



Human Anatomy - 1st year

2020-2021



Anatomy Of Chest

Lecture (1)

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College of medicine

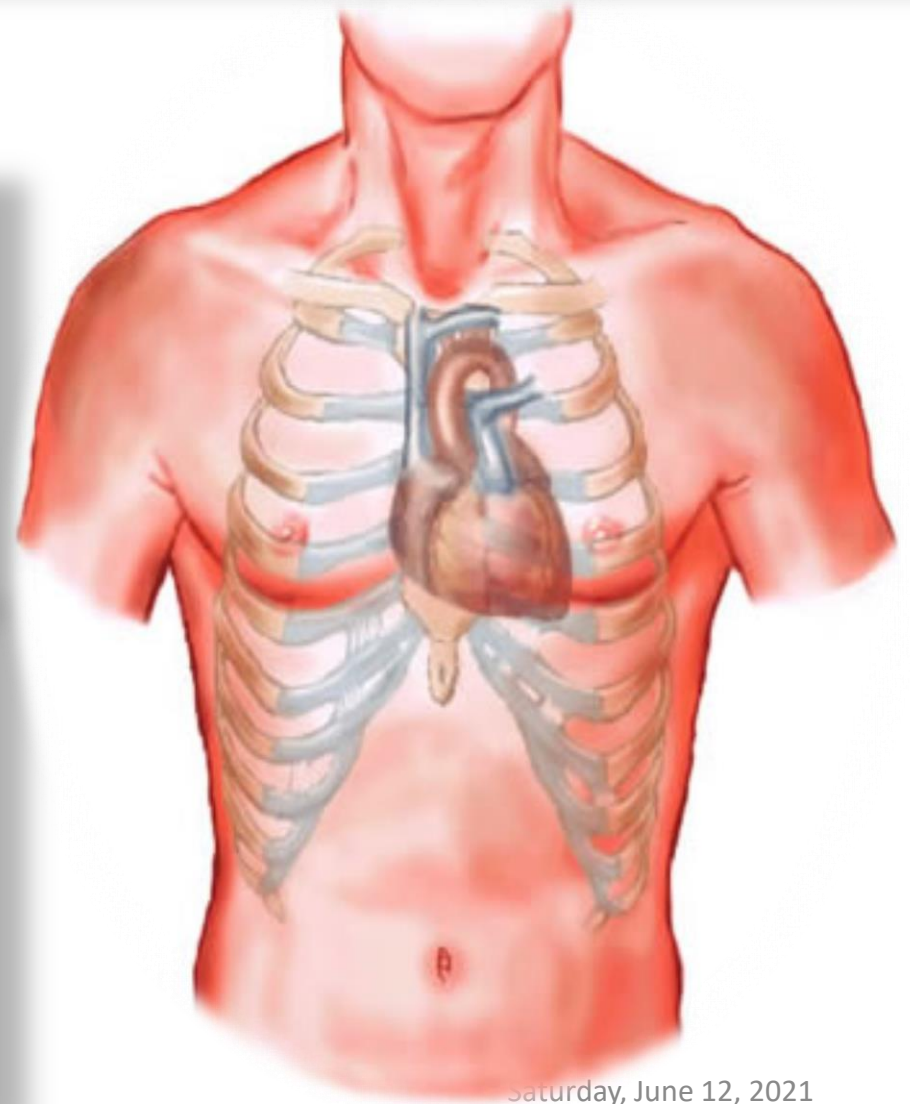
University of Basrah



Anatomy Of Thorax

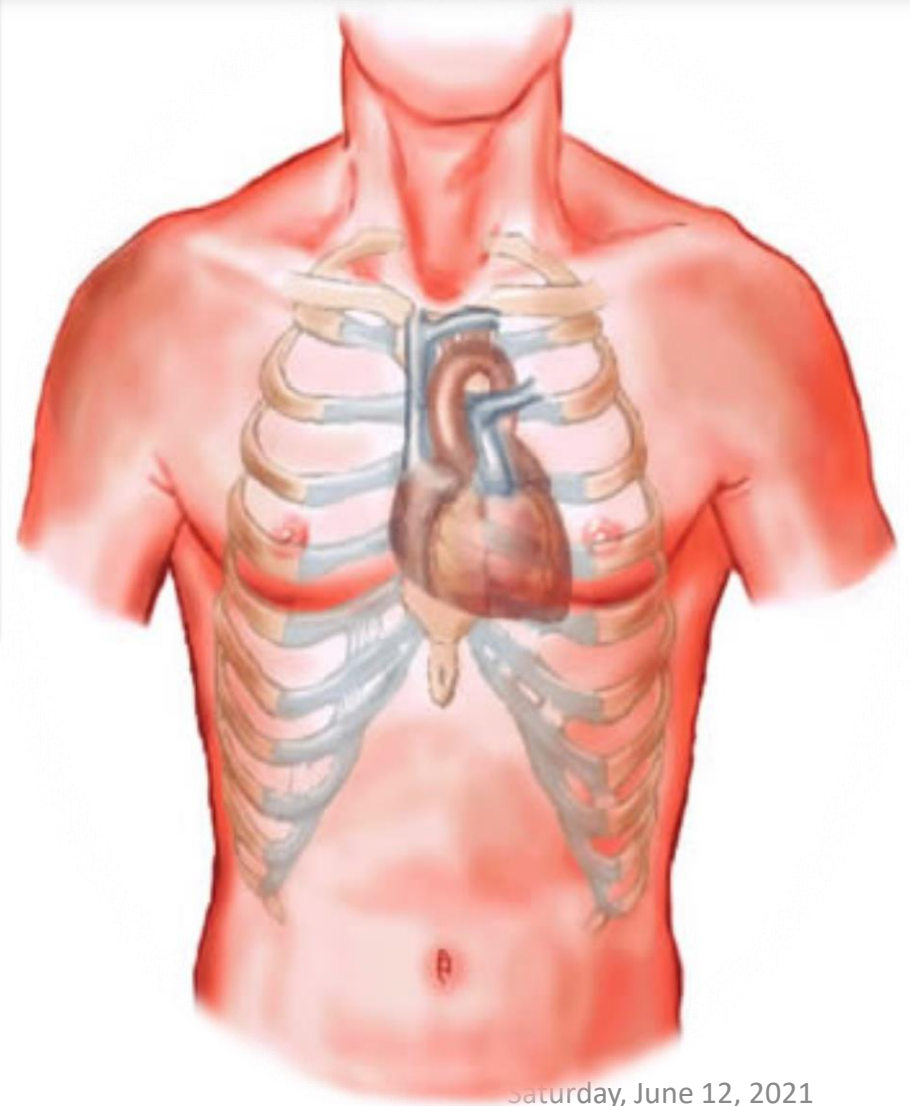
Learning Objective

1. The extents of the chest •
2. The surface anatomy of chest •
3. Lines of orientation of chest •
3. The Bones forming the thoracic cage •
4. Clinical notes •



