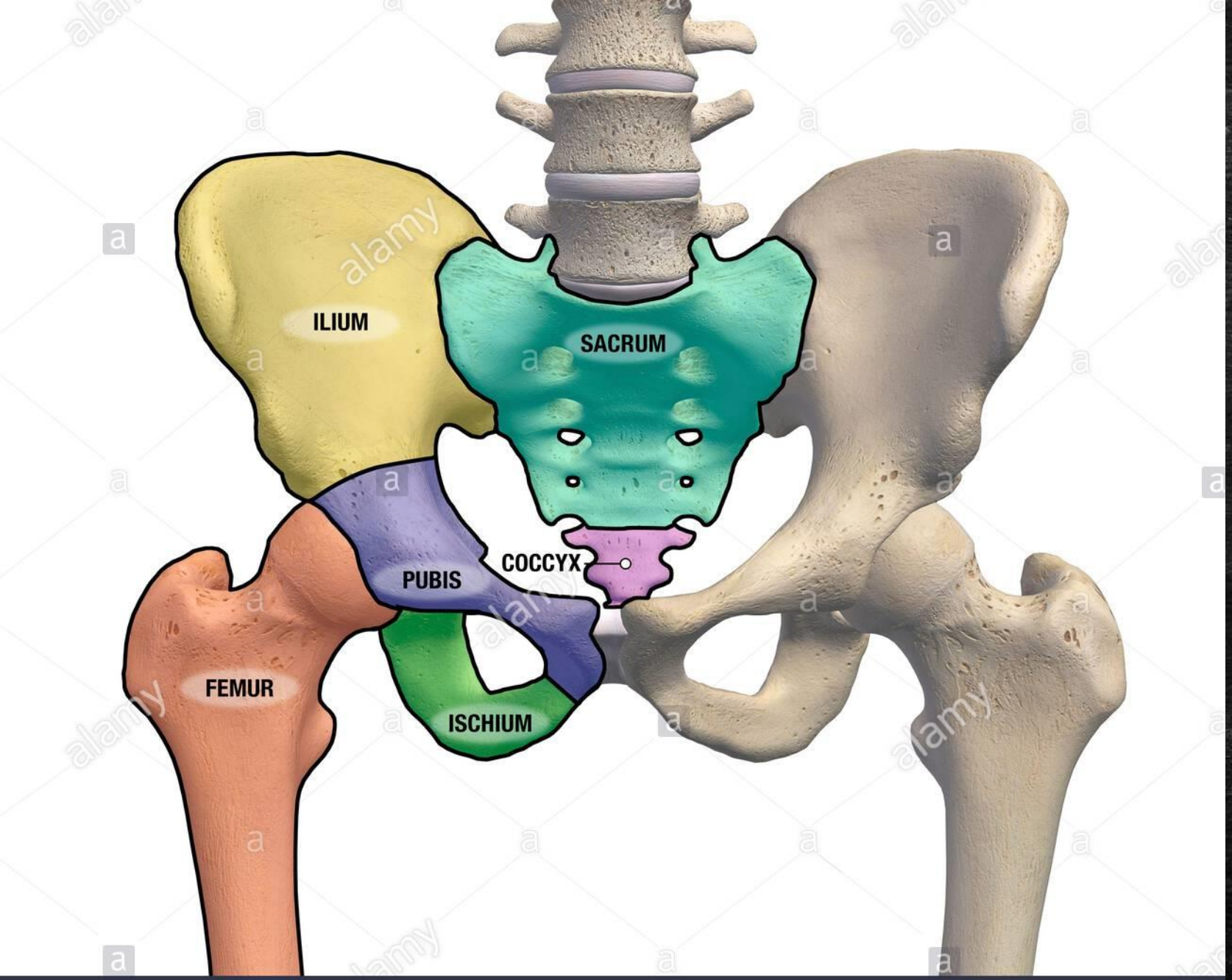
Pelvic Girdle

sacrum

os coxae (hip) (each contains 3 fused bones which are ilium, ischium and pubis).

Lower Extremities

femur , tibia , fibula , patella ,tarsal bones , metatarsal bones and phalanges .



Vertebrae

33-34 vertebrae form the **vertebral column** of the human body.

They are named by region:

