

الكلية : كلية الطب

القسم او الفرع : التشريح البشري

المرحلة: الاولى

أستاذ المادة : مهند سهيل نجم

اسم المادة باللغة العربية : التشريح

اسم المادة باللغة الإنكليزية : **anatomy**

اسم المحاضرة الأولى باللغة العربية: تشريح منطقة الصدر

اسم المحاضرة الأولى باللغة الإنكليزية : **Thorax Anatomy**

Thoracic Cage

Dr. mohanad suhail najm

The chest

The chest: is the region of the body between the neck and the abdomen.

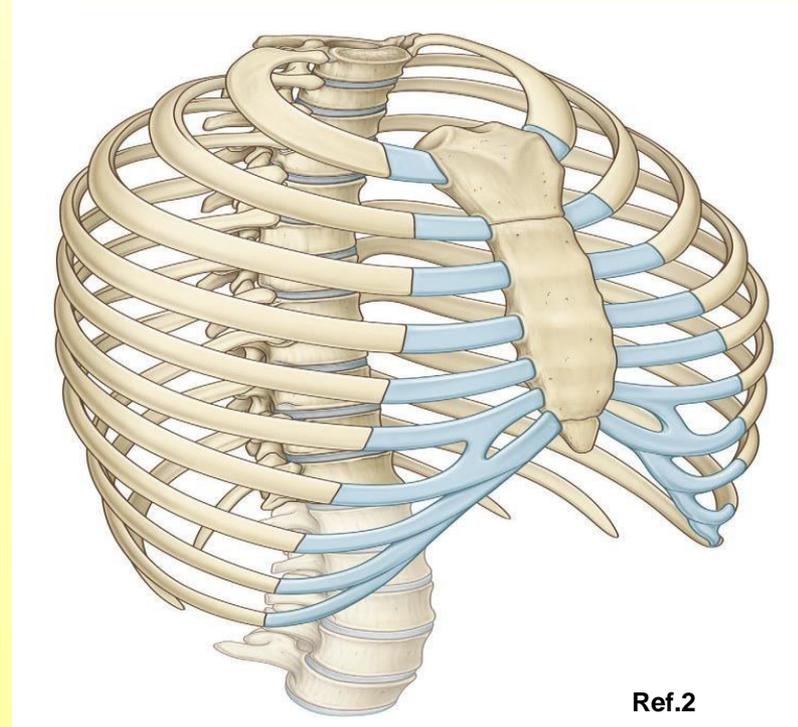
- It is flattened in front and behind but rounded at the sides.
- The skeletal framework of the thoracic walls is referred to as the **thoracic cage**.

The thoracic cavity

enclosed by the thoracic wall and the diaphragm .

is subdivided into three major compartments:

- a left and a right pleural cavity, each surrounding a lung, and
- the mediastinum



Thoracic Cage

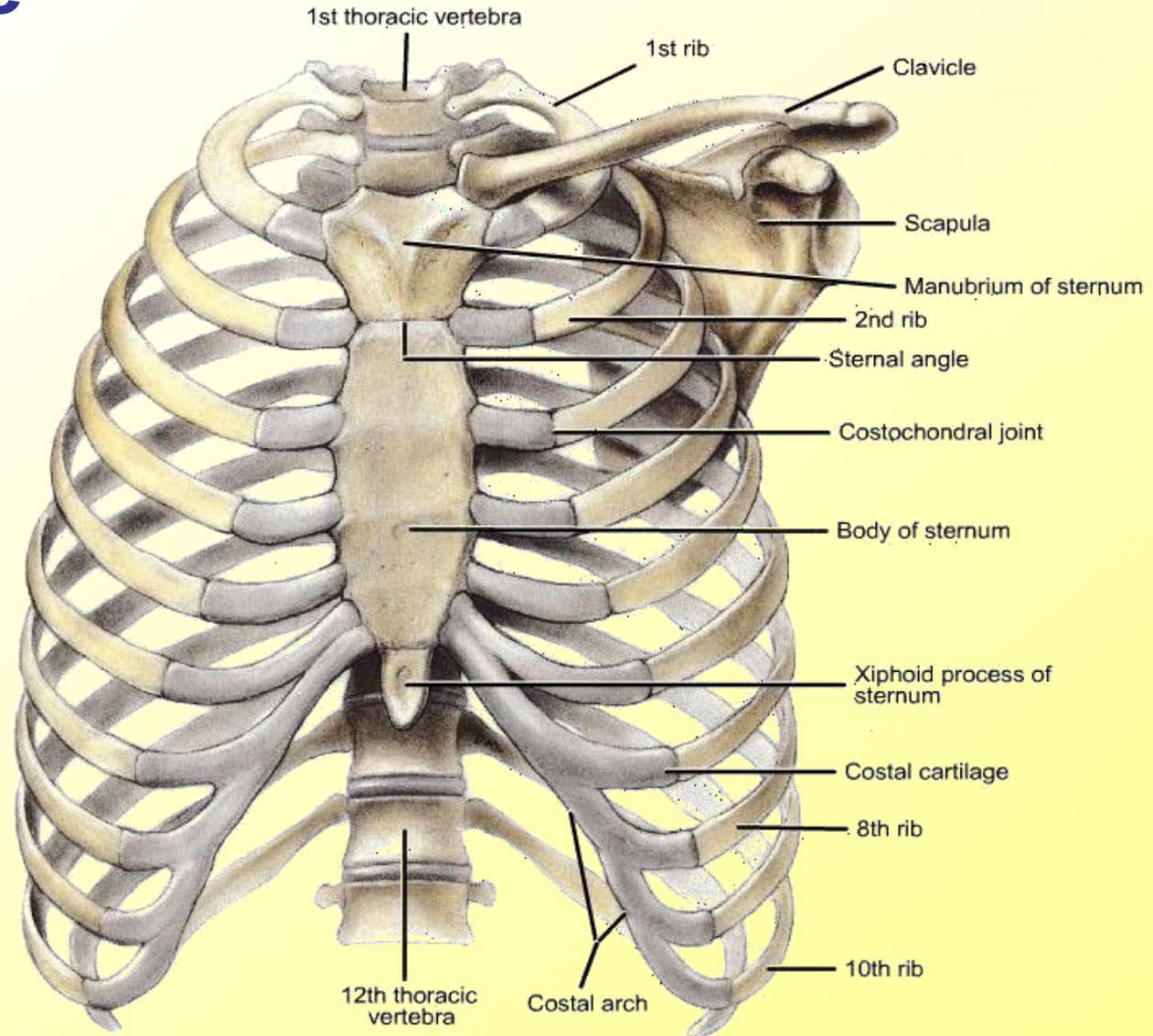
A- Sternum

1. Manubrium
2. Body
3. Xiphoid process

B -Ribs

1. True
2. False
3. Floating

C- Thoracic vertebrae



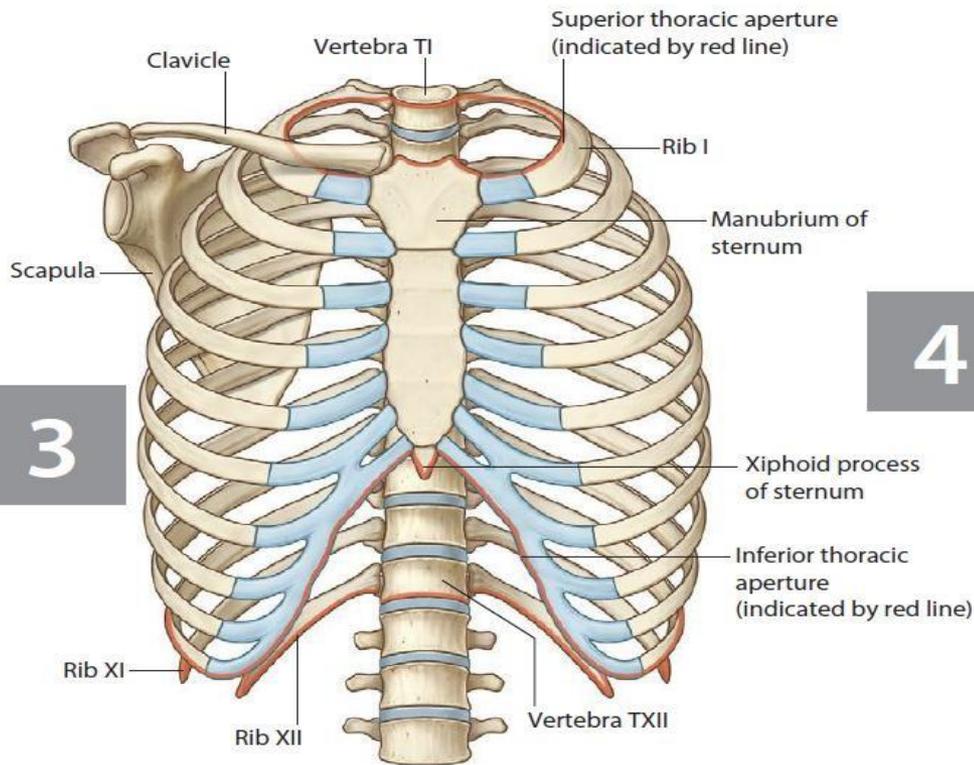
Thoracic Cage

- ❖ This is formed by the thoracic part of the
 - A. the sternum and costal cartilages anteriorly
 - B. ribs and intercostal spaces laterally on either side
 - C. vertebral column posteriorly

- ❖ Superiorly, the thorax communicates with the neck
- ❖ inferiorly, it is separated from the abdomen by the diaphragm.
- ❖ The thoracic cage protects the lungs and heart.
- ❖ provides attachment for the muscles of the thorax, upper extremity, abdomen, and back.

