

ANATOMY

[FIRST YEAR – MUSCULOSKELETAL BLOCK]

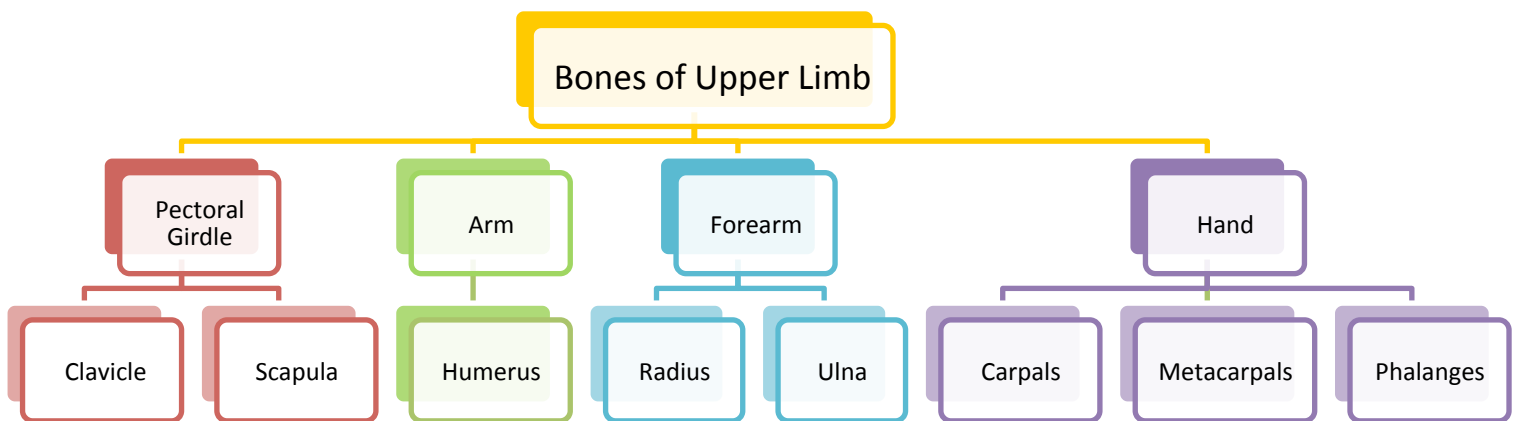
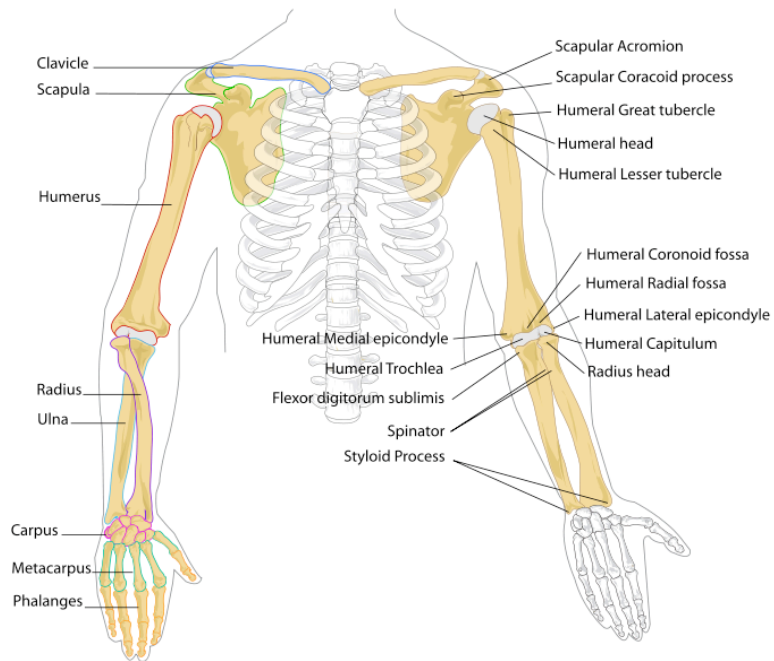


DONE BY: ANATOMY TEAM

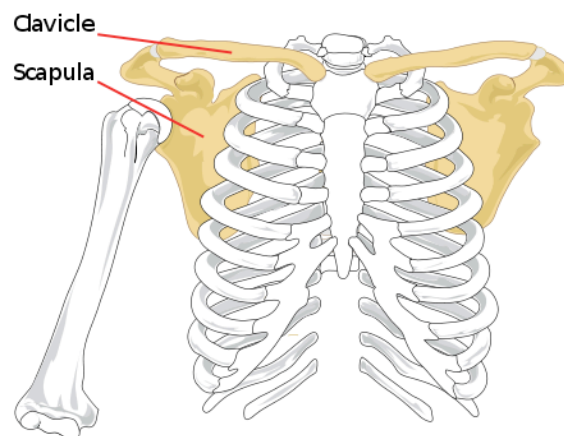
~ You should first know the meanings of these words

Word	Meaning	Example
Processes	A projection, a prominence	Coracoid process in the scapula
Notch	An indentation (incision) on an edge or surface	Radial notch in the ulna
Fossa	A hollow place	Radial fossa in the humerus
Tubercles	A nodule or a small rounded projection on a bone	Dorsal tubercle in the radius
Groove	A channel, a long narrow depression	Intertubercular groove in the humerus
Interosseous	Between bones	Sharp medial interosseous in the radius

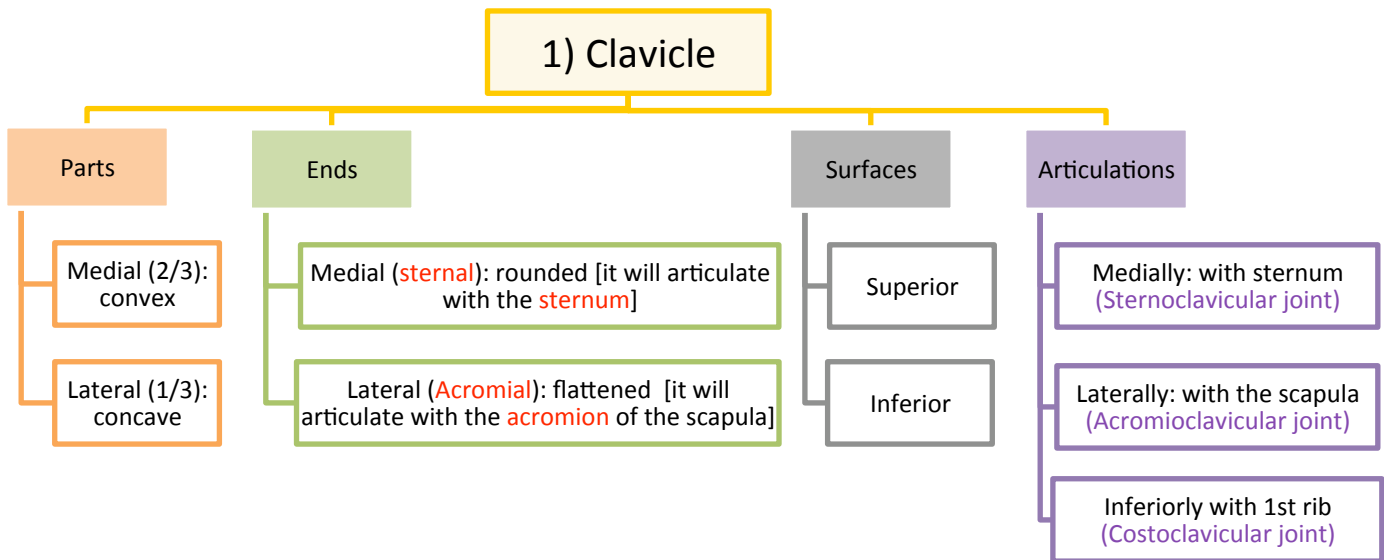
BONES OF UPPER LIMB



The pectoral girdle: very light and allows upper limb to have exceptionally free movement



Front view

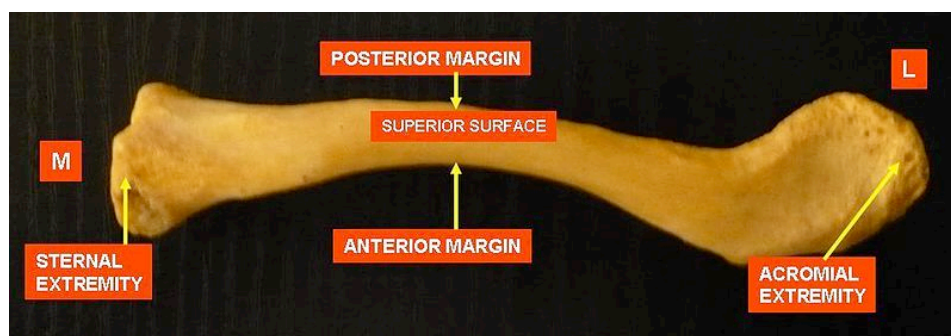


The clavicle:

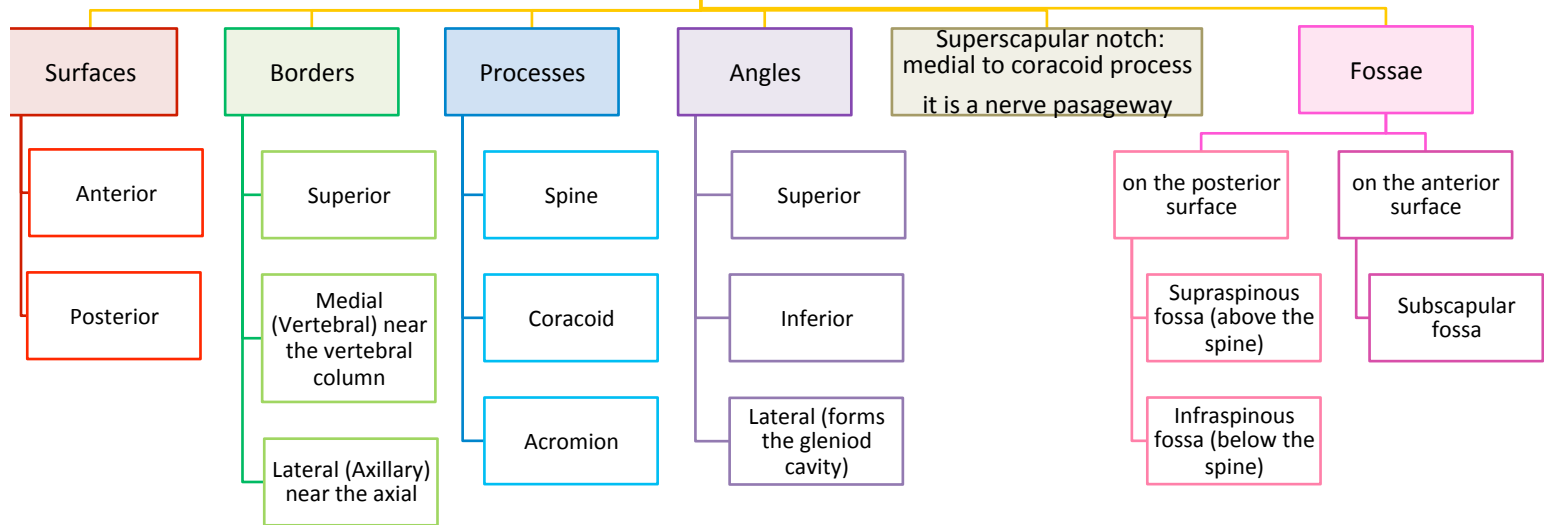
- *Long bone
- *Lying horizontally across the root of the neck
- *subcutaneous throughout its length
- *If it's broken, the whole shoulder region caves in medially

Functions:

- *holds the arm away from the trunk
- *Transmits forces from the upper limb to the axial skeleton
- *provides attachment for muscles



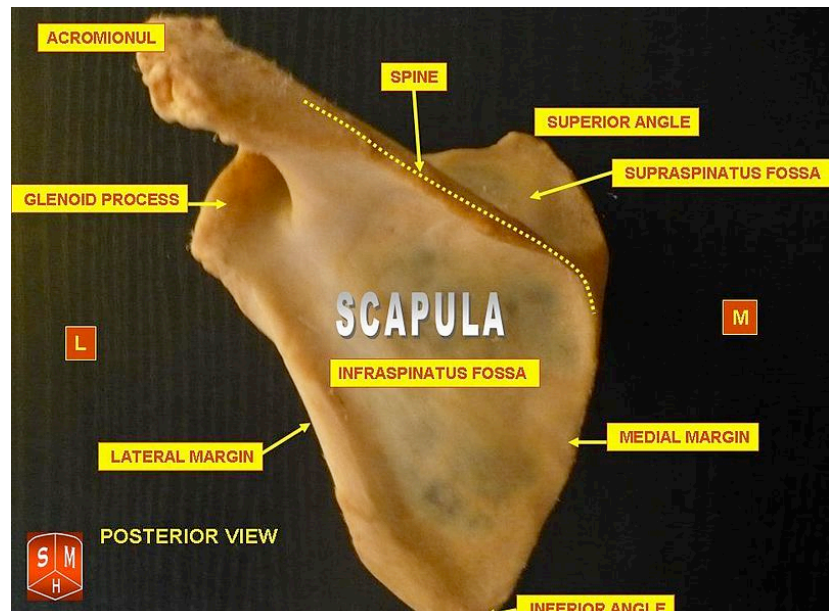
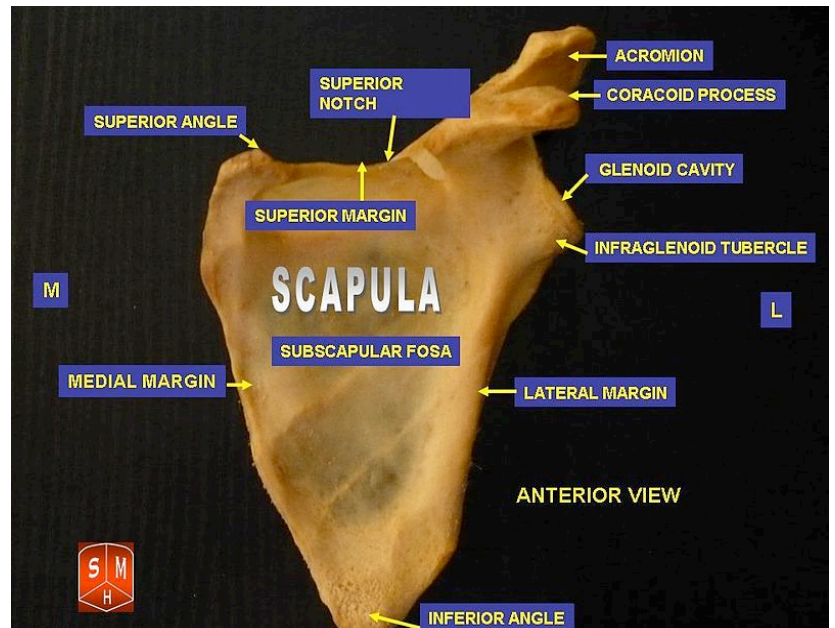
2) Scapula



The scapula:

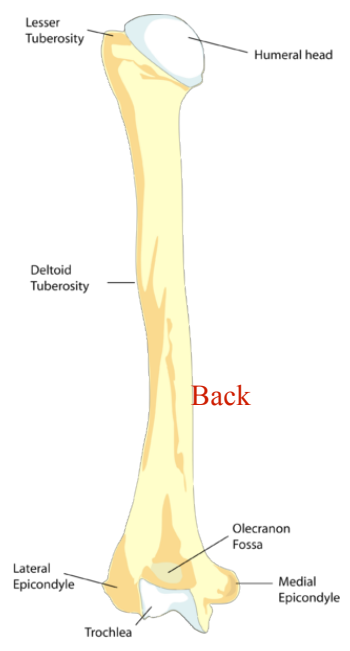
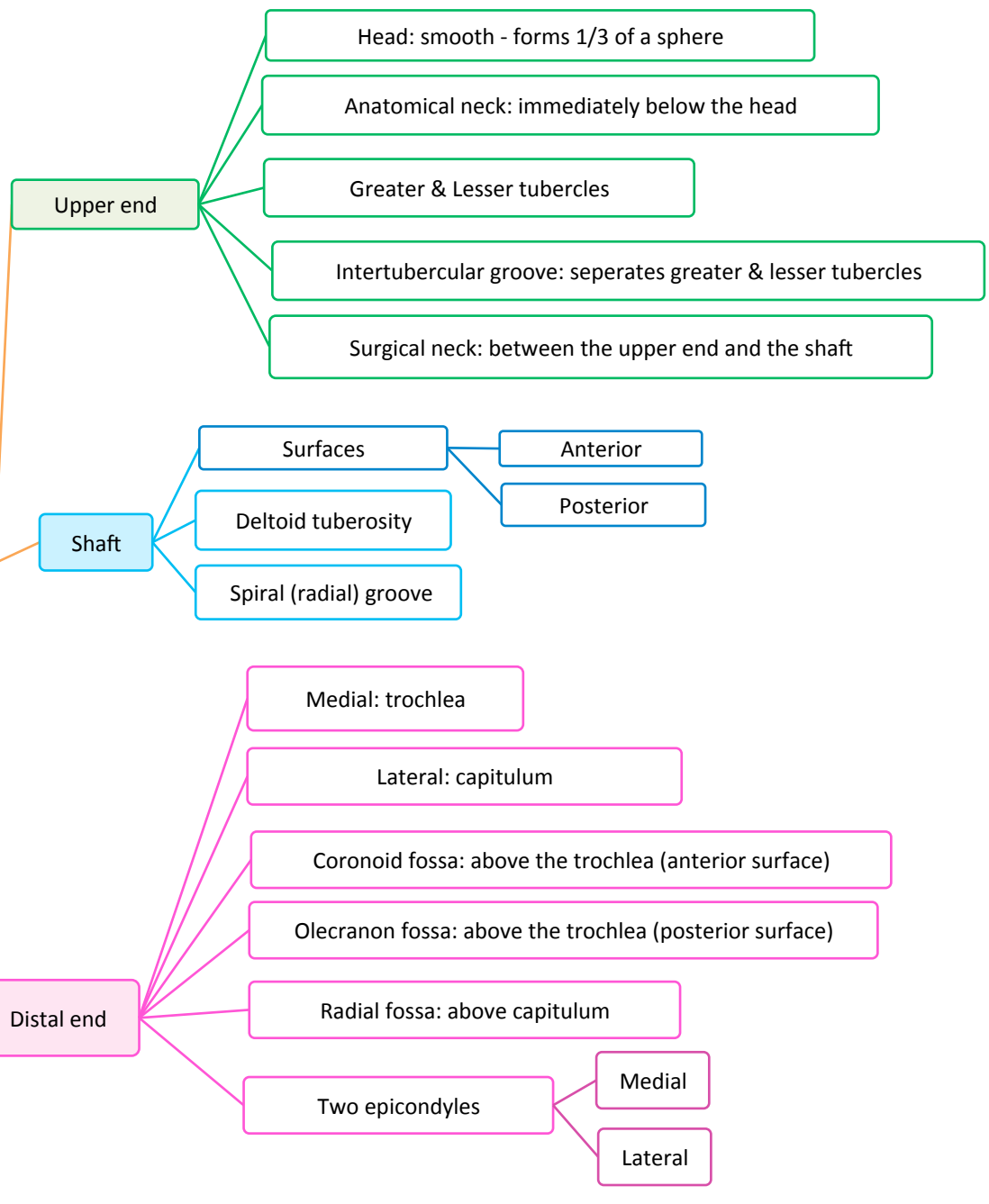
*Triangular flat bone