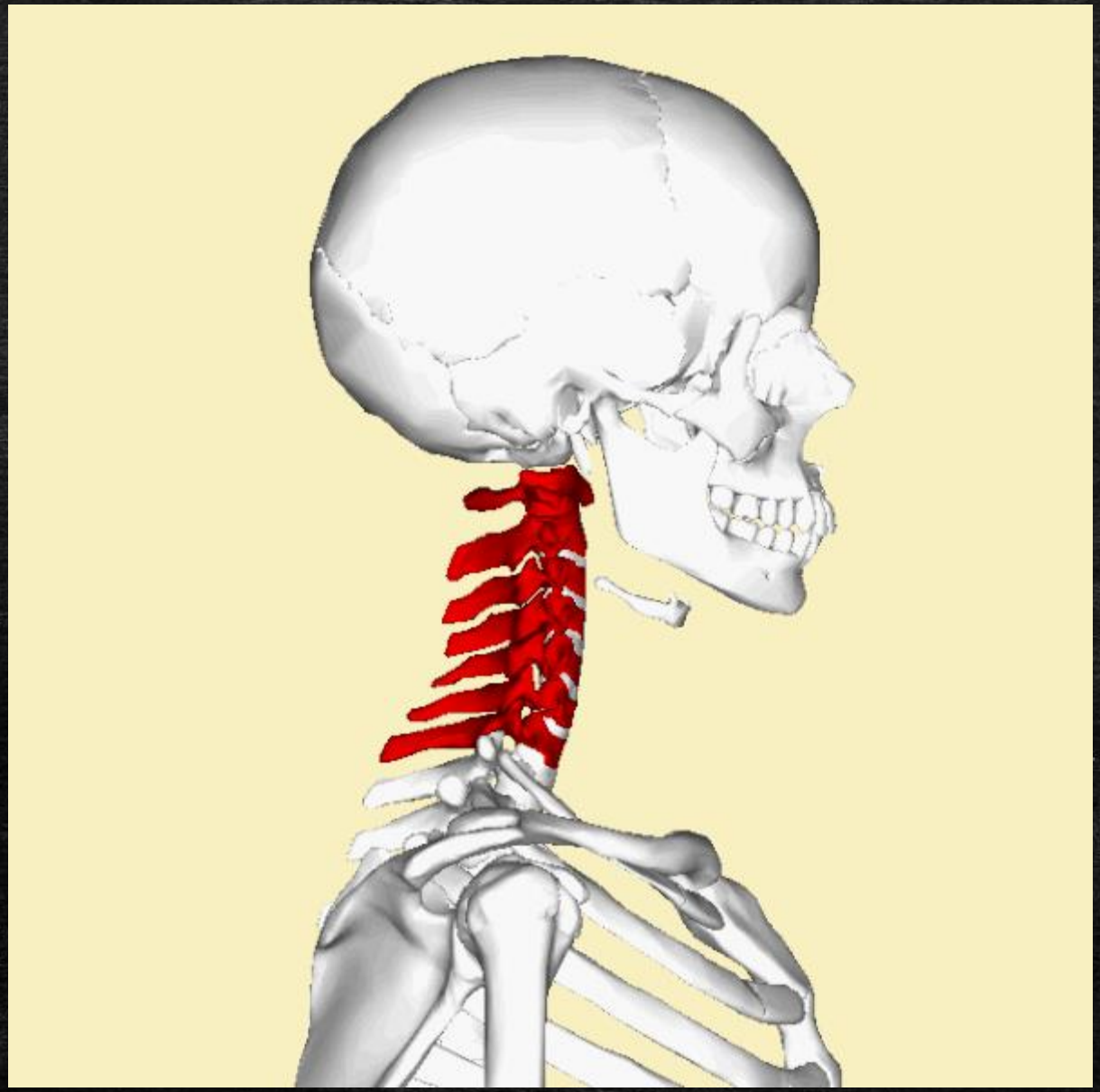
Cervical (neck) - 7 vertebrae

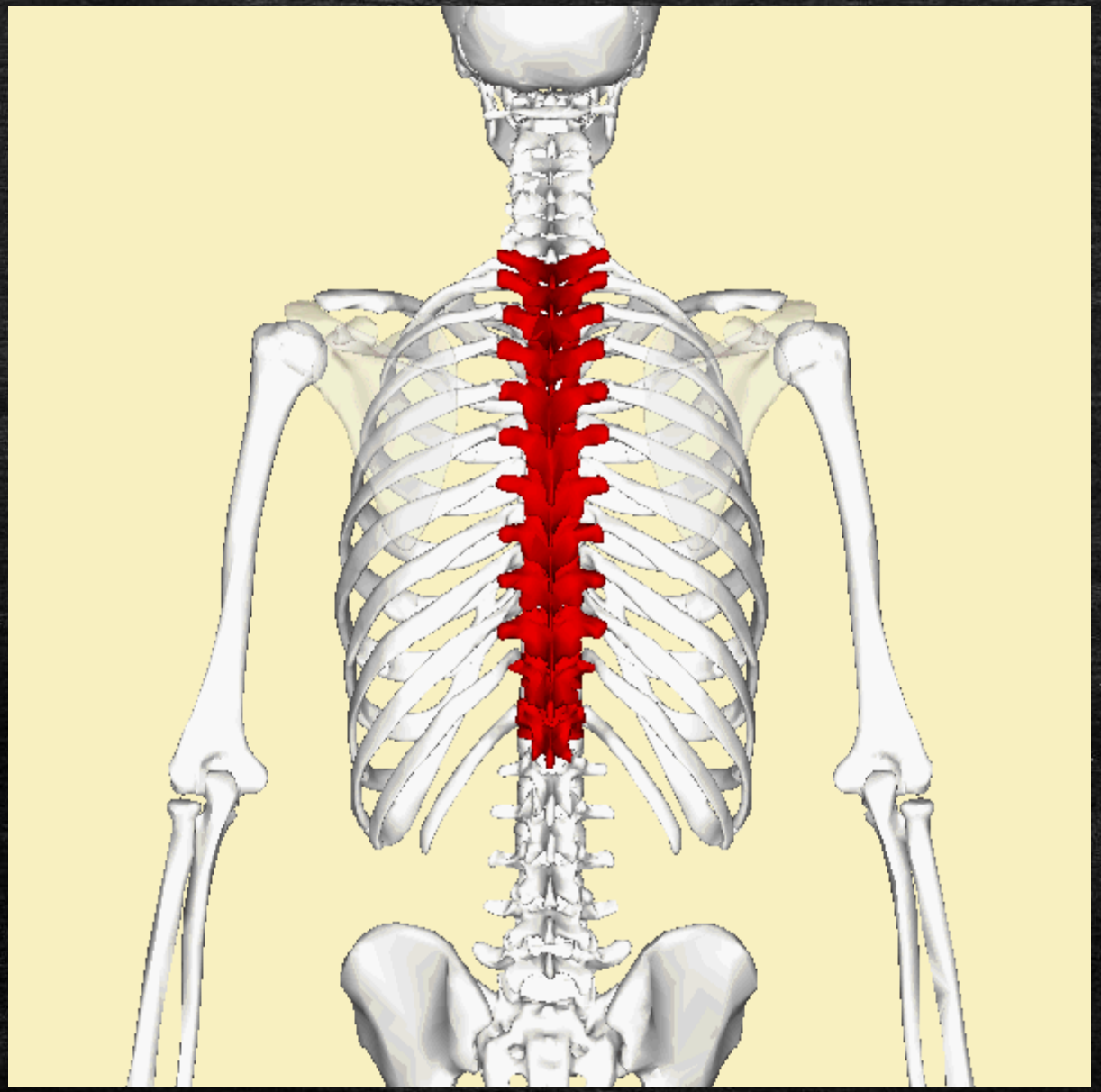
Thoracic (chest) - 12 vertebrae

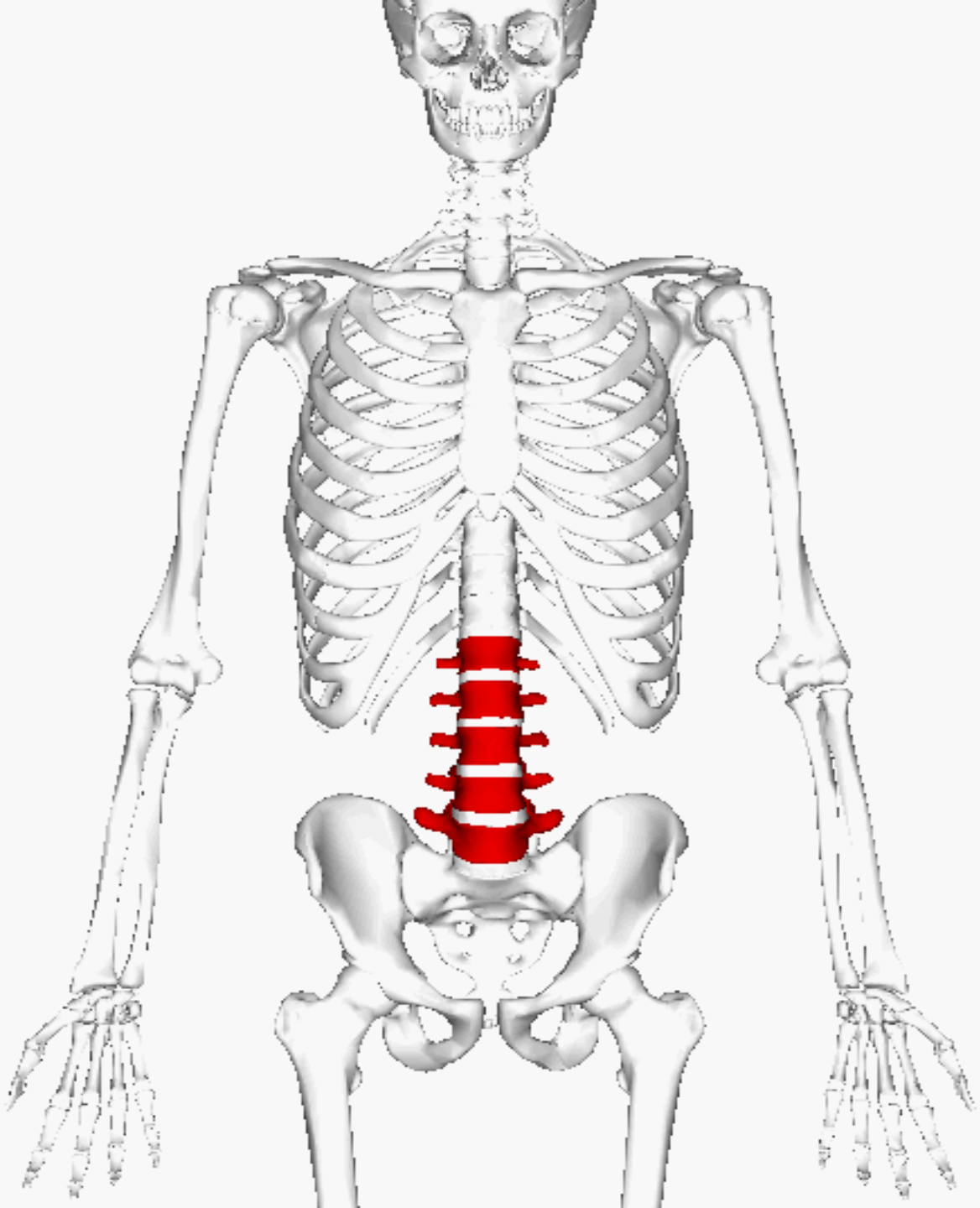
Lumbar (lower back) - 5 vertebrae

Sacrum 5 fused vertebra

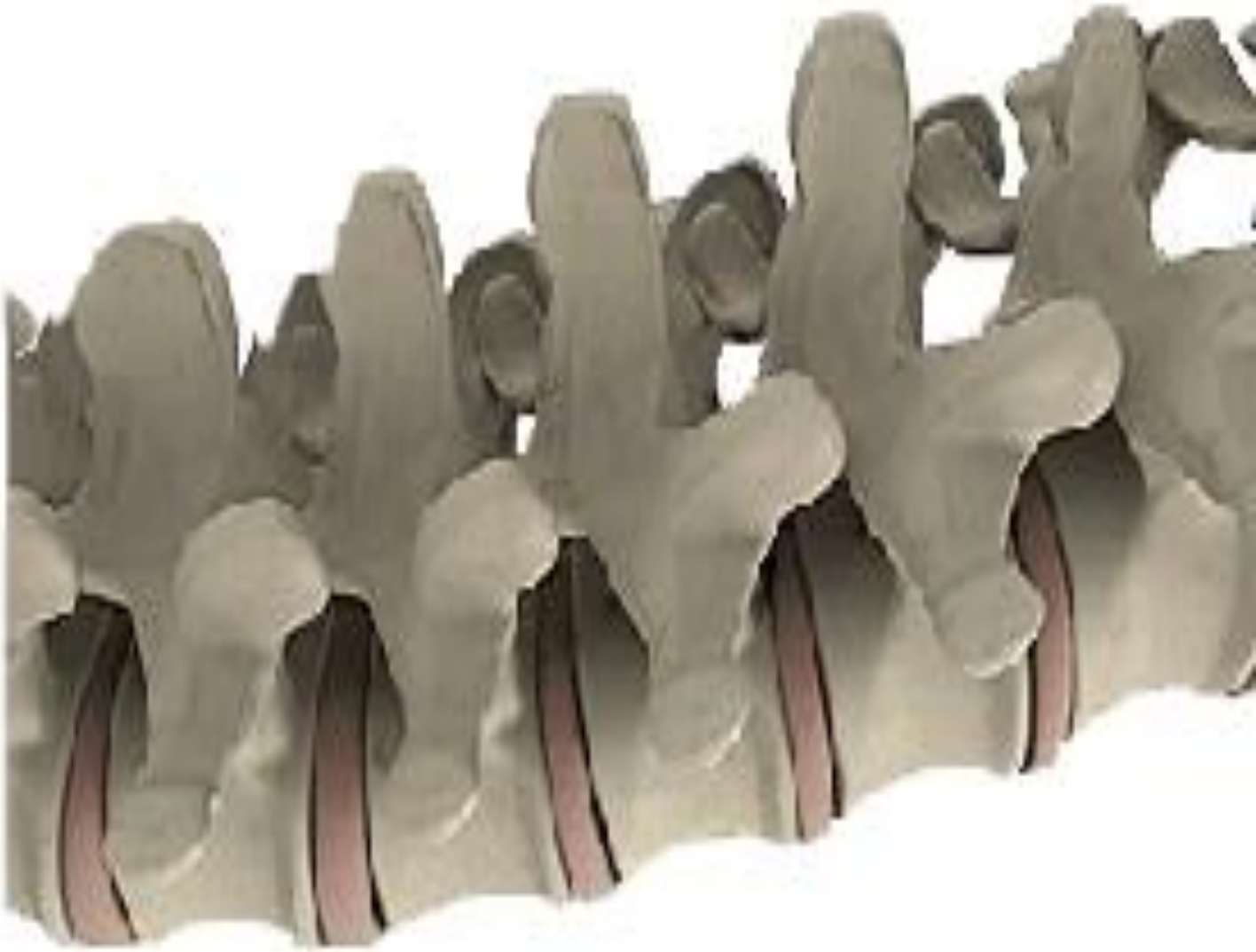
Coccyx (tailbone) 4-5 vertebra (vestigeal)







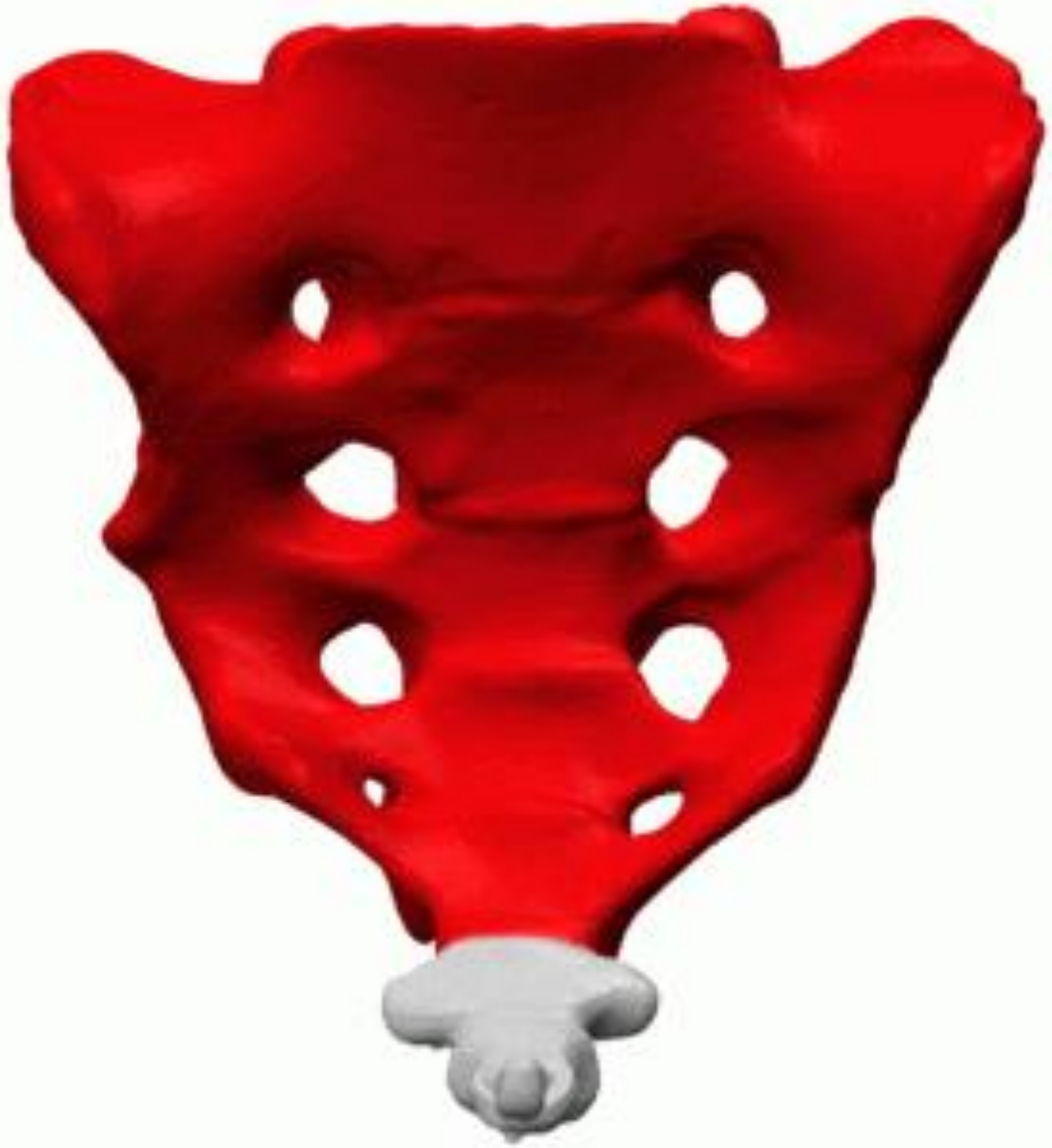
The vertebrae are separated from each other by intervertebral discs which are fibrocartilagenous in structure that allow the spine to flex and extend as well as rotated and also play a role in the spread of the body weight along the column .