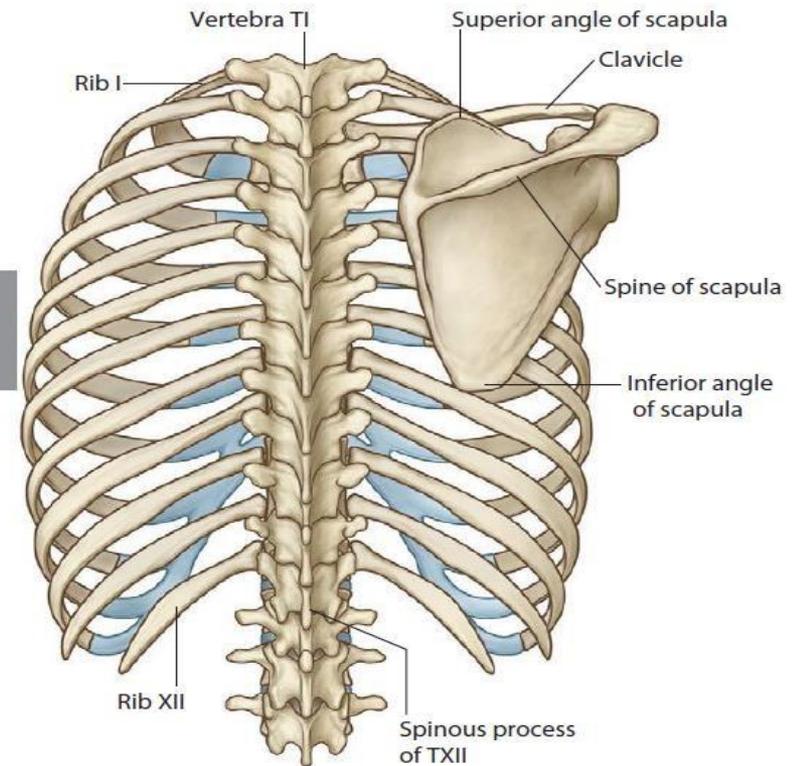
Thoracic Apertures

- ❖ Superior thoracic aperture
- ❖ Inferior thoracic aperture



Bony framework of thorax
(anterior view)

4

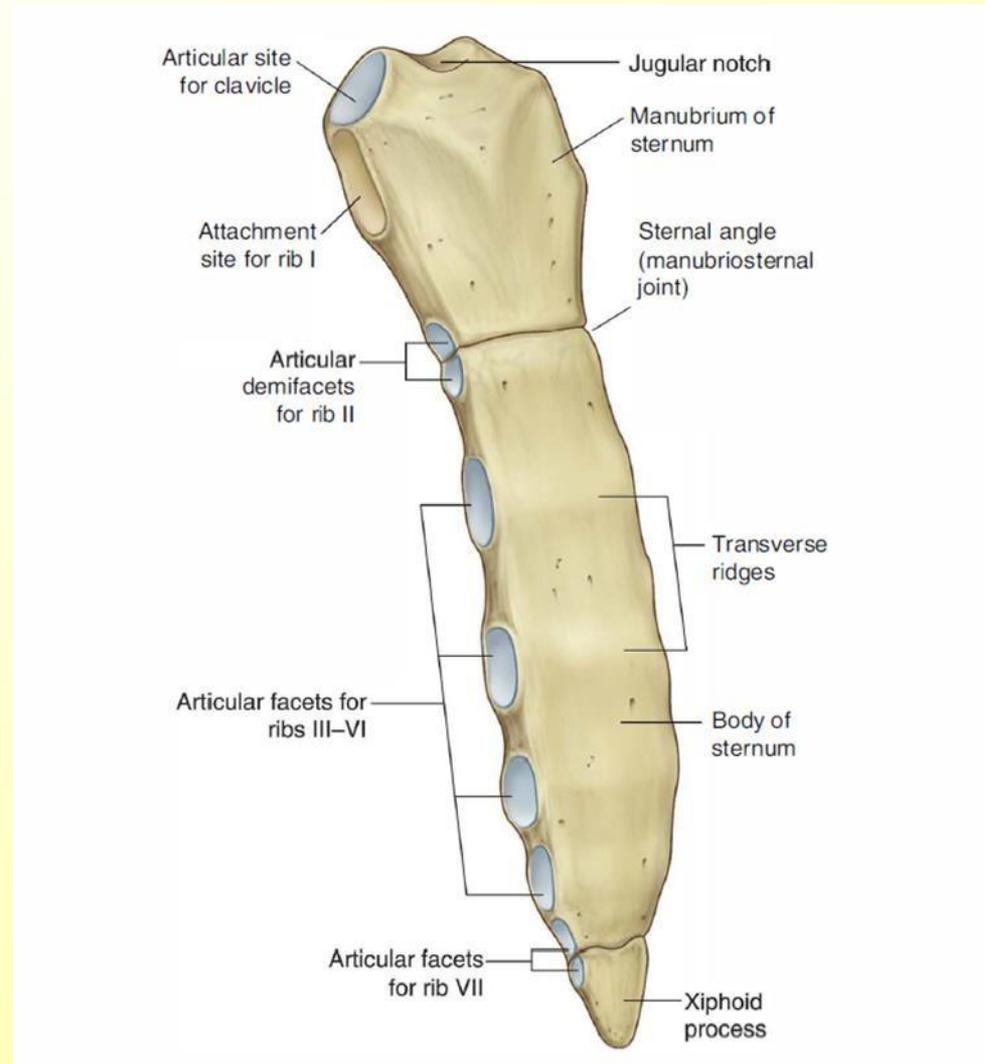


Bony framework of thorax
(posterior view)

Sternum

is the elongate, flat bone that lies in the midline of the anterior chest wall

1. Manubrium
2. Body
3. Xiphoid process



manubrium

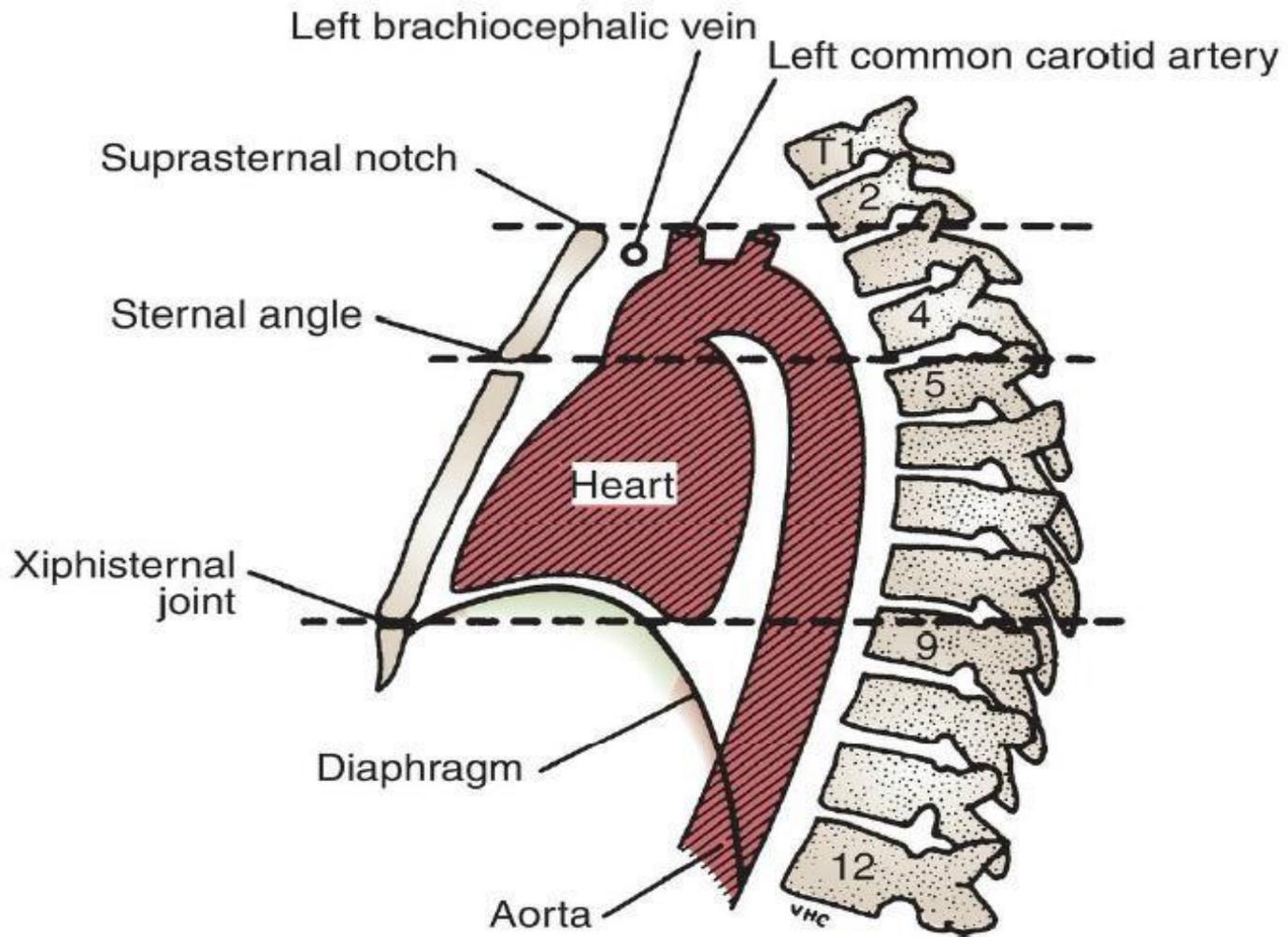
- is the upper part of the sternum.
- it articulates with the body of the sternum at the **manubriosternal joint**, and it also articulates with the **clavicles** and with the **first costal cartilage** and the upper part of the **second costal cartilage** on each side.
- **The suprasternal** (jugular) notch is the easily palpable, concave notch on the superior border of the manubrium.
- **The clavicular notch** is an ovoid articular surface at each superolateral corner of the manubrium, on each side of the jugular notch.