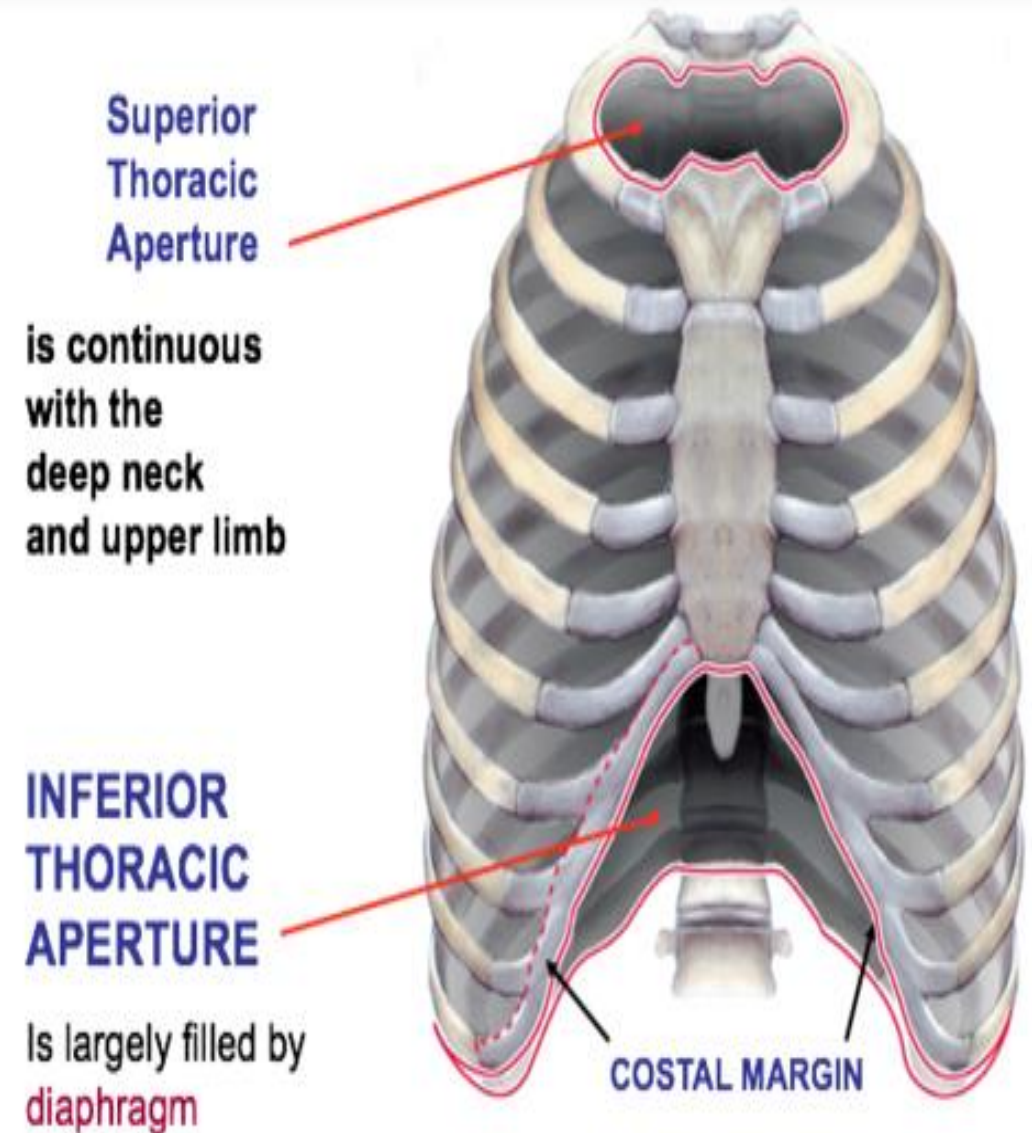
Anatomy Of Thorax

The human thorax (Chest) includes thoracic cavity and thoracic wall . The thorax contains many organs and structures including heart, lung ,thymus gland, trachea ,esophagus ,muscles ,great blood vessels and many other internal structures.



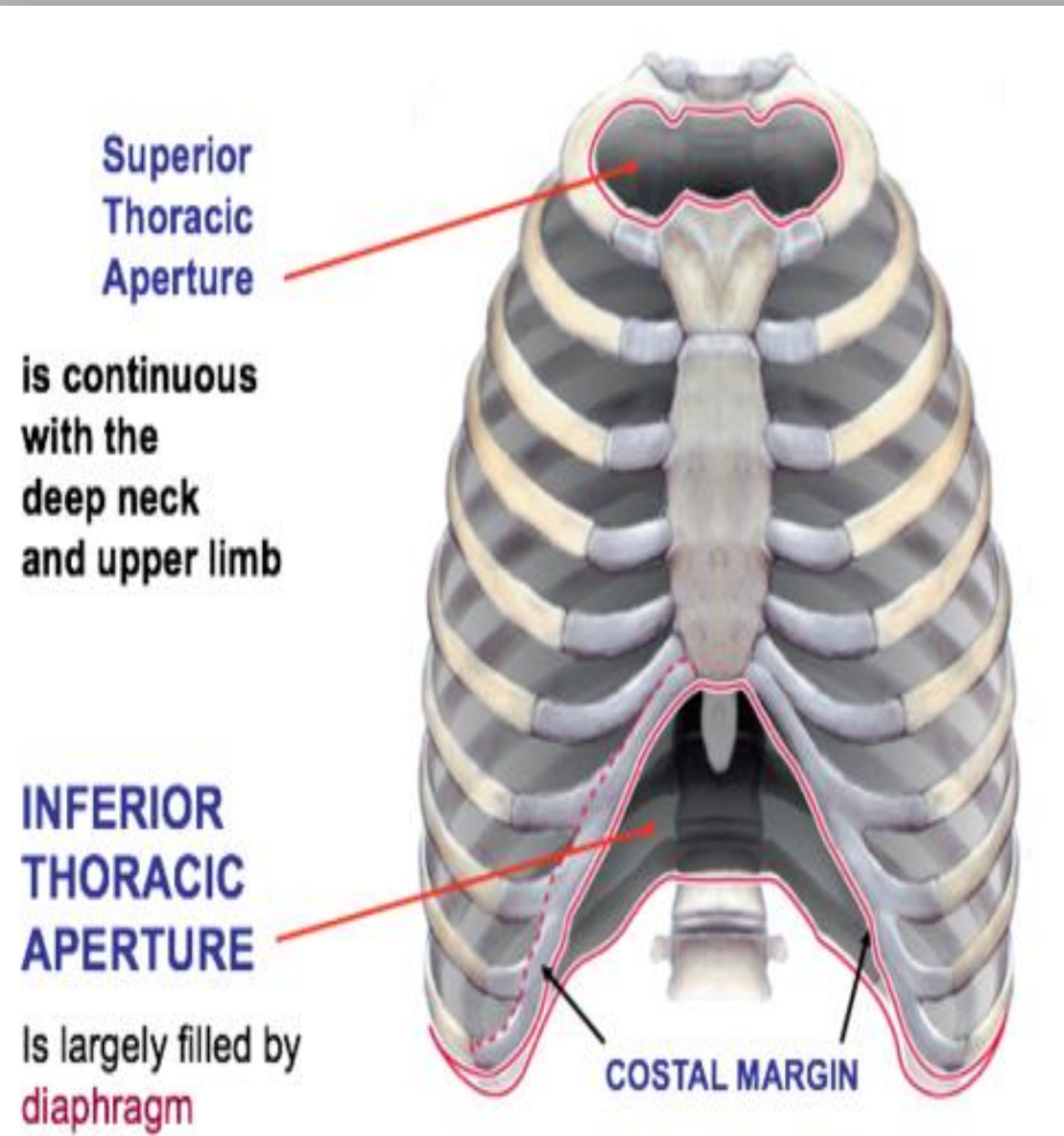
The thorax has two major openings:

