General Anatomy

Lecture 3: Mandible & Vertebral Column

Dr. Mohamed Fathi Elrefai

Ass. Professor of Anatomy & Embryology

mohamed@hu.edu.jo

Mandible

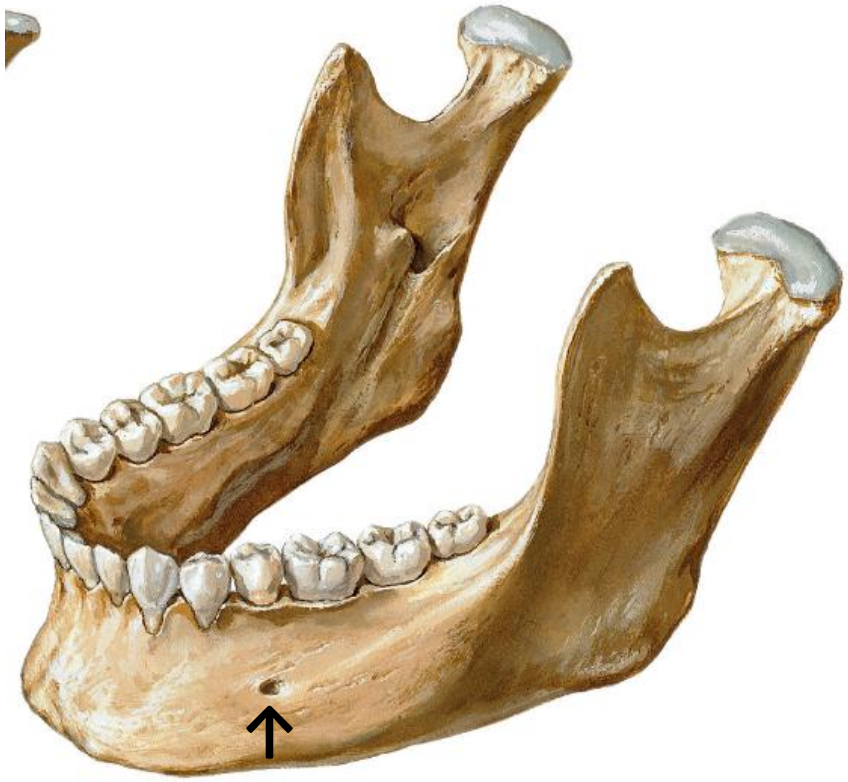
** Is formed of two bones, (right and left) which unite at the symphysis menti after the frist year.

** The mandible is formed of a body and two rami.

A. The body

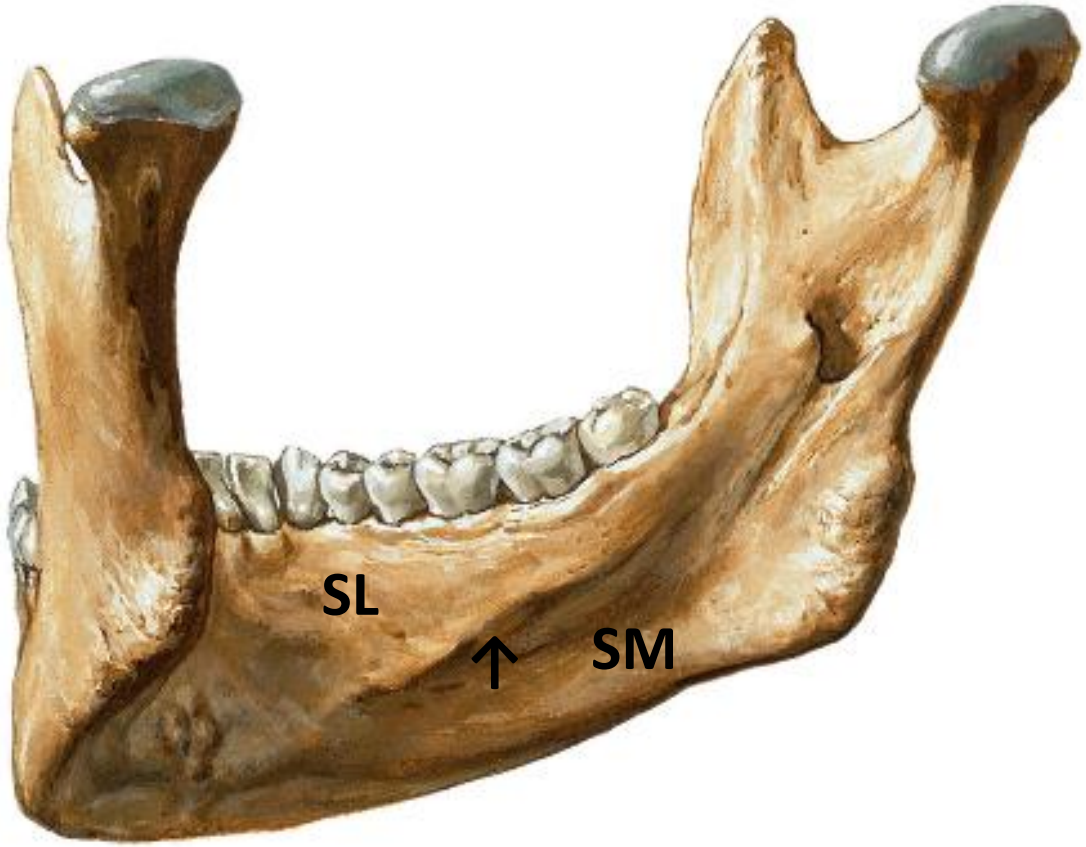
* **External surface:**

* **The mental foramen** lies midway between upper & lower borders, below 2nd premolar tooth.



* Internal surface :

- It shows the mylohyoid line (↑).
- Below this line is the submandibular fossa (SM), while above this line is the sublingual fossa (SL).



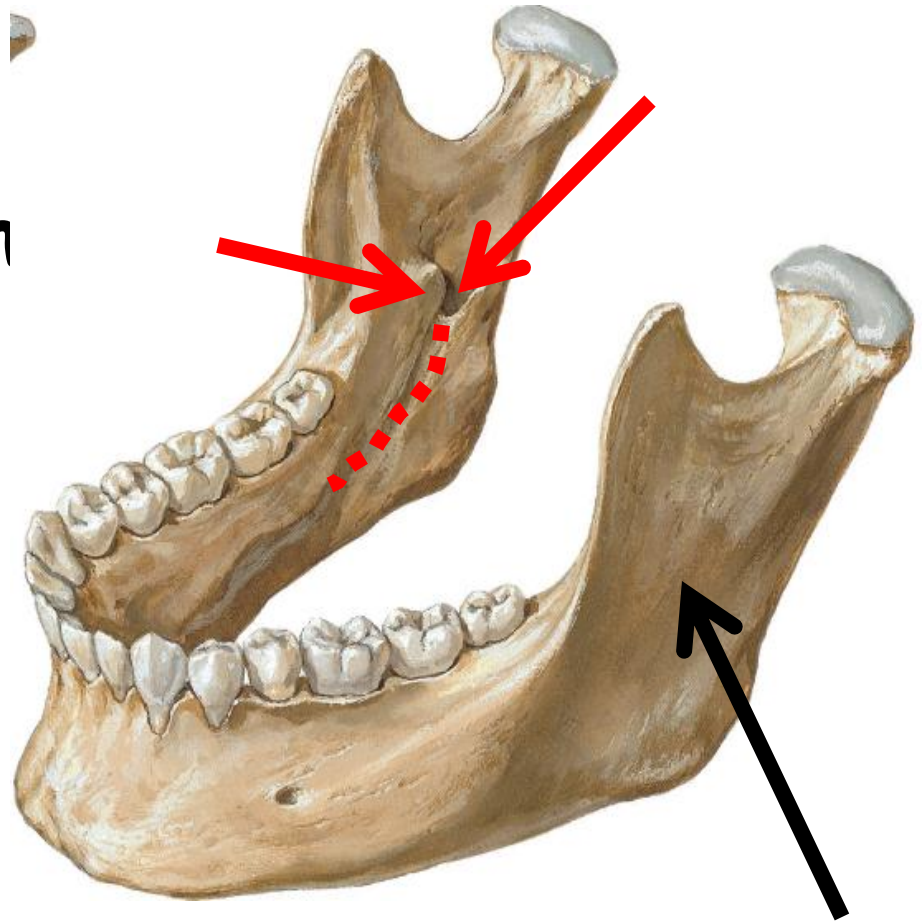
B. Ramus of mandible

* It has two surfaces.