angle of Louis

- The articulation of the manubrium with the body forms the sternal angle (angle of Louis)
- which can be recognized by the presence of a transverse ridge on the anterior aspect of the sternum .

The sternal angle landmark

- (1) the manubriosternal joint (a symphyseal joint),
- (2) the attachment points of the second costal cartilages .
- (3) a horizontal line that typically projects posteriorly onto the T4 intervertebral disc.
- (4) the plane of separation between the superior and inferior mediastina



The body

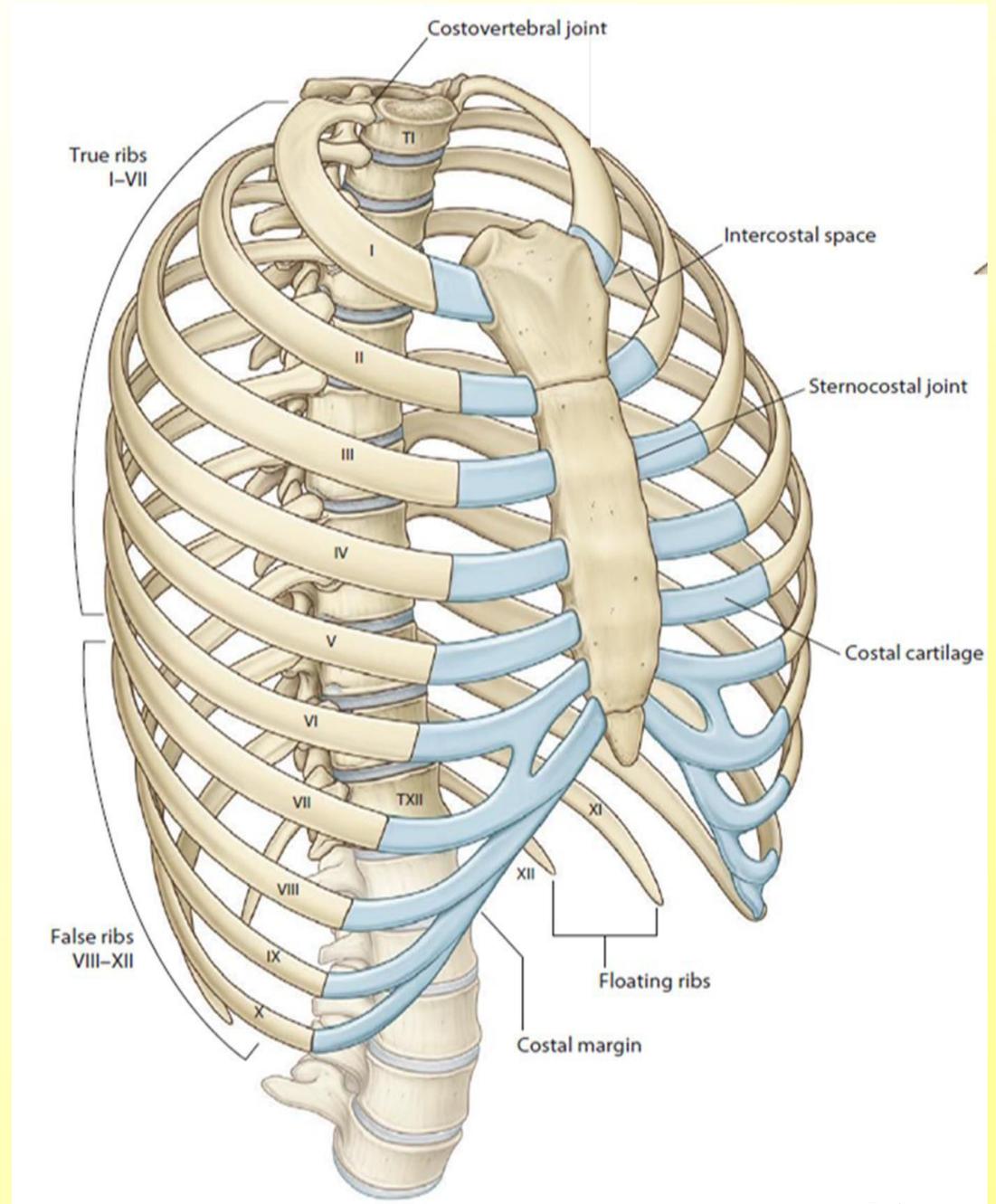
The body is the relatively long, middle part of the sternum. It articulates above with the manubrium at the manubriosternal joint and below with the xiphoid process at the xiphisternal joint. It articulates with the second to theseventh costal cartilages on each side