Sacrum and coccyx

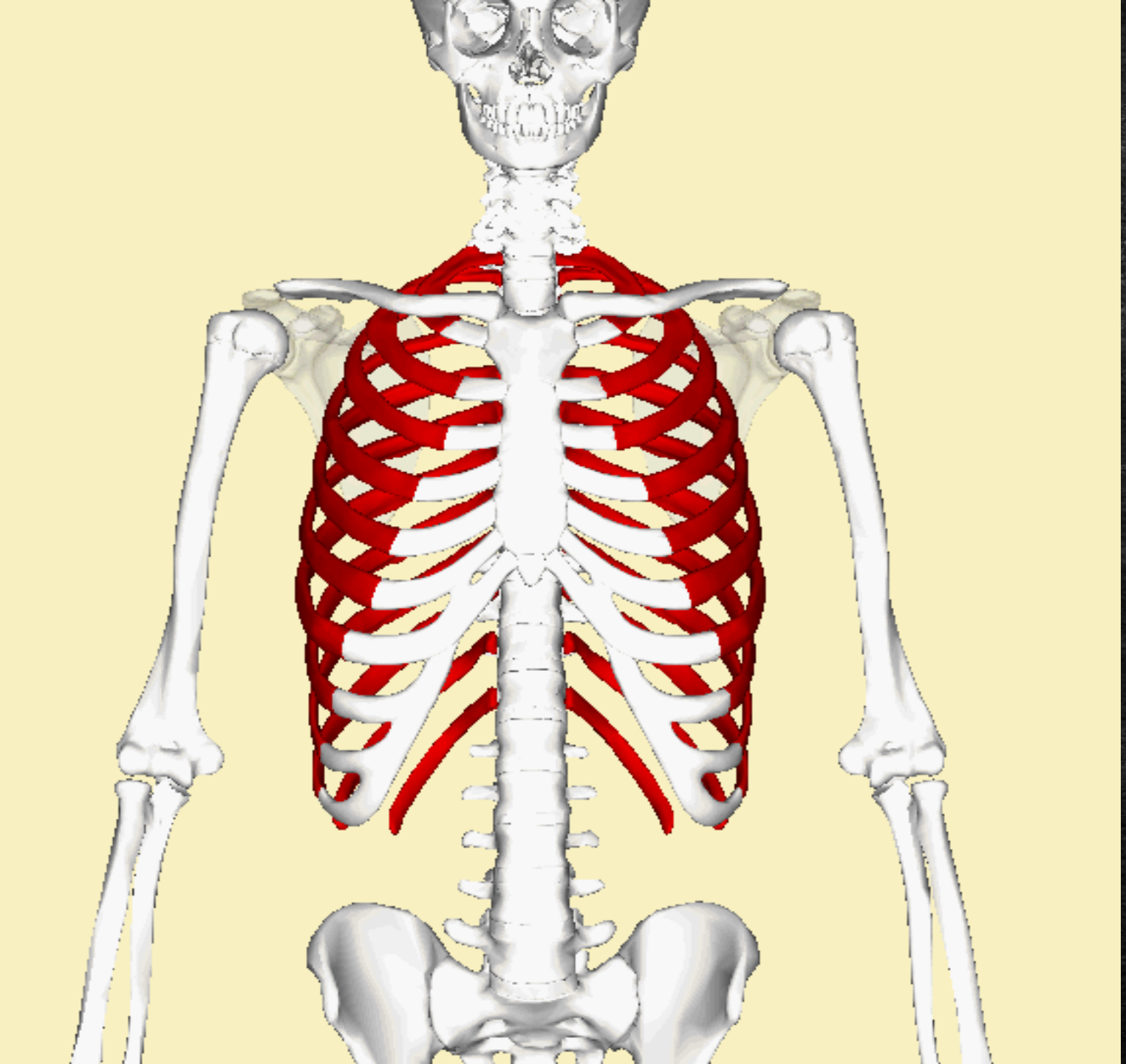
The sacral and coccygeal vertebra are fused together

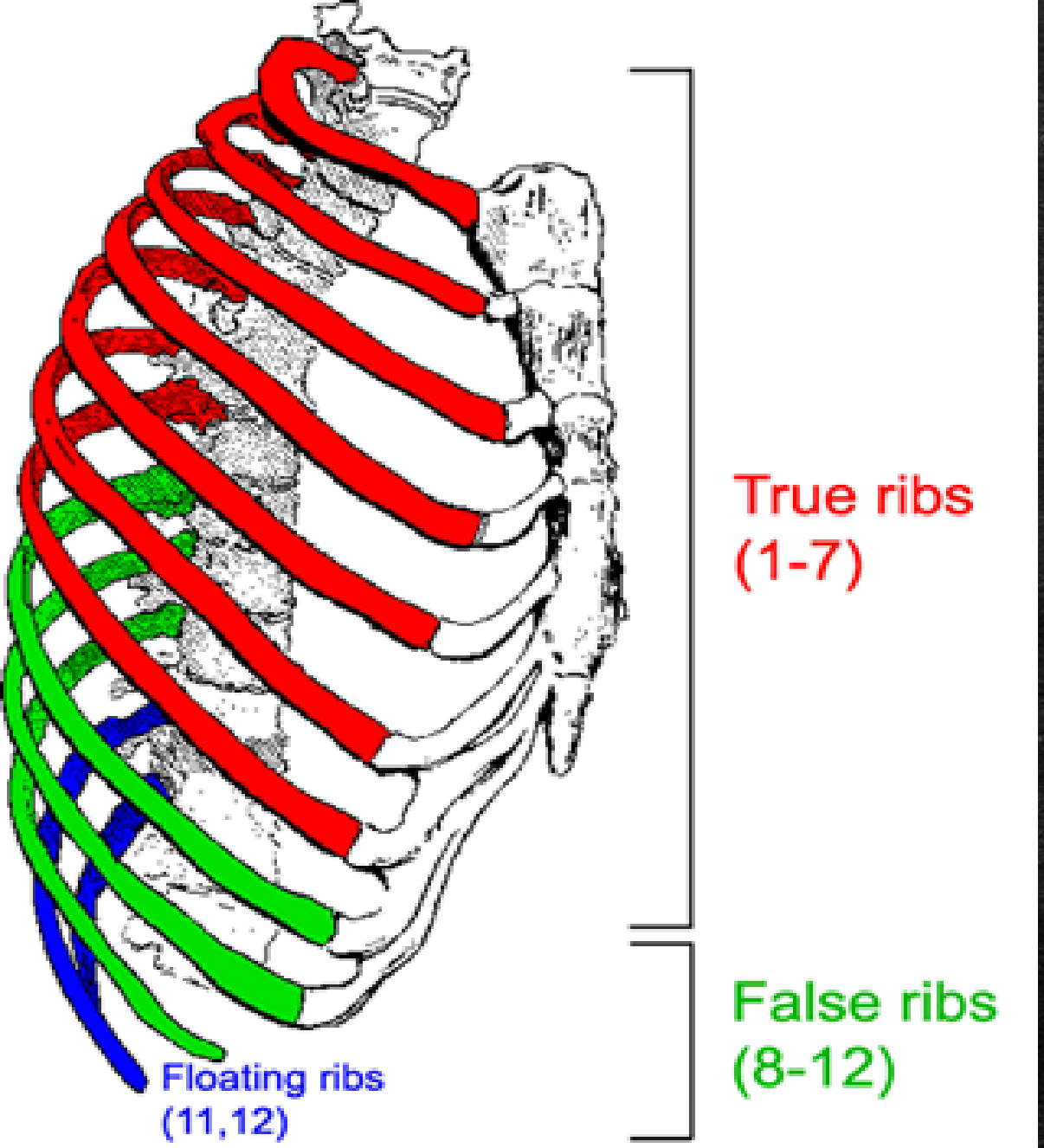
Without any intervening disc so they appear as one piece.



Ribs

There are 12 ribs That attached to the sides of the sternum and articulated posteriorly with the sides of the thoracic vertebrae .

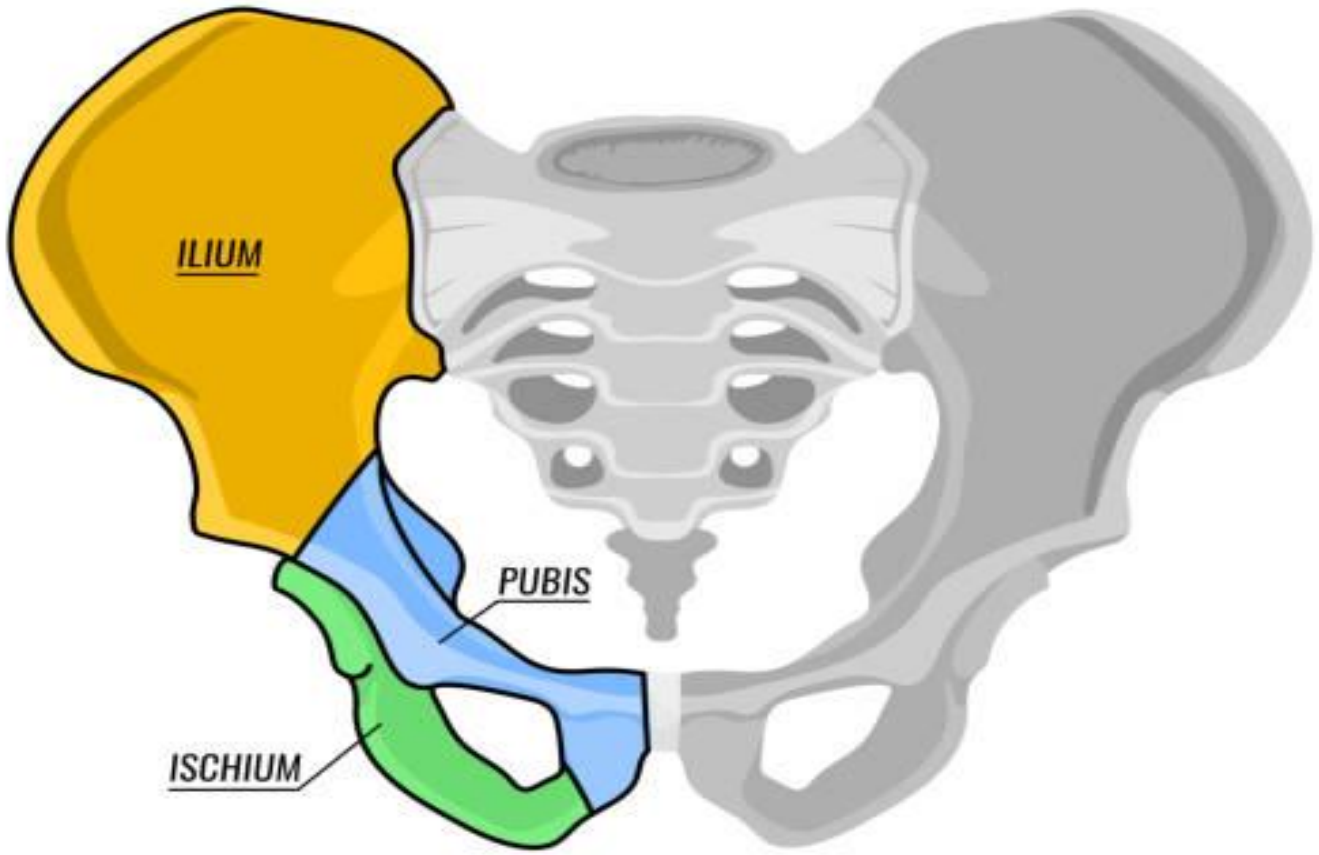



True ribs
(1-7)
False ribs
(8-12)
Floating ribs
(11,12)