☠️ ① **Superior thoracic aperture** opens towards the neck. It is bounded by the bones of the upper thorax; manubrium of sternum anteriorly, the first pair of ribs laterally, and the body of the vertebra T1 posteriorly. Many important vessels and nerves emerge from thorax to neck and upper limb.



Opening of thorax

☠☠② **Inferior thoracic aperture** is almost completely covered by the diaphragm separating it from the abdominal cavity. It is bounded posteriorly by 12th thoracic vertebra, laterally by costal margin and anteriorly by xiphisternal joint. It transmits esophagus and many large vessels and nerves.



Extents Of The Thorax

It extends :

Anteriorly: from the clavicles above to the inferior costal margin below

Posteriorly from 1st rib and T1 to 12th rib and T12 .

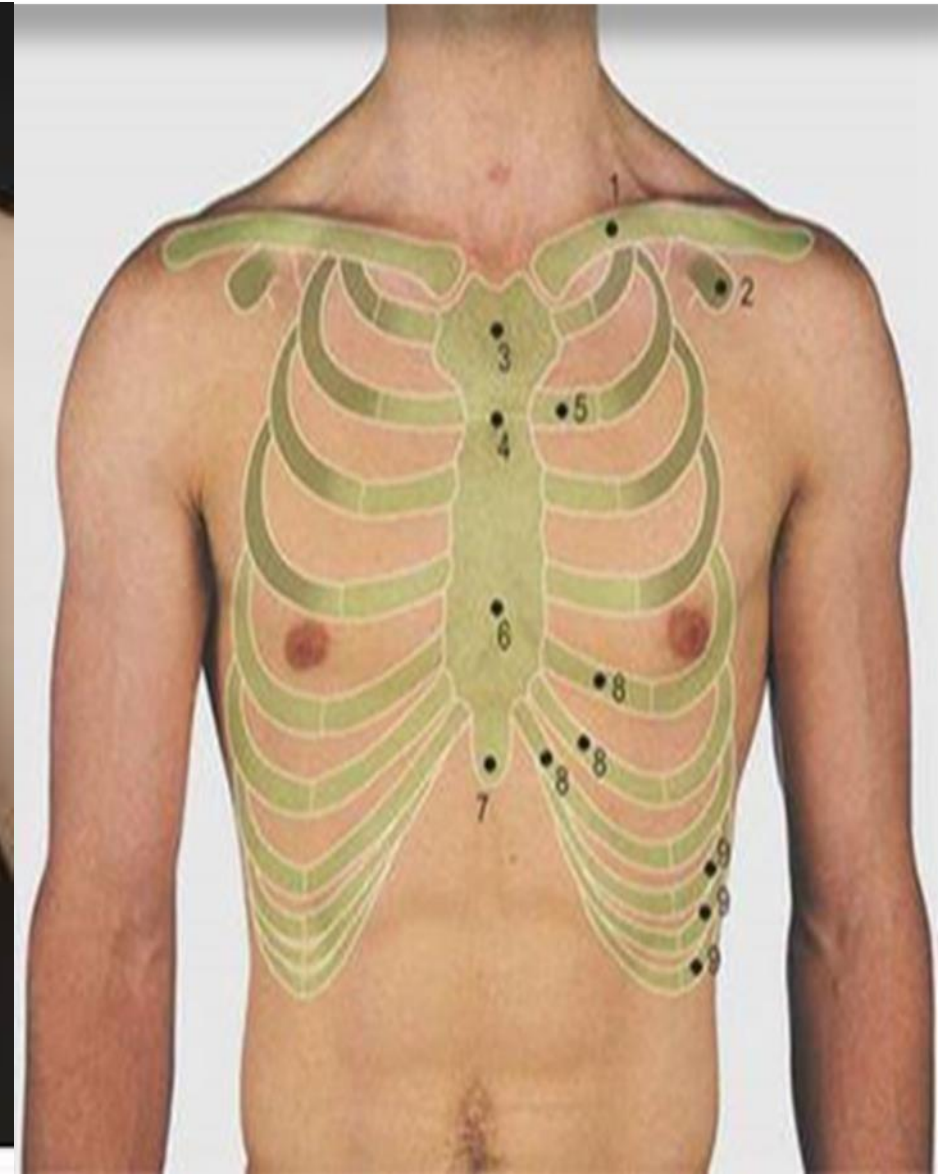
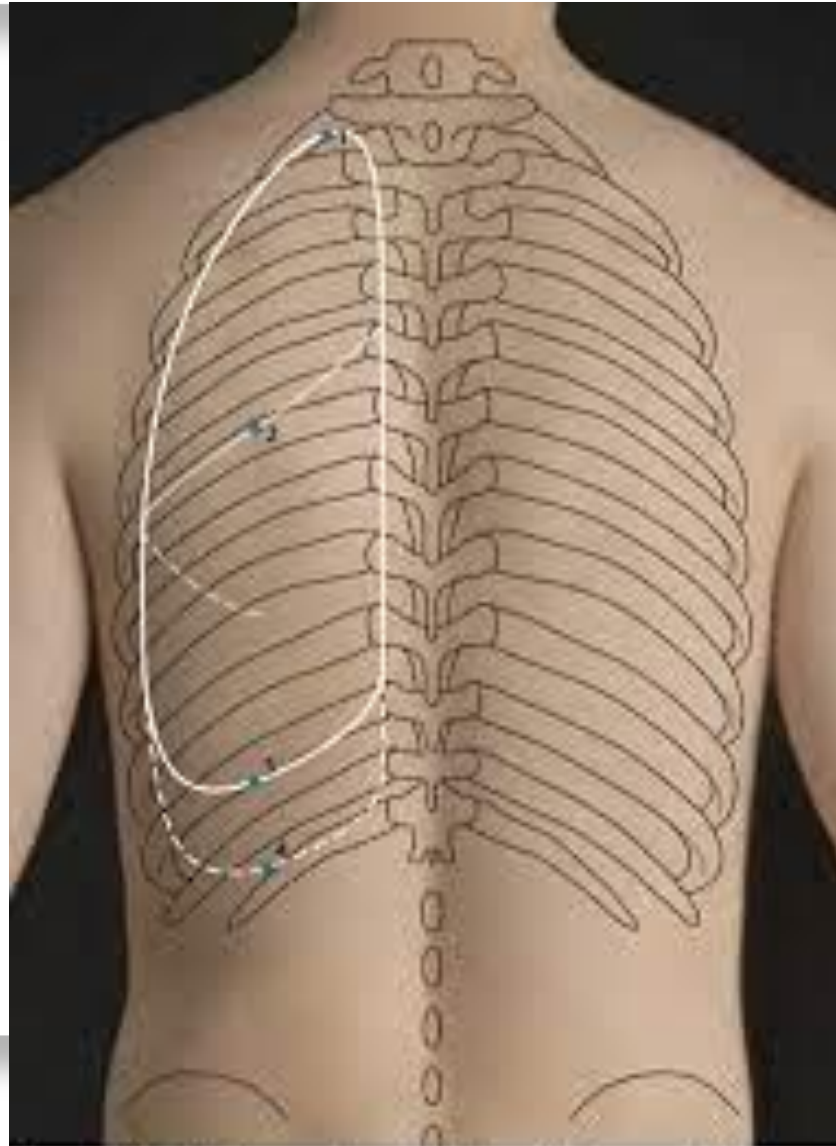
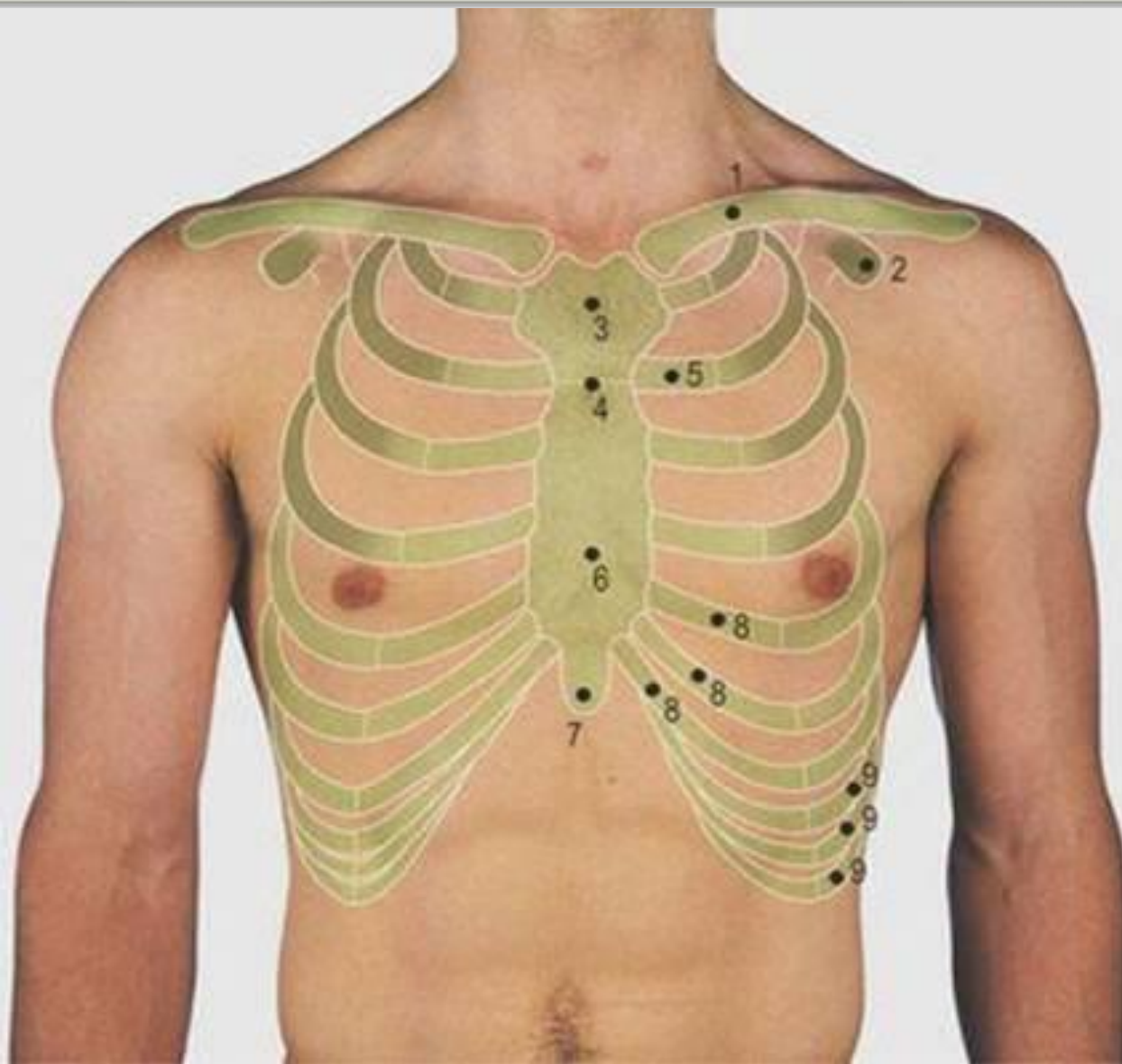


Figure 5 Posterior surface markings of lung and pleura.