The xiphoid process

is the small, “pointed” (at its inferior end), most inferior part of the sternum

Ribs

- 1) True
- 2) False
- 3) Floating

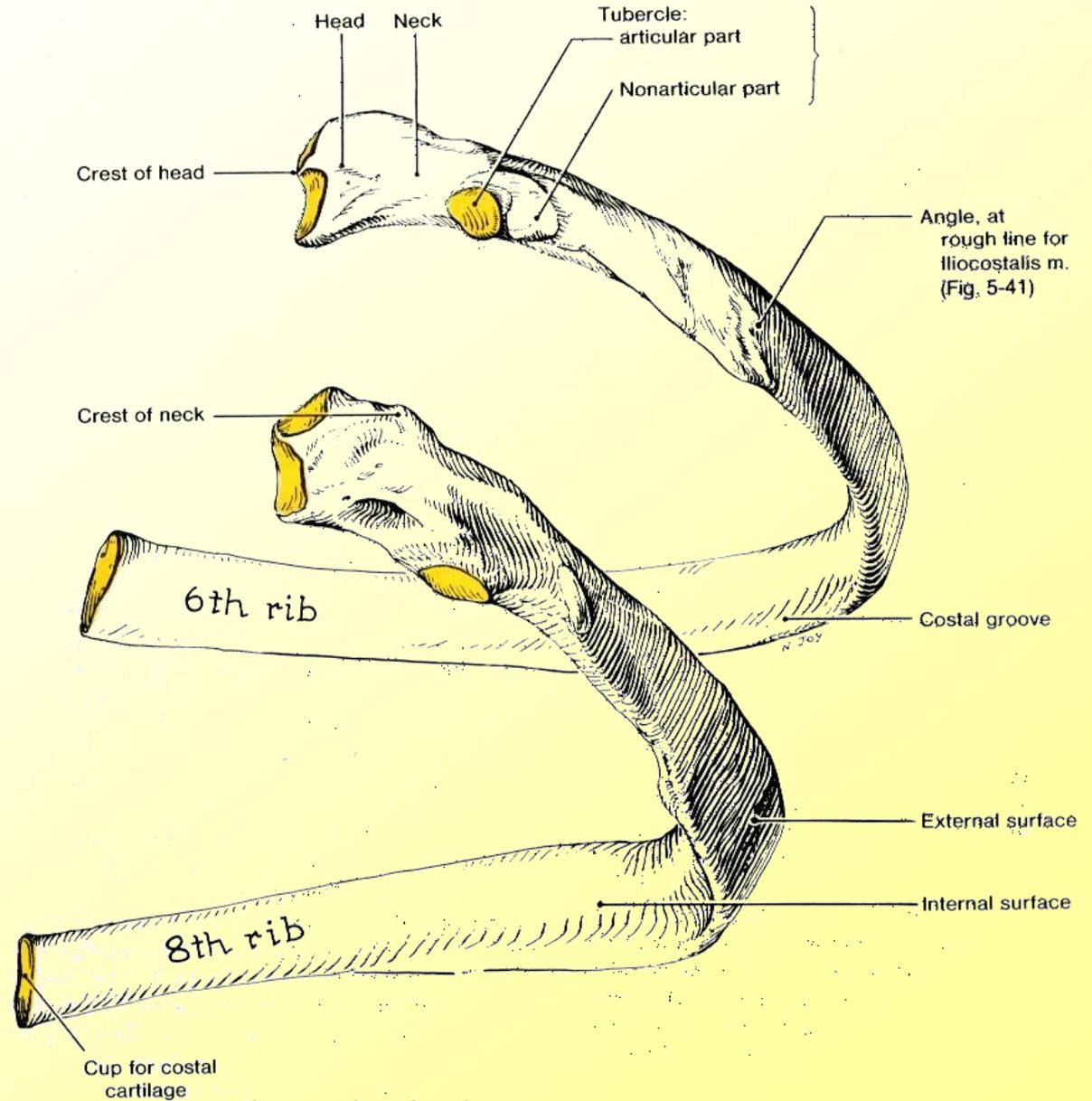


Ribs

- are the elongate, flattened, arched bones that form a large part of the thoracic wall
- Normally, both males and females have 12 pairs of ribs.
- The posterior end of each rib articulates with one or two thoracic vertebrae.
- There are three types of ribs that can be classified as **typical** or **atypical**
 1. **True ribs (pairs 1 to 7)** are connected directly to the sternum via individual costal cartilages.
 2. **False ribs (pairs 8 to 10)** are connected to the sternum via Individual costal cartilages that join together and attach collectively to the seventh costal cartilages.
 3. **Floating ribs (pairs 11 to 12)** do not attach to the sternum.

Typical Ribs

- 3rd – 9th ribs



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Typical Ribs

the typical rib is a long, twisted, flat bone having a rounded, smooth superior border and a sharp, thin inferior border

The anterior end of each rib is attached to the corresponding costal cartilage.

Rib has

➤ The head

Is the posterior (vertebral) end wedge-shaped and has **two facets**, separated by the **crest of the head**. one facet for articulation with the numerically corresponding vertebra, and one facet for the vertebra superior to it.

➤ **The neck** :is the flattened, situated between the head and the tubercle.

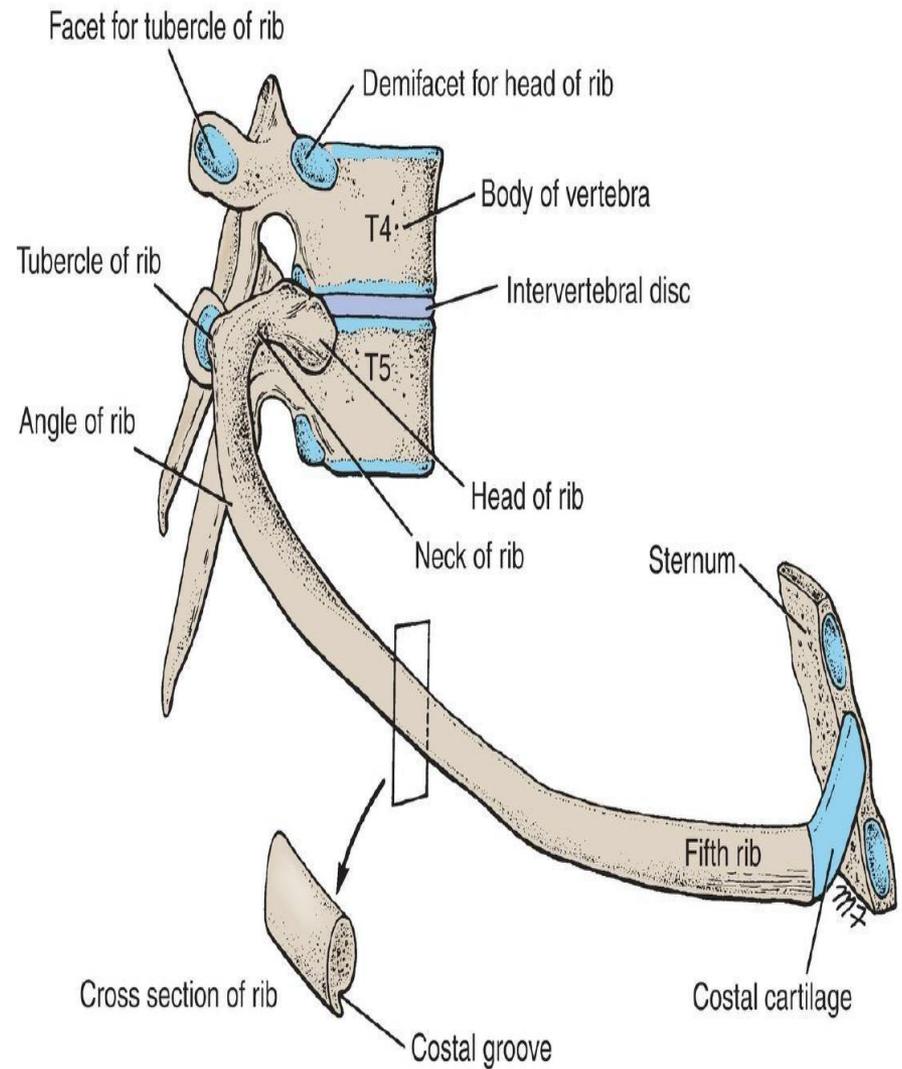
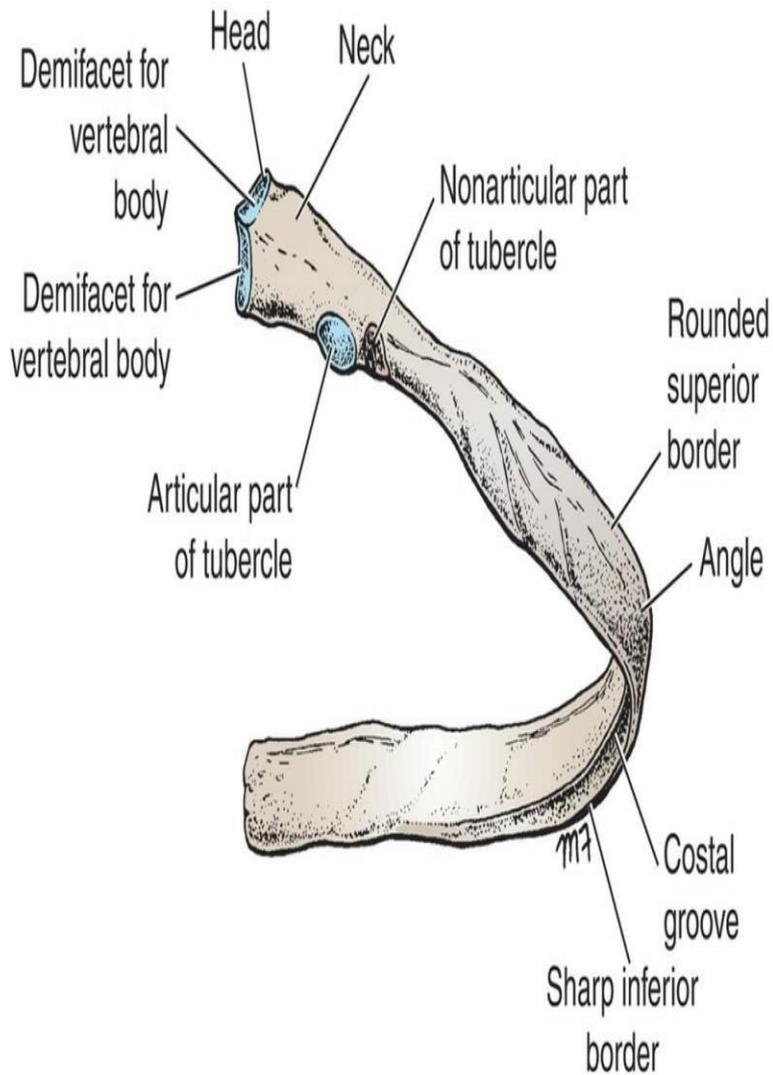
➤ **The tubercle** : located at the junction of the neck and body; **a smooth articular part** articulates with the corresponding transverse process of the vertebra, and **a rough nonarticular part** provides attachment for the costotransverse Ligament.

➤ **The body (shaft)**: is the long, thin, flattened, and twisted part that extends from the tubercle to the anterior (sternal) end.

➤ **The costal groove**: is the elongate depression along the inferior aspect of the internal surface of the shaft of the rib. This holds the intercostal vessels and nerve.