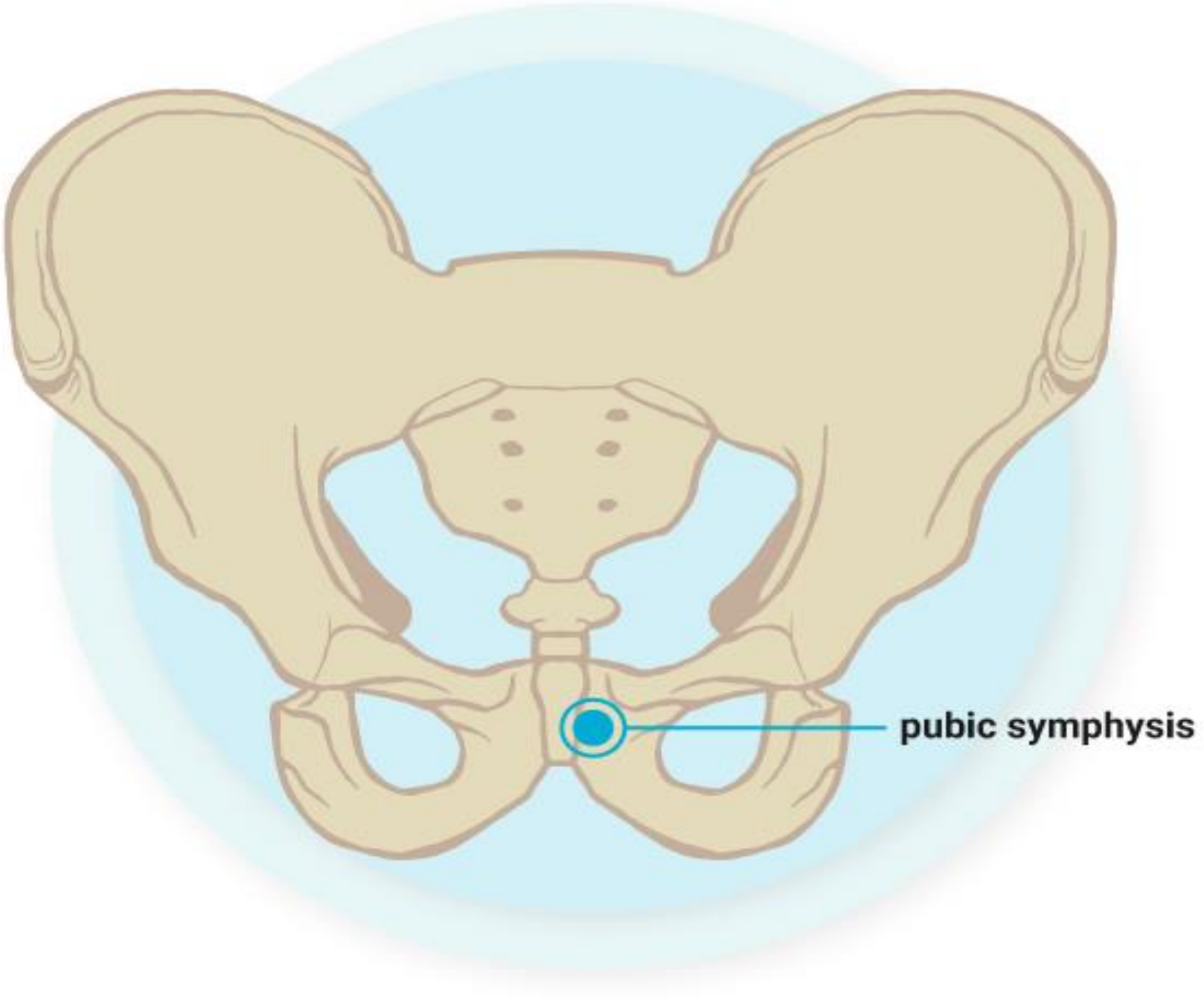
pelvis

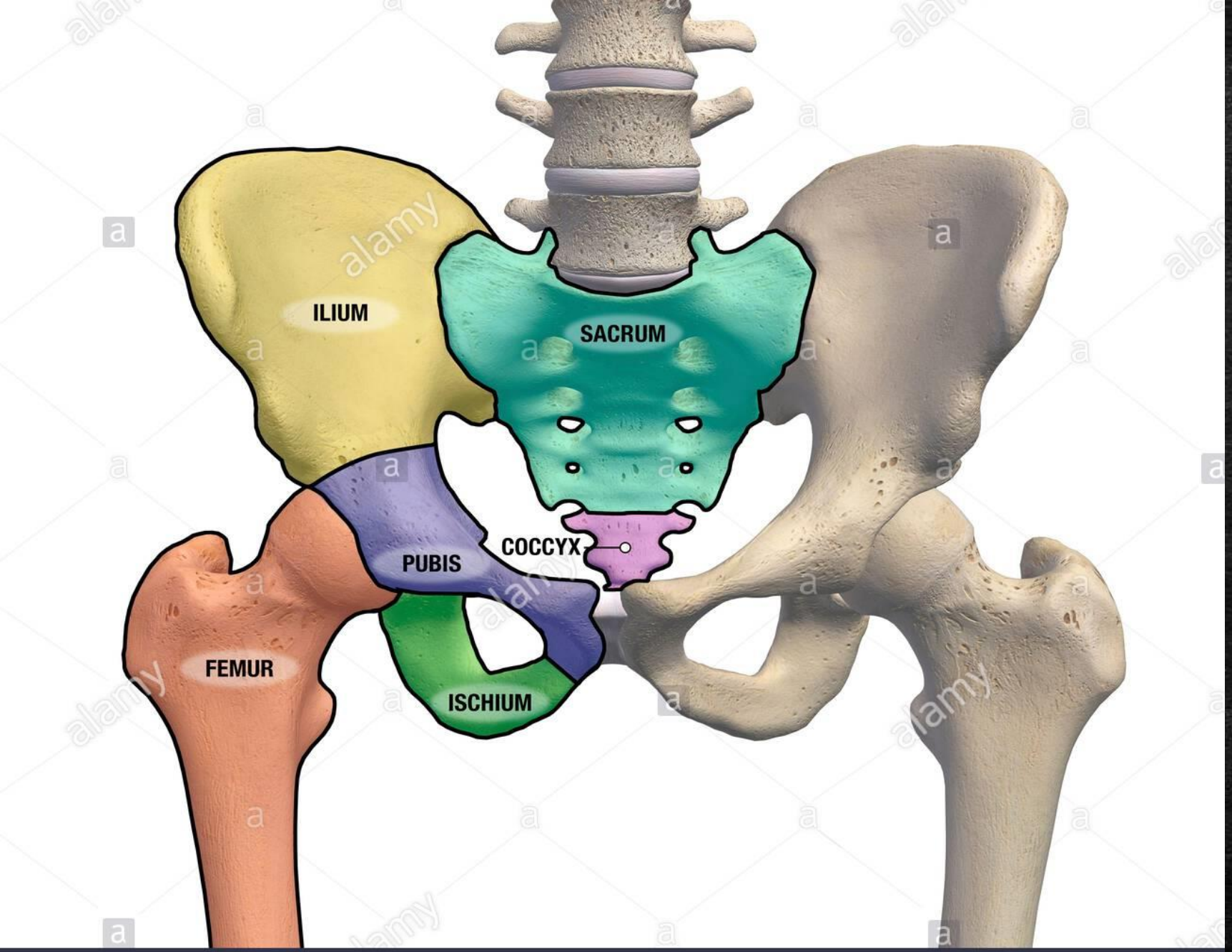
The pelvis consist of two hip bones right and left which

articulated posteriorly with the sacrum and anteriorly articulated to each other at the pubic symphysis.



PELVIS ANATOMY


pubic symphysis



Anatomical classification of the bones

1- Long bones : like humerus

2- Short bones : like those found in the ankle and wrist (tarsus and carpus)

3- Flat bones : of the skull (cranium)

4- Irregular bones : of the face .

5- Sesamoid bones : patella .

Sclerous Tissue

According to Shape

1. Long bones — Found in limbs
2. Short bones — Found in hands
3. Flat — Found in skull
4. Irregular — Found in axial skeleton and girdle
5. Pneumatic — Found in skull
6. Sesamoid — Found in certain tendons

Sesamoid Bone

- Sesamoid bones are small ovoid modules of bones and are named because of their resemblance to the seeds.
- These bones develop in the **tendons** are subjected to the friction during the movement of the joints.
- Sesamoid bones acts as the **pulleys** for muscle contraction.

Examples:

1. Patella—in quadriceps femoris
2. Pisiform—in the flexor carpi ulnaris


R


Femur
Lateral Epicondyle
Lateral Femoral Condyle
Lateral Tibial Condyle
Head of Fibula
Fibula
Medial Epicondyle
Patella
Intercondylar Notch
Medial Femoral Condyle
Medial Tibial Condyle
Intercondylar Eminence
Tibia

Boney landmarks

- Other formations occur in relation to the passage of a tendon often to direct the tendon or improve its leverage or to control the type of movement occurring at the joint.

The various marking and features of bone are:

Condyle: Rounded articular area (the lateral femoral condyle).

Crest: Ridge of a bone (the iliac crest).

Epicondyle: Eminence superior to condyle (the lateral epicondyle of the humerus).

Facet: Smooth, flat area, usually covered with cartilage, where a bone articulates with another bone (superior costal facet on the body of vertebra for articulation with rib).

Foramen: Passage through a bone (the obturator foramen).

Fossa: Hollow or depressed area (the infraspinatus fossa of the scapula).

Groove: Elongated depression or furrow (arterial grooves in calvaria).

Line: Linear elevation (the soleal line of tibia).

Malleolus: Rounded process (the lateral malleolus of fibula).

Notch: Indentation at the edge of the bone (the greater sciatic notch).

Protuberance: Projection of bone (external occipital protuberance).

Spine: Thorn like processes (the spine of the scapula).

Spinous process: Projecting spine like (the spinous process of vertebra).

Trochanter: Large blunt elevation (the greater Trochanter of femur).

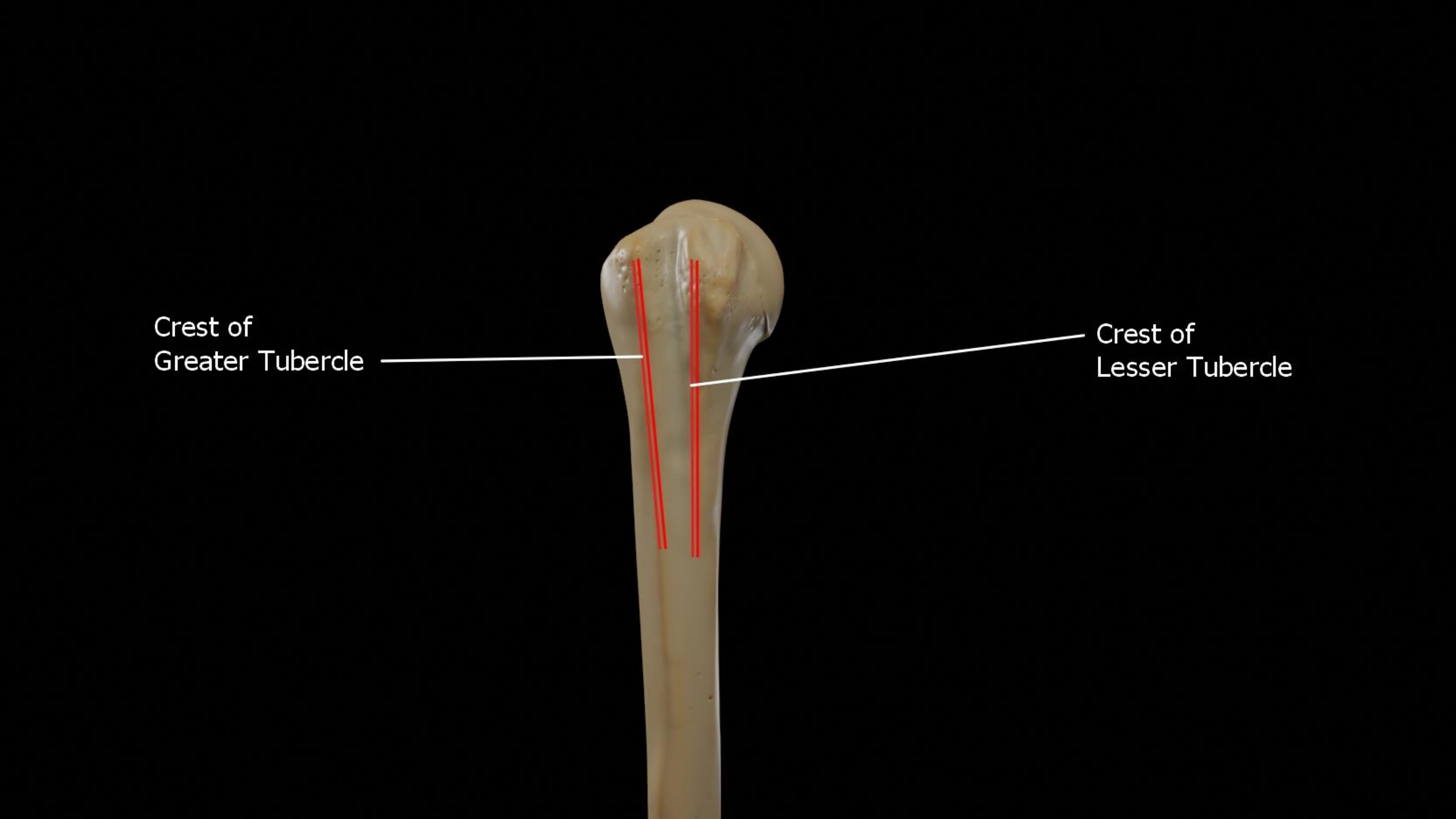
Tubercle: Small raised eminence (the greater tubercle of the humerus).