1. The medial surface: shows the mandibular foramen which leads to mandibular canal.

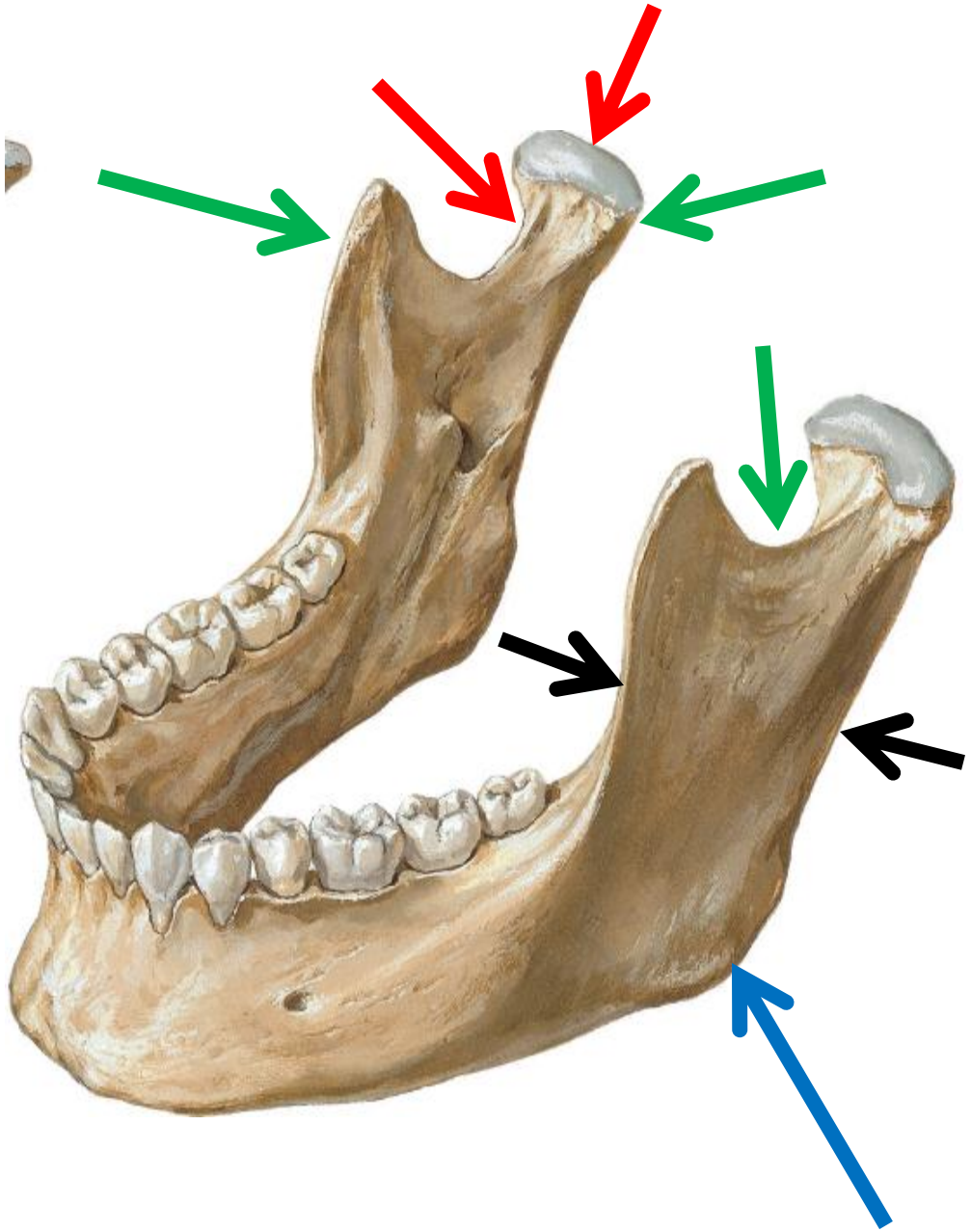
- Projecting over the foramen is the lingula .
- The mylohyoid groove starts at the lower border of the foramen.