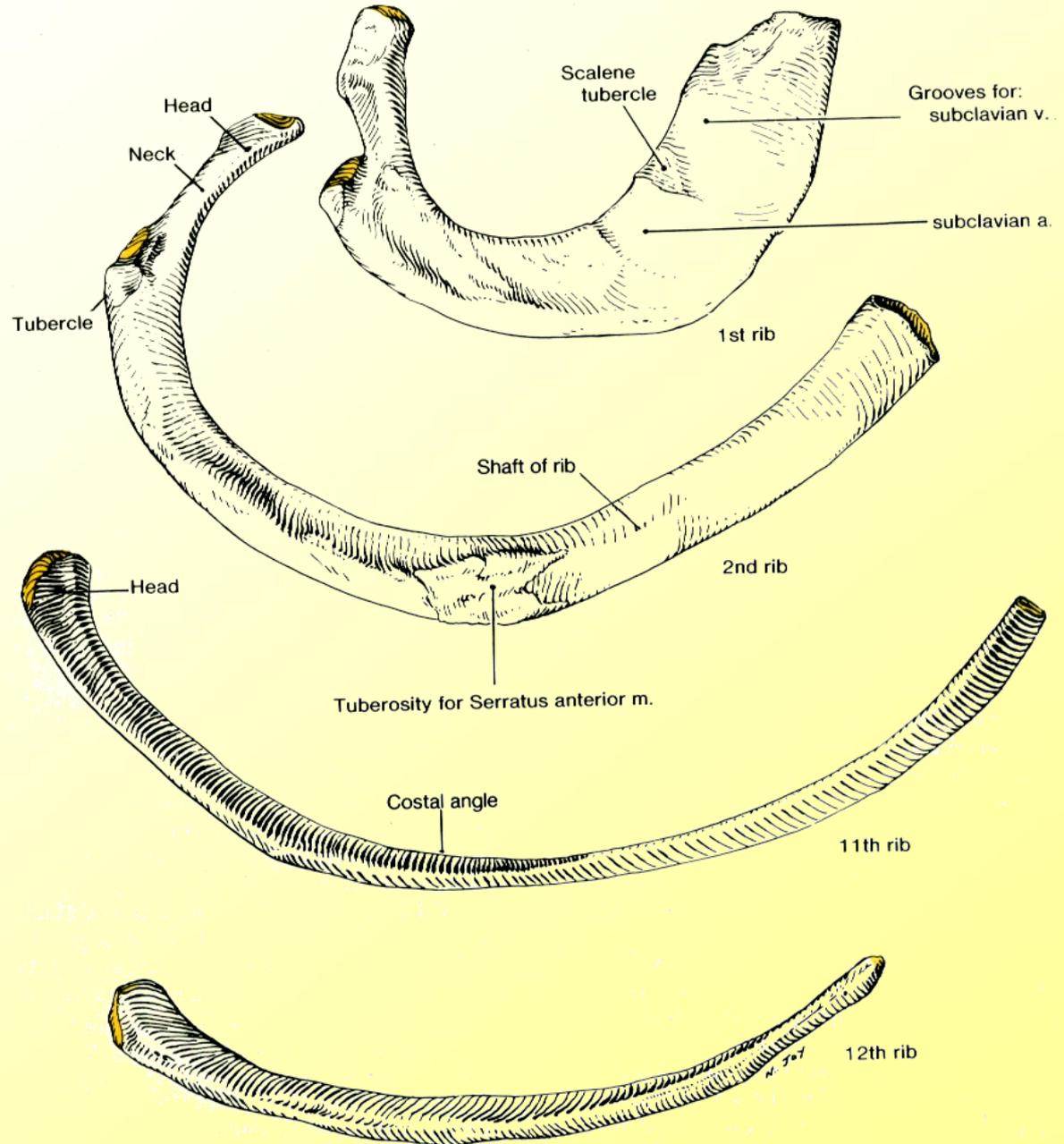
➤ **The angle**: is the point (usually slightly distal to the tubercle) at which the body of the rib bends sharply and turns from a lateral to a more anteriorly directed orientation.

➤ **The anterior (sternal) end**: of the rib is flat and has a depression for the costal cartilage.



Atypical Ribs

- 1st and 2nd
- 10th – 12th ribs

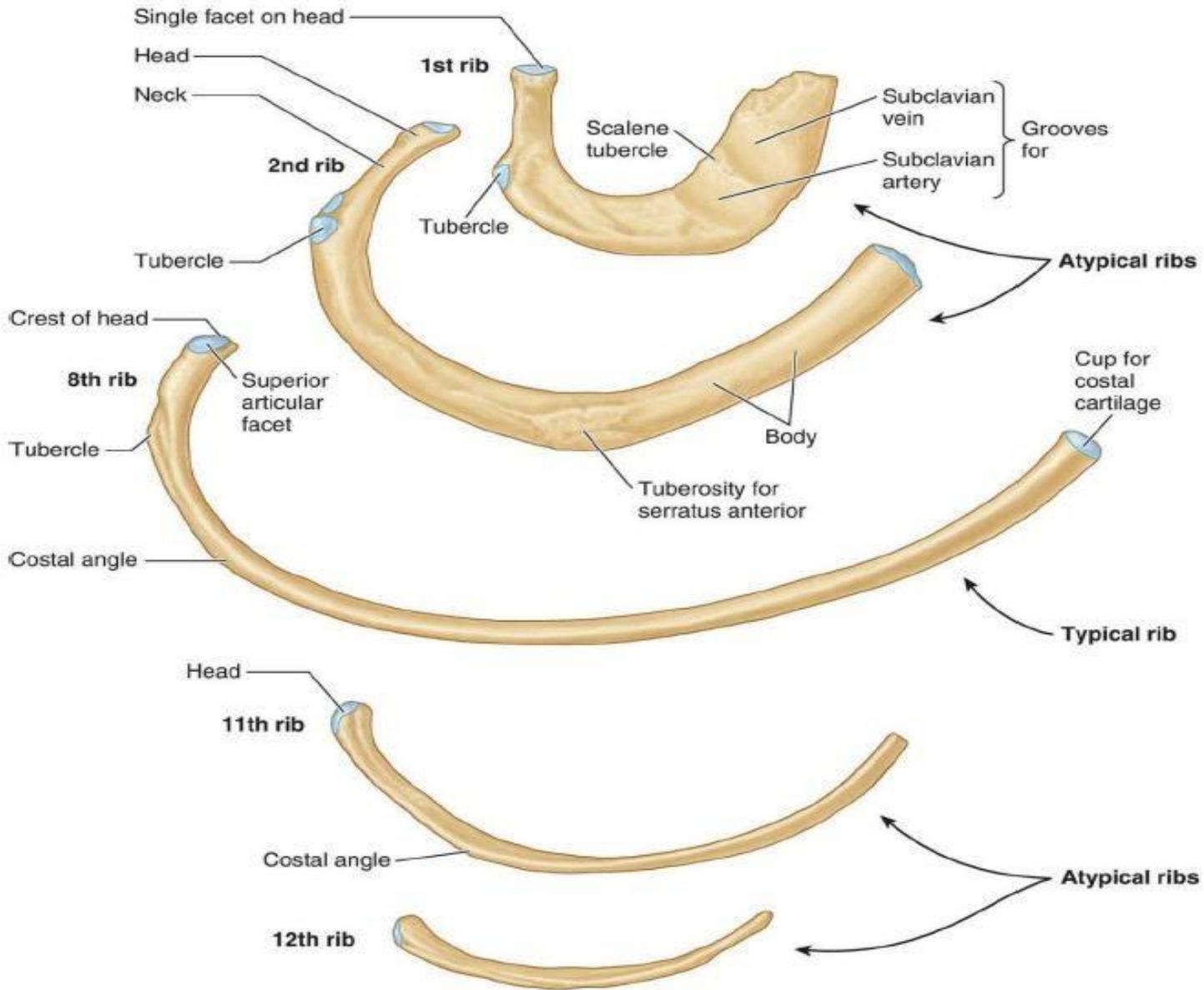


Atypical Ribs

First Rib:

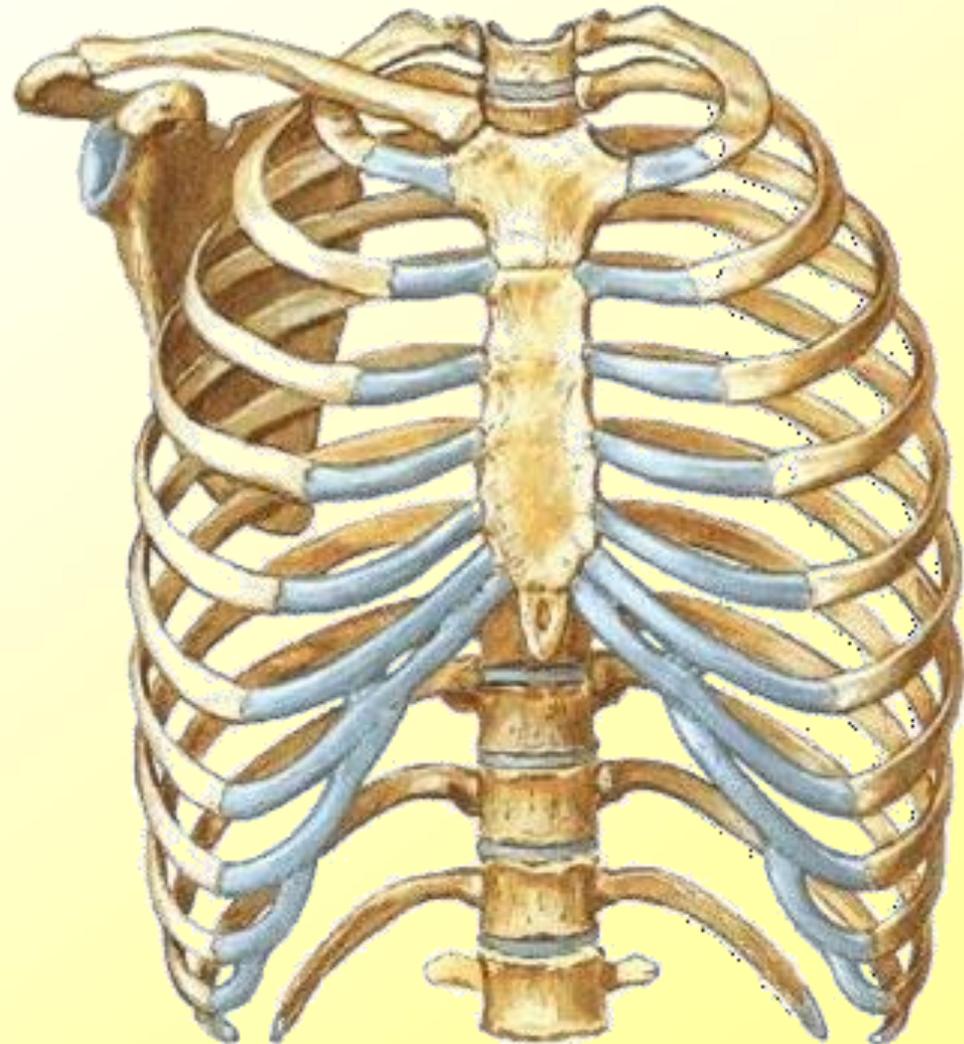
- This rib is the broadest shortest and flattened from above downward.
- It has a single facet on its head for articulation with T1 vertebra only
- It has two transversely directed grooves crossing its superior surface for the subclavian vessels.
- The grooves are separated by a scalene tubercle and ridge, to which the anterior scalene muscle is attached.
- Anterior to the scalenus anterior, the subclavian vein crosses the rib.
- posterior to the muscle attachment, the subclavian artery and the lower trunk of the brachial plexus cross the rib and lie in contact with the bone.