*Extends between 2nd & 7th ribs



3) Arm

Humerus



*The humerus is: a typical long bone

*The deltoid tuberosity is: a rough elevation halfway down the lateral aspect

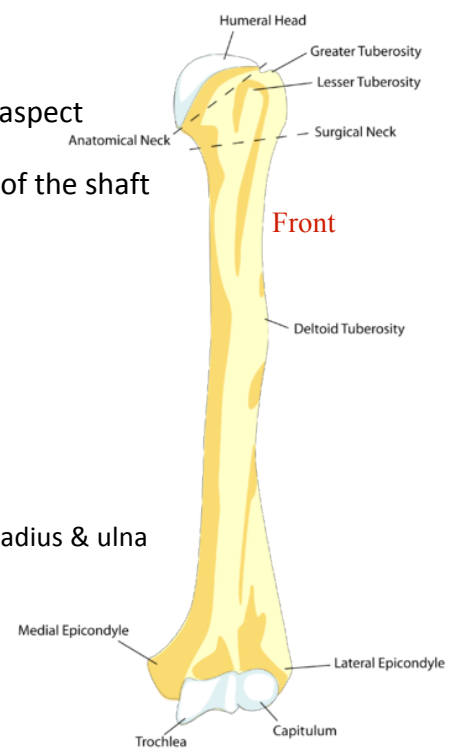
*The spiral (radial) groove: - runs obliquely down the posterior aspect of the shaft

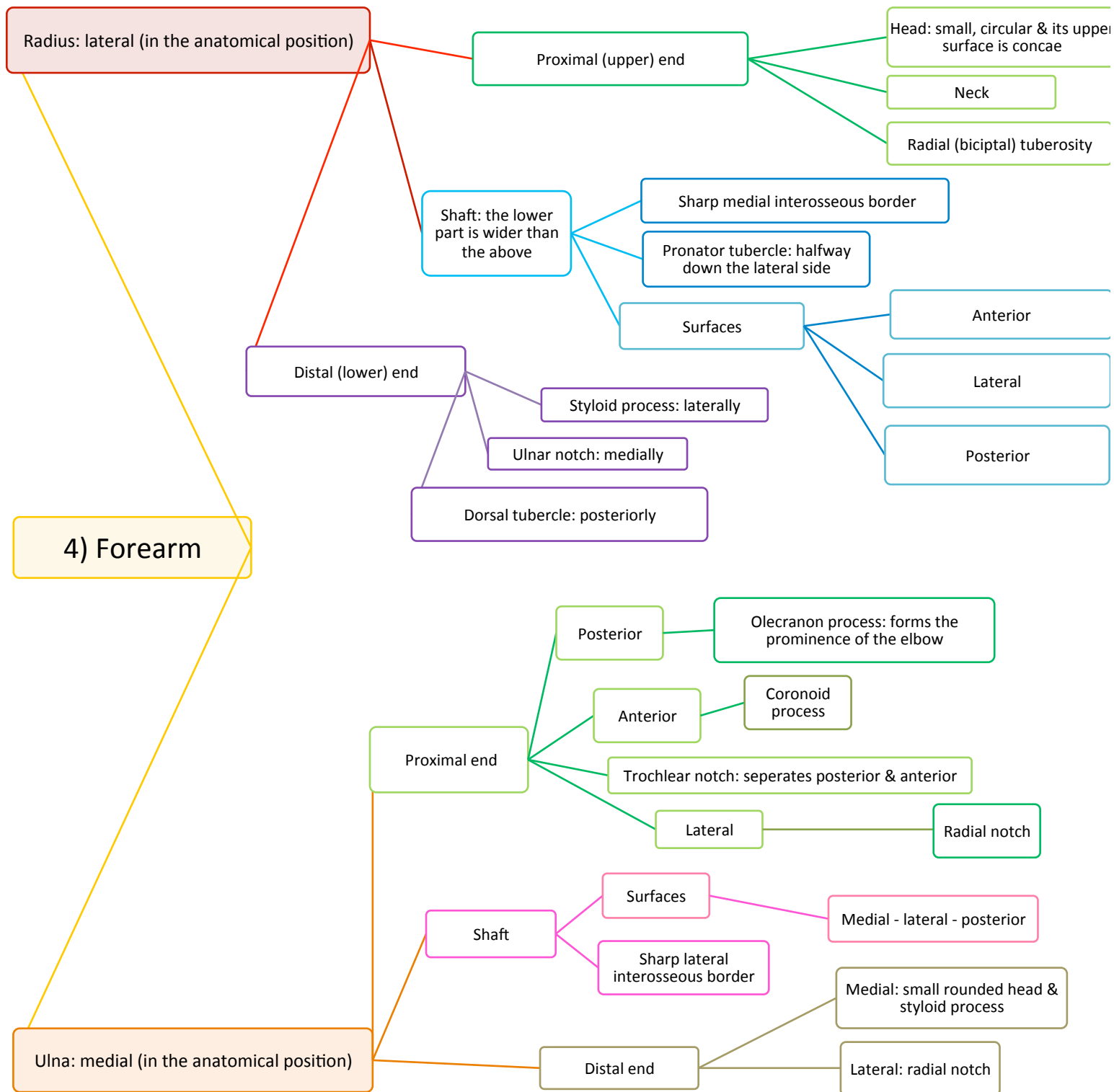
- It lodges the important radial nerve and vessels

Articulations of the arm:

1) Shoulder joint: head of the humerus with the glenoid cavity of the scapula

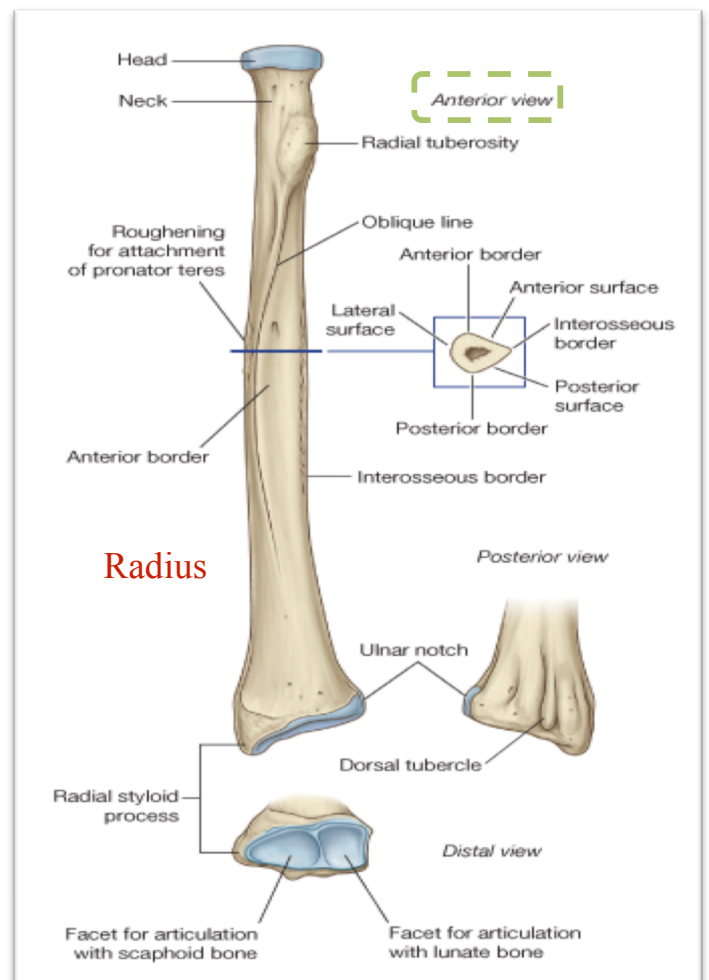
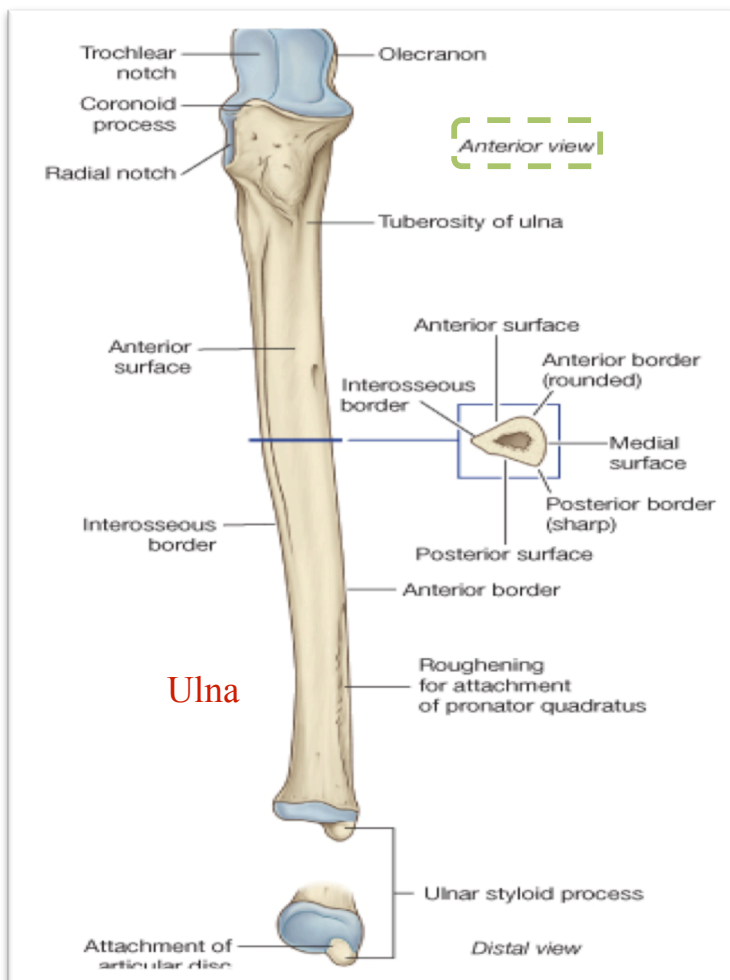
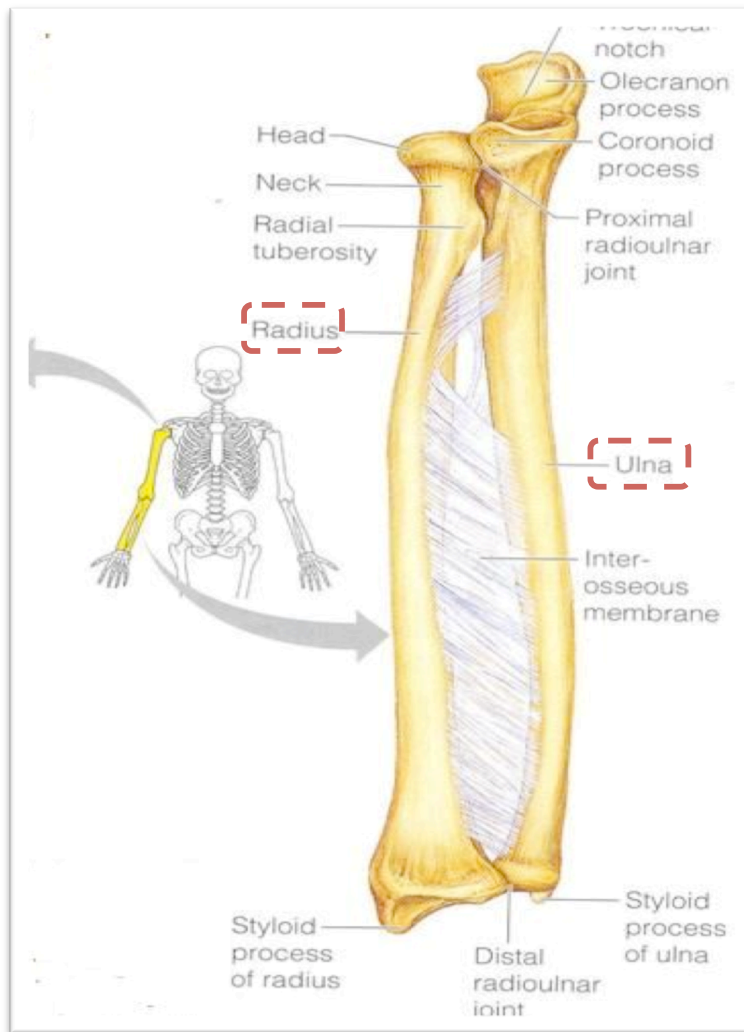
2) Elbow joint: Lower end (trochlea & capitulum) with the upper ends of the radius & ulna



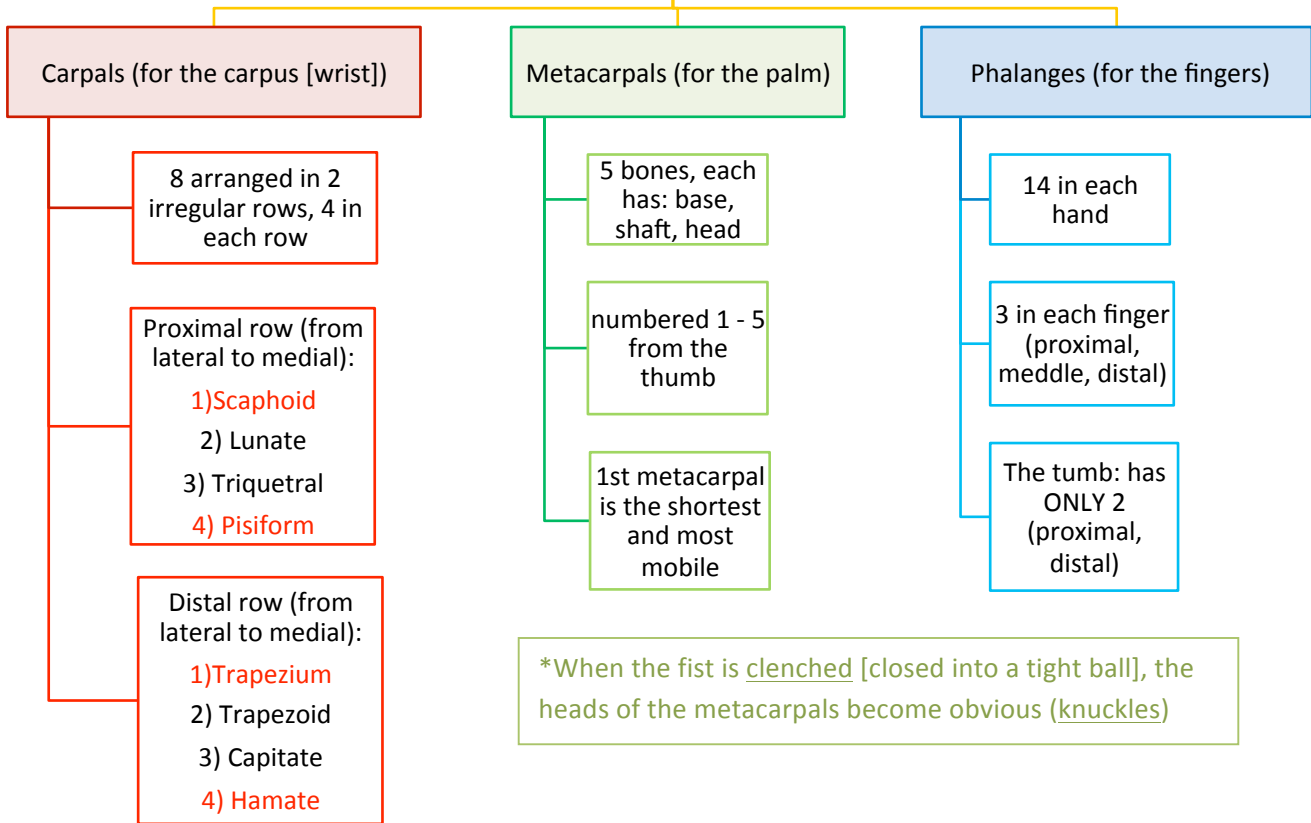


Articulations of radius & ulna

- 1) **Elbow joint:** connects distal end of humerus with the proximal ends of radius & ulna
- 2) **Proximal radioulnar joint**
- 3) **Distal radioulnar joint**
- 4) **Interosseous membrane:** connects radius & ulna