2. The lateral surface: is flat

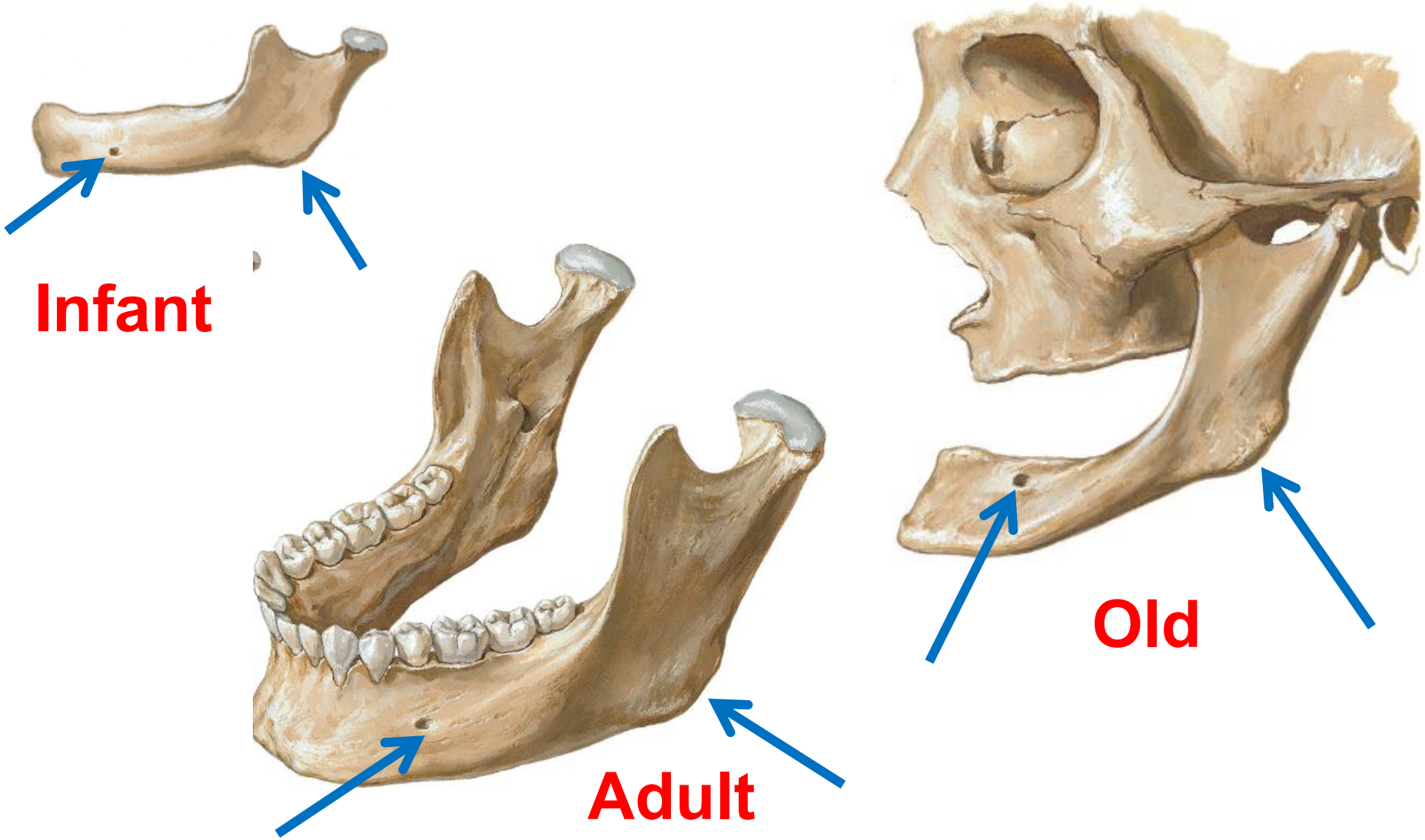


** Upper border:

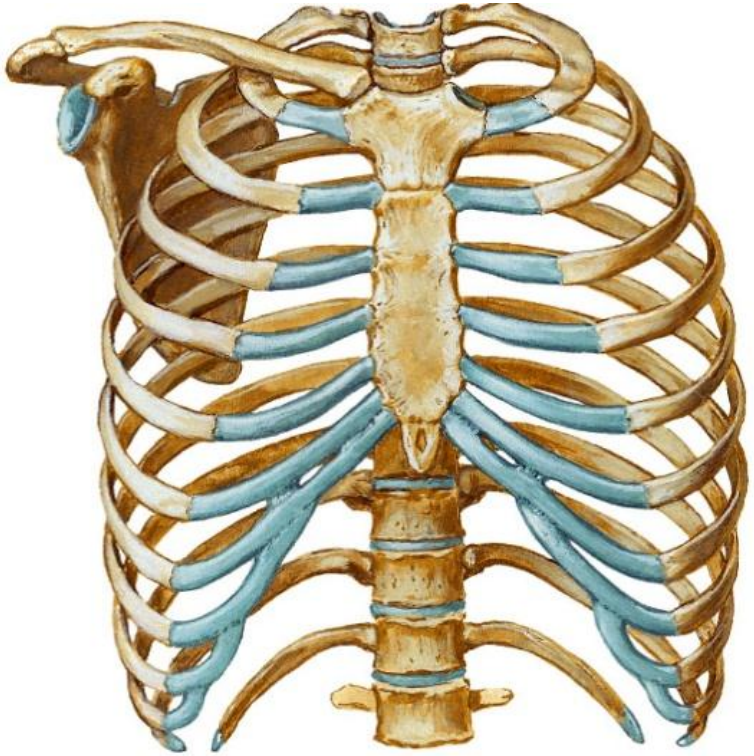
- Shows two process coronoid anteriorly and condylar process posteriorly and in between the mandibular notch.
- The condylar process is expanded to form the head of the mandible.
- The constricted area below the head is the neck.
- Angle of the mandible is the area of meeting of body and the ramus .

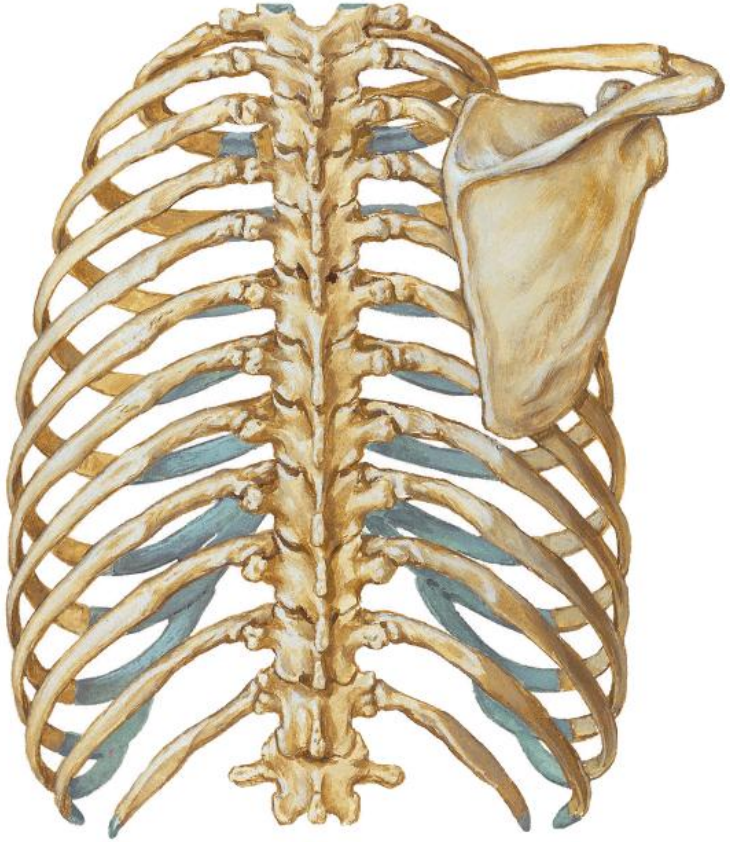


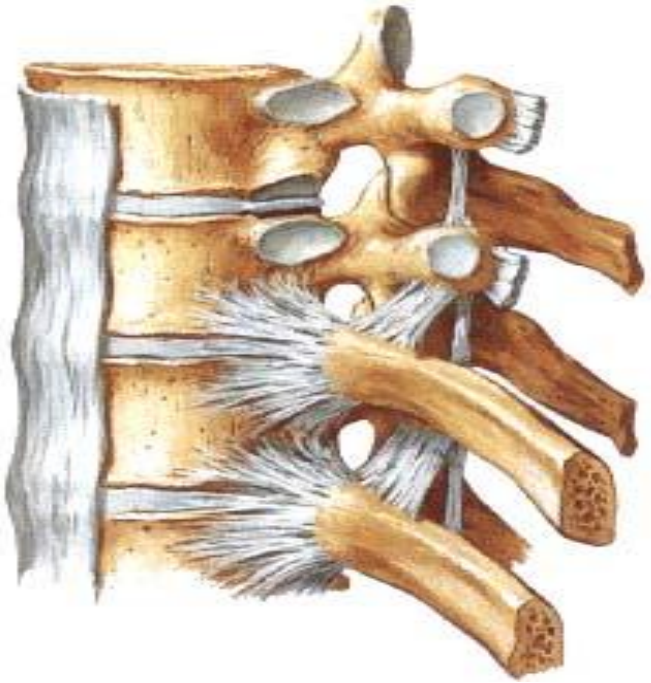
Age changes of the mandible



* **The vertebral column:** is formed of a series of bones called vertebrae (which are 33 vertebrae).
* The vertebrae articulate together by cartilagenous intervertebral discs.