- **The 2nd rib:**
- has a thinner, less curved body and is substantially longer than the 1st rib. Its head has two facets for articulation with the bodies of the T1 and T2 vertebrae; **main atypical feature** : is a rough area on its upper surface, the tuberosity for **serratus anterior**.
- **The 10th–12th ribs**, like the 1st rib, have only one facet on their heads and with a single vertebra.
- The **11th and 12th** ribs are short and have no neck or tubercle.



Costal Cartilages

- **Types and articulations**



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Costal cartilages

- ❖ Costal cartilages are bars of cartilage connecting the
 - ✓ upper seven ribs to the lateral edge of the sternum
 - ✓ the 8th, 9th, and 10th ribs to the cartilage immediately above.
 - ✓ The cartilages of the 11th and 12th ribs end in the abdominal musculature.
- The costal cartilages contribute significantly to the elasticity and mobility of the thoracic walls.
- In old age, the costal cartilages tend to lose some of their flexibility as the result of superficial calcification.

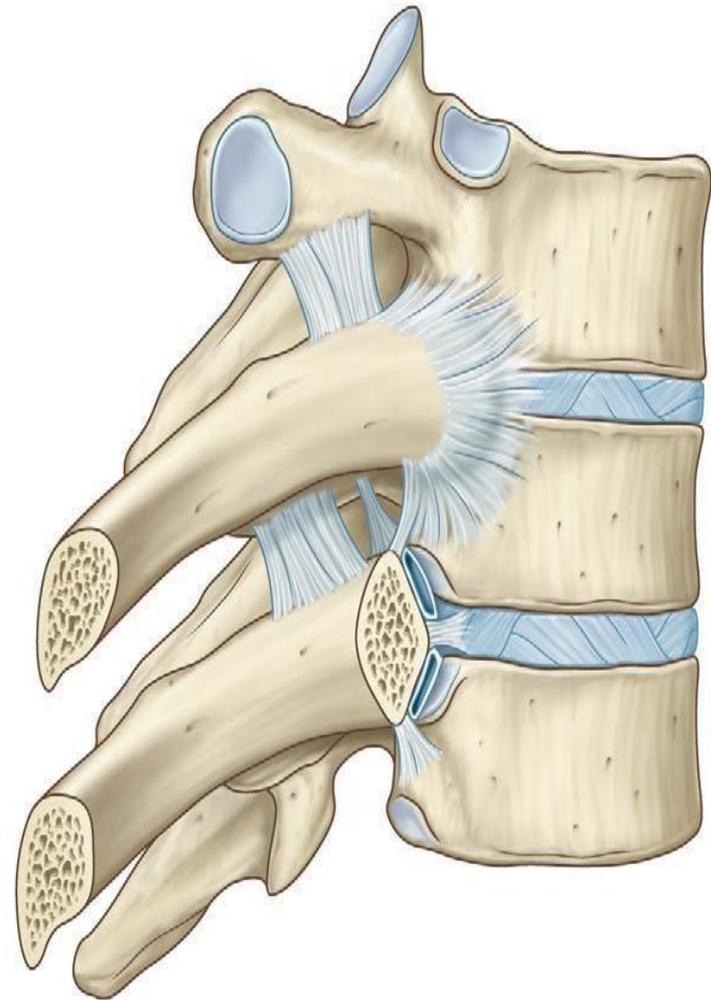
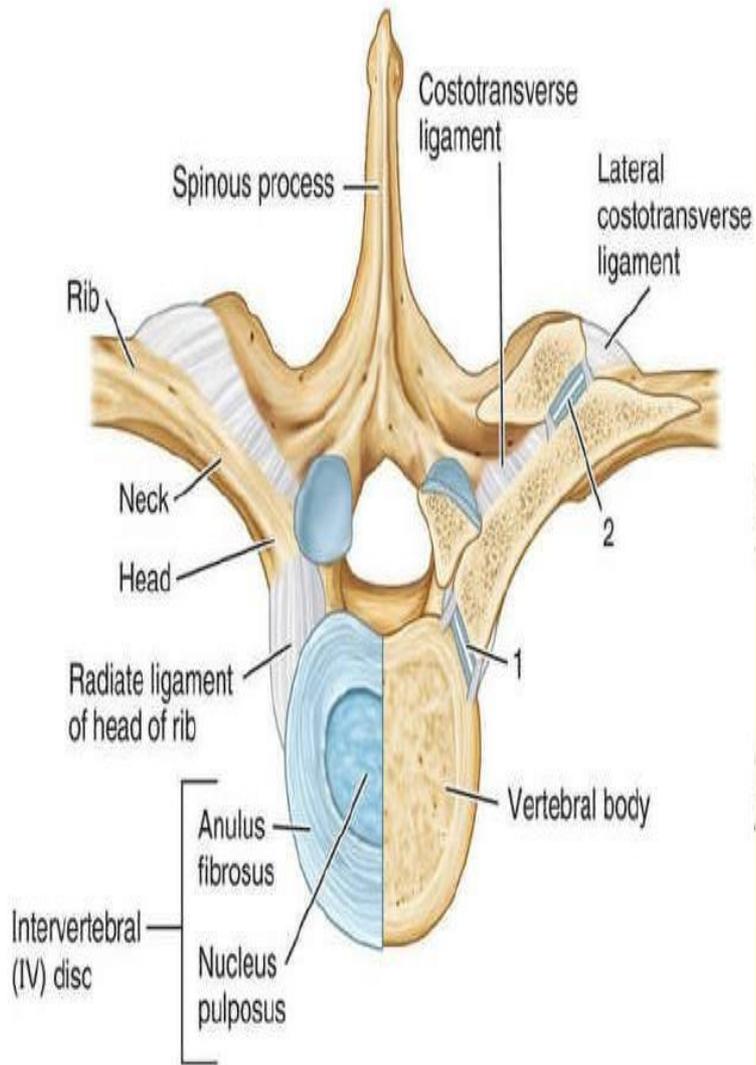
1.Costo-vertebral joints