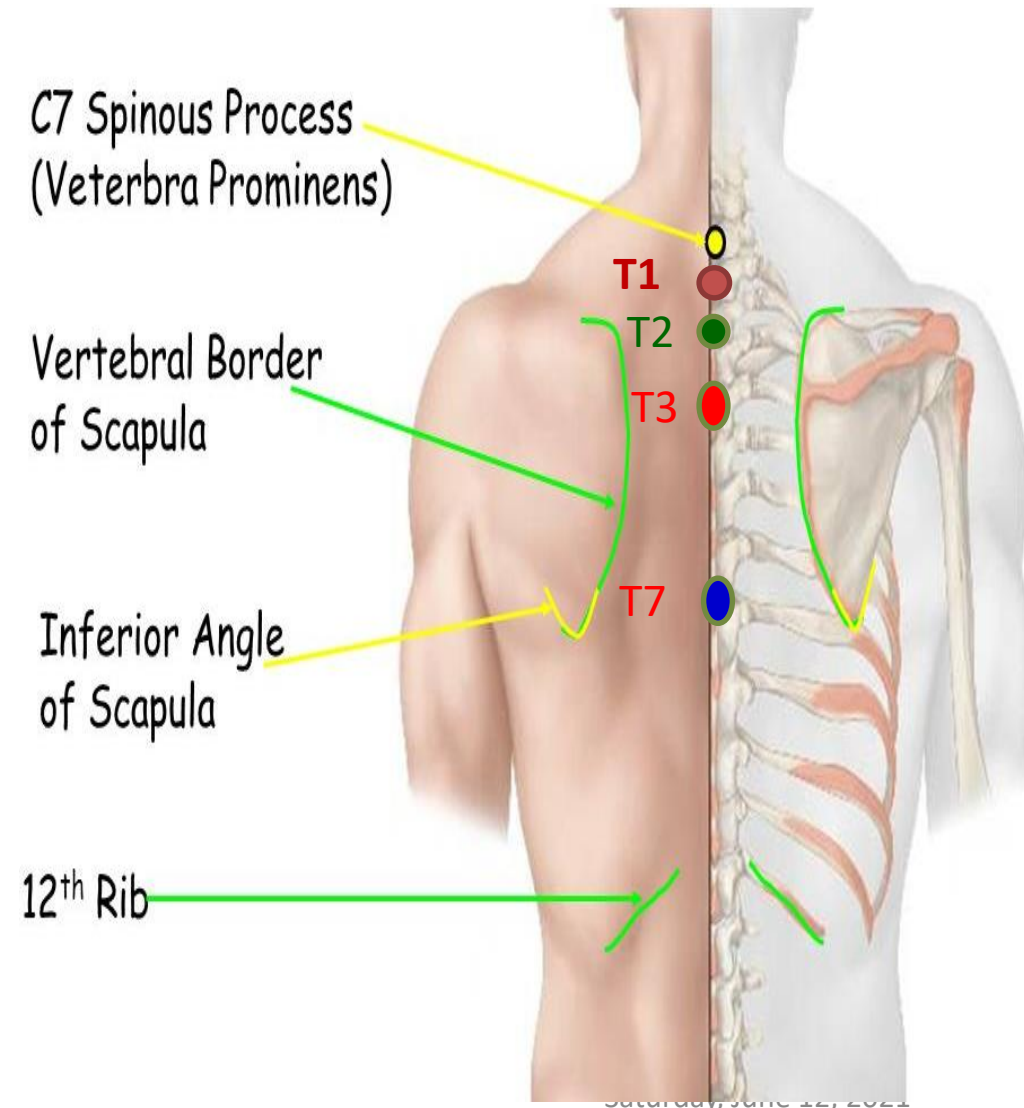
Surface Anatomy Of Anterior chest wall

- 1 .Clavicle •
- 2 .Coracoid process of scapula •
- 3 .Manubrium sterni •
- 4 .Manubriosternal joint (angle of Louis)
- 5 .Second costal cartilage •
- 6 .Body of sternum •
- 7 .Xiphoid process and Xiphisternum
- 8 . costal cartilage of 5th, 6th and 7th (true ribs)
- 9 . 8th , 9th and 10th (false) ribs and costal margin .



Surface Anatomy Of Posterior chest wall

1. Scapula overlies the first to seventh ribs.
2. Superior angle lies opposite the spinous process of the T2
3. Spine of scapula lies opposite spinous process of the T3
4. Inferior angle covers the 7th rib and at level of spine of 7th thoracic vertebra.
5. Vertebral border of scapula
6. 12th rib
7. Posterior midline, C7 is prominence
8. Spine of the 1st thoracic vertebra may be prominent.
9. Spines of the remaining thoracic vertebrae run downward.