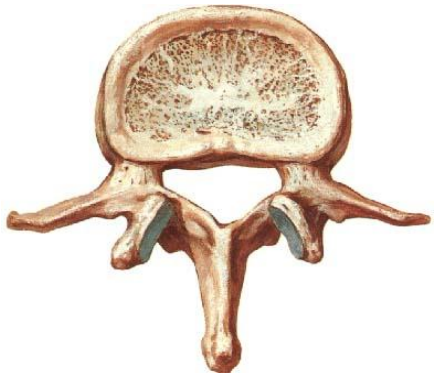


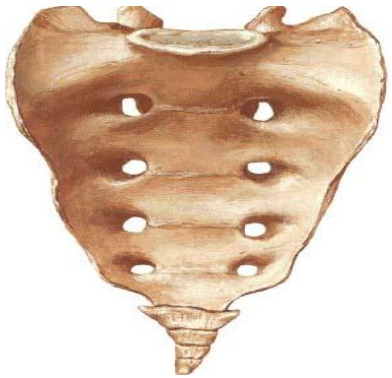
* **The column is divided into 5 regions:**

  7 cervical - 12 thoracic - 5 lumbar - 5 sacral (fused to form the sacrum) - 4 coccygeal (fused to form the coccyx).

* **The vertebral column:**

1. Forms the axial skeleton of the body.
2. Supports the weight of the body.
3. Protects & surrounds the spinal cord.





** **Curves of vertebral column**:

* **Primary curve**: The vertebral column is concave anteriorly at birth.

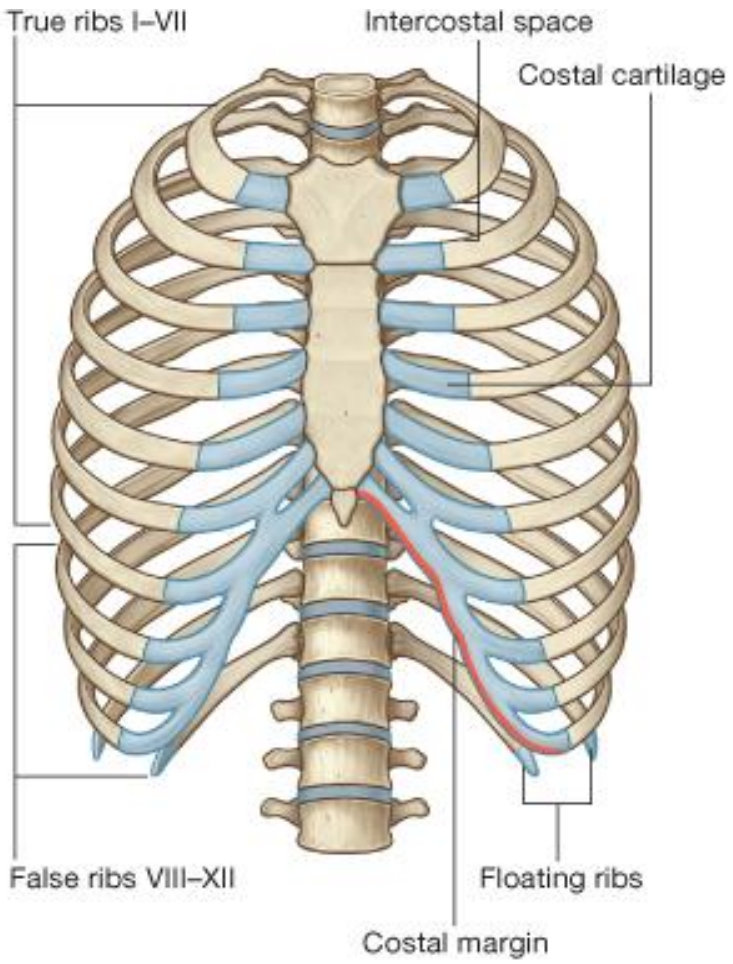
* **Secondary curves**:

(a) The cervical curve: becomes convex anteriorly when the child extends his head at the 3rd - 4th month.

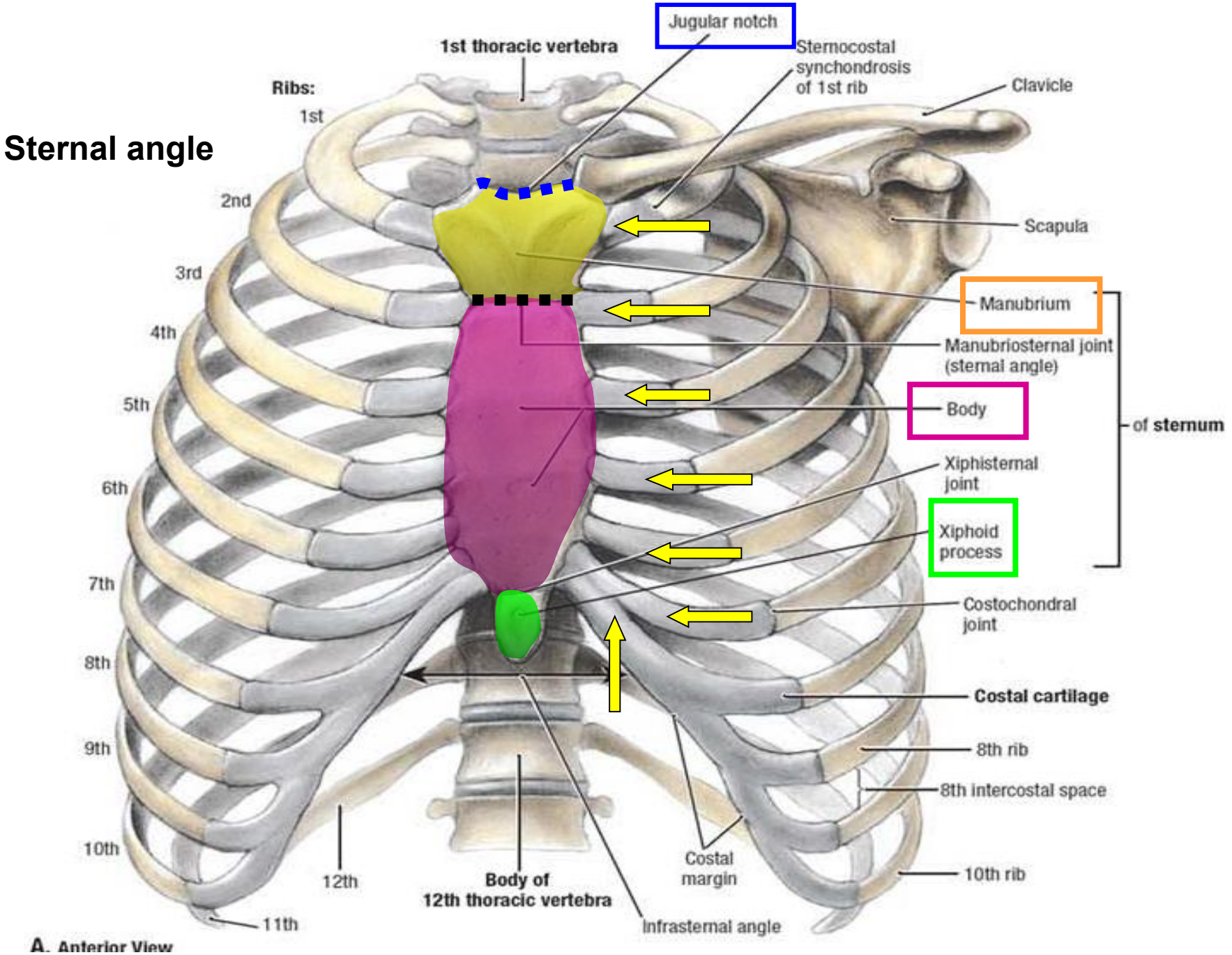
(b) The lumbar curve: becomes convex anteriorly when the child begins to walk between 12-18 months due to strengthening of the muscles of the back.