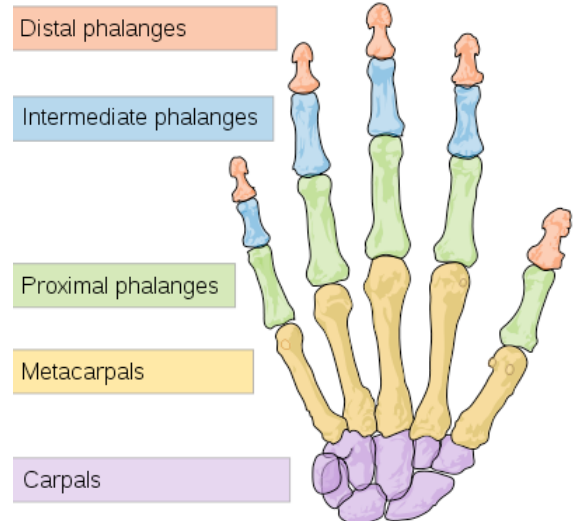
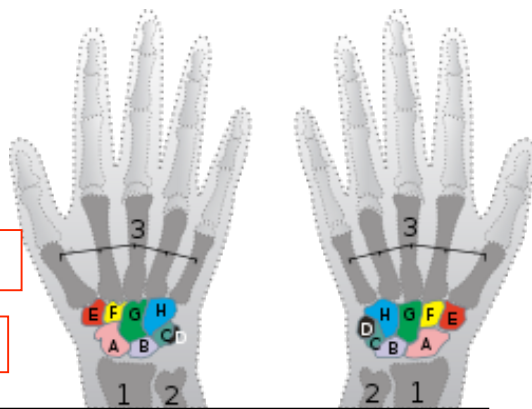
5) Hand



To memorize them, our doctor taught us this sentence, first letter of each word is the first letter of each bone:

سلوى لازم تلعب بوكر
تخسر تريح كله هيسة

(not) Anatomical Position	Right Hand
	Left Hand



Proximal: **A=Scaphoid**, **B=Lunate**, **C=Triquetrum**, **D=Pisiform**
 Distal: **E=Trapezium**, **F=Trapezoid**, **G=Capitate**, **H=Hamate**

Articulations:

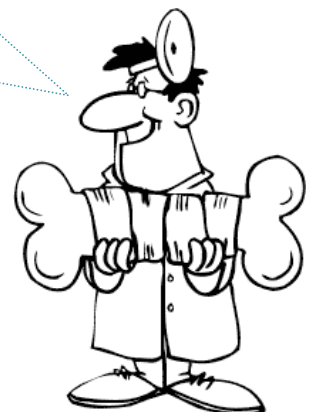
- 1) Carpometacarpal joints:** connects bases of the metacarpal bones with the distal row of the carpal bones
- 2) Metacarpophalangeal joints:** connects heads (knuckles) with the proximal phalanges
- 3) Interphalangeal joints:** connects the phalanges with each other
- 4) Wrist joint:** connects distal end of radius with the proximal row of carpal bones

Summary: the upper limb articulations

Articulation	What it connects
Sternoclavicular joint	clavicle with sternum (Medially)
Acromioclavicular joint	clavicle with the scapula (Laterally)
Costoclavicular joint	clavicle with the 1st rib (Inferiorly)
Shoulder joint	head of the humerus with the glenoid cavity of the scapula
Elbow joint	Lower (distal) end of humerus [trochlea & capitulum] with the upper (proximal) ends of the radius & ulna
Proximal radioulnar joint	
Distal radioulnar joint	
Carpometacarpal joints	bases of the metacarpal bones with the distal row of the carpal bones
Metacarpophalangeal joints	heads (knuckles) with the proximal phalanges
Interphalangeal joints	connects the phalanges with each other
Wrist joint	distal end of radius with the proximal row of carpal bones
Interosseous membrane	connects radius & ulna

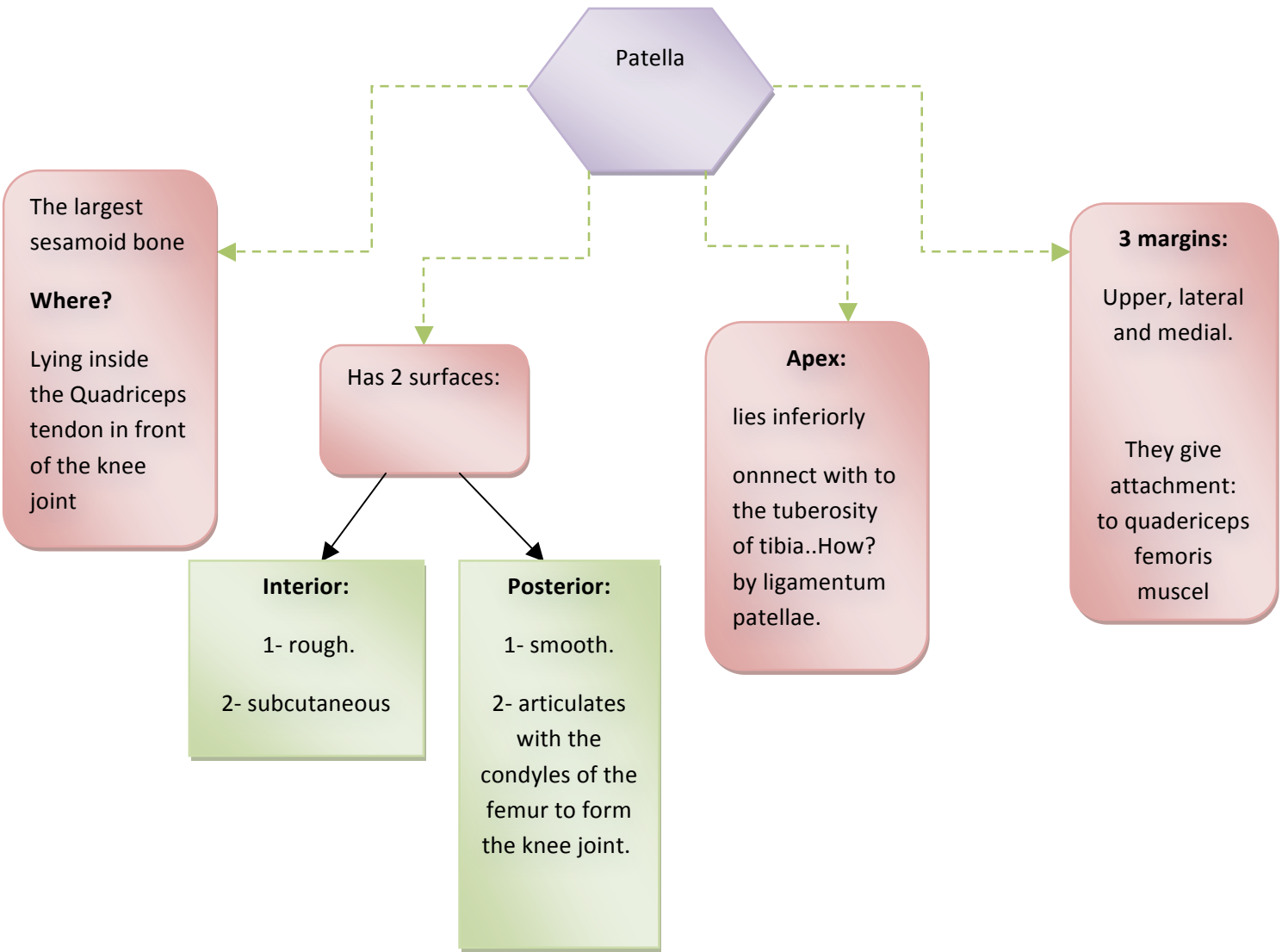
*We might be asked in the exam (theoretical or practice) to determine if the shown bone is taken from the right or left limb. So, keep that in mind when studying.

*You can borrow bones from the morgue ;D



BONES OF LOWER LIMBS

bone	Upper end	shaft	Lower end	articulations	notes
<u>Femur</u>	Head: has a central depression (fovea capitis). Neck. - Greater & lesser trochantars. - Intertrocantric line (anteriorly) Intertrochantric crest (posteriorly), has: quadrate tubercle.	- 3 surfaces (Anterior, medial, lateral). - 3 borders (Medial, lateral, posterior). - Gluteal tuberosity. - Medial supracondyler ridge. - Lateral supracondyler ridge. - Popliteal surface.	- Lateral, medial condyles. Separated by: 1- Articular Patellar surface (Anteriorly). 2- Inter-condyler fossa (posteriorly). - Medial, lateral epicondyles.	- Hip joint. - Knee joint. (No fibula).	- The posterior border is called (Linea Aspera).
<u>Tibia (Medial bone)</u>	- Medial condyle: has groove for semimembranosus muscle. - Lateral condyle: has a Fibular facet on the lateral side. - Intercondyler area: has 2 Intercondyler eminence.	- Tibial tuberosity. - 3 borders (Anterior, medial, lateral). - 3 surfaces (Medial, lateral, posterior). - Soleal line on the posterior surface.	- Medial malleolus. - Fibular notch.	- Proximal tibio-fibular joint. - Distal tibio-fibular joint. - Ankle joint.	- Medial condyle is larger than the lateral one. - Lateral border (interosseous border).
<u>Fibula (Lateral bone)</u>	- Head. - Neck. - Styloid process.	- 4 surfaces. - 4 borders.	- Lateral malleolus.	- Proximal tibio-fibular joint. - Distal tibio-fibular joint. - Head articulates with Lateral condyle of Tibia. - Ankle joint.	- Medial border (interosseous border).



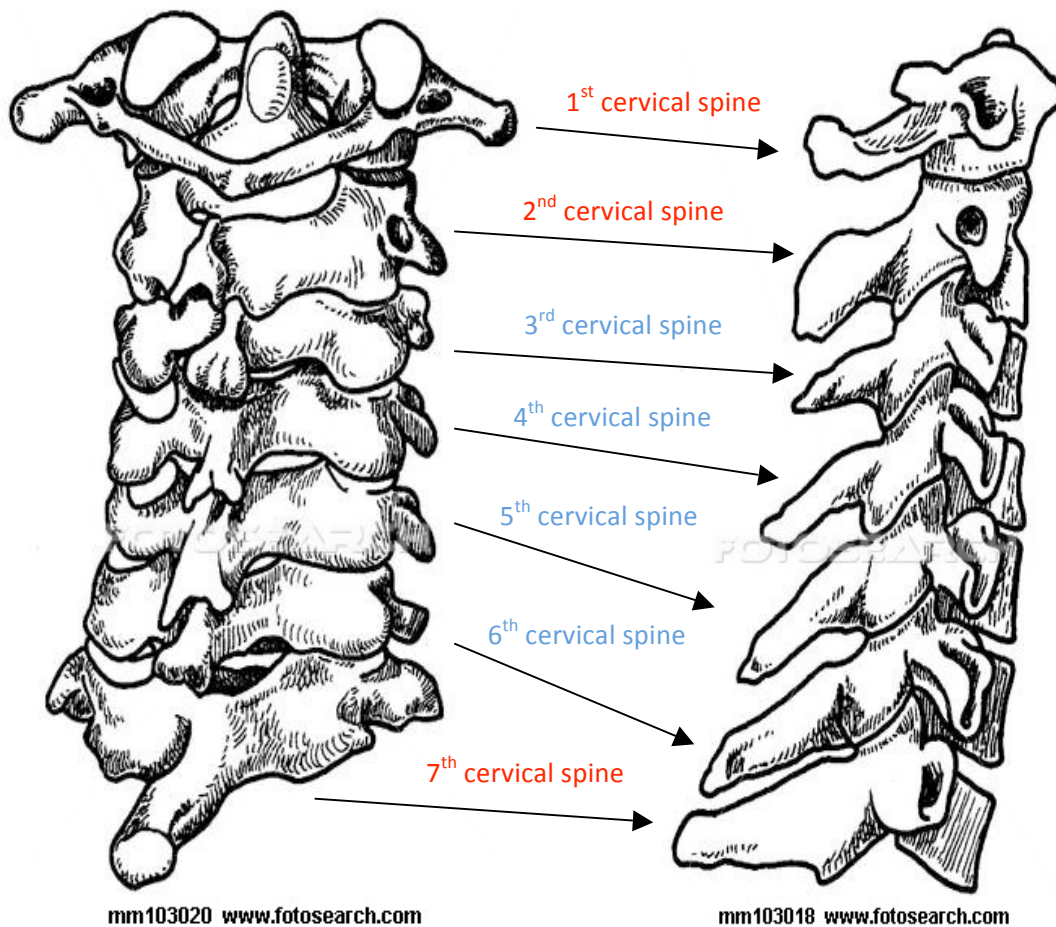
Bone	Ligaments
Femur	- Fovea capitis : the attachment of ligament of the head. - Inter-trochanteric line : the attachment of iliofemoral ligament.
Tibia	-The upper smooth part of the Tibial Tuberosity : the attachment to Ligamentum Patellae.

Quick review for all the limbs

	Upper end	shaft	Lower end	Articulation
Humerus:	<ul style="list-style-type: none"> -Head. -Anatomical neck. -Greater & Lesser tubercles. Intertubercular groove. -Surgical Neck. (Separate the upper end and the shaft). 	<ul style="list-style-type: none"> Deltoid tuberosity -Spiral (Radial) groove (it lodges the important radial nerve and vessels). 	<ul style="list-style-type: none"> Trochlea: -Coronoid fossa. (above- anteriorly) -Olecranon fossa. (Above posteriorly) Capitulum: -Radial fossa. (above) -Two Epicondyles. (Medially + laterally) 	<ul style="list-style-type: none"> Shoulder joint. -Elbow joint.
Radius:	<ul style="list-style-type: none"> Head. Neck. -Radial (Bicipital) Tuberosity. 	<ul style="list-style-type: none"> -Sharp Medial interosseous. (Medially) Pronator tubercle. 	<ul style="list-style-type: none"> -Styloid process. (Laterally) -Ulnar notch. (medially) -Dorsal tubercle. (Posteriorly) 	<ul style="list-style-type: none"> -wrist joint. (no ulna). Elbow joint.
Ulna:	<ul style="list-style-type: none"> -Olecranon process. (posteriorly) Coronoid process. (Inferiorly) -Trochlear notch. (separate the two processes) Radial notch. (Laterally) 	<ul style="list-style-type: none"> -Sharp lateral interosseous. (laterally) 	<ul style="list-style-type: none"> Head. -Styloid process. -Radial notch. (laterally) 	<ul style="list-style-type: none"> -Proximal Radioulnr joint. -Distal Radioulnr joint.
Femur:	<ul style="list-style-type: none"> -Head. -Neck. - Greater and lesser trochanters inter-trochanteric line. (Anteriorly) - the inter-trochanteric crest (Posteriorly) 	<ul style="list-style-type: none"> -linea aspera. the gluteal tuberosity. -medial supracondylar ridge -lateral supracondylar ridge. -popliteal surface. 	<ul style="list-style-type: none"> -articular patellar surface. -intercondylar notch or fossa. -2 condyles. (Take part in the knee joints) -the medial & lateral epicondyles. 	<ul style="list-style-type: none"> knee joint. (no fibula) -hip joint. (with acetabulum of the hip bone).
Tibia:	<ul style="list-style-type: none"> -Medial condyle. Lateral condyle. -Intercondylar area. (has inter condylar eminence) 	<ul style="list-style-type: none"> -Tibial tuberosity: -Upper smooth part: (give attachment to ligamentum patella). Lower rough part: (Subcutaneous) -soleal line. 	<ul style="list-style-type: none"> Medial malleolus. Fibular notch. (laterally) 	<ul style="list-style-type: none"> -ankle joint. -Proximal tibio-fibular joints. distal tibifibular joints.
Fibula:	<ul style="list-style-type: none"> Head Styloid process Neck 	<ul style="list-style-type: none"> medial interosseous border gives attachment to interosseous membrane. 	<ul style="list-style-type: none"> Lateral malleolus 	<ul style="list-style-type: none"> -ankle joints. -Proximal tibio-fibular joints. -distal tibiofibular joints.

	hands	foot	
Carpals	<p>- 8 bones</p> <p>- 2 irregular rows</p> <p>proximal row: Scaphoid & pisiform.</p> <p>-distal row: Trapezium & hamate</p>	<p>- 7 bones.</p> <p>Their names are:</p> <p>1-calcaneum. (the biggest and form the heel).</p> <p>2- talus.(articulates with fibula and tibia at ankle joint).</p> <p>3-navicular.</p> <p>4-cuboid.</p> <p>5- 3 cuneiform</p>	Tarsals
Metacarpals	<p>- 5 bones.</p> <p>Each one has:</p> <p>- base.</p> <p>-shaft.</p> <p>-head. (form the knuckles when the fist is clenched).</p> <p>-the first metacarpal: Is the shortest and most mobile.</p>	<p>-5 bones.</p> <p>-each one has:</p> <p>-base.</p> <p>-shaft.</p> <p>-head.</p> <p>-the first metatarsal: Is the largest and lies medially.</p>	Metatarsals
phalanges	<p>-14 bones.</p> <p>- each one has:</p> <p>-proximal.</p> <p>-middle.</p> <p>- distal.</p> <p>-the thumb has only: Proximal and distal.</p>	<p>- 14 bones.</p> <p>Each one has:</p> <p>proximal.(has:base,shaft,and head)</p> <p>- middle. (has:base,shaft,and head).</p> <p>- distal. (has:base,shaft,and head).</p> <p>The big toe has only: Proximal and distal.</p>	Phalanges