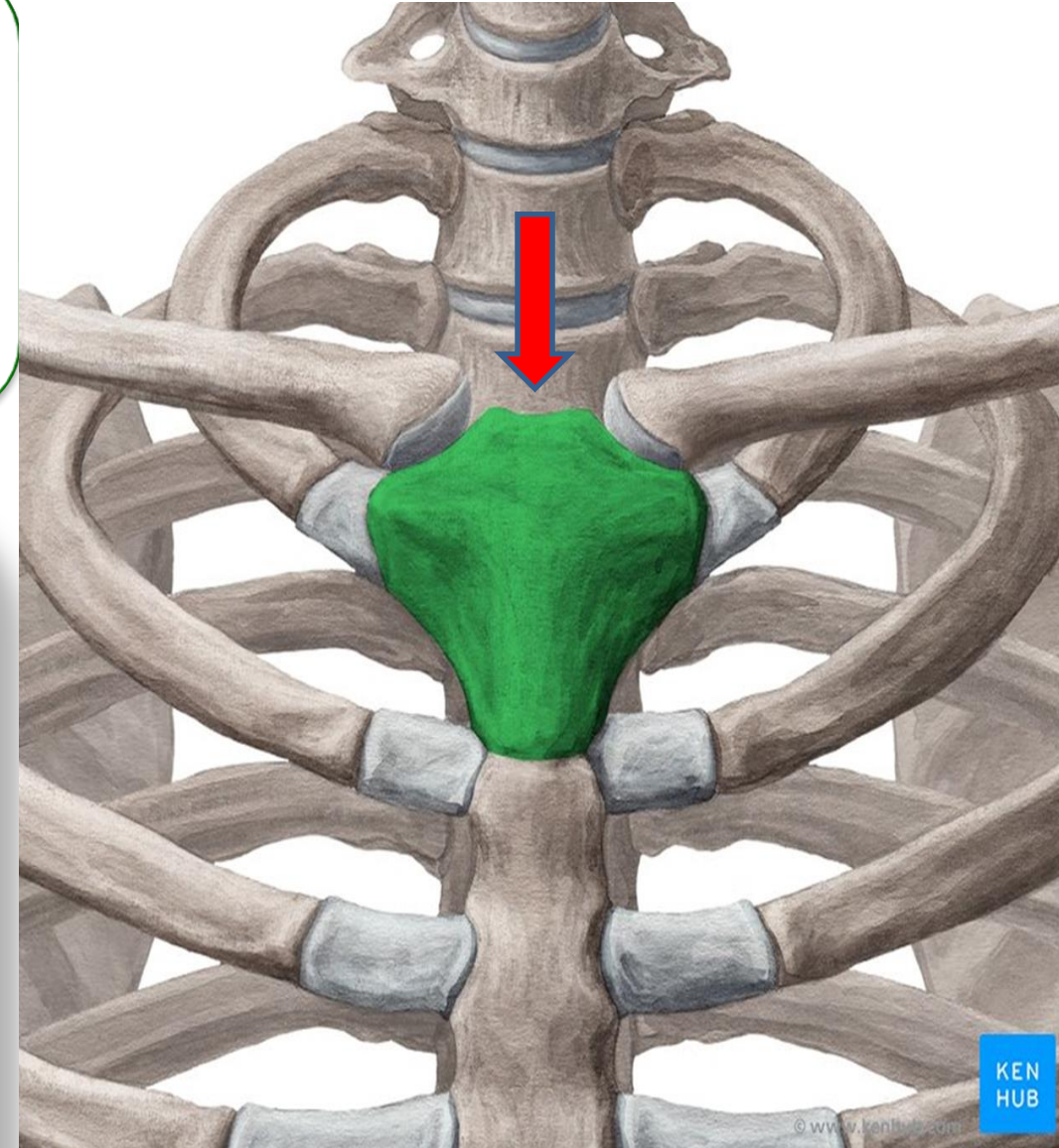


Surface Land marks

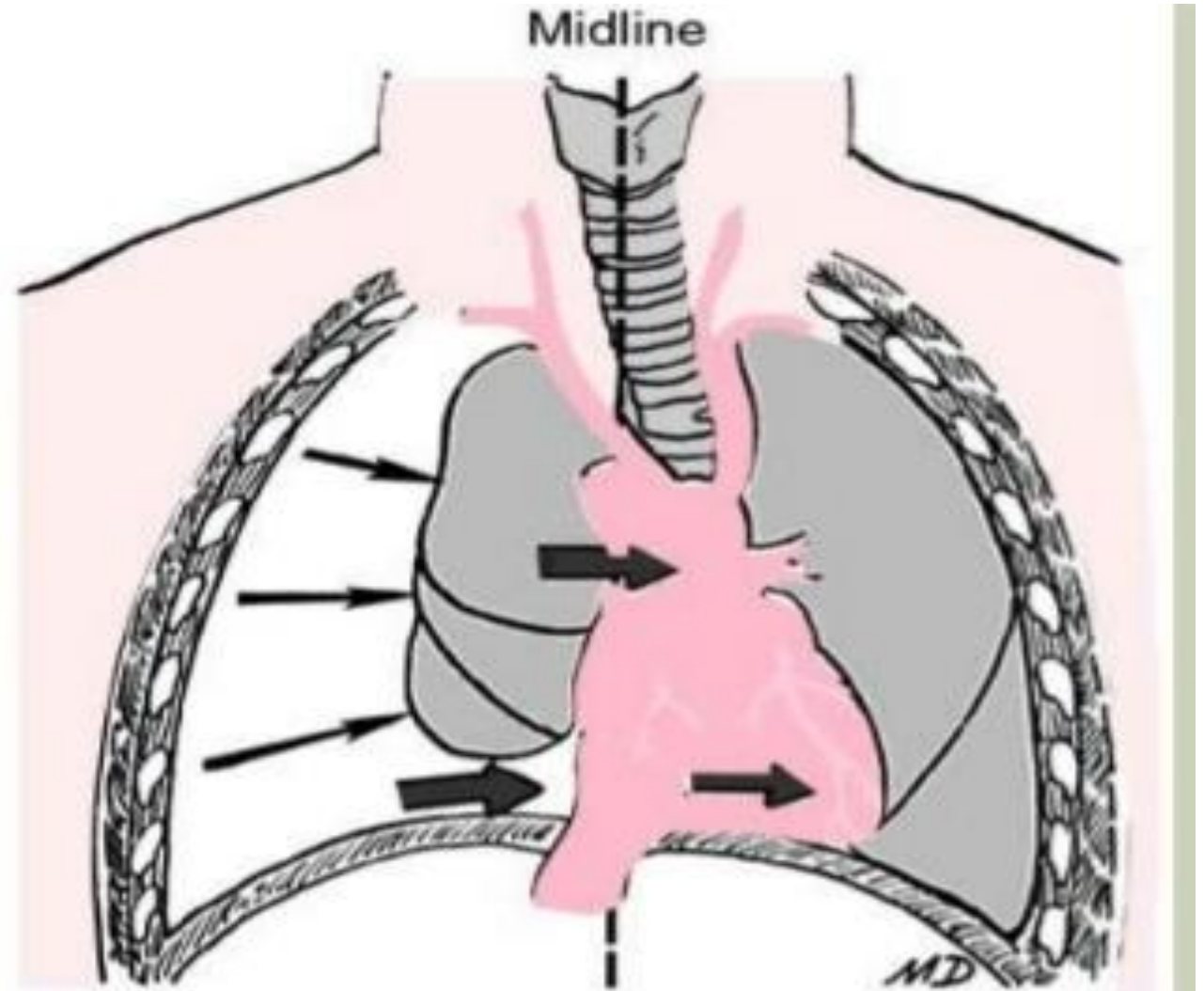