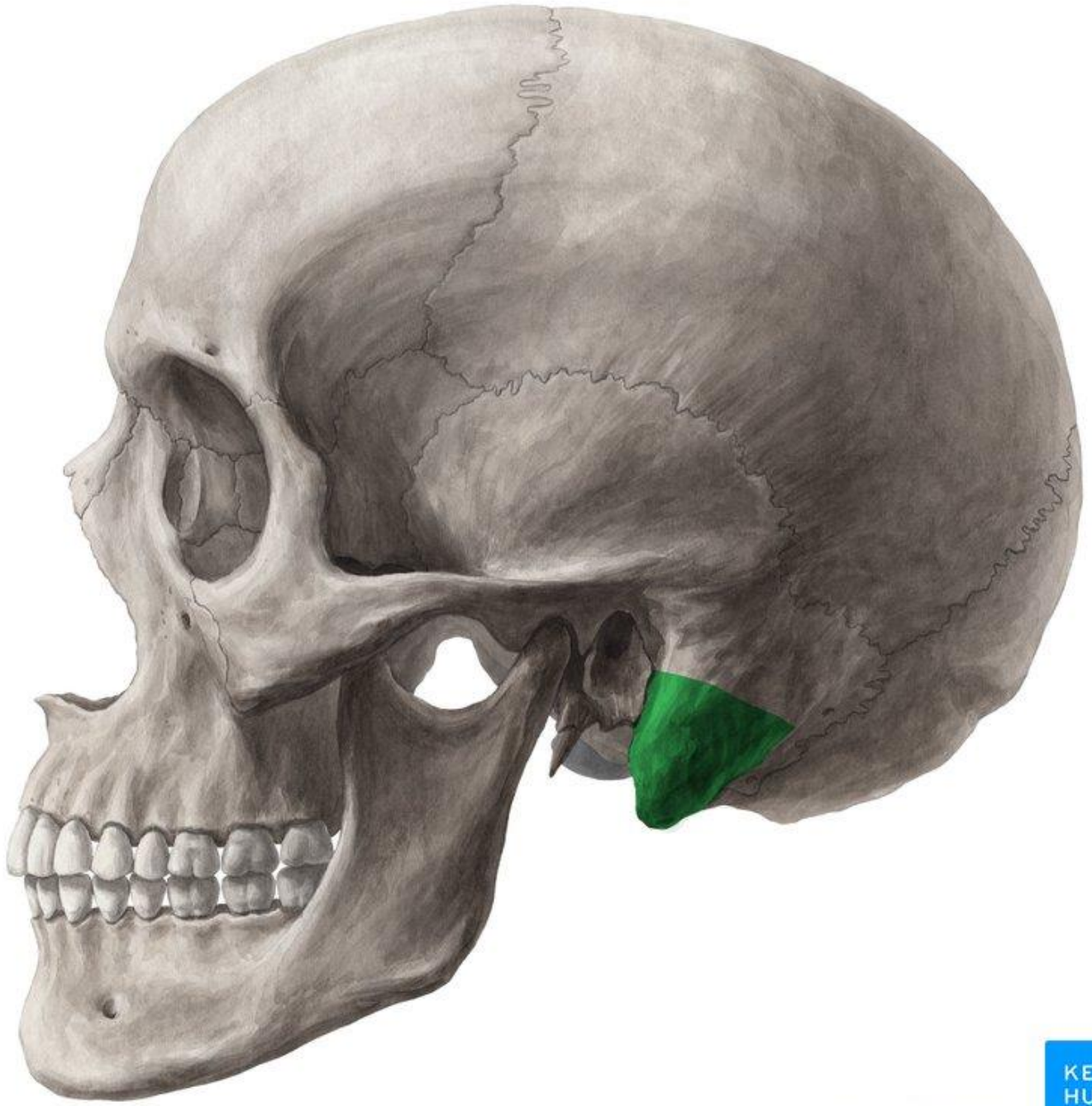
Tuberosity: Large rounded elevation (ischial tuberosity).

crest A narrow, ridgelike projection (the iliac crest of the os coxae)

process Any marked bony prominence (the mastoid process of the temporal bone)

ramus A flattened angular part of a bone (the ramus of the mandible)


Crest of
Greater Tubercle
Crest of
Lesser Tubercle

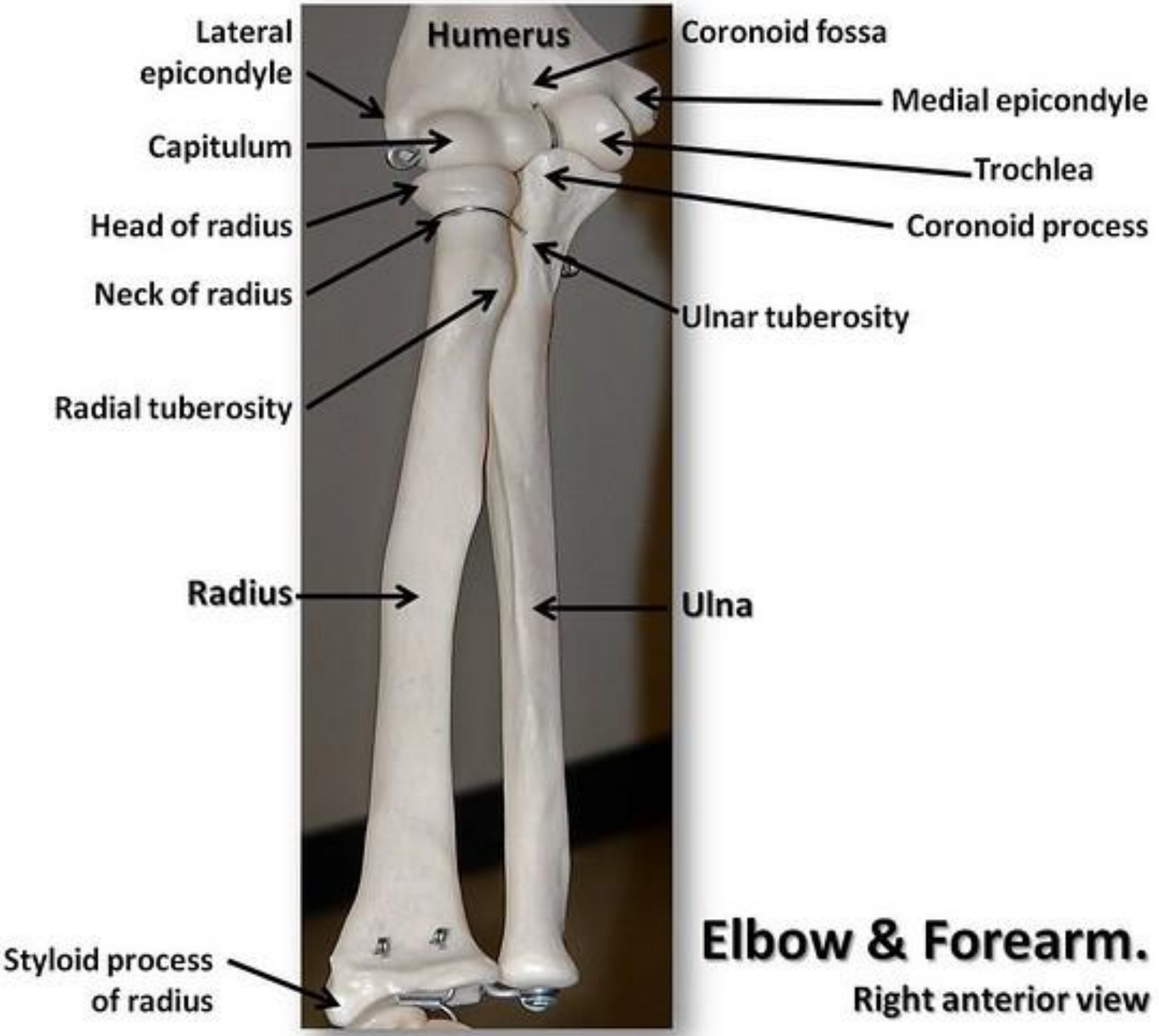


spine A sharp, slender process (the spine of the scapula)

trochanter A massive process found only on the femur (the greater trochanter of the femur)

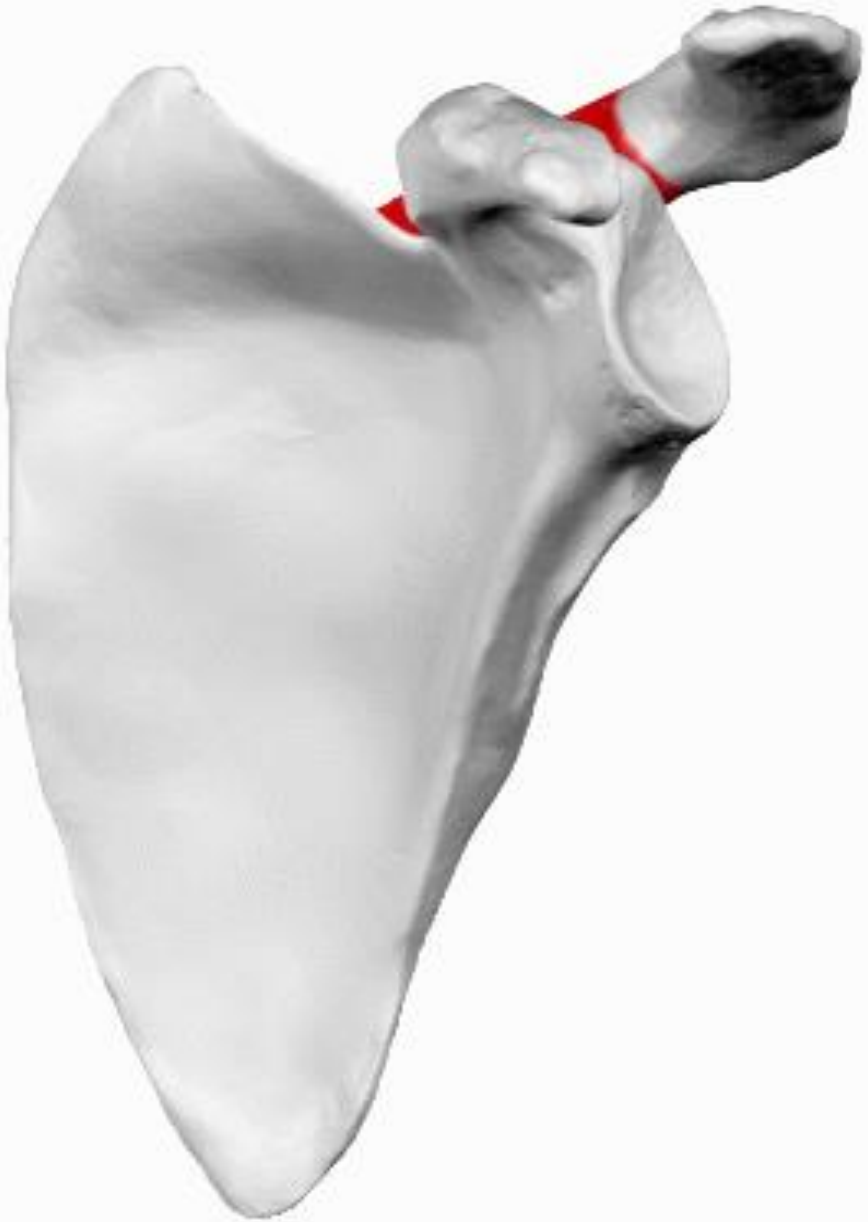
tubercle (*too'ber-k'l*) *A small, rounded process (the greater tubercle of* the humerus)