Cervical Vertebrae

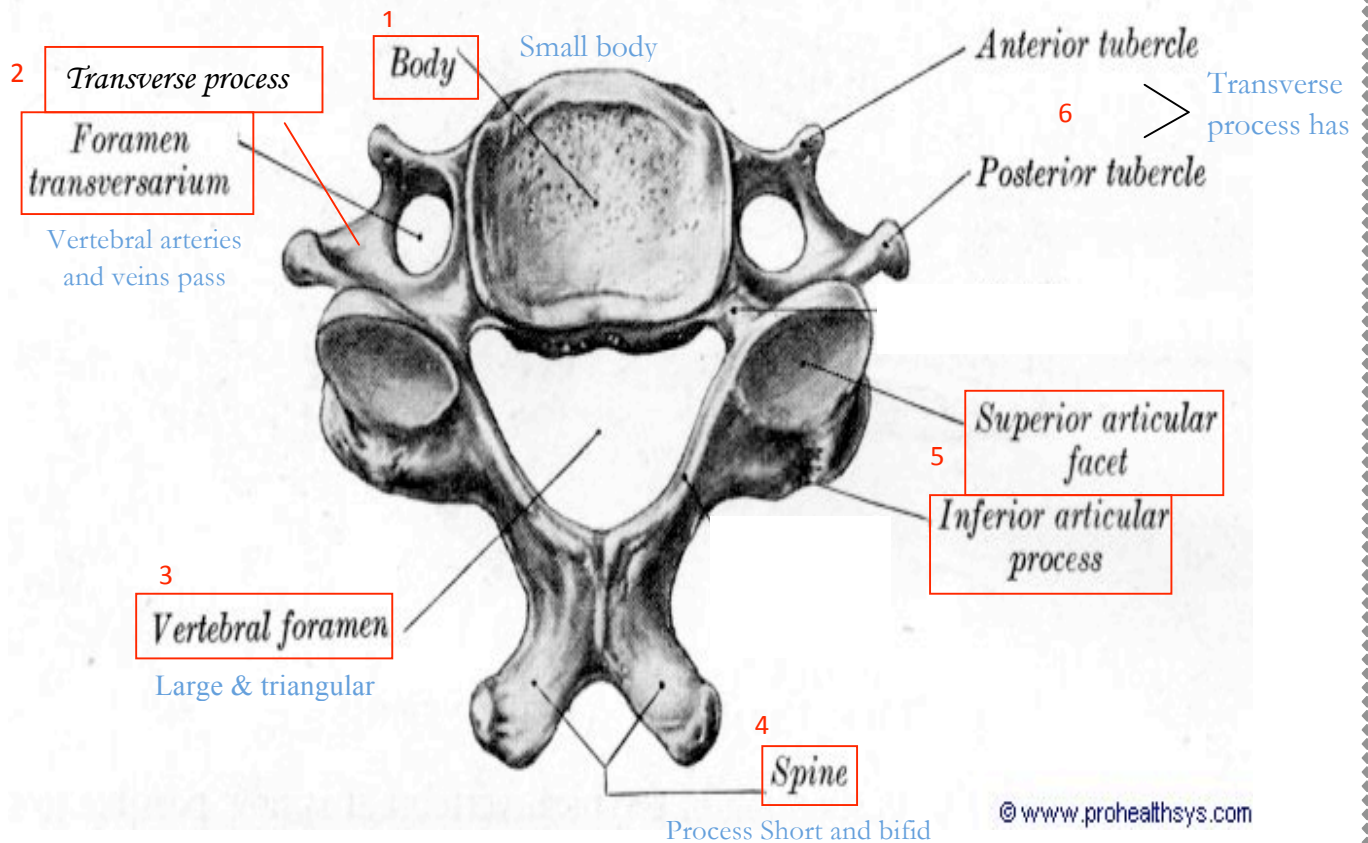


■ Atypical spines

■ Typical Spines

Typical cervical Spines (3, 4, 5, 6)

FIG. 267.—A typical cervical vertebra. Superior aspect.

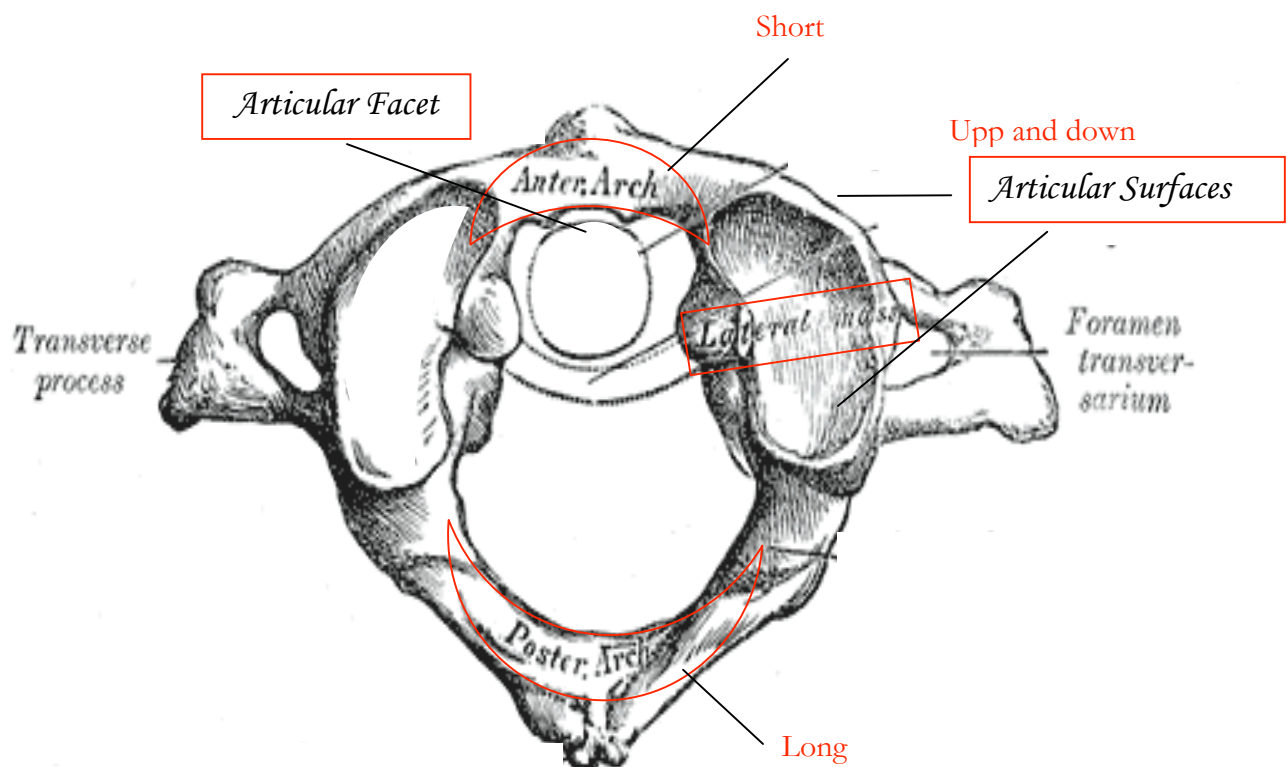


All spines are characterized by presence of foramen transversarium in the transverse process

Atypical Cervical Spines (1, 2, 7)

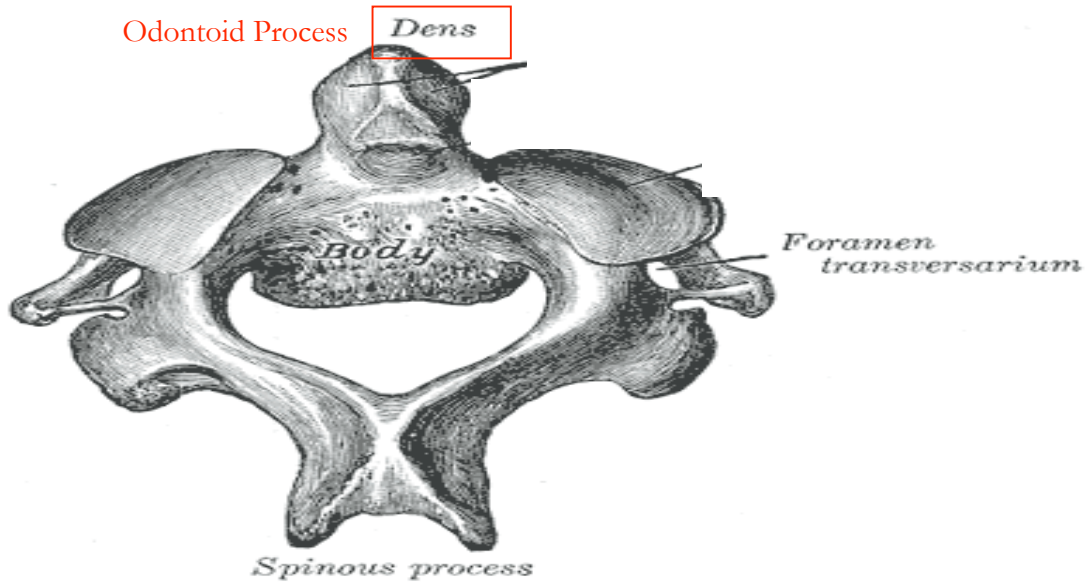
1st cervical spine (Atlas)

- No Body
- No Spine
- Makes Atlanto-Occipital Joint superior (articular surface attaches with occipital condyles of skull), Synovial joint, makes nodding movement (flexion, extension, lateral flexion, no rotation).
- Makes 2 Atlanto-Axial joint inferior (one with the articular surface and one median with dens of axis), 3 synovial joints, allow lateral rotation (extensive rotation).



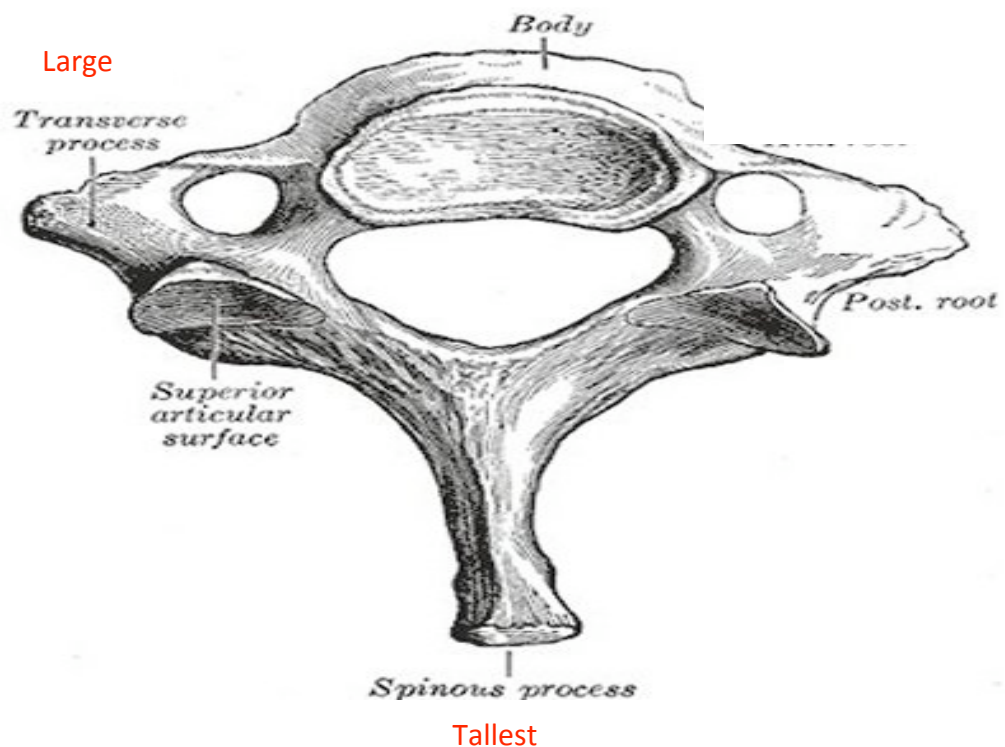
2nd cervical spine (Axis)

- Odontoid process or dens represents the body of atlas. It attaches to atlas, plus holds the skull.



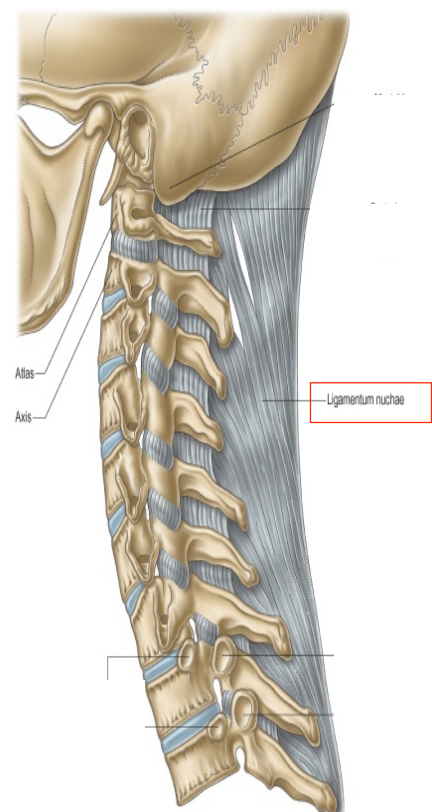
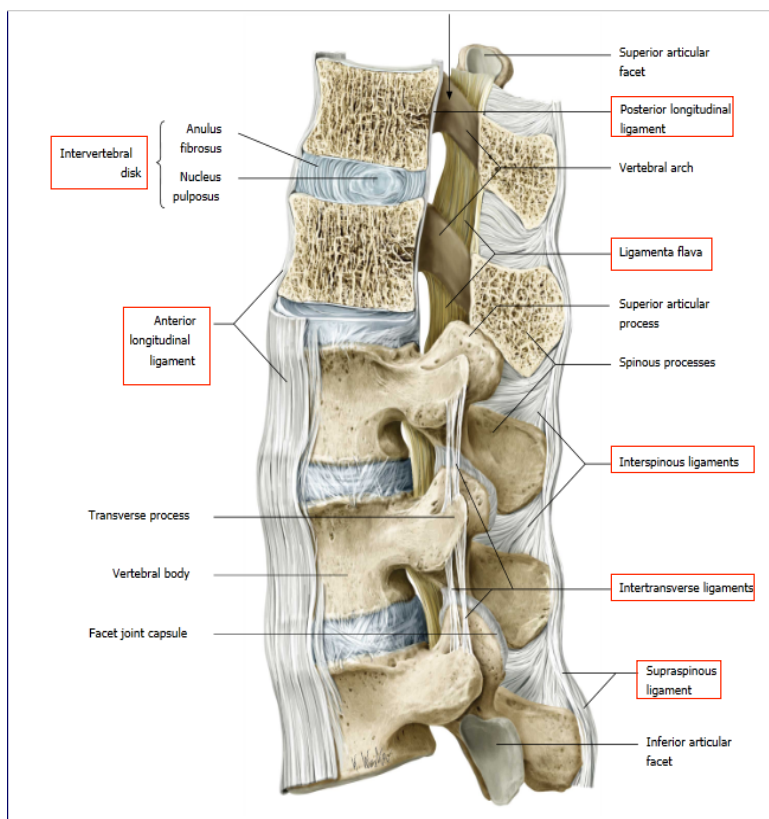
7th cervical spine (cervical Prominens)

- Longest spinous process, not bifid
- First spine to be felt subcutaneously
- Transverse process large and foramen transversarium is small or absent (no artery transmission)

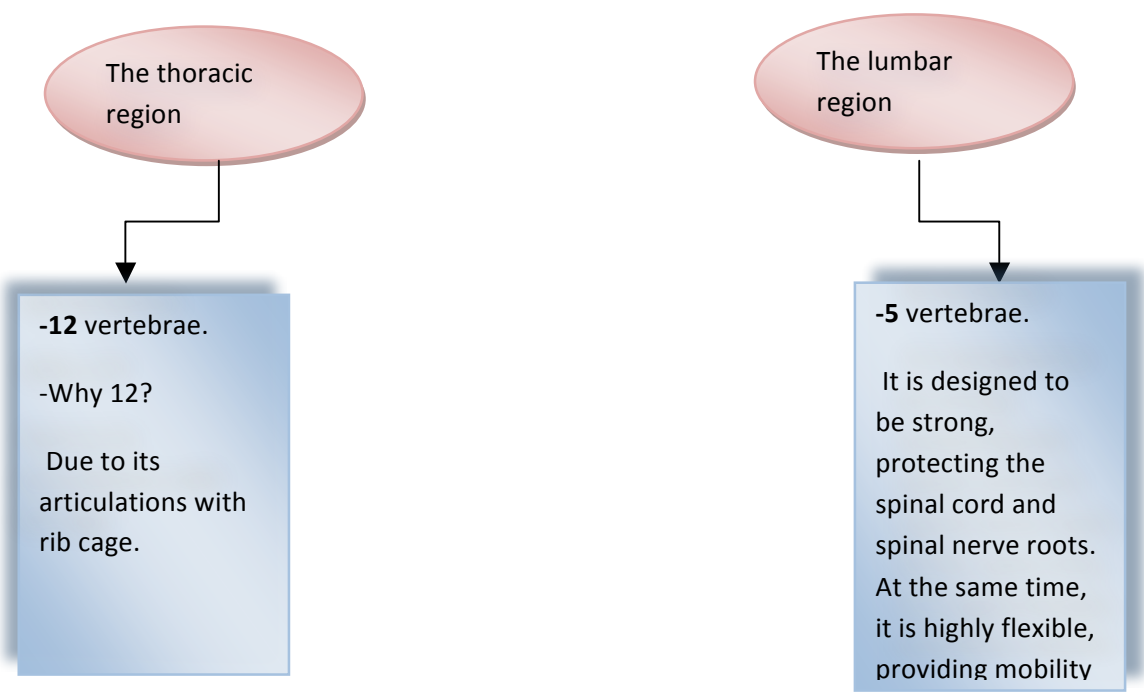
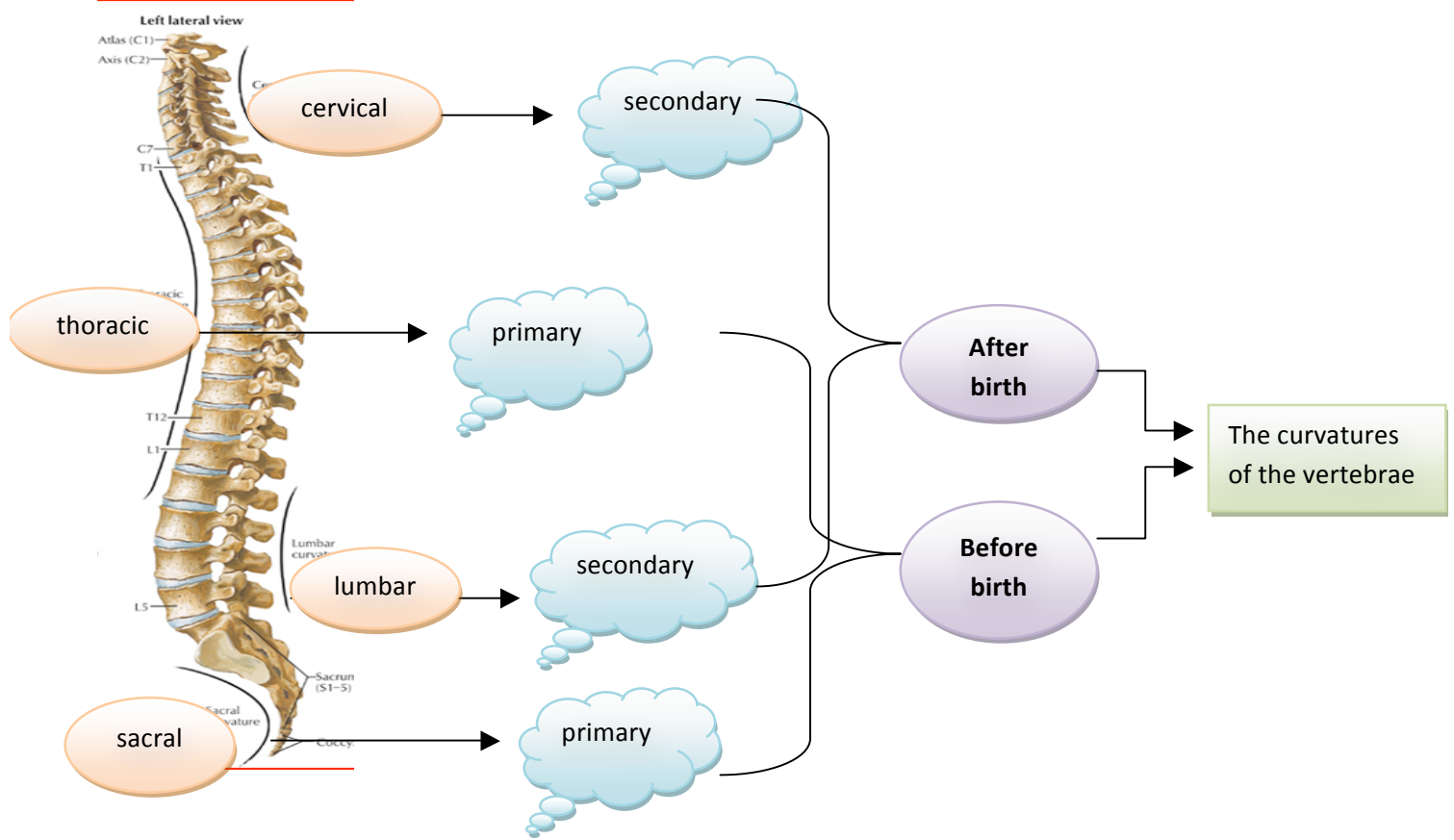