Thoracic cage

- **Formed of:**
- **Anteriorly**→ sternum (manubrium, body & xiphoid process). It is joined to the upper 7 costal cartilages.
- **On each side**→ 12 pairs of ribs separated by **intercostal spaces.**
- **Posteriorly**→ 12 thoracic vertebrae.



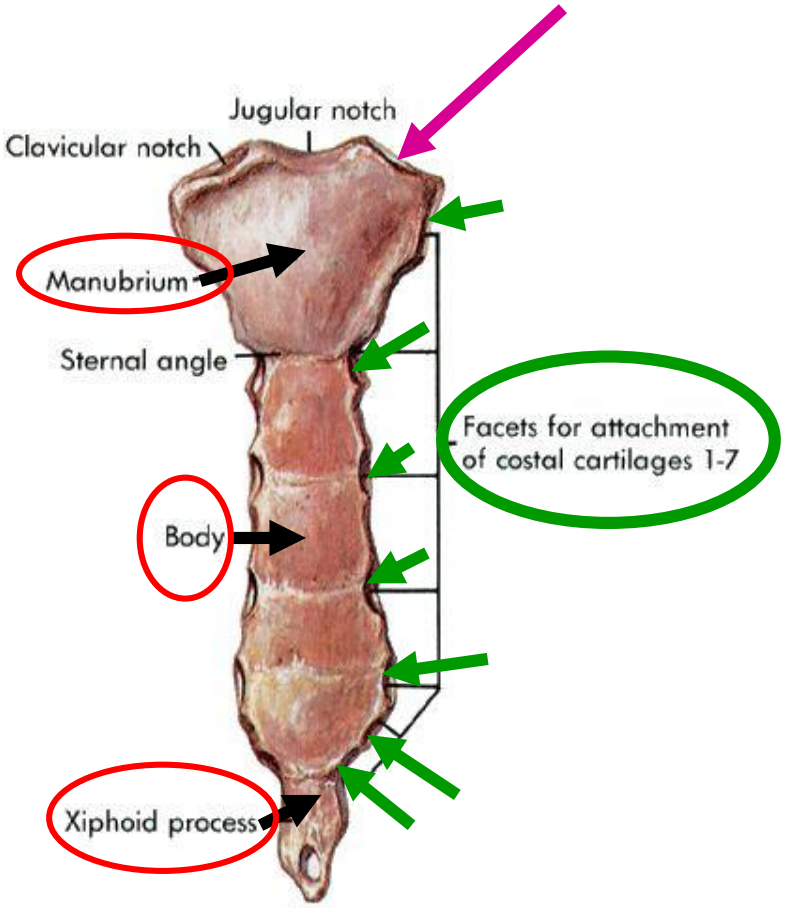
Sternal angle



A. Anterior View

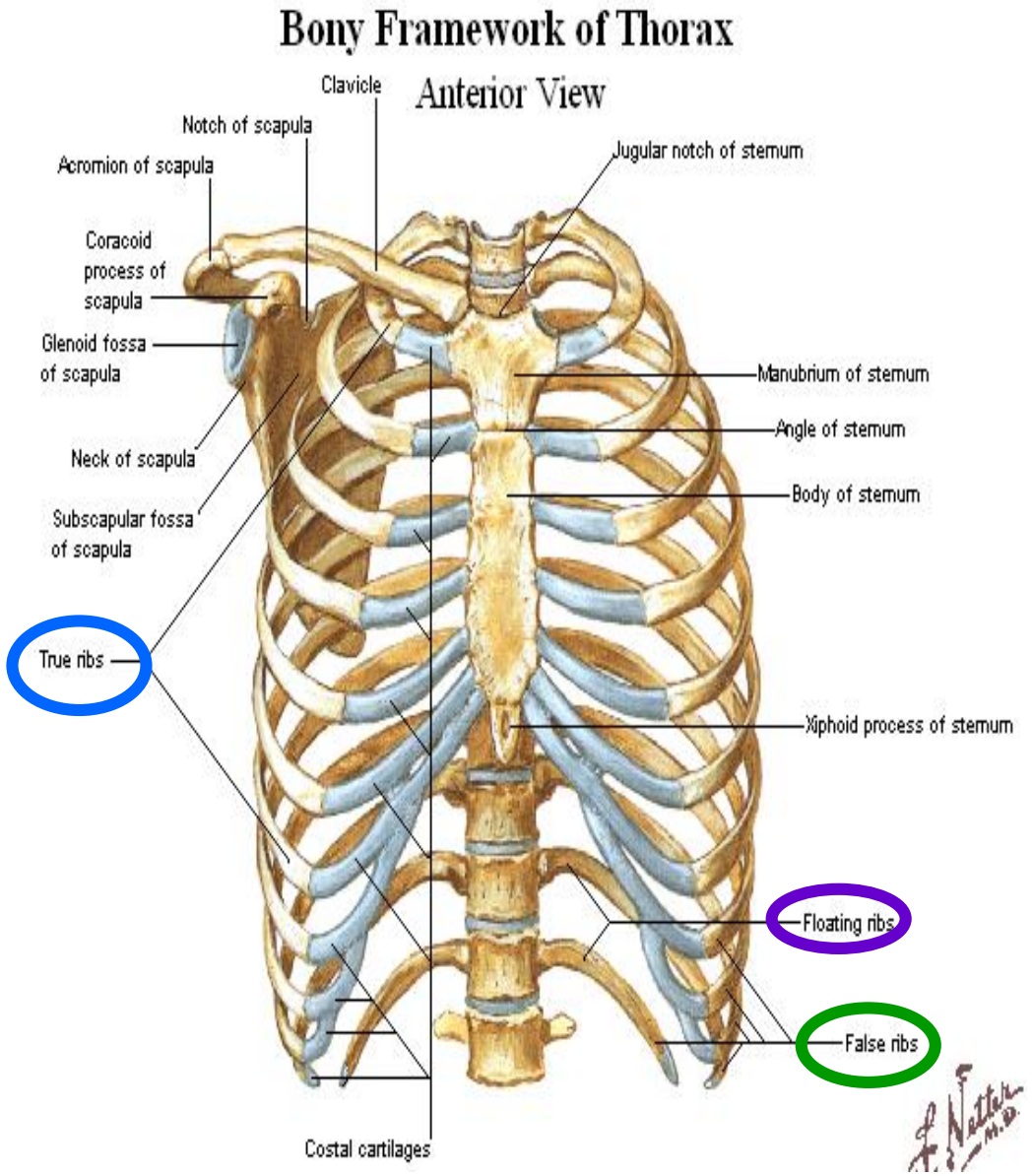
The Sternum

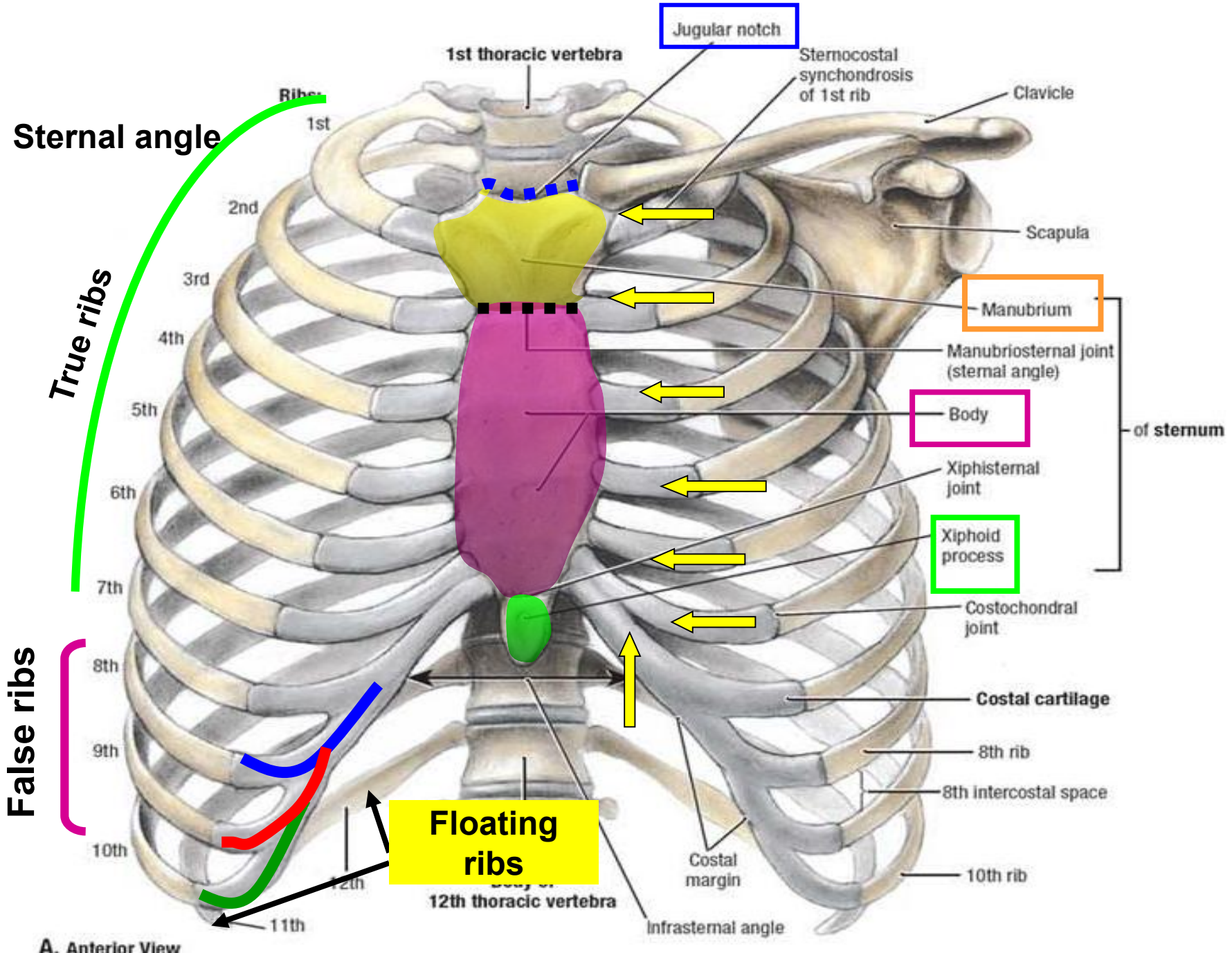
- **Formed of** 3 parts → manubrium, body & xiphoid process.
- **Articulates with** → clavicles & upper 7 costal cartilages.



The Ribs

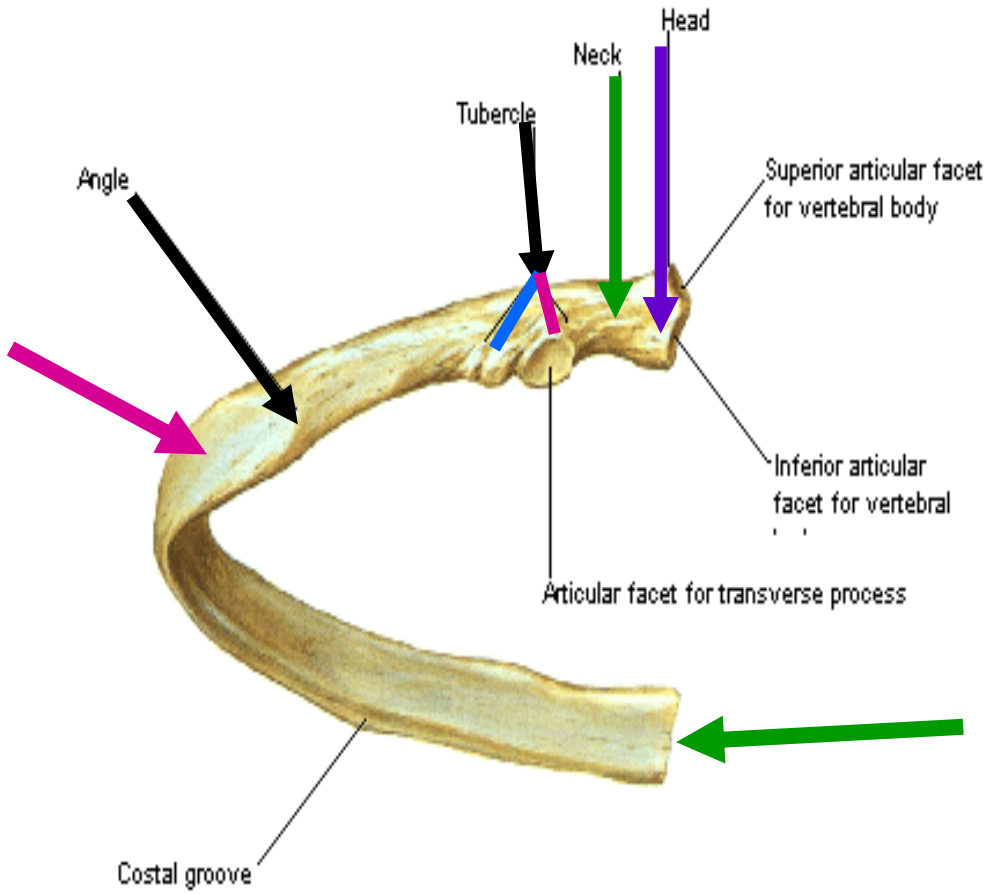
- 12 pairs of ribs articulate with the thoracic vertebrae.
- Upper seven are true ribs as each articulates by its costal cartilage to the sternum.
- Lower five are false ribs as their costal cartilages fail to reach the sternum.
- Last two are called floating ribs as their costal cartilages are free.




Sternal angle
True ribs
False ribs
Jugular notch
1st thoracic vertebra
Sternocostal synchondrosis of 1st rib
Clavicle
Ribs:
1st
2nd
3rd
4th
5th
6th
7th
8th
9th
10th
11th
Scapula
Manubrium
Manubriosternal joint (sternal angle)
Body
of sternum
Xiphisternal joint
Xiphoid process
Costochondral joint
Costal cartilage
8th rib
8th intercostal space
10th rib
Floating ribs
Costal margin
12th thoracic vertebra
Infrasternal angle
A. Anterior View