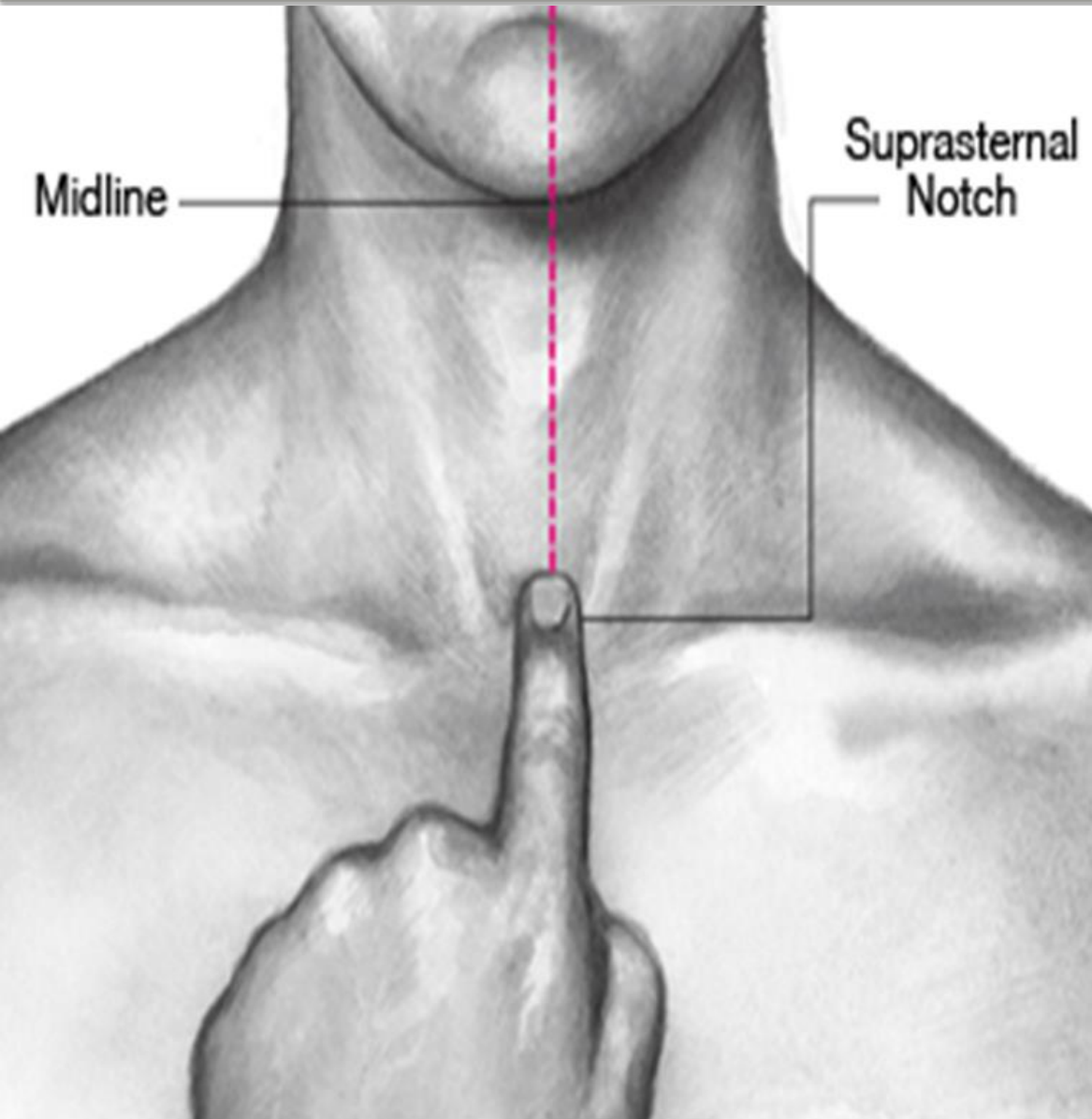
1. Suprasternal notch