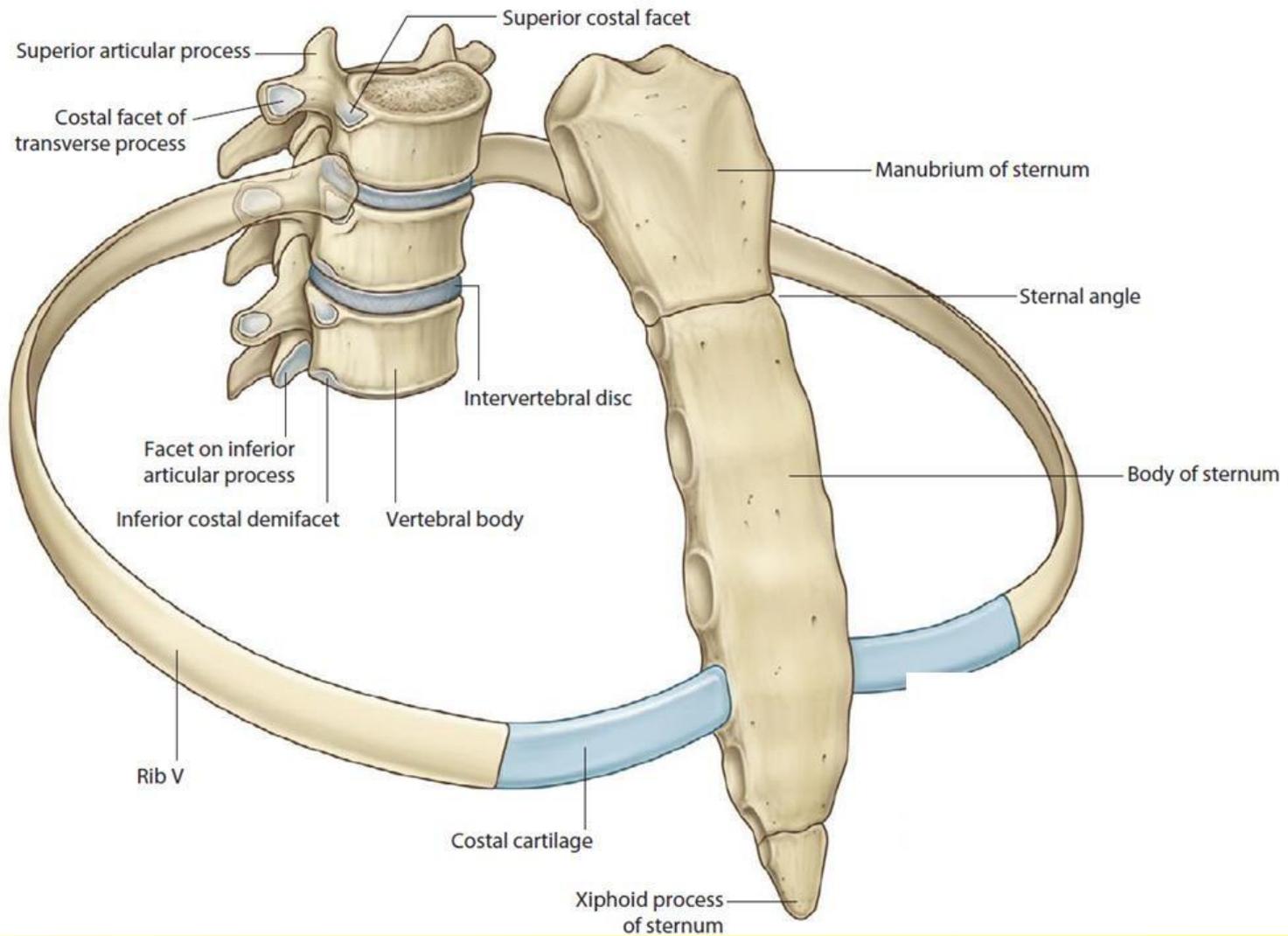
Head articulation:

The first rib and the 3 lowest ribs have a single **synovial joint** with their corresponding vertebral body. For the second to ninth ribs, the head articulates by means of a synovial joint with the corresponding vertebral body and that of the vertebra above it .

Joints of Tubercles of Ribs

The tubercle of a rib articulates by means of a **synovial joint** with the transverse process of the corresponding vertebra **This joint is absent on the 11th and 12th ribs.**





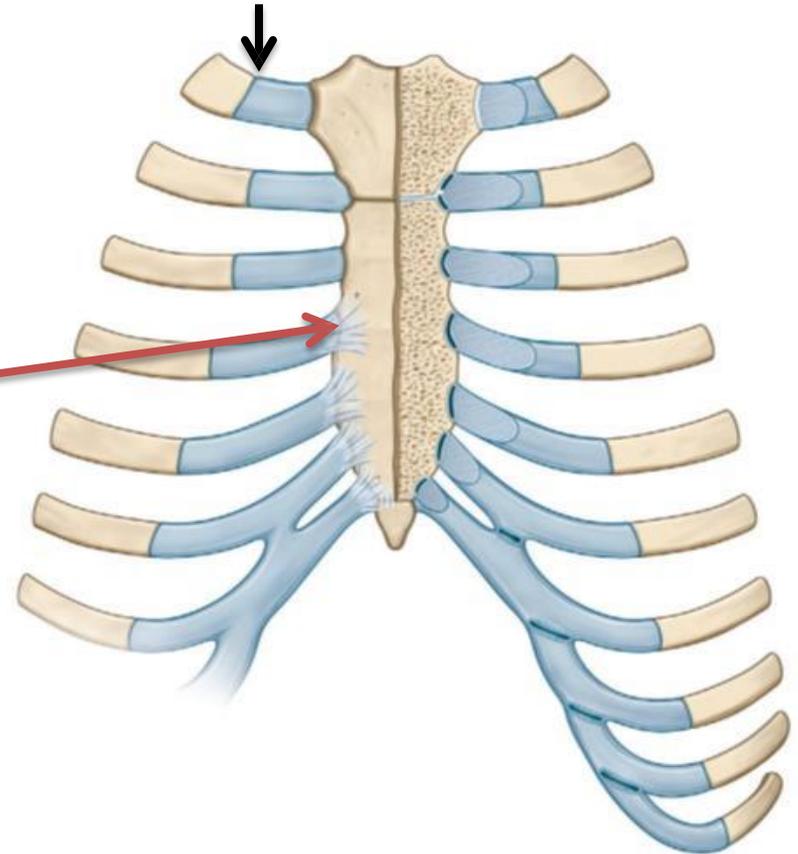
Articulations of Ribs

2. Costo- chondral joints

3. Chondro-sternal joints

Chondro-sternal joints

Costochondral junctions

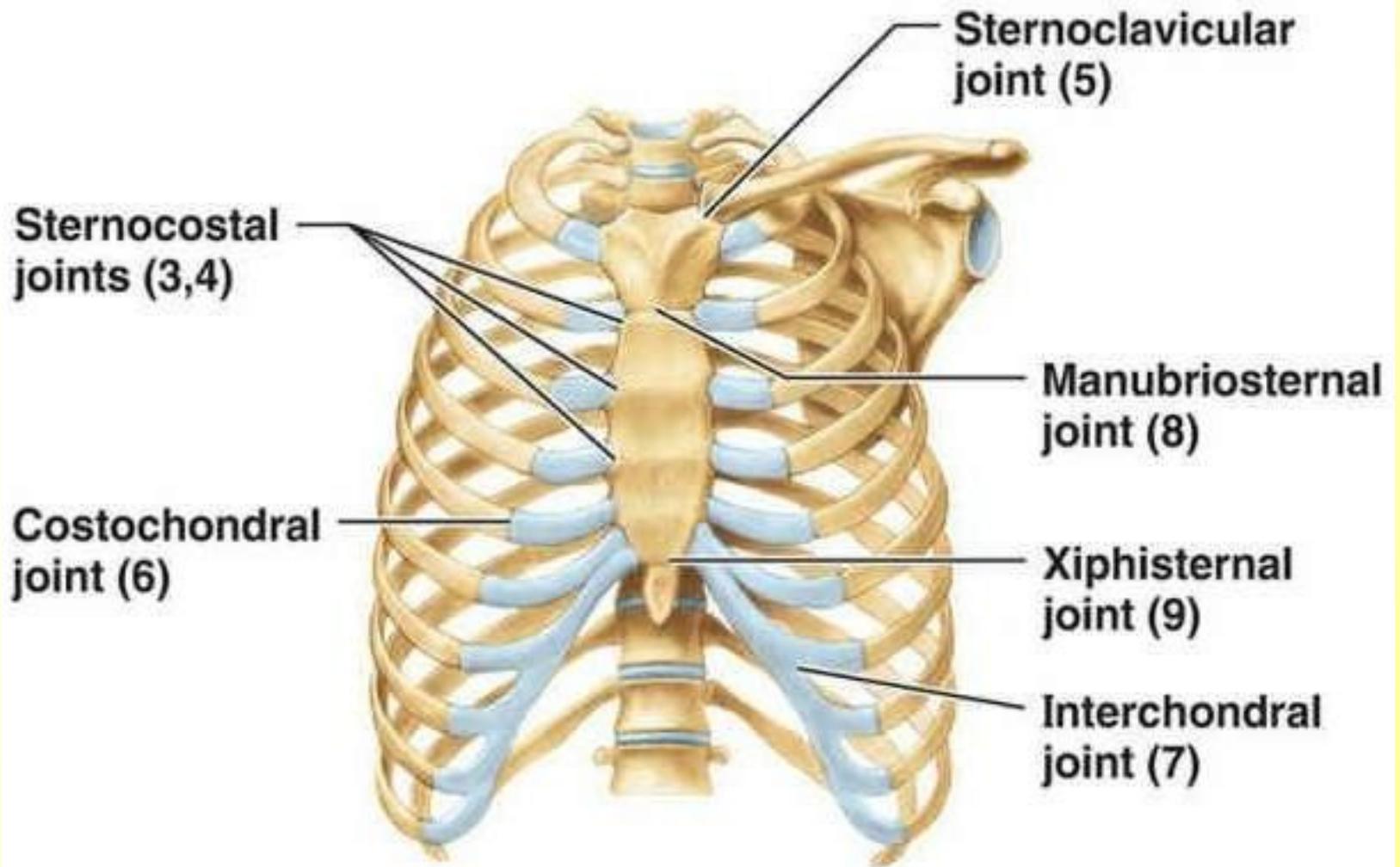


2. Joints of Ribs and Costal Cartilages

These joints are cartilaginous joints. No movement is possible here.