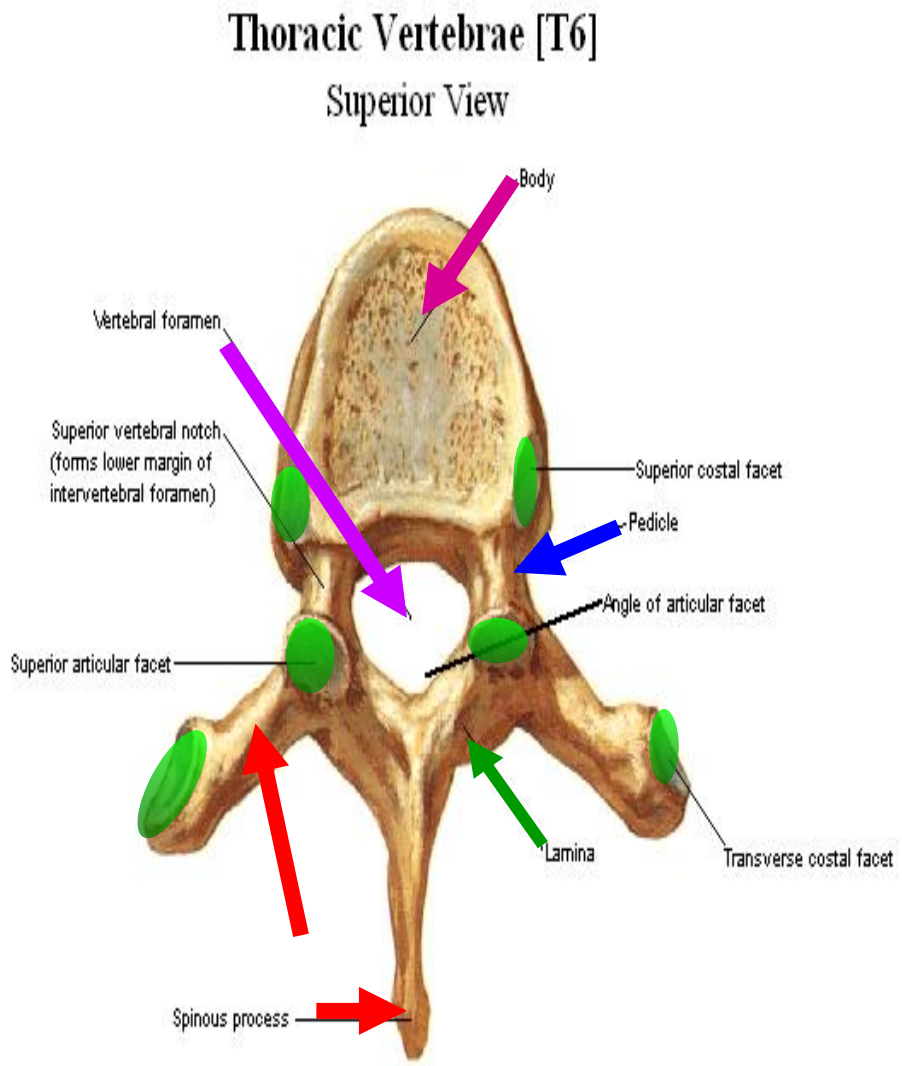
Parts of a typical rib

- **Vertebral end →** head, neck & tubercle
- **Shaft**
- **Sternal end →** groove for attachment of costal cartilage.



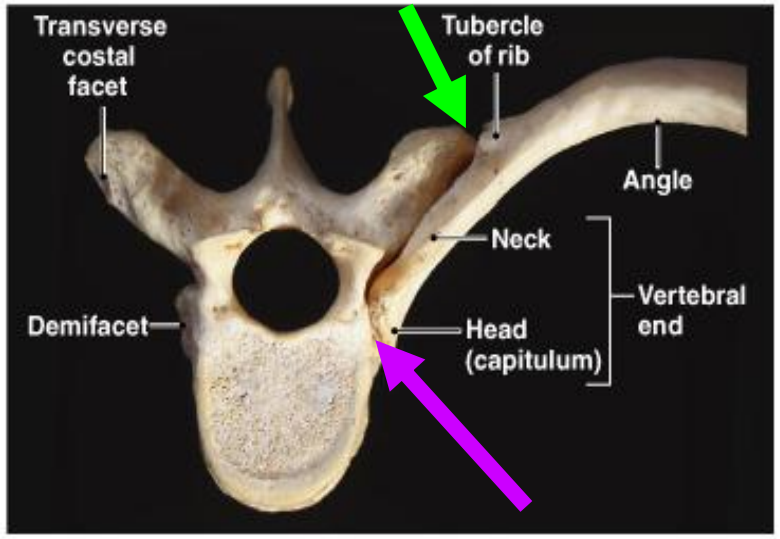
The Thoracic Vertebrae

* 12 in number
* Each is formed of :
- Body
- Pedicle
- Transverse process
- Lamina
- Spine
- Vertebral foramen
- Articular facets

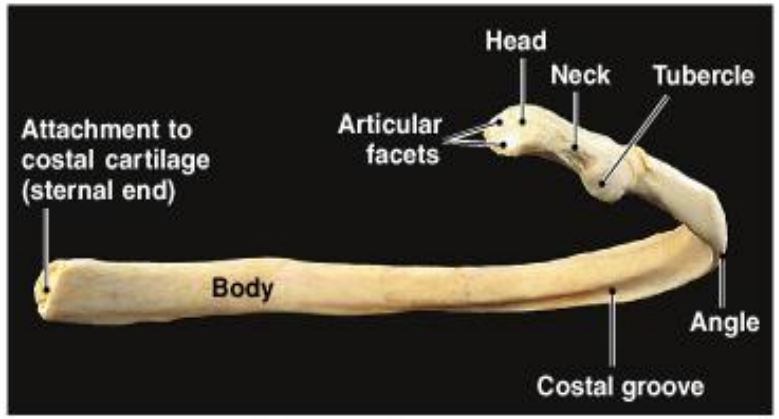


Articulation of vertebra to rib

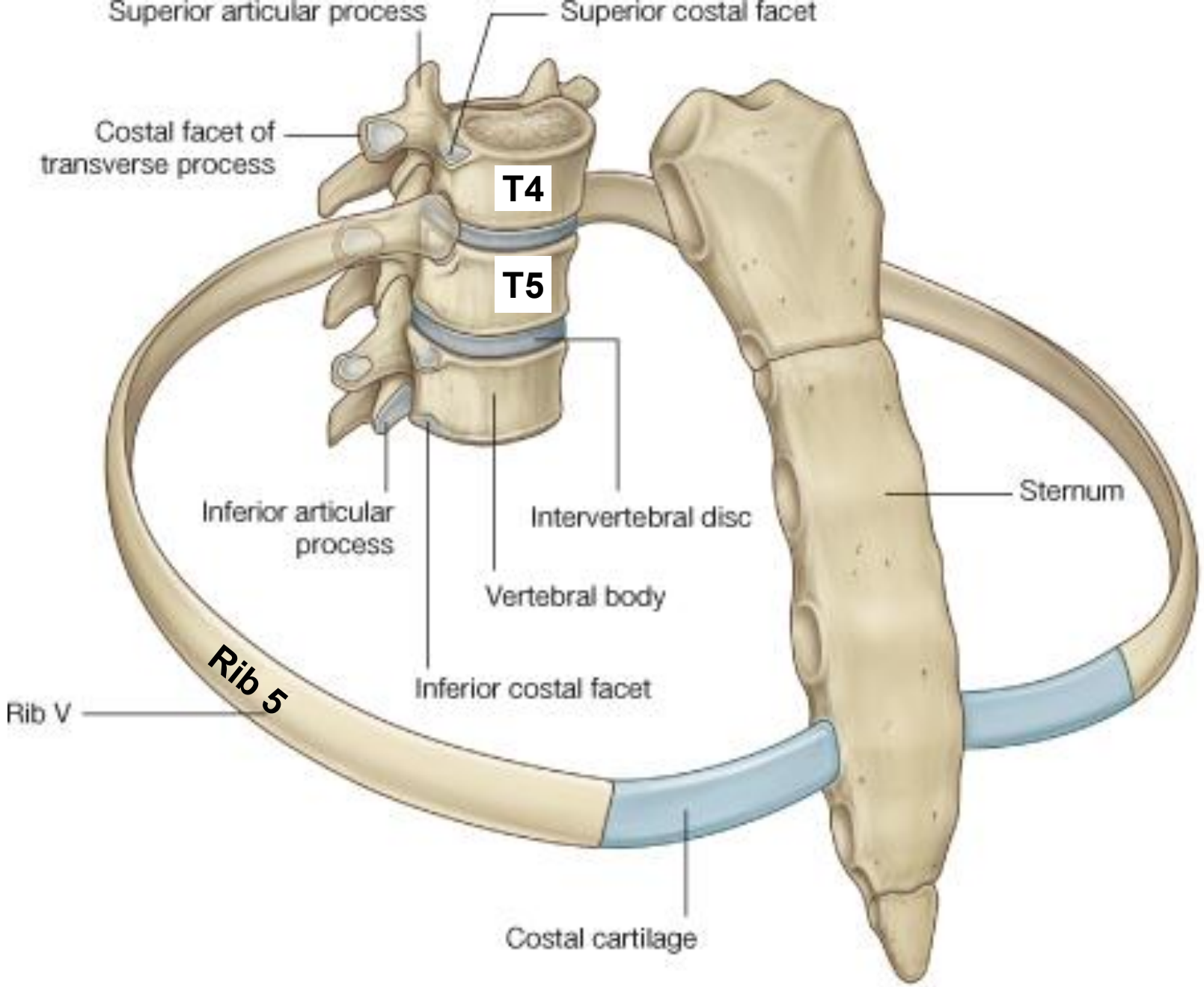
- Head of rib articulates with Body of vertebra
- Tubercle of rib articulates with Transverse process of vertebra