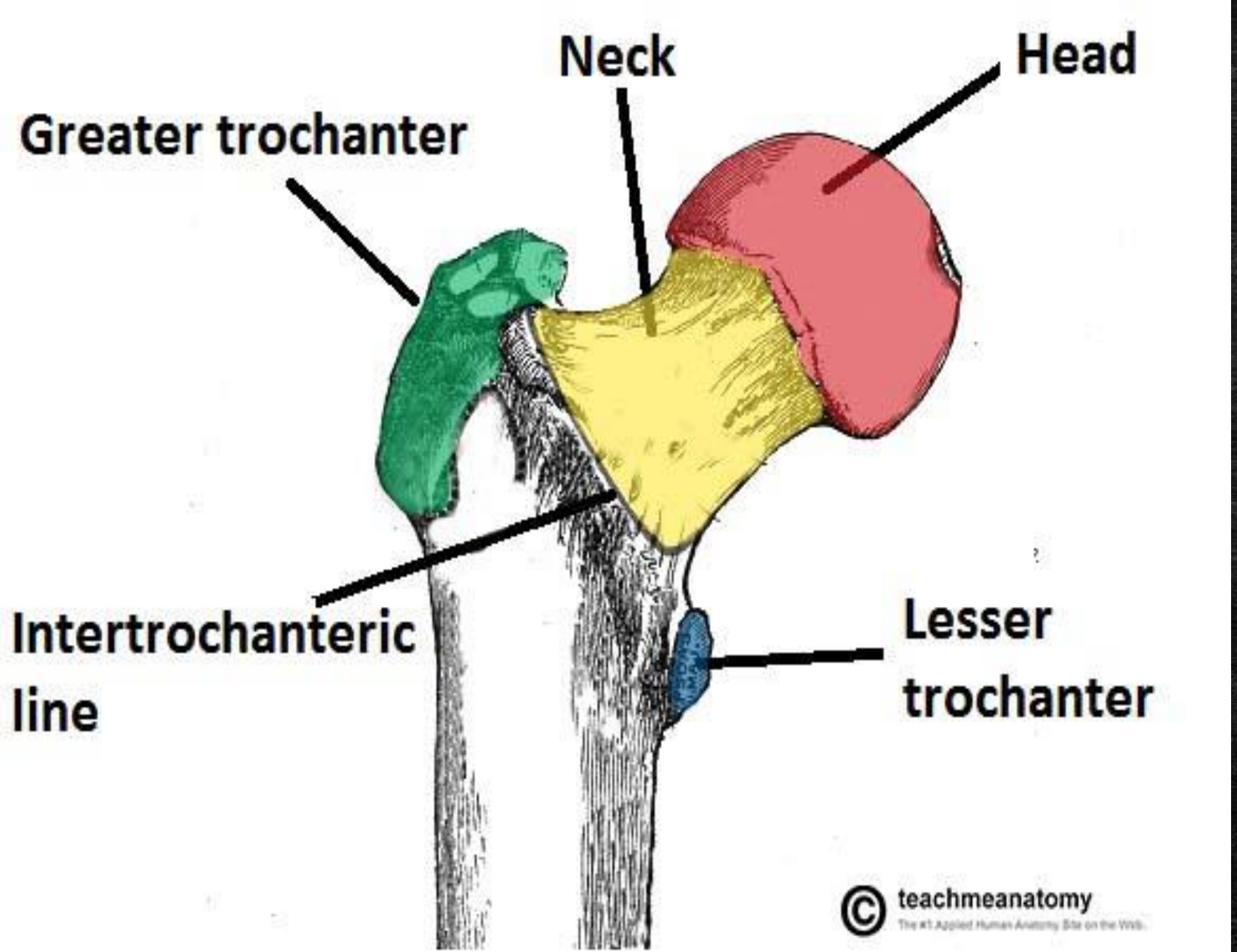
tuberosity A large, roughened process (the radial tuberosity



Elbow & Forearm.

Right anterior view



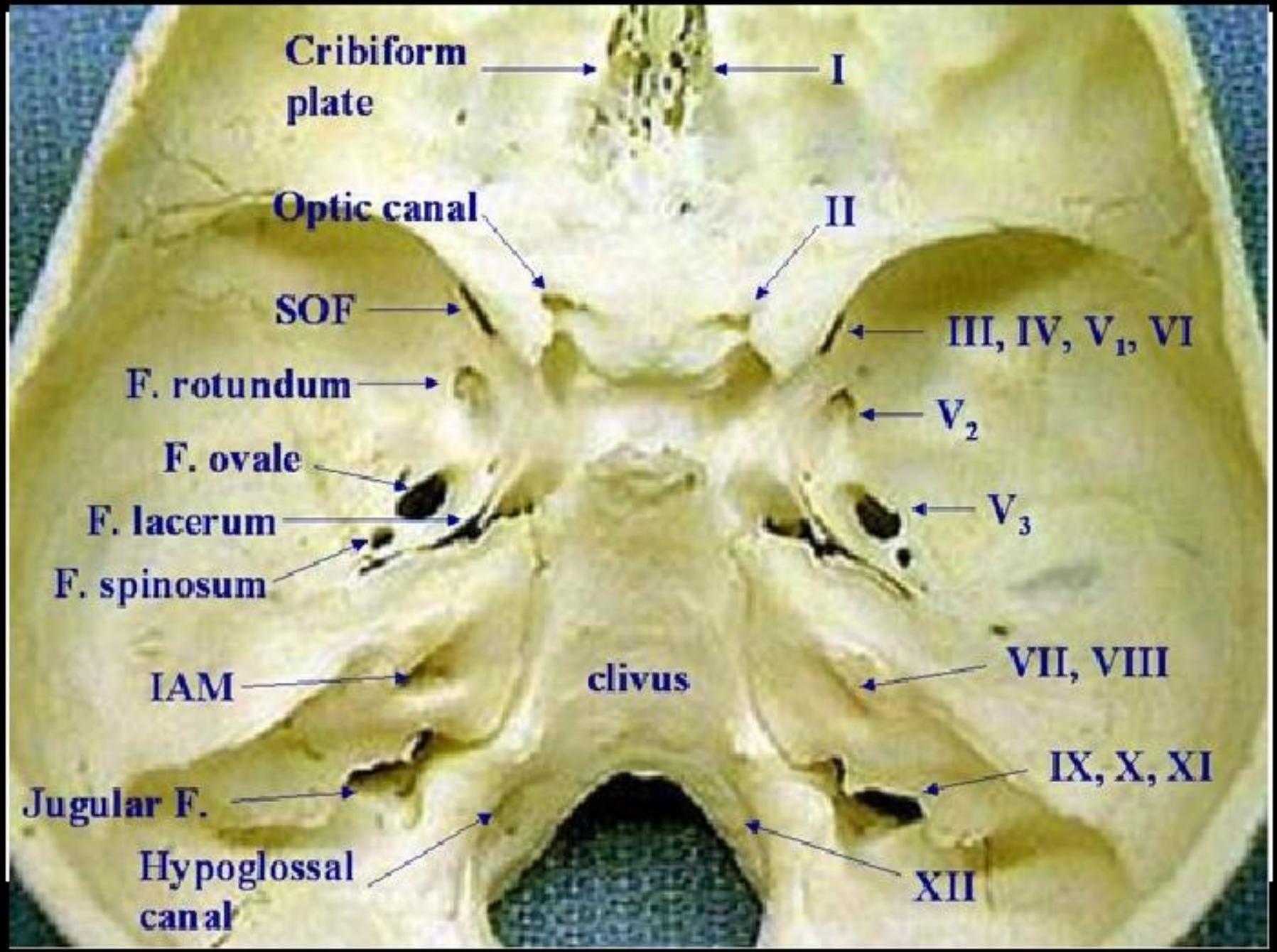

Neck
Head
Greater trochanter
Intertrochanteric line
Lesser trochanter
© teachmeanatomy


Greater Tubercle

Depressions and Openings

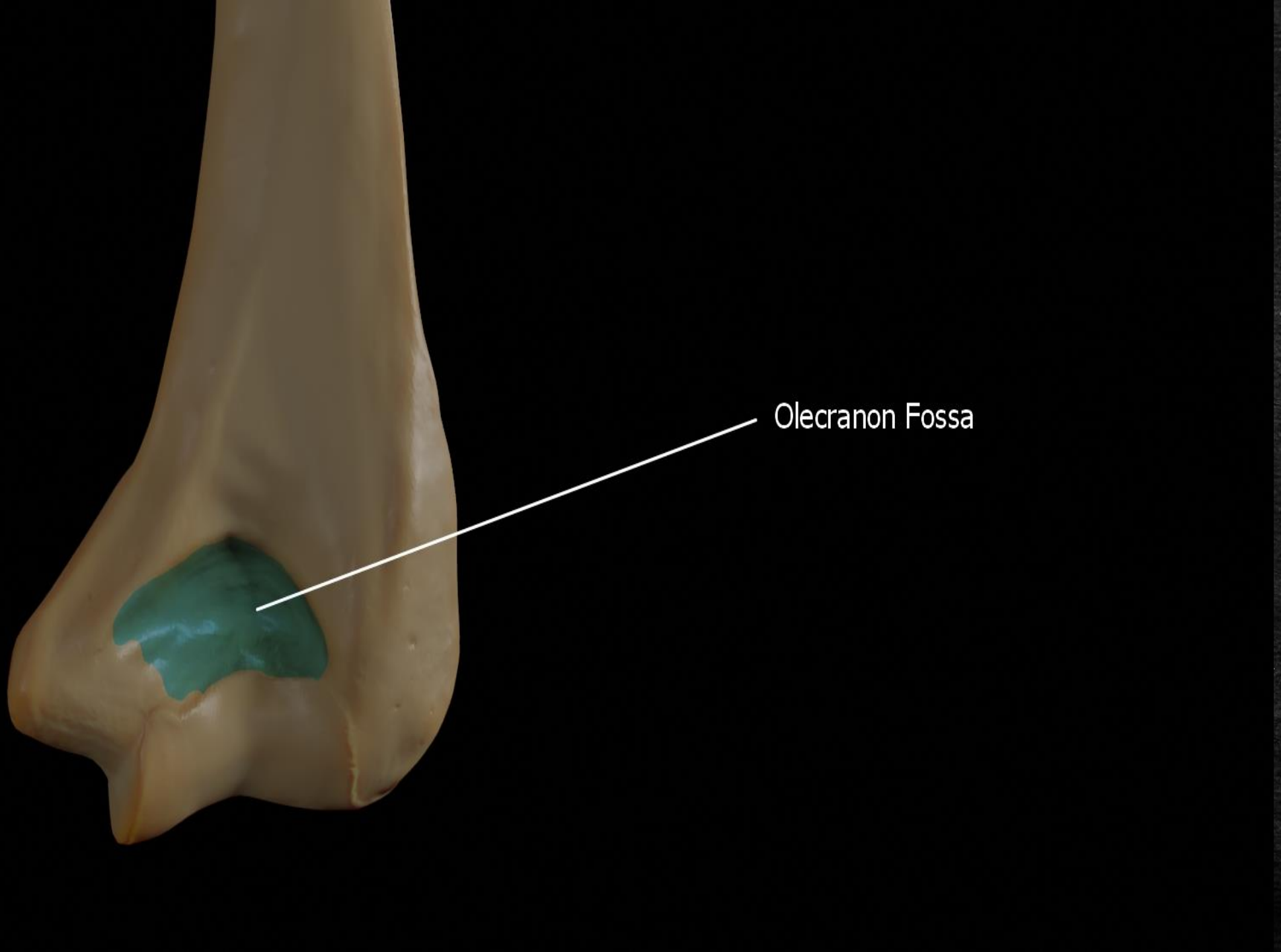
fissure A narrow, slitlike opening (the superior orbital
fissure of the sphenoid bone)
foramen (*fo˘-ra'men— A rounded opening through a bone (the foramen*
plural, *foramina) magnum of the occipital bone)*