3. Joints of Costal Cartilages with Sternum

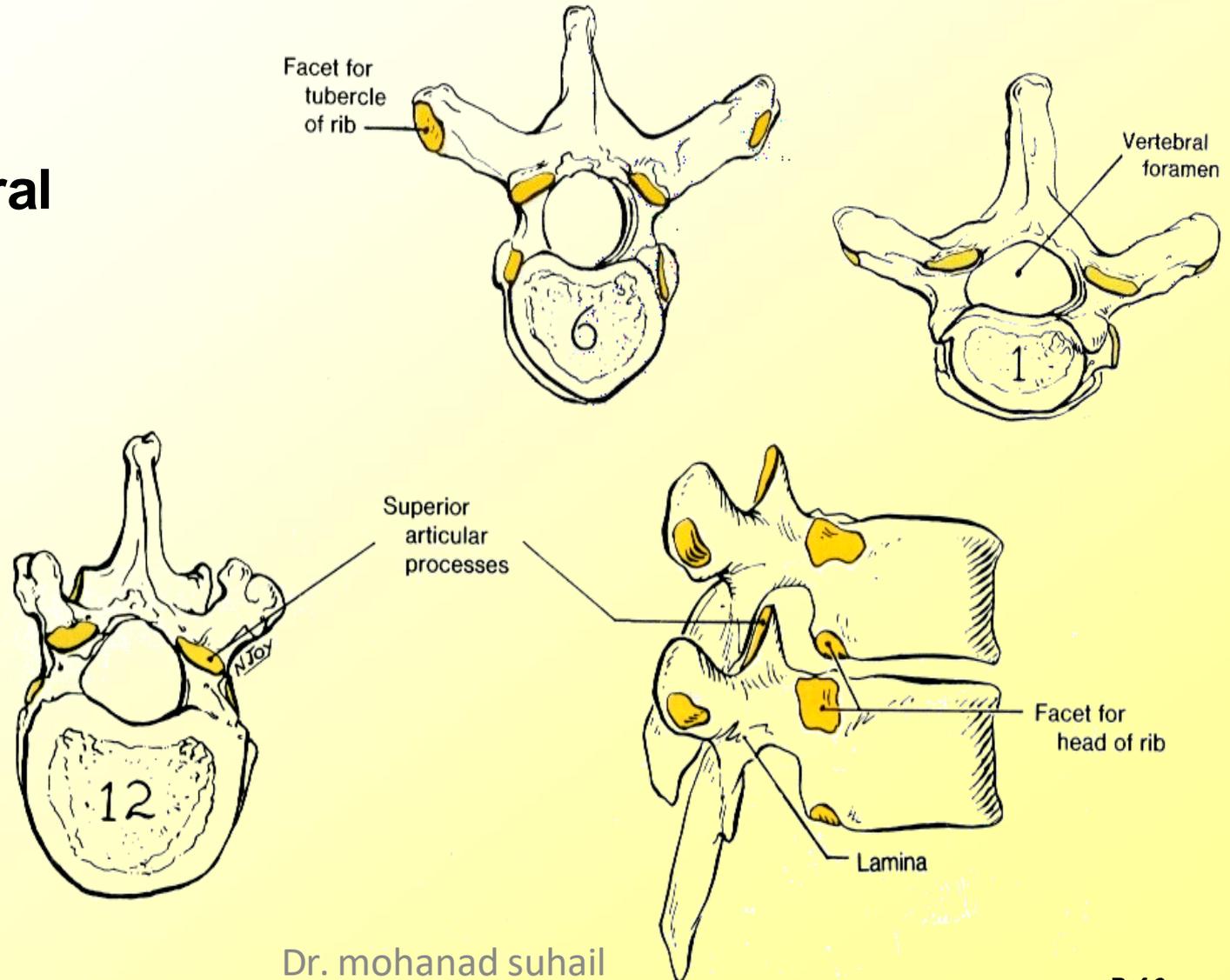
1. The first costal cartilages articulate with the manubrium by **cartilaginous joints that do not permit movement**.
2. The second to seventh costal cartilages articulate with the lateral border of the sternum by **synovial joints**.
3. In addition, the 6th, 7th, 8th, 9th, and 10th costal cartilages articulate with one another along their borders by small synovial joints.
4. The cartilages of the 11th and 12th ribs do not articulate with the sternum and are embedded in the abdominal musculature



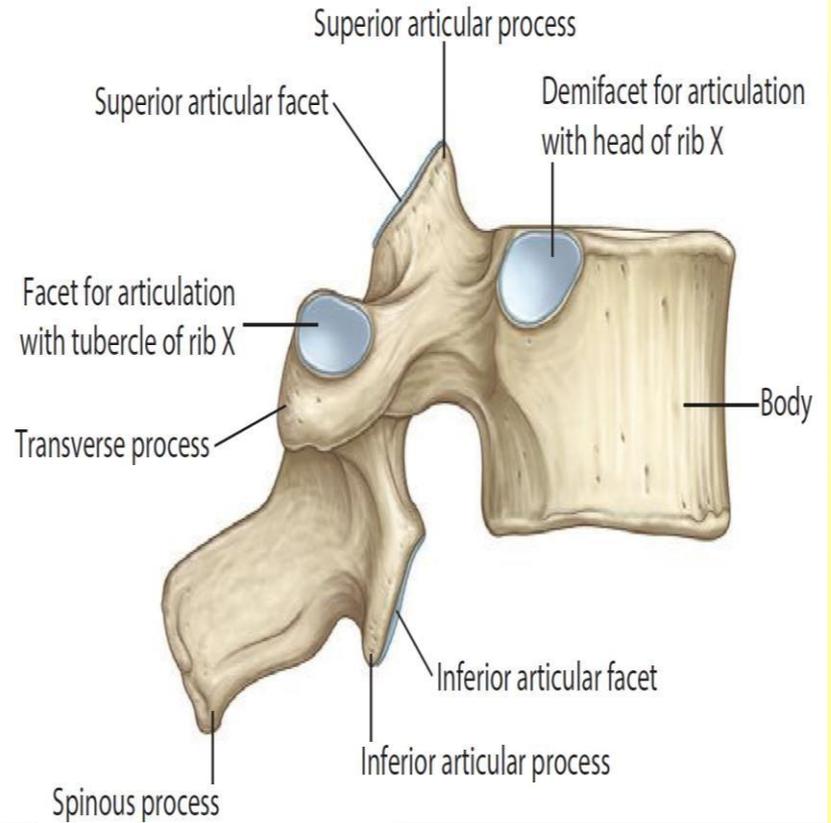
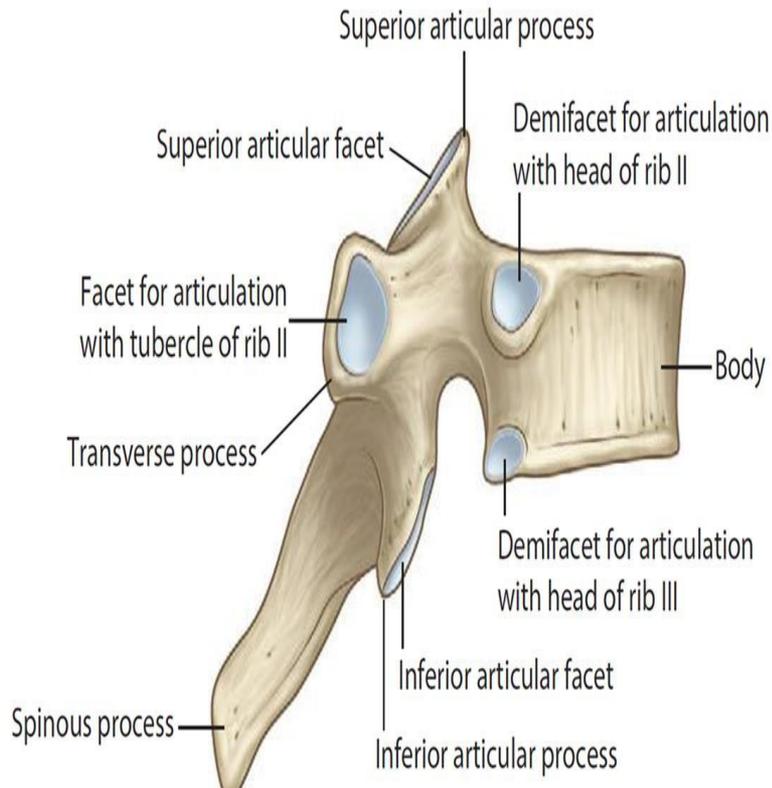
(D) Anterior view

Thoracic Vertebrae

- **Body**
- **Vertebral arch**



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Thoracic Vertebrae

Most thoracic vertebrae are typical in that they are independent and have

bodies, vertebral arches, and processes for muscular and articular connections . **Characteristic features of thoracic vertebrae include the following:**

- **Bilateral costal facets (demifacets)** on the vertebral bodies, usually occurring in inferior and superior pairs, for articulation with the heads of ribs.
- **Costal facets** on the transverse processes for articulation with the tubercles of ribs, except for the inferior two or three thoracic vertebrae.
- long, inferiorly slanting spinous processes