Joints of cervical spine

- Cartilaginous Joints between bodies (except first two spines)
 - Hyaline Cartilage between two bodies then Intervertebral disc of fibrocartilage
- Vertebral arches made of Synovial joints between articular processes. Facets covered by hyaline cartilage and surrounded by capsule.
- Ligaments:
 - Longitudinal ligaments run anterior and posterior to the bodies
 - Supraspinous ligament
 - Interspinous ligament
 - Ligamentum flavum
 - Intertransverse ligaments
 - Ligamentum nuchae



Thoracolumbar spine.



Can you recognize the thoracic vertebrae from the LUMBAR VERTEBRA?

	thoracic vertebrae	Lumbar vertebra	
Has 7 processes	<ul style="list-style-type: none"> - (1) spinous - (2) transverse. - (4) articular processes. - (2superiorly and 2inferiorly) . 	<ul style="list-style-type: none"> -1 spinous 2 transverse (4) articular processes. (2)superiorly and (2)inferiorly 	Has 7 processes
Body	<ul style="list-style-type: none"> - Medium size. - Heart shape. - Has costal facet on lateral sides. 	<ul style="list-style-type: none"> -large size. -kidney shape 	body
Vertebral foreman	Small & rounded	triangular	Vertebral foreman
Spines	<ul style="list-style-type: none"> - Long. - downward 	<ul style="list-style-type: none"> -short. -backward. - flat 	spines
transverse processes	-Has costal facet	<ul style="list-style-type: none"> - long - slender. 	transverse processes
vertebral arches	<ul style="list-style-type: none"> - pedicle (near the body) - laminae (near the spinous process) 	<ul style="list-style-type: none"> - pedicle (near the body). -laminae (near the spinous process). 	vertebral arches
Costal facet (1)	<ul style="list-style-type: none"> -Where? On the transverse process -why? To articulate with the tubercles of the ribs 	thick	laminae
Costal facet (2)	<ul style="list-style-type: none"> -Where? On the sides of the bodies. -why? To articulate with the heads of the ribs 	thick	pedicles
movements	Only rotation	Flexion,Extension ,Lateral flexion And Rotation	movements

The joints and the ligaments of Thoracolumbar

Joints

Synovial joints

(BETWEEN TWO VERTEBRAL ARCHES)

e.g. **between the superior and inferior articular processes of adjacent vertebrae.**

cartilaginous joint

(BETWEEN TWO VERTEBRAL bodies)

e.g. **intervertebral disc of fibrocartilage.**

LIGAMENTS

anterior longitudinal ligament

-front and sides of the vertebral bodies
-wide and is strong.

Intertransverse ligaments

run between adjacent transverse processes

posterior longitudinal ligament

-the posterior surface of bodies and posterior borders of the discs
-weak and narrow

**Other
LIGAMENTS**

**Ligamentum
flavum**

**Interspinous
ligaments**

Supraspinous ligament

What are the MUSCLES PRODUCING MOVEMENTS of the Thoracic and lumbers regions ??

Thoracic region

3 muscles:

1-semispinalis muscle.

2-rotator muscles.

3-oblique muscles of the anterolateral abdominal wall.

Remember: rotation only.

Lumber regions

1-Flexion:

1-rectus abdominis.

2-psoas muscles.

2-Extension:

1-postvertebral muscles.

3-Lateral flexion

1-postvertebral muscles.

2-quadratus lumborum.

3-the oblique abdominal muscles.

4- The psoas muscles.

4-Rotation

1-rotator muscles .

2-oblique abdominal muscles.

Some problems and disease can happened to the vertebrae or to the spinal cord

1-herniatic disc: the annulus fibrosus ruptures, allowing the nucleus pulposus to herniate and protrude into the vertebral canal **which can compress the spinal cord and /or spinal nerves and cause pain .**

2- spondylolysis & spondylolisthesis: The fifth lumbar vertebra is by far the most common site for these diseases but it also can happen anywhere else in the vertebral column.

Important notes

intervertebral discs

1-Compose of:

1- annulus fibrosus:

Peripheral part , fibrocartilage.

2- nucleus pulposus:

Central part, mass of gelatinous material has large amount of water, a small number of collagen fibers, and a few cartilage cells.

2- its function:

1- increases **the length of the vertebral column**

2-absorbers the load on the vertebral column if it suddenly increased.

3-Allow one vertebra to rock forward or backward on another.

Exceptions:

T11 & T12

Do not have a facet in the transverse process

L5

Is the largest of all movable vertebrae. Why? It carries the weight of the whole upper body.

How is it distinguished? by its **massive body** and **thick transverse processes**

1st & 2nd cervical

Do not have intervertebral discs.

Why?

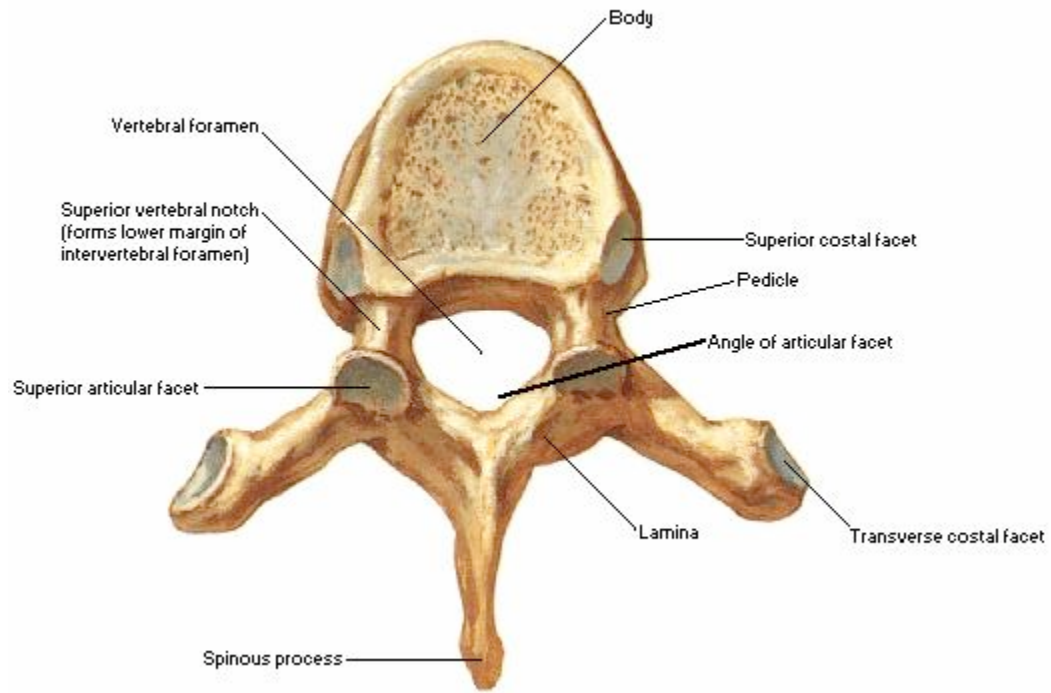
Because they don't have vertebral bodies ,

Sacrum & coccyx

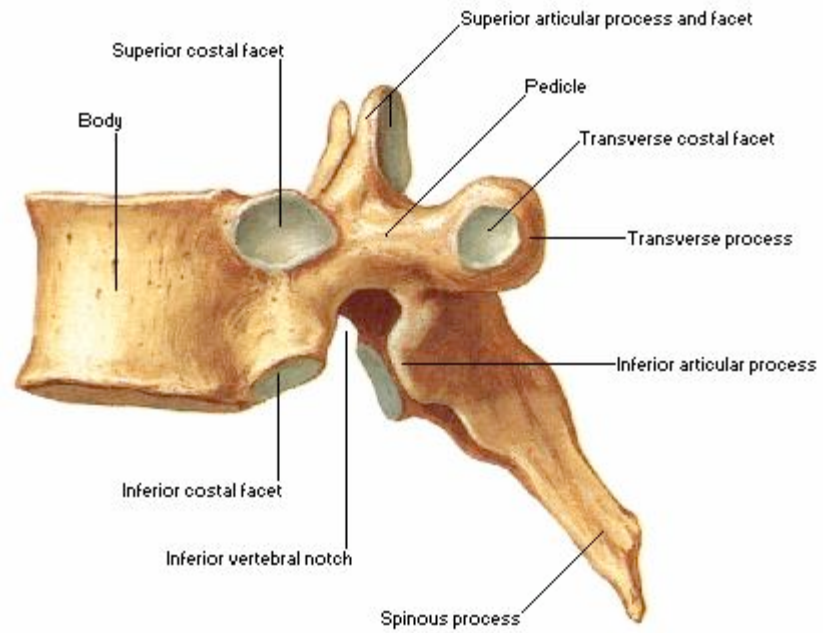
Don't have intervertebral discs.

Why? Because they're fused bones.