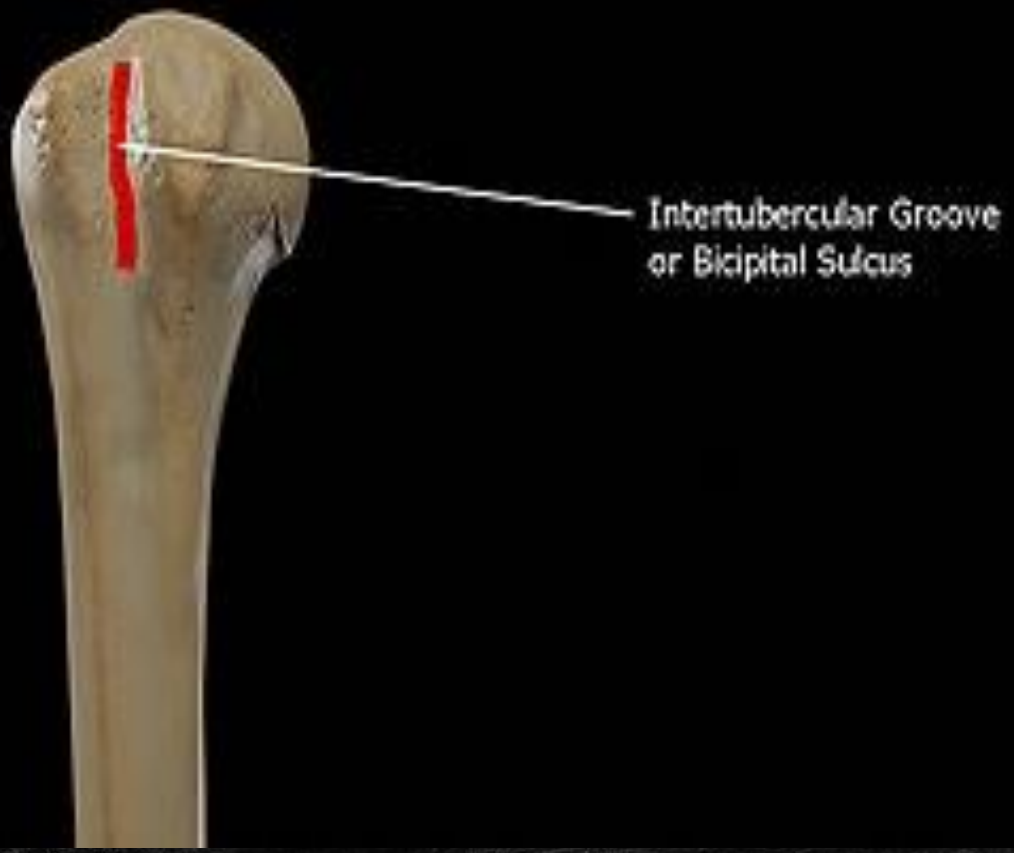

Superior orbital fissure


Cribiform plate
I
Optic canal
II
SOF
III, IV, V1, VI
F. rotundum
V2
F. ovale
F. lacerum
V3
F. spinosum
IAM
clivus
VII, VIII
IX, X, XI
Jugular F.
Hypoglossal canal
XII

fossa (*fos'aˇ*) *A flattened or shallow surface (the infraspinous fossa of the scapula*)

sulcus A groove that accommodates a vessel, nerve, or tendon (the intertubercular sulcus of the humerus)


Olecranon Fossa

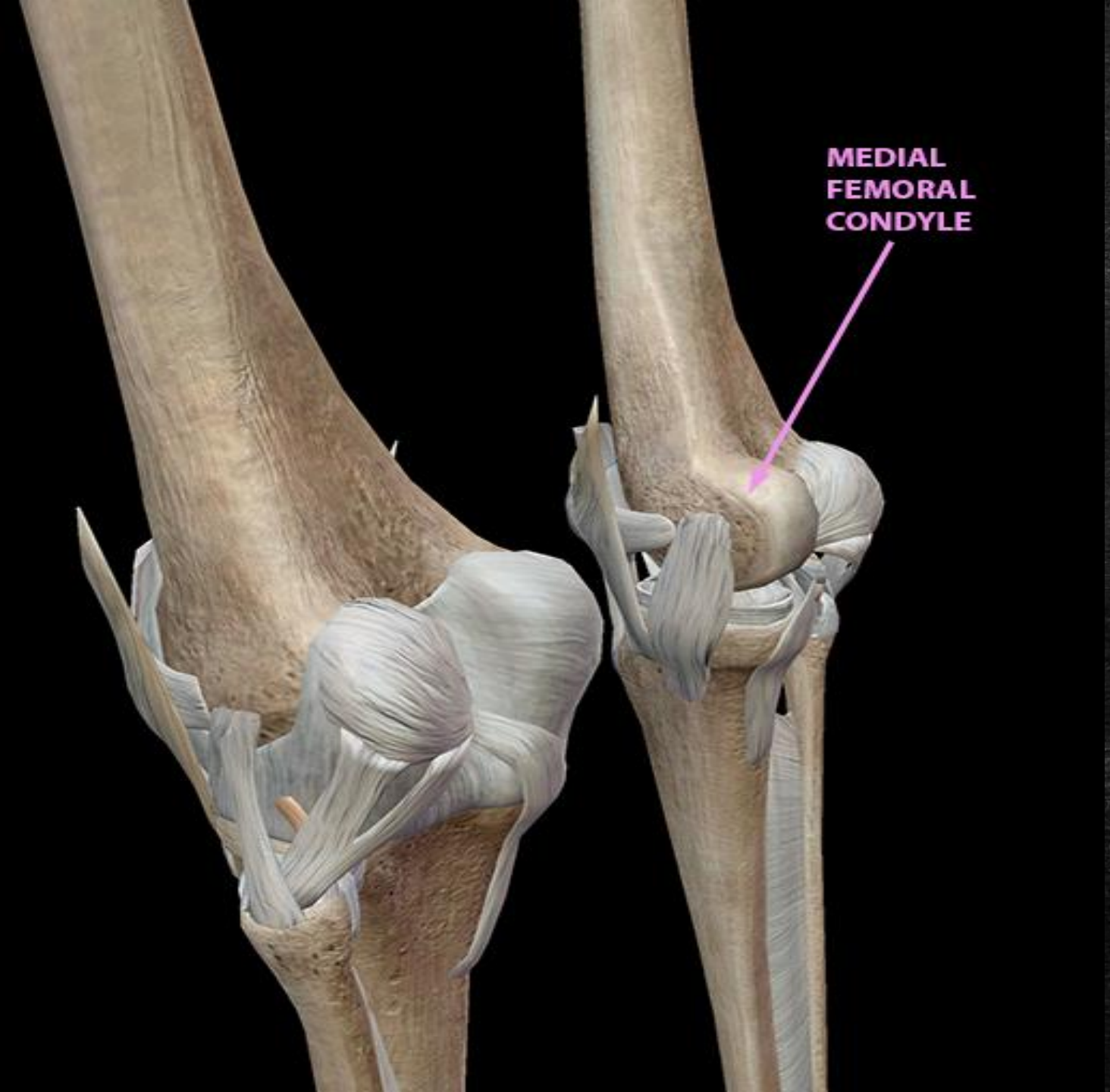

Intertubercular Groove
or Bicipital Sulcus

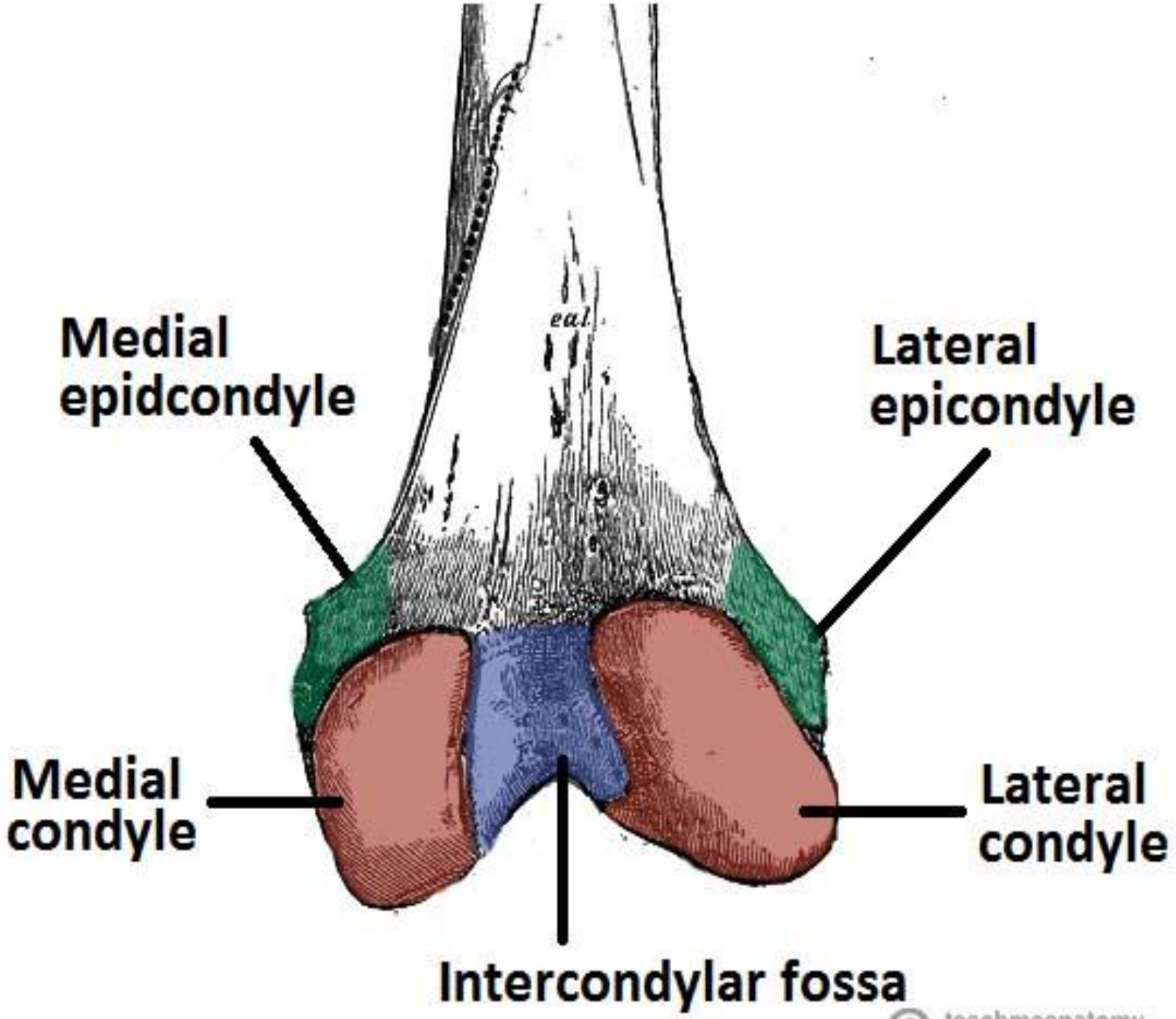
Articulating Surfaces

condyle (*kon'dil) A large, rounded articulating knob (the lateral femoral condyle*)