Fossa jugularis sternalis, or jugular notch, is a large, visible dip in the neck between the clavicles, and above the manubrium of the sternum. Lies opposite to the lower border of 2nd thoracic vertebrae .

Its significant : to localize the position of the trachea which must be centrally located normally . Deviation of trachea indicates pathology which pushes or pulls the trachea .



Also known as jugular notch

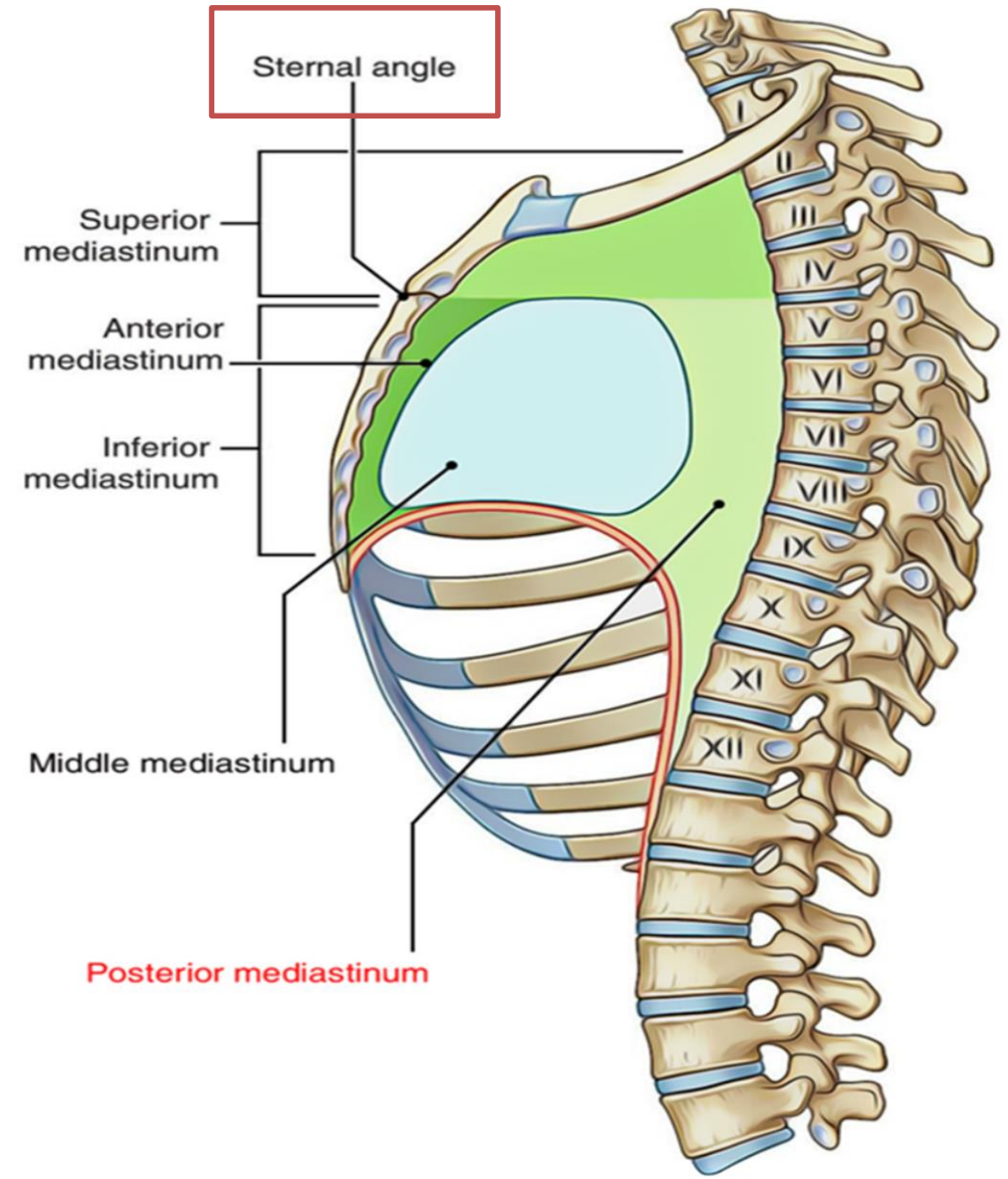


Surface Land marks

Manubriosternal angle

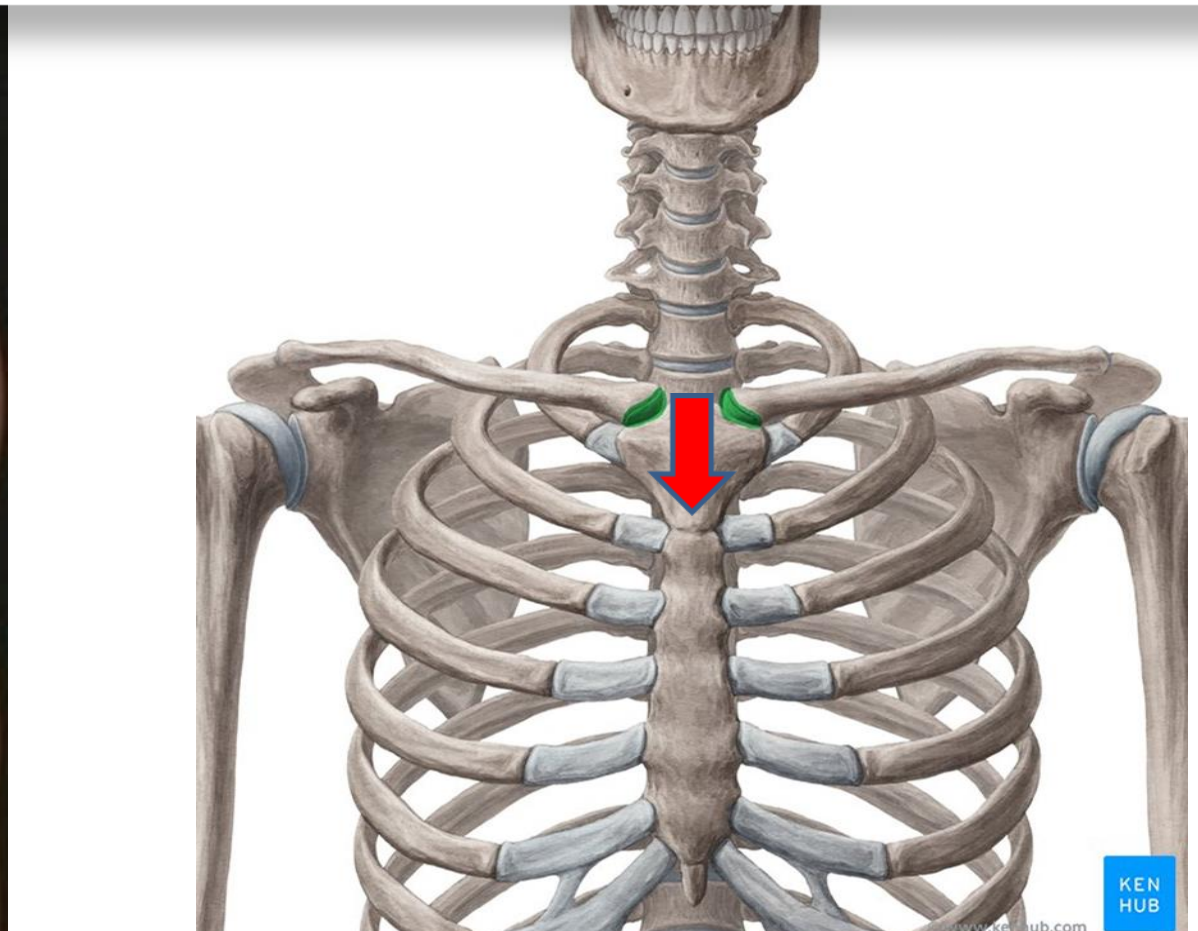
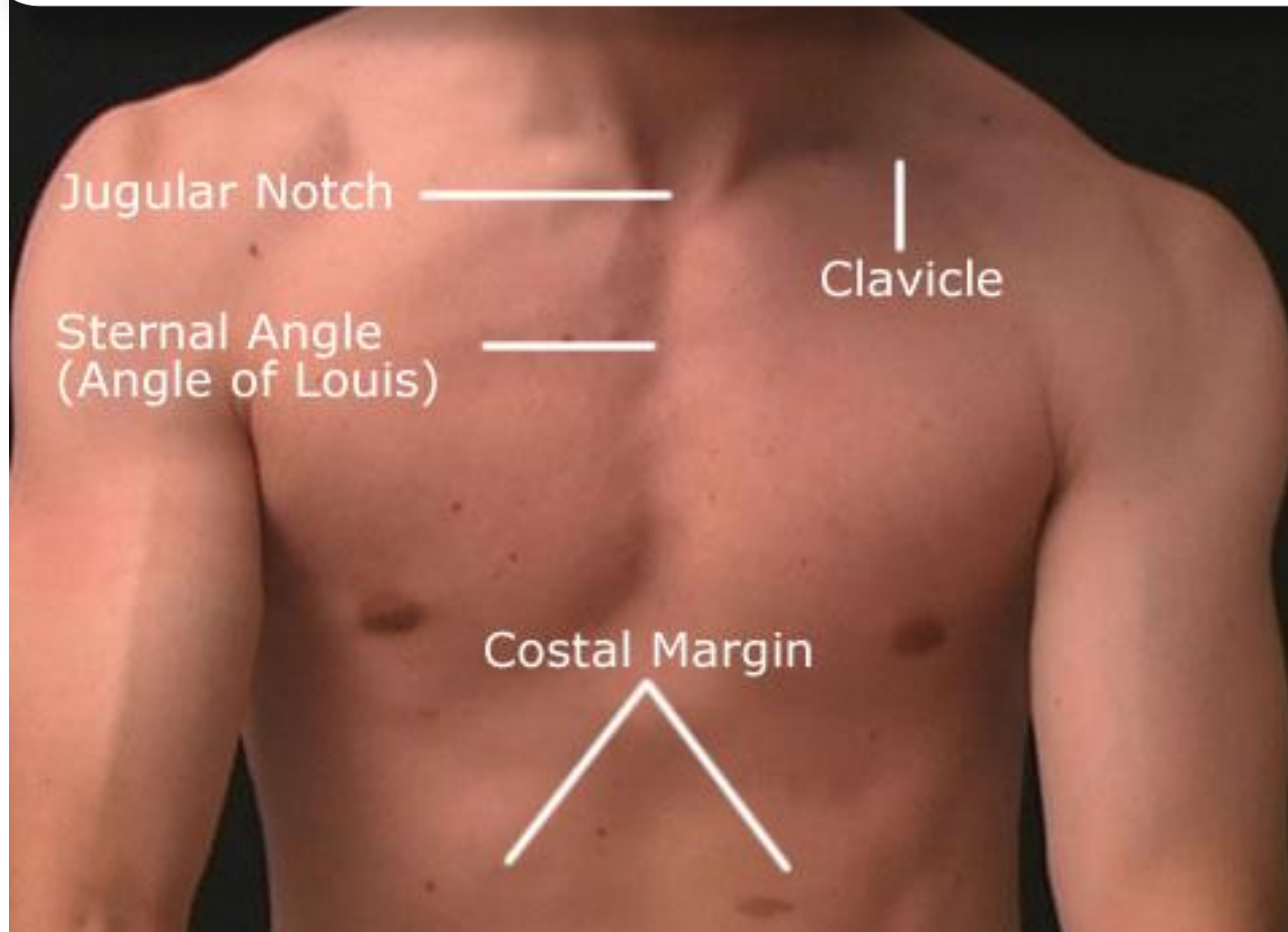
- *Prominence in the upper part of the chest
- *is formed by articulation of manubrium and body of sternum
- * It lies at level of 2nd costal cartilages anteriorly and opposite to lower border of T4 posteriorly .