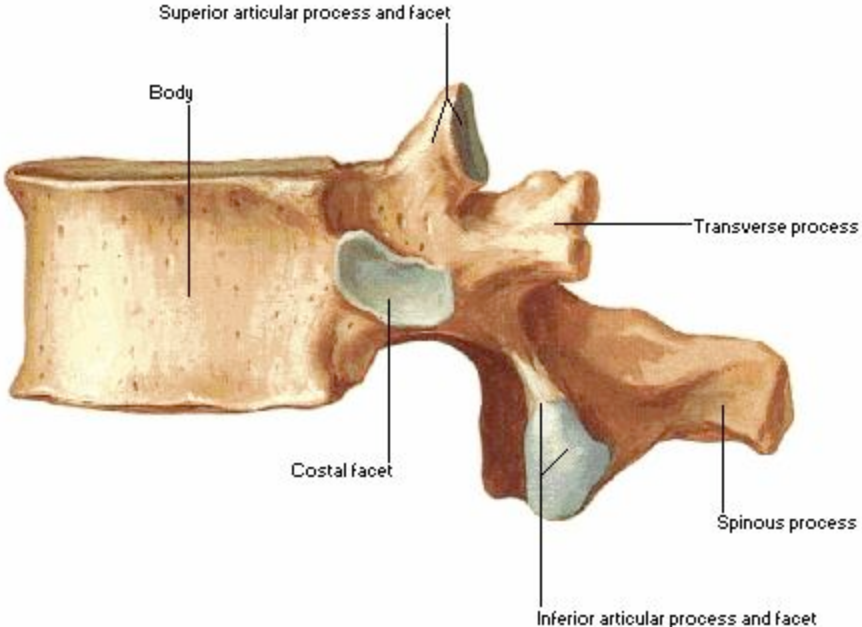
Superior View



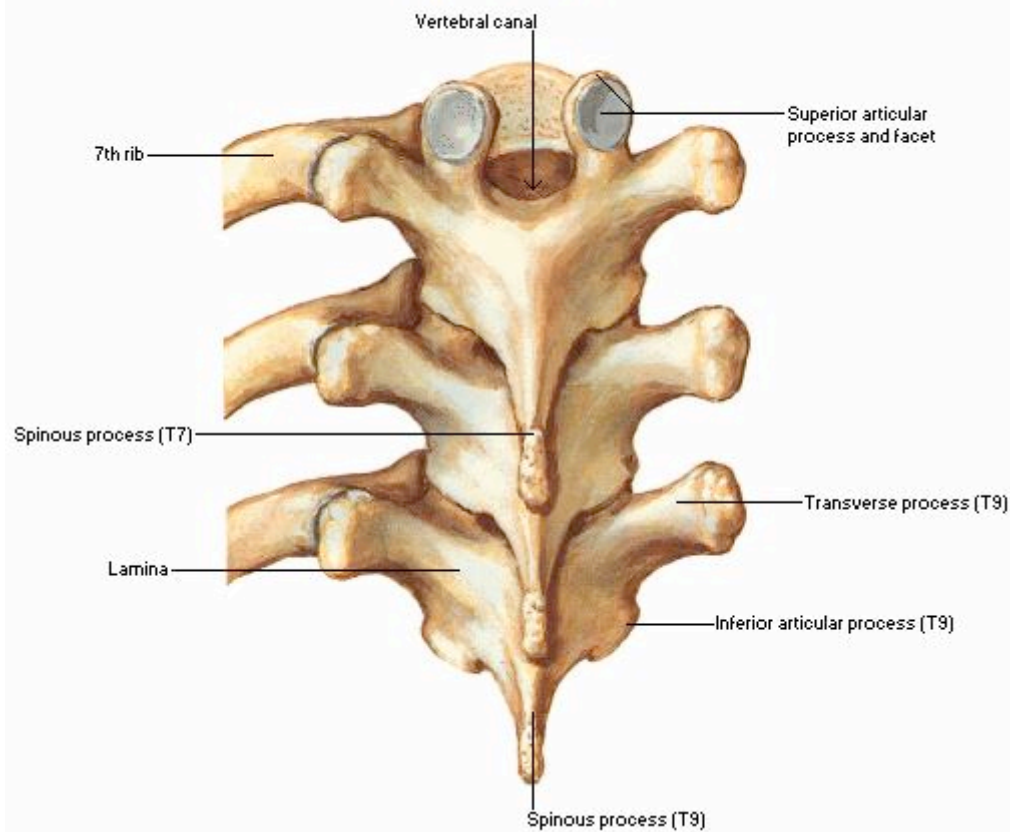
Lateral View



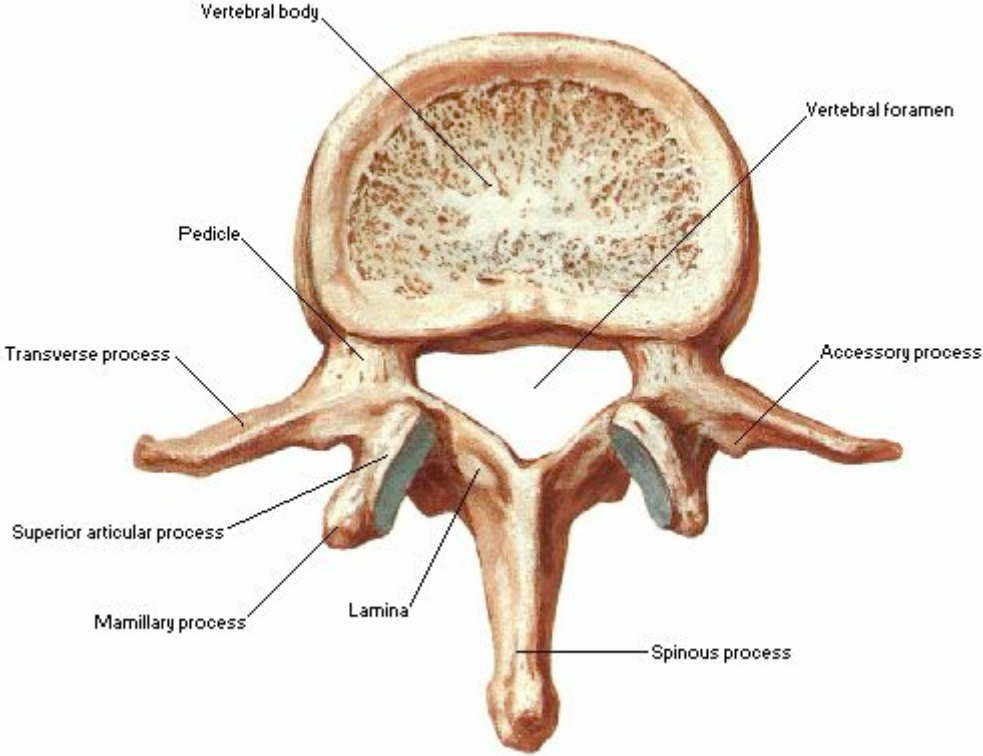
Lateral View



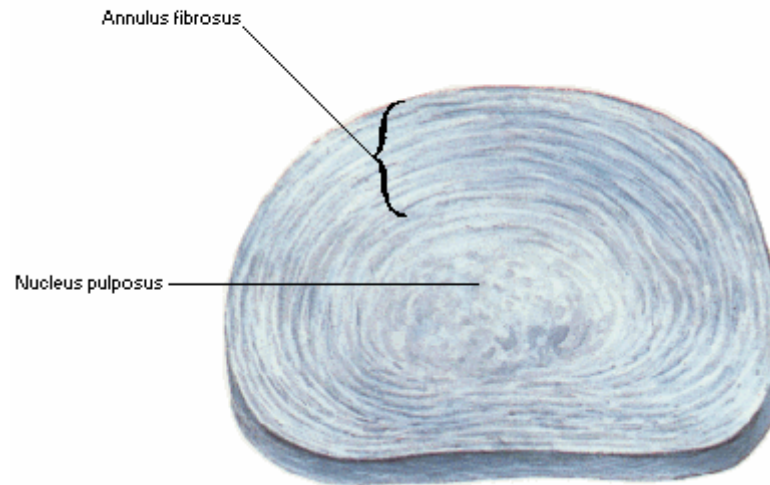
Posterior View



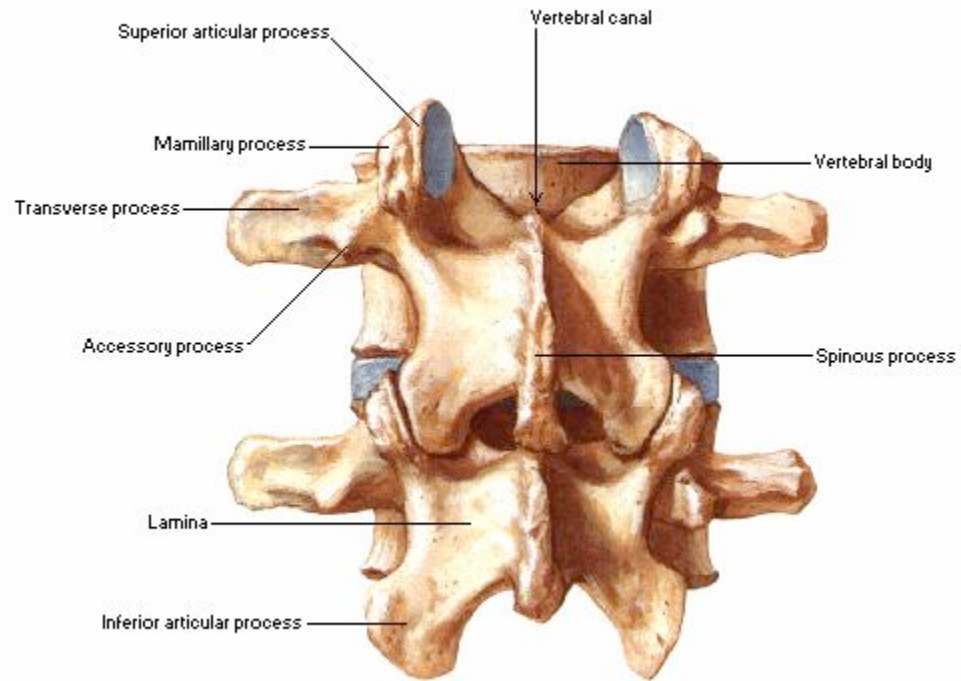
Superior View



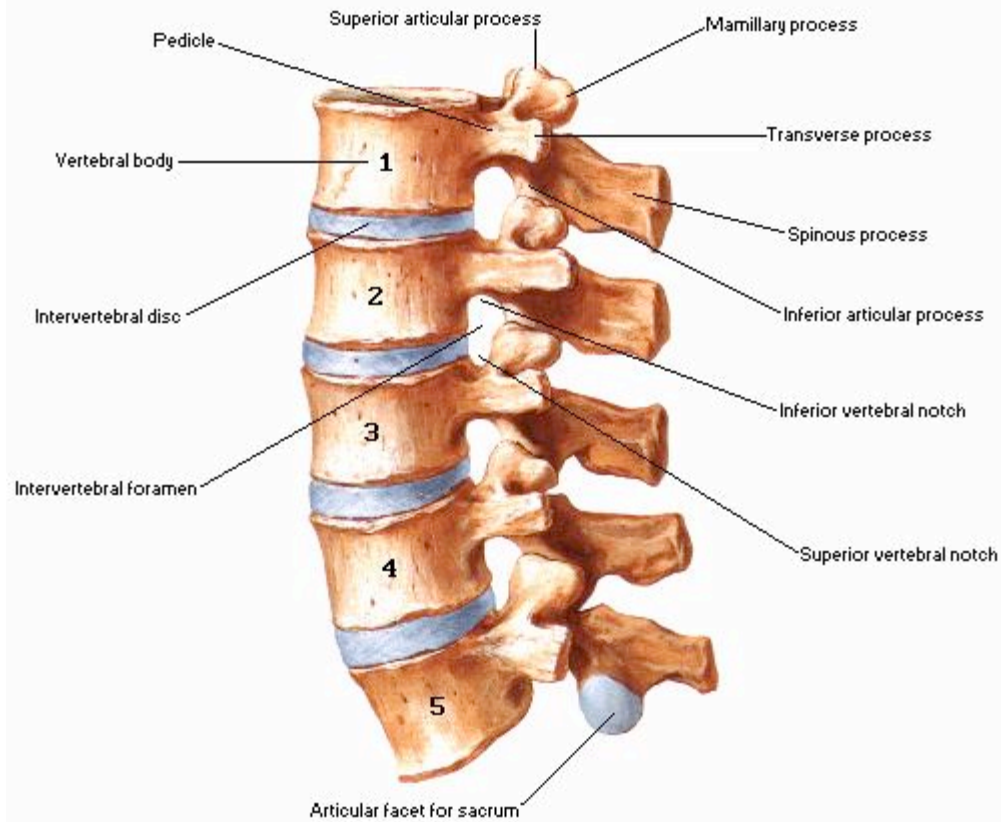
Intervertebral Disc



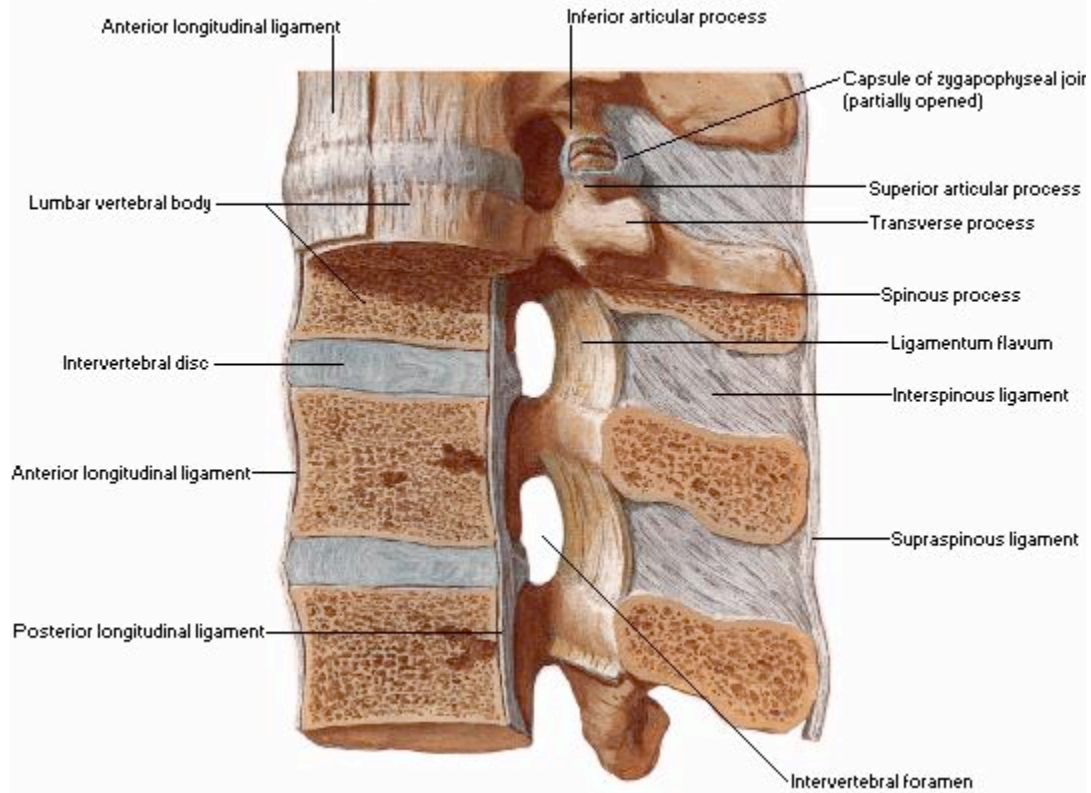
Posterior View



Left Lateral View



Left Lateral View - Partially Sectioned



The Axial Skeleton - Vertebral Column

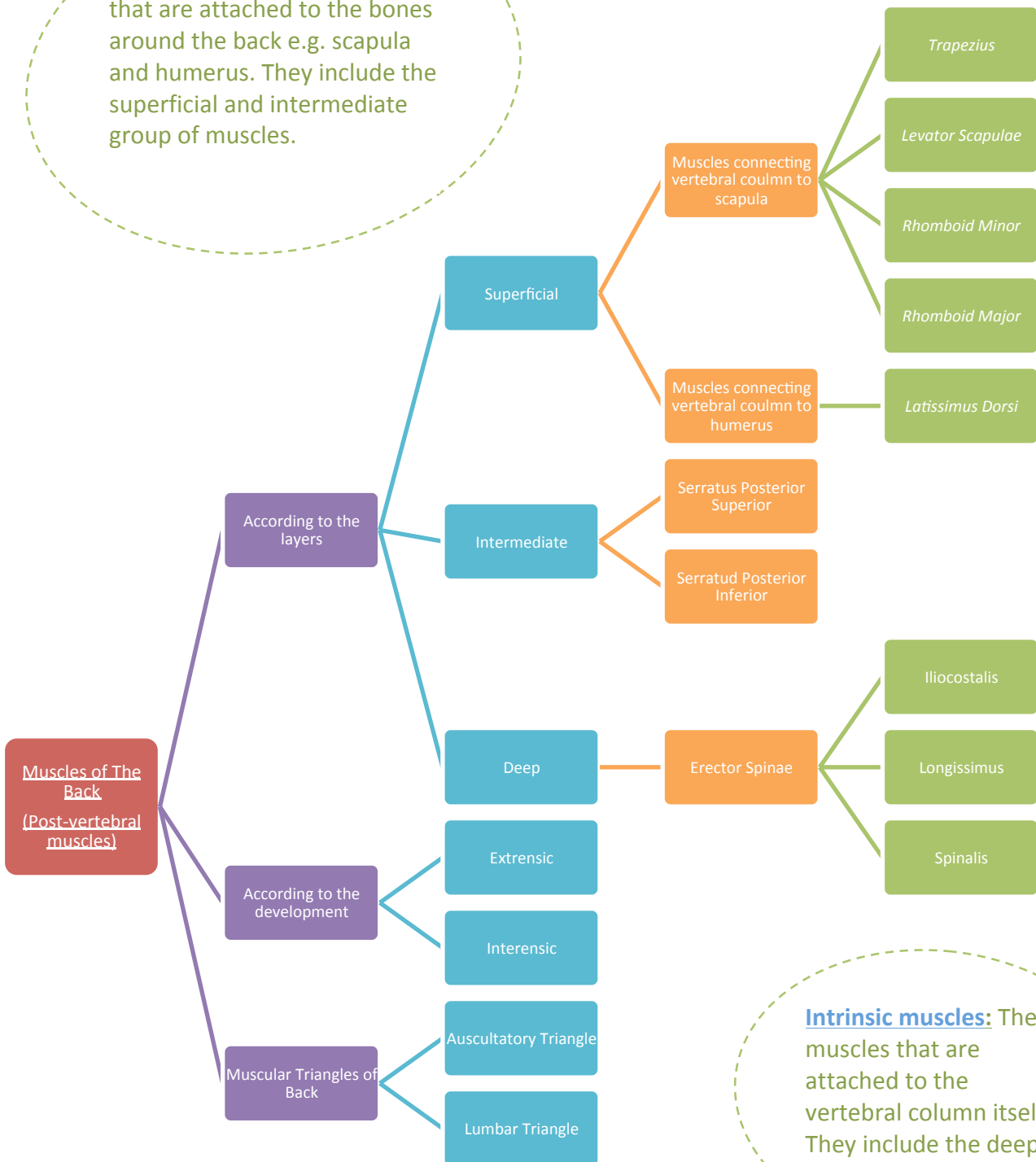
<u>Bone Name</u>	<u># bones</u>	<u>Bone marking</u>	<u>Description & Related Structures of Importance</u>
<i>Typical Vertebra</i>	32	lamina pedicle transverse process spinous process articular processes (superior and inferior) vertebral foramen body intervertebral foramen	connects transverse to spinous process (cut during a laminectomy) connects body to transverse process process directed laterally process directed posteriorly have facets to form joints between adjacent vertebrae contains spinal cord largest part of the vertebra intervertebral discs are found between adjacent vertebral bodies formed when 2 vertebra come together, contain spinal nerves
<i>Cervical</i>	7	body spinous process vertebral foramen transverse process transverse foramen	small body with articular processes horizontal, bifid (forked) appearance large (especially with respect to size of body), slight oval shape contains transverse foramina contains vertebral artery
<i>Atlas (C1)</i>		articular facet for dens superior and inferior articular processes and facets anterior and posterior arches	has no body, body has become the dens (odontoid process) of the axis
<i>Axis (C2)</i>		body and dens superior and inferior articular processes and facets	has odontoid process (dens), which is the fused body of C1
<i>Vertebra Prominens (C7)</i>		spinous process	very large, blunt, not bifid, not covered by ligamentum nuchae therefore, is the first spinous process easily felt under the skin
<i>Thoracic</i>	12	body superior and inferior articular processes and facets spinous process vertebral foramen transverse process	heart-shaped, contains demifacets for articulation of the head of a rib points inferiorly relatively small, circular in shape contains costal facets for articulation of the tubercle of a rib.
<i>Lumbar</i>	5	body superior and inferior articular processes and facets spinous process vertebral foramen transverse process	very large, heavy body short and blunt, square shaped, horizontal small (especially with respect to size of body), round short and blunt, heavy
<i>Sacrum</i>	5 (fused)	anterior sacral foramina posterior sacral foramina median sacral crest auricular surfaces superior articular processes sacral hiatus	contain ventral (anterior) rami of sacral spinal nerves contain dorsal (posterior) rami of sacral spinal nerves represents fused spinous processes of sacral vertebrae "ear" like process, articulates with the iliac bones contain facets to articulate with inferior articular processes of L5 the "gap" at the inferior end of the sacral canal
<i>Coccyx</i>	2 to 3 (fused)		

Be able to identify the primary (thoracic and sacral) and secondary (cervical and lumbar) curvatures of the spine

Muscles of The Back

(Post-Vertebral Muscles)

Extrinsic muscles: The muscles that are attached to the bones around the back e.g. scapula and humerus. They include the superficial and intermediate group of muscles.



Intrinsic muscles: The muscles that are attached to the vertebral column itself. They include the deep group of muscles.

Muscles of The Back – According to Layers

Muscle Groups (According to Layers)	Characteristics – in general	Muscles within the groups	Innervation	Development	Notes
Deep	<ul style="list-style-type: none"> - Attached to the vertebral column. - Movement of the vertebral column and the head. (using extensors and rotators) - Extend from Sacrum to skull. 	Erector Spinae: 1- Iliocostalis (Lateral) 2- Longissimus 3- Spinalis (Medial)	Supplied by Anterior rami of spinal nerves.	Not in the back (Extrinsic muscle).	
Intermediate	<ul style="list-style-type: none"> - Attached to the ribs. - Respiratory movement. - Separated from the deep group by (Thoracolumbar Fascia). 	1- Serratus Posterior Superior (upper ribs elevator – in inhalation). 2- Serratus Posterior Inferior (lower ribs depressor – in Exhalation).	Supplied by Anterior rami of Thoracic spinal nerves.	Not in the back (Extrinsic muscle).	
Superficial	<ul style="list-style-type: none"> - Attached to the upper limb - Movement of the upper limb. 	1- Muscles connecting Vertebral Column to Scapula: Trapezius, Levator Scapulae, Rhomboid Minor, Rhomboid Major. 2- Muscle connecting Vertebral Column to Humerus: Latissimus Dorsi.	Supplied by Posterior rami of spinal nerves.	In the back (Intrinsic muscle).	

Muscles of The Back – Superficial Group

1- Muscles connecting the vertebral column to the scapula:	Origin	Insertion	Action	Innervation
Trapezius	Spinous processes of Cervical and Thoracic vertebrae.	Lateral 1/3 of clavicle + acromion & spine of scapula.	Role in rotation of scapula during abduction of humerus above horizontal.	Supplied by Spinal part of accessory (11 th) cranial nerve.
Levator Scapulae	Transverse processes of Cervical vertebrae.		Elevates Scapula	
Rhomboid Minor		Medial border of Scapula	Retract Scapula	Supplied by Dorsal scapular nerve.
Rhomboid Major				
2- Muscles connecting the vertebral column to the Humerus:	Spines of Thoracic vertebrae	Bicipital groove of Humerus. (Intertubercle groove).	<ul style="list-style-type: none"> - Extention. - Adduction. - Medial rotation of humerus. 	Supplied by Thoracodorsal nerve.
Latissimus Dorsi				

Table 9-2 Back and Scapular Muscles

Muscle	Origin	Insertion	Nerve Supply	Action
1st Layer				
1- Trapezius	Occipital bone, ligamentum nuchae, spine of seventh cervical vertebra, spines of all thoracic vertebrae	Upper fibers into lateral third of clavicle; middle and lower fibers into acromion and spine of scapula	Spinal part of accessory nerve (motor) and C3 and 4 (sensory)	Upper fibers elevate the scapula; middle fibers pull scapula medially; lower fibers pull medial border of scapula downward
2- Latissimus dorsi	Iliac crest, lumbar fascia, spines of lower six thoracic vertebrae, lower three or four ribs, and inferior angle of scapula	Floor of bicipital groove of humerus	Thoracodorsal nerve	Extends, adducts, and medially rotates the arm

From males slides

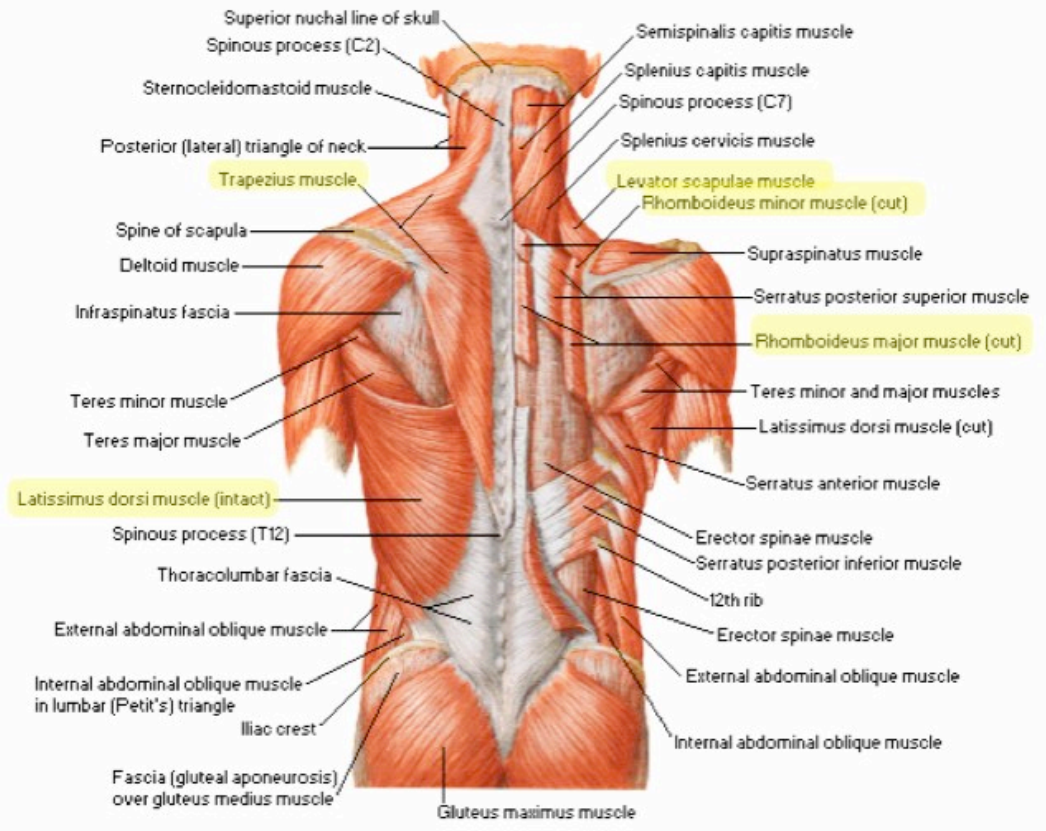
2nd layer (deep)

1- Levator scapulae	Transverse processes of first four cervical vertebrae	Medial border of scapula	C3 and 4 and dorsal scapular nerve	Raises medial border of scapula
2- Rhomboid minor	Ligamentum nuchae and spines of seventh cervical and first thoracic vertebrae	Medial border of scapula	Dorsal scapular nerve	Raises medial border of scapula upward and medially
3- Rhomboid major	Second to fifth thoracic spines	Medial border of scapula	Dorsal scapular nerve	Raises medial border of scapula upward and medially

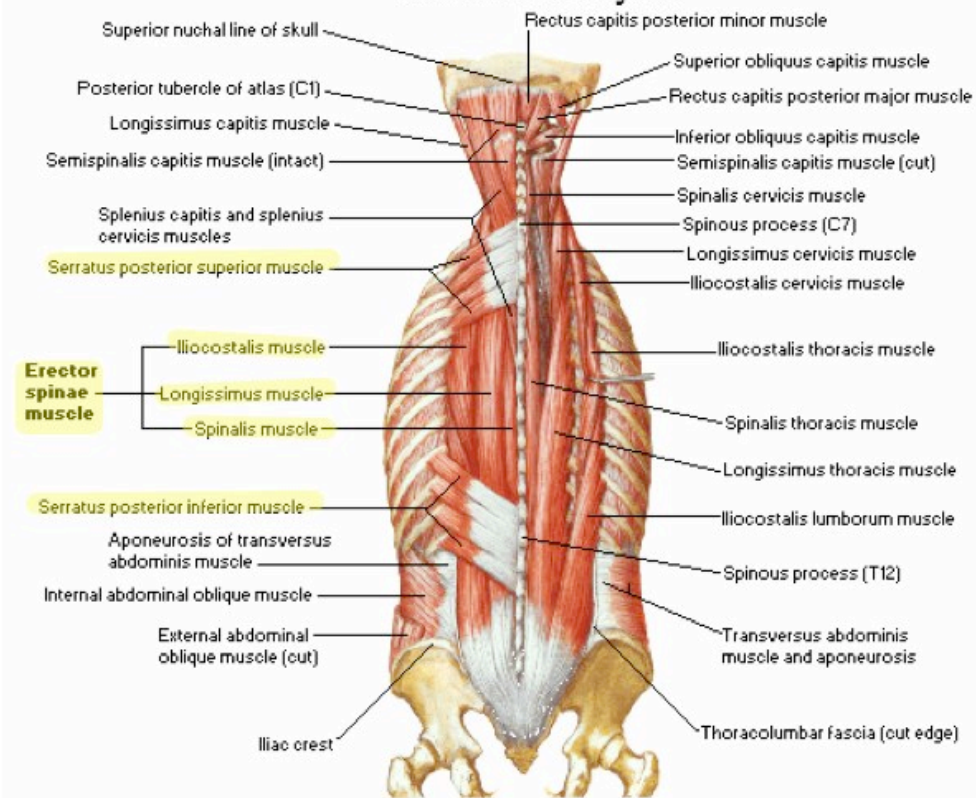
Muscles of The Back – Muscular Triangles of Back

Muscular Triangles of Back	Boundaries (three for each, since their shape is triangular)	Role
Auscultatory Triangle	1- Latissimus Dorsi. 2- Trapezius. 3- Medial border of Scapula.	Used to listen to (articulate) the lungs, because this site is where the breath sound is easily heard with the Stethoscope.
Lumbar Triangle	1- Latissimus Dorsi. 2- Posterior border of external oblique muscle of the abdomen. 3- Iliac Crest.	<ul style="list-style-type: none"> - Site of abdominal wall hernia. - Site of where the pus may emerge from the abdominal wall.

Superficial Layers



Intermediate Layers



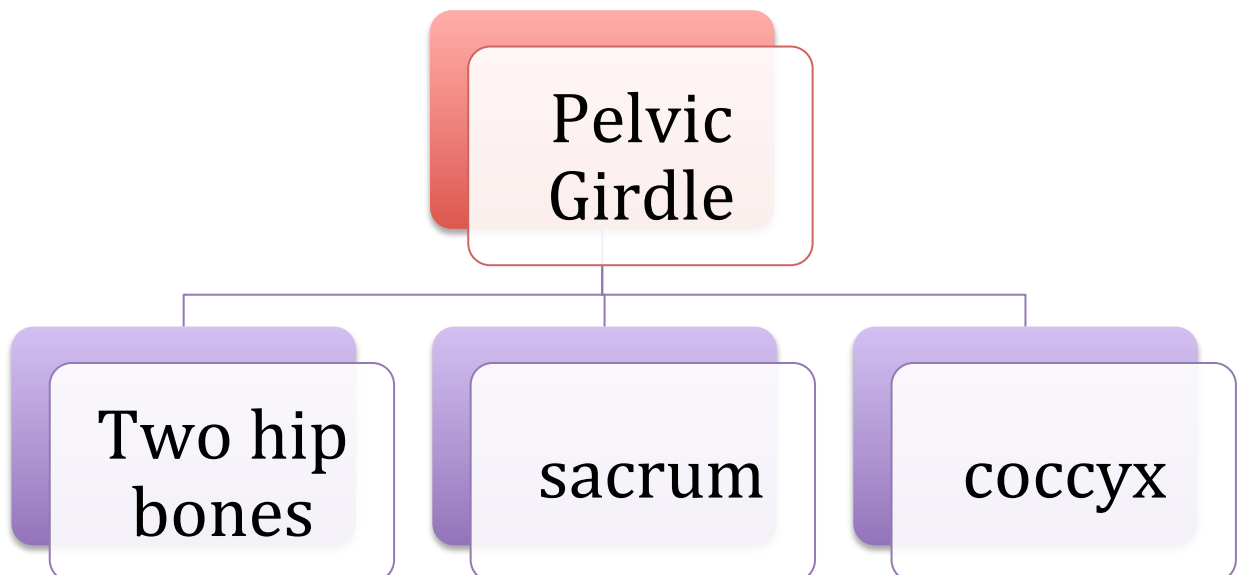
Pelvic and sacrum

Characteristics of the pelvis

- It provides a strong, stable connection between the trunk and lower extremities.
- Its bones are large & heavy.
- Bearing weight is their most important function.
- The total weight of the upper body rests on the pelvis.

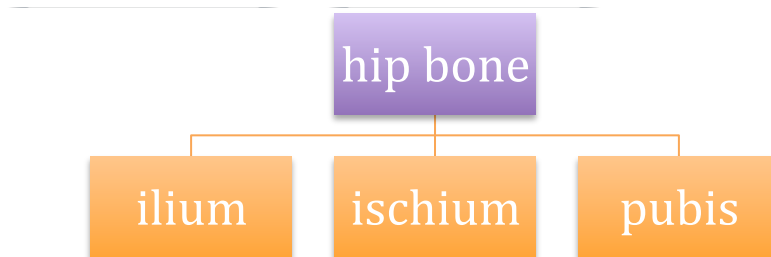
Its Main Functions are:

- Transmit the weight of the body from the vertebral column to the femurs.
- Contain, support and protect the pelvic viscera.



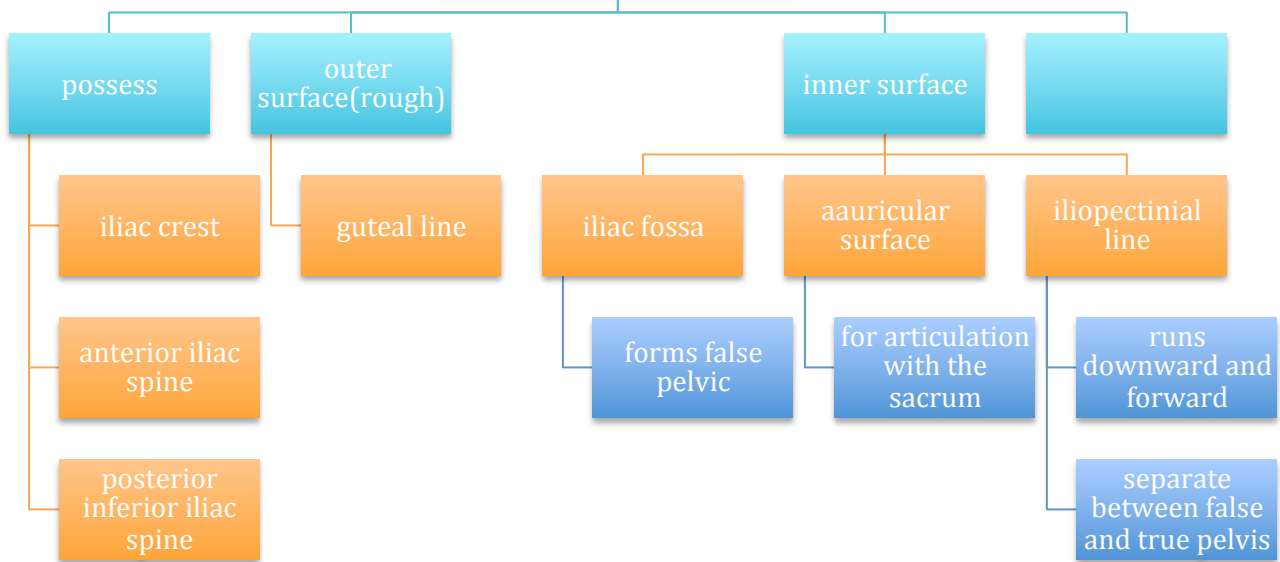
First: the hip bone:

- *Large*
- *Irregular bone.*
- *It is formed by the fusion of three bones*
- *And joined at the deep socket (Acetabulum)*



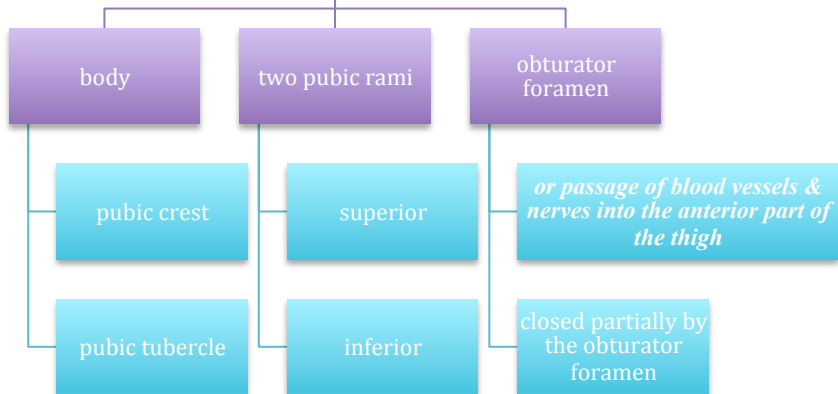
ilium

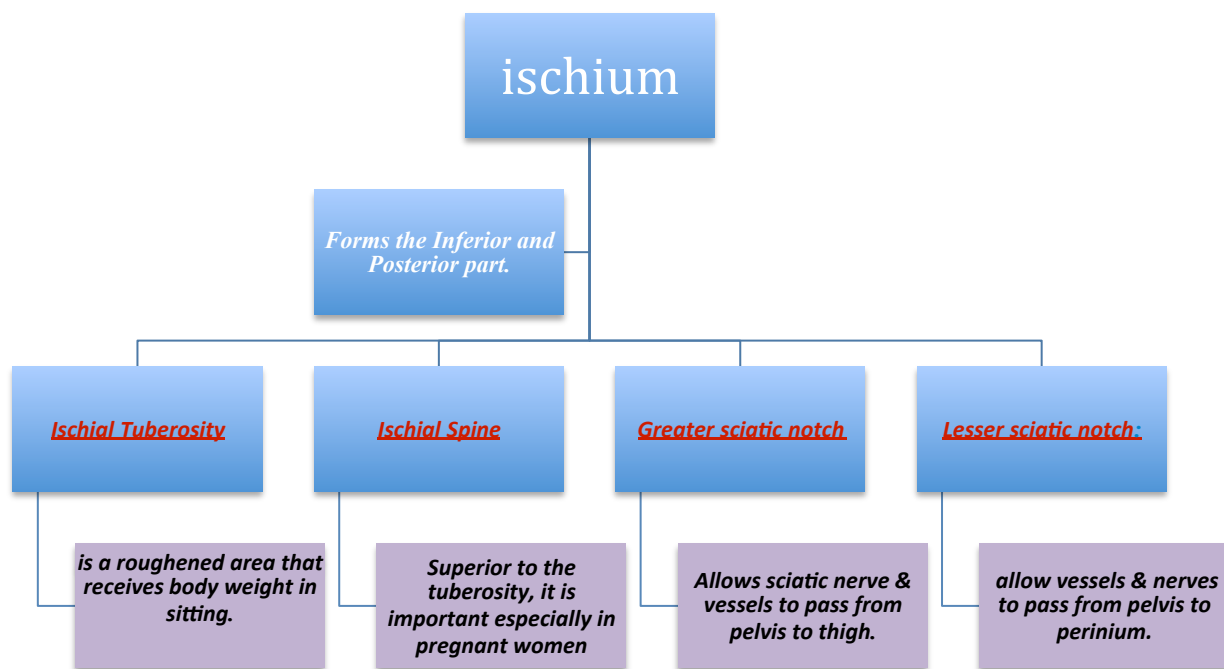
The Upper Flattened Part of the hip bone.



pubis

forms the anterior and inferior part of the hip bone





Articulations of the hip bone:

1. Symphysis Pubis:

A Cartilagenous joint between the two pubic bones

2. Sacroiliac Joints

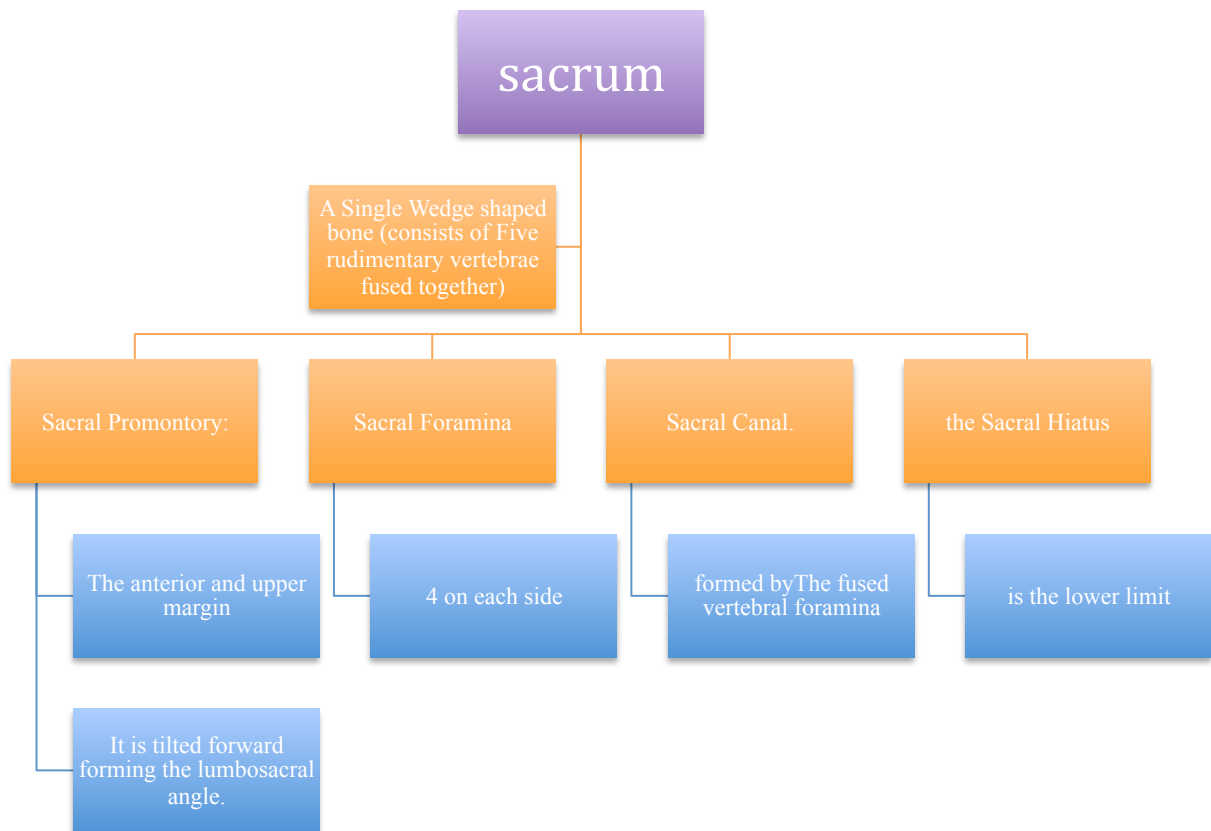
Strong synovial joints, between the auricular surfaces of ilium and sacrum.

Transmit the weight of the body from vertebral column to the bony pelvis.

3. Hip Joint:

The outer surface articulates at the acetabulum with the head of femur

second: sacrum



articulation of sacrum :

- **Lumbosacral joint:**

The upper border articulates with the 5th Lumber vertebra.

- **Sacroccocygeal joint:**

The inferior part articulates with the Coccyx.

- **Sacroiliac joints:**

Lateral with the Hip bones .

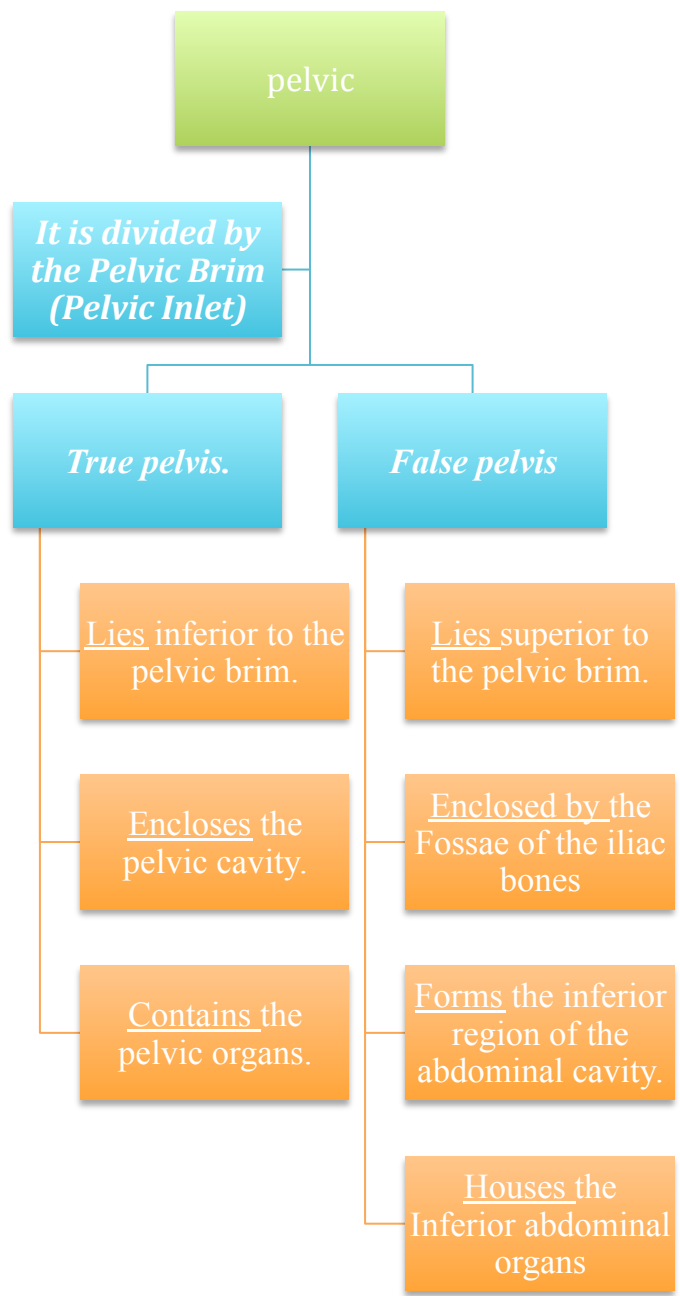
third :coccyx

4 vertebrae fused together forming → triangular piece

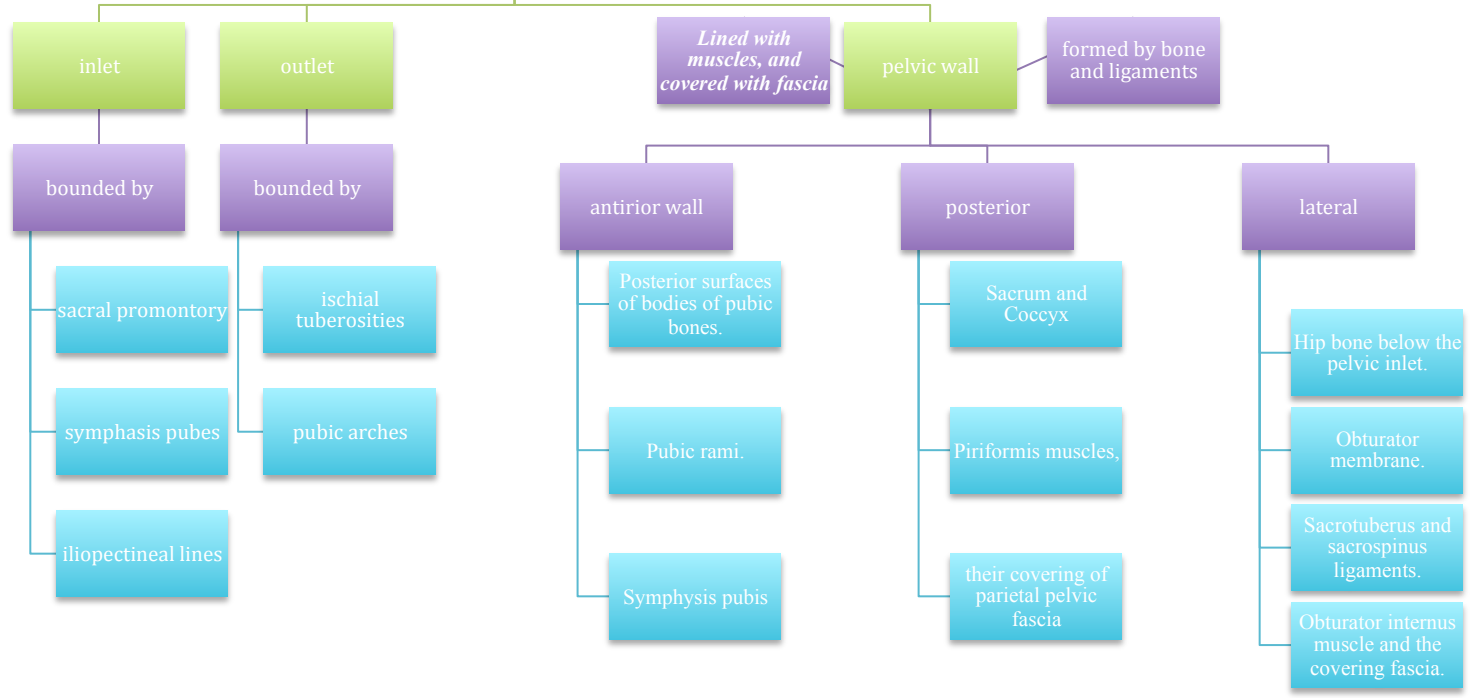
Orientation of the pelvic :

It is the Correct Position of the bony pelvis relative to the trunk:

- 1.The front of the **Symphysis pubis** and the **Anterior Superior iliac spines** lie in the same vertical plane.
2. The pelvic surface of the Symphysis pubis faces upward and backward.
- 3.The anterior surface of the Sacrum is directed forward and downward.



true pelvis



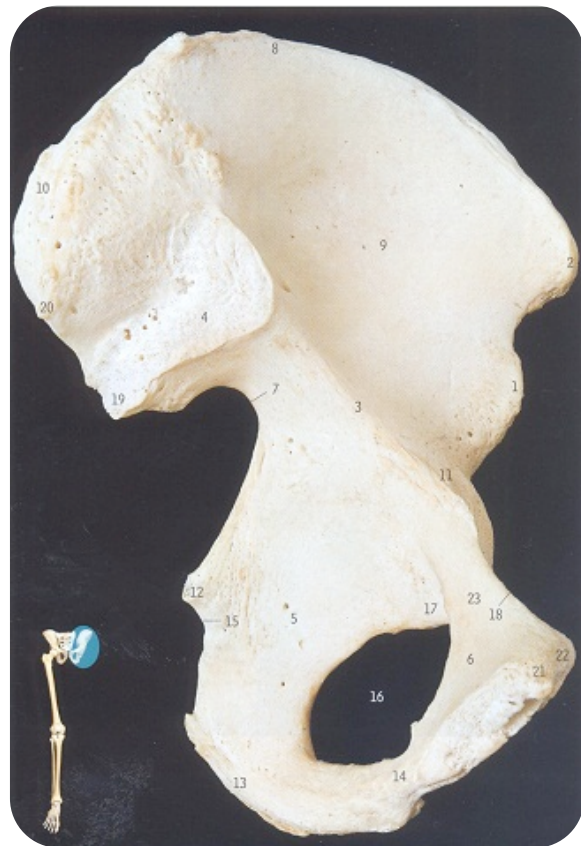
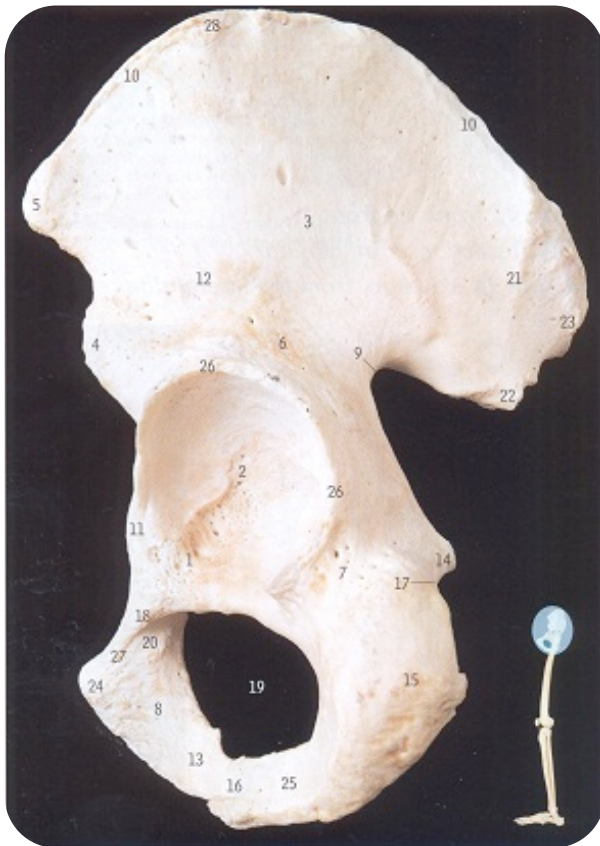
differences between male and female pelvic:

Structure	male	Female
Pelvic		
False arch		More rounded and pubic angle greater
pelvic inlet	Heart shaped	Oval or rounded
Pelvic outlet		larger
Ischial tuberosities	Turned in	everted
Ischial spines		Shorter and farther apart
Pelvic cavity		Roomier
Sacrum		
Length		Shorter
Breadth		Wider
Curvature		Less curved

Types of Obstetrical Female Pelvis

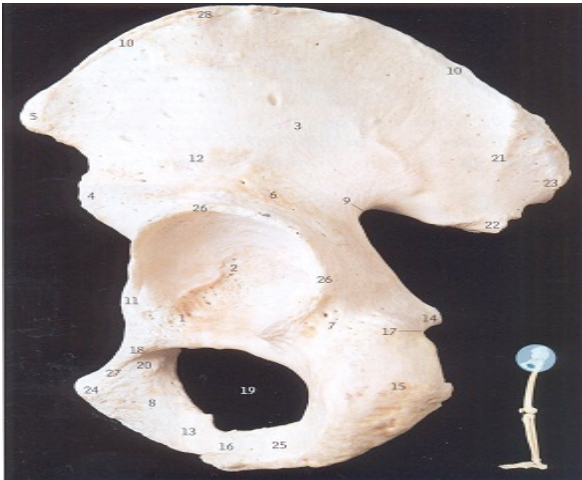
- (1) Gynaecoid.
- (2) Anthropoid.
- (3) Android.
- (4) Platypelloid.

Hip Bone



Features

- **Consist of three parts :**
 - **Ilium (6)**
 - **Ischim (7)**
 - **Pubis (8)**
- They are joined by the acetabulum(2)
(laterally)**



Lateral surface of hip bone

- Acetabulum (2)	Inferior ramus of pubis (13)
-Anterior inferior iliac spin(4)	Ischial spine (14)
Anterior superior iliac spin(5)	Ischial tuberosity (15)
Body of ilium (6)	Lesser chiatric notch (17)
Body of ischium (7)	Obturator foramen (19)
-Body of pubis(8)	-Posterior inferior iliac spin(22)
Greater chiatric notch (9)	posterior superior iliac spin(23)
Iliac crest (10)	Pubic tubercle (24)
Ramus of ischium (25)	Superior ramus of pubis (27)



Medial surface of hip bone

-Iliopectenial line (3)

-Auricular surface (4)

-Iliac crest (8)

-Ischial spine (12)

-Ischial tuberosity (13)

Pubic crest (21)

-Pubic tubercle (22)

Ilium

	<ul style="list-style-type: none"> • <i>It`s the upper flattened part of the hip bone</i>
Anterior Surface	<ul style="list-style-type: none"> • <i>Iliopectinial line (3)</i> • <i>Aauricular surface (4)</i>
Anterior& posterior surface	<p style="margin: 0;">-Iliac crest(8) :</p> <ul style="list-style-type: none"> • <i>Run between the anterior superior iliac spine(5) and the inferior superior iliac spin(4)</i> • <i>Below are the anterior posterior iliac spine (23)and the inferior posterior iliac spine (22)</i>

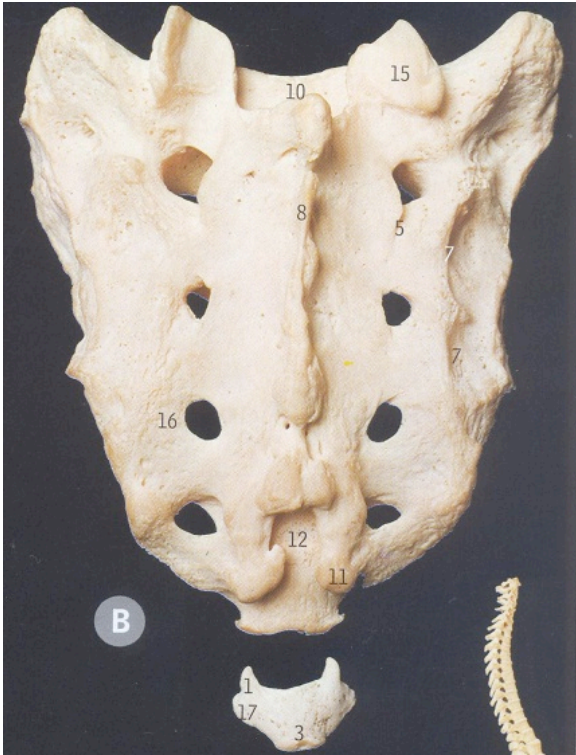
Ischium

<i>It`s the inferior and posterior part</i>	
Anterior and posterior	<ul style="list-style-type: none"> • Ischial spine(14) • Ischial tuberosity (15) • Greater sciatic notch(9) • Lesser sciatic notch(17) • Ischial ramus (25)

Pubis

<i>The anterior part of the hip bone</i>	
Features	<ul style="list-style-type: none"> ▪ Body : <li style="padding-left: 20px;">- pubic crest (21) <li style="padding-left: 20px;">- pubic tubercle (22) ▪ Superior rami (27) ▪ Inferior rami (13) ▪ Obturator foramen (19)

Sacrum



- Consist of five vertebrae fused together

Anteriorly (A)

- Sacral promontory (9).

Posteriorly (B)

- Sacral canal (10)
- Sacral hiatus (12)

COCCYX

- It consist of 4 vertebrae fused together forming a single triangular piece .