facet A flattened or shallow articulating surface
(the costal facet of a thoracic vertebra)

head A prominent, rounded articulating end of a bone


MEDIAL
FEMORAL
CONDYLE


Medial epidcondyle
Lateral epicondyle
Medial condyle
Lateral condyle
Intercondylar fossa
eal.
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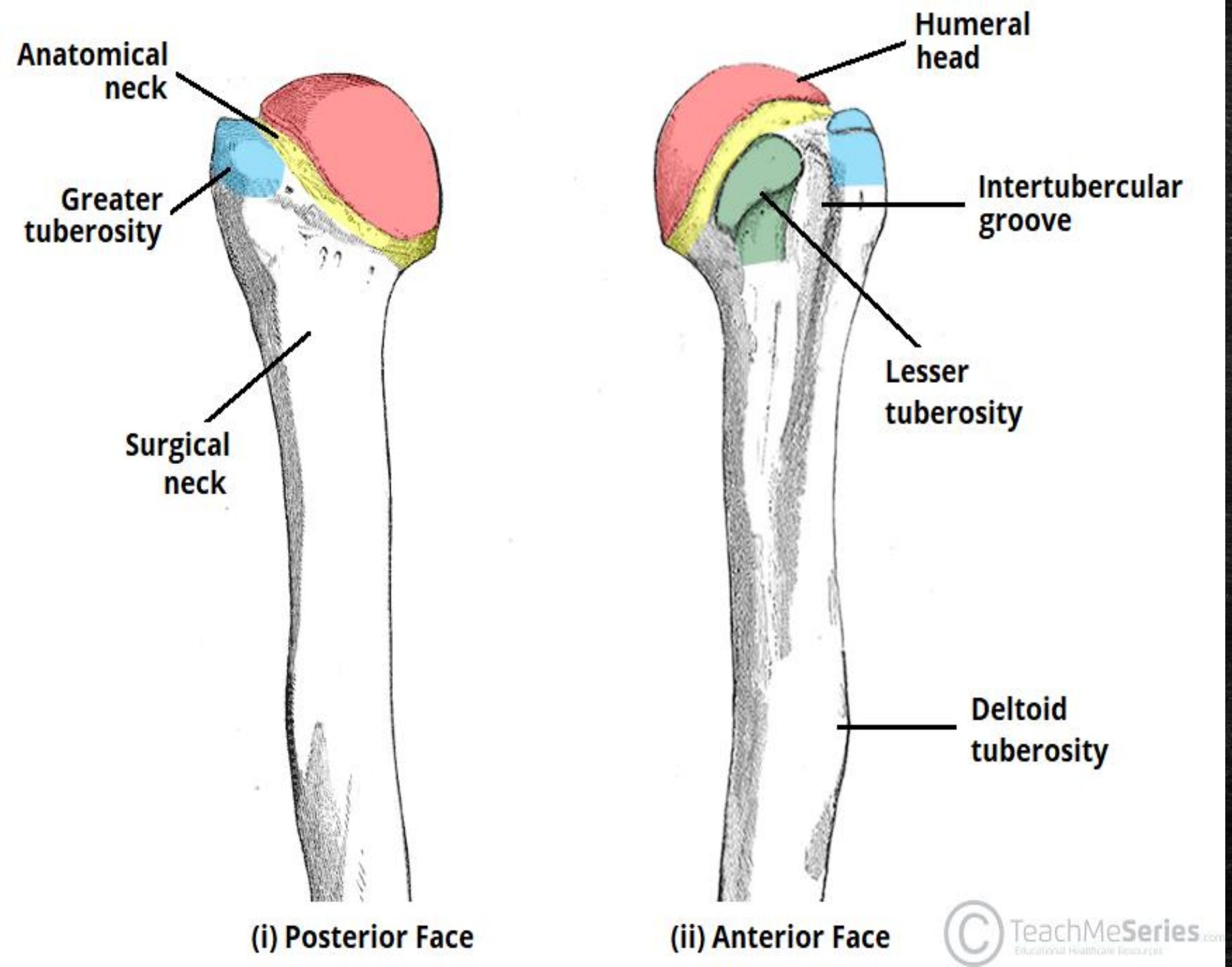
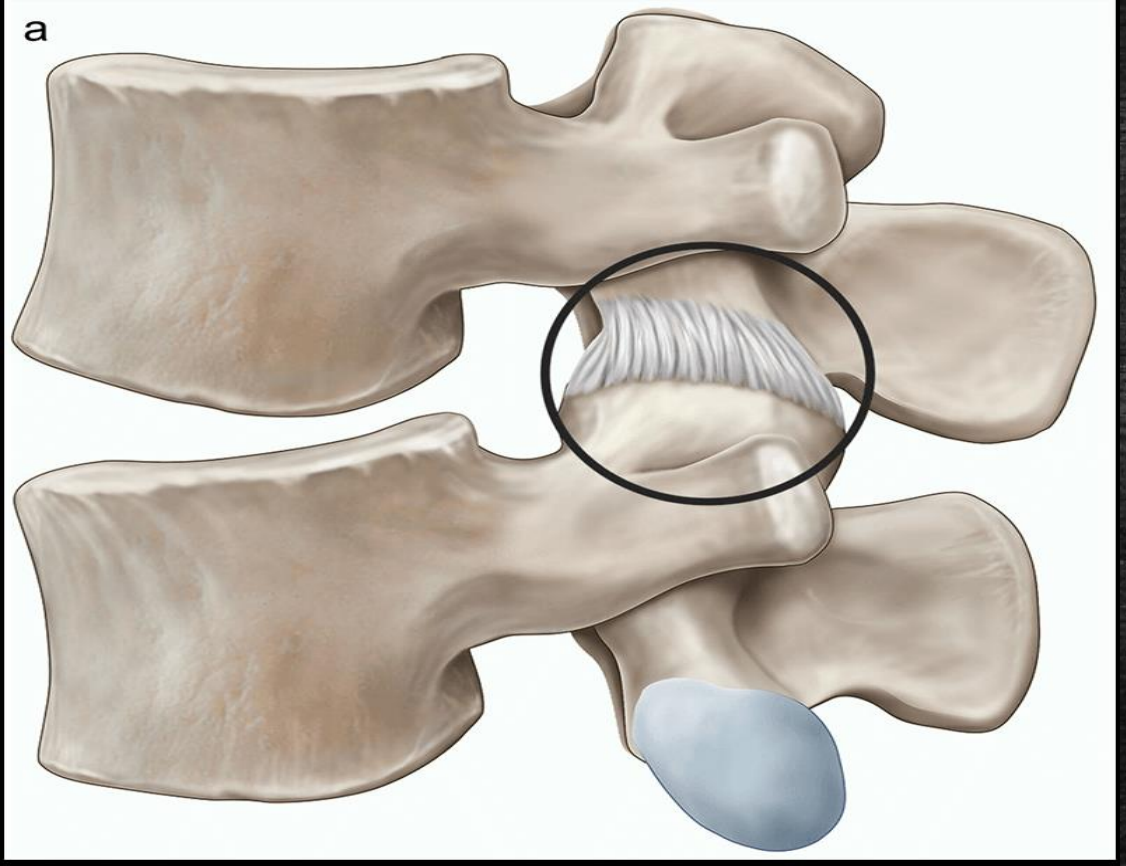
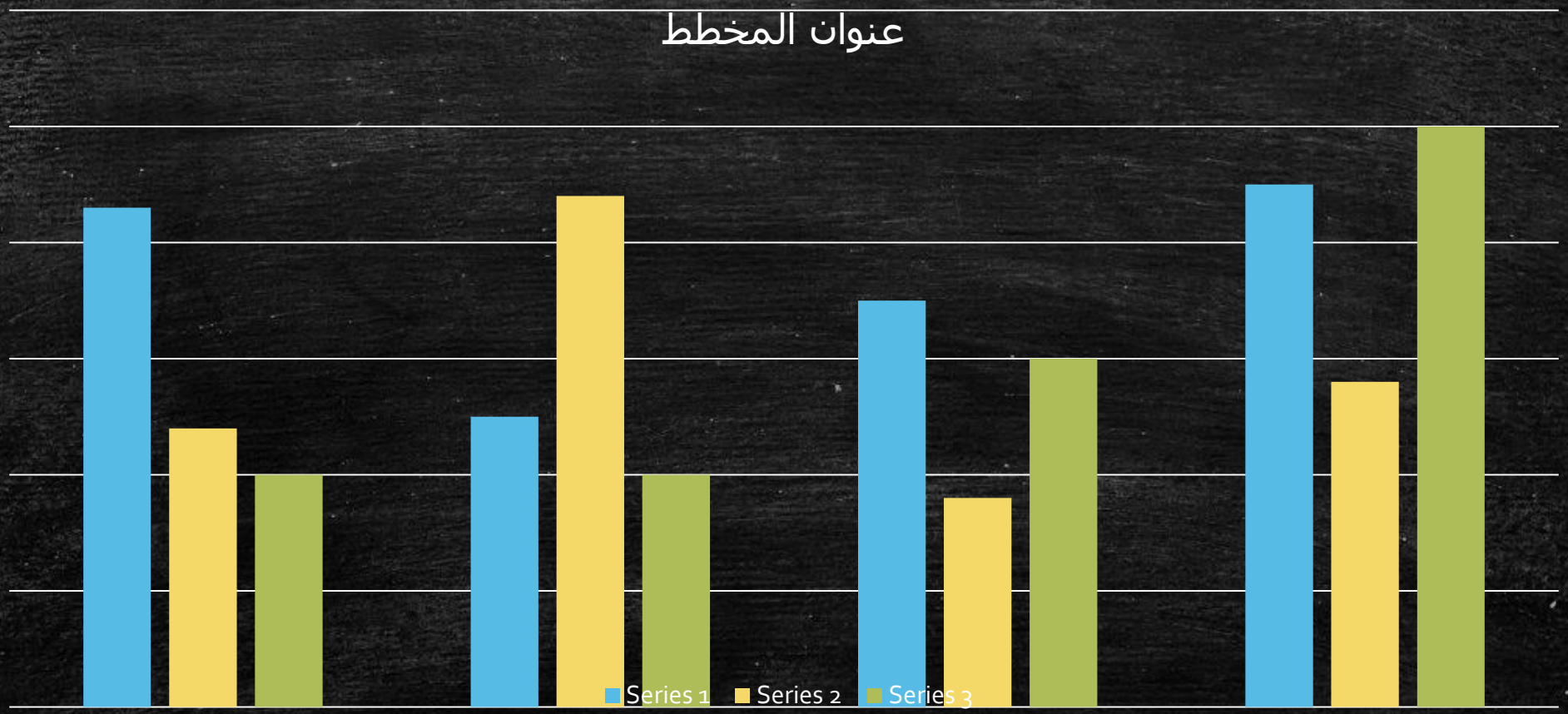



a


b


END

Title and Content Layout with Chart



Two Content Layout with Table

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Class	Group A	Group B
Class 1	82	95
Class 2	76	88
Class 3	84	90

Two Content Layout with SmartArt

- Group A
  - Task 1
  - Task 2
- Group B
  - Task 1
  - Task 2
- Group C
  - Task 1

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Add a Slide Title - 1

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