(a) Superior view



(b) Posterior view


Superior articular process
Superior costal facet
Costal facet of transverse process
T4
T5
Inferior articular process
Intervertebral disc
Sternum
Vertebral body
Rib 5
Inferior costal facet
Rib V
Costal cartilage

Cervical Vertebrae

Atlas = 1st Cervical Vertebra

* Articulates with skull above & axis below.
* Formed of 2 lateral masses connected by anterior & posterior arches.
* Its transverse process shows a foramen transversarium.

Axis = 2nd Cervical Vertebra

* Articulates with atlas above & 3rd cervical vertebra below.
* It has a well-defined process called dens.
* Its transverse process shows a foramen transversarium.

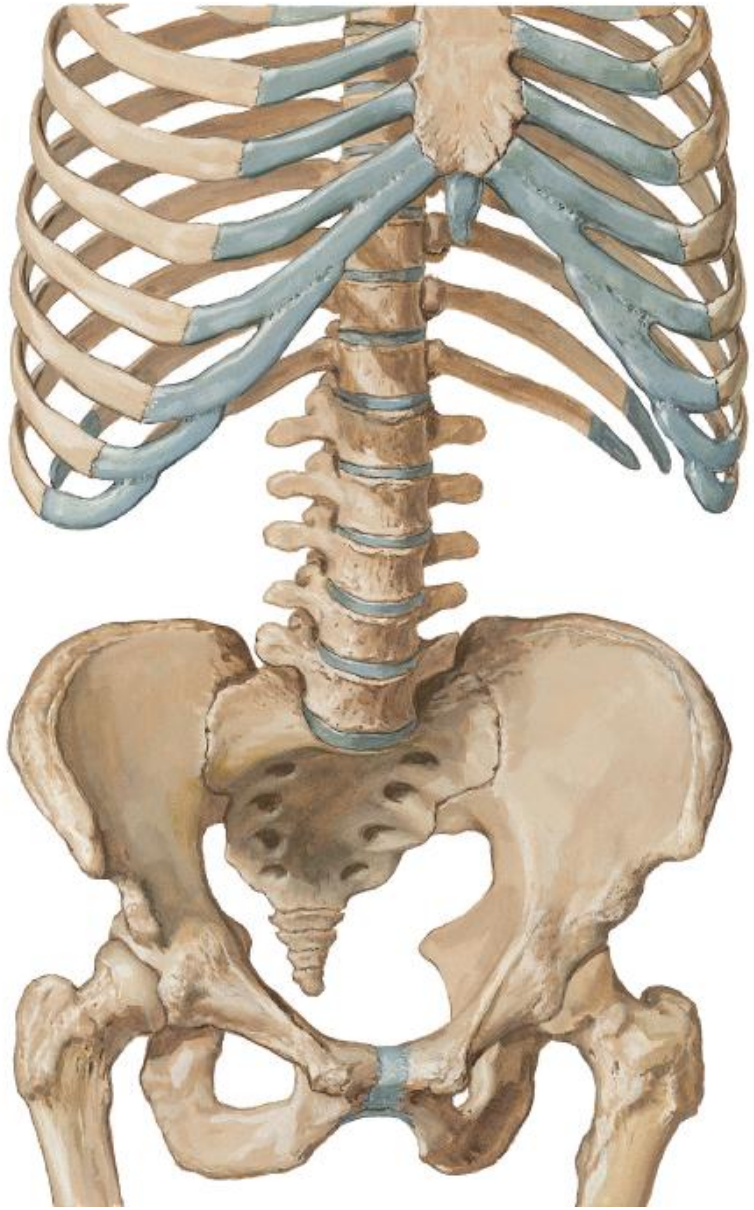
Typical Cervical Vertebra (3-6)

* Its spine is bifid.
* Its transverse process shows a foramen transversarium.

7th Cervical Vertebra

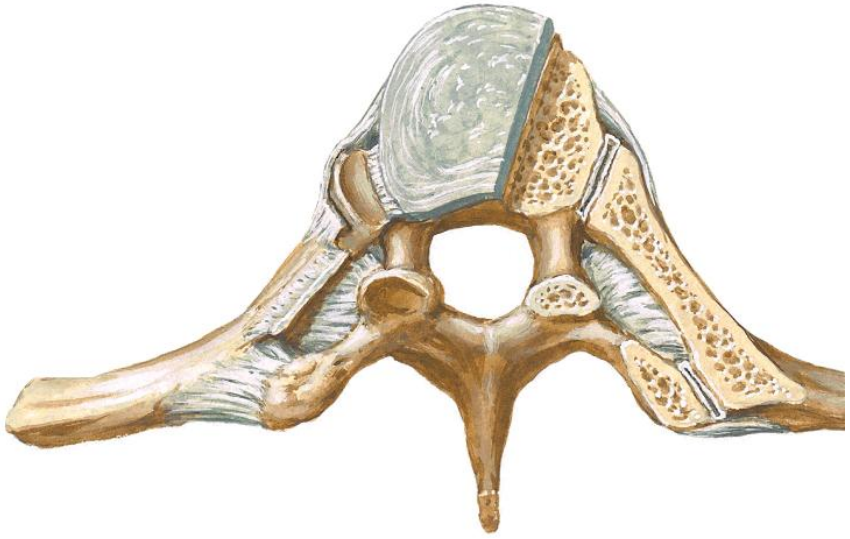
* Its spine is long & not bifid.
* Its transverse process shows a foramen transversarium.

- **The lumbar vertebrae** are the largest vertebrae in the body.
- No foramina transverseria in transverse processes & no bifid spines.
- **The sacrum** is a single triangular bone that is formed by fused 5 sacral vertebrae.
- The sacrum articulates with the 5th lumbar vertebra above & with the hip bones on each side.



Intervertebral Disc

* Each 2 vertebrae are separated from each other by an intervertebral (IV) disc.
* The IV disc is considered as a 2ry cartilaginous joint.
* It is formed of white fibrocartilage (which is the hardest type of cartilage).
* It is formed of 2 parts:
    a. An inner part called nucleus pulposus.
    b. An outer peripheral part called annulus fibrosus.
* Its dislocation (called disc prolapse) causes a compression of one of the adjacent spinal nerves leading to severe pain.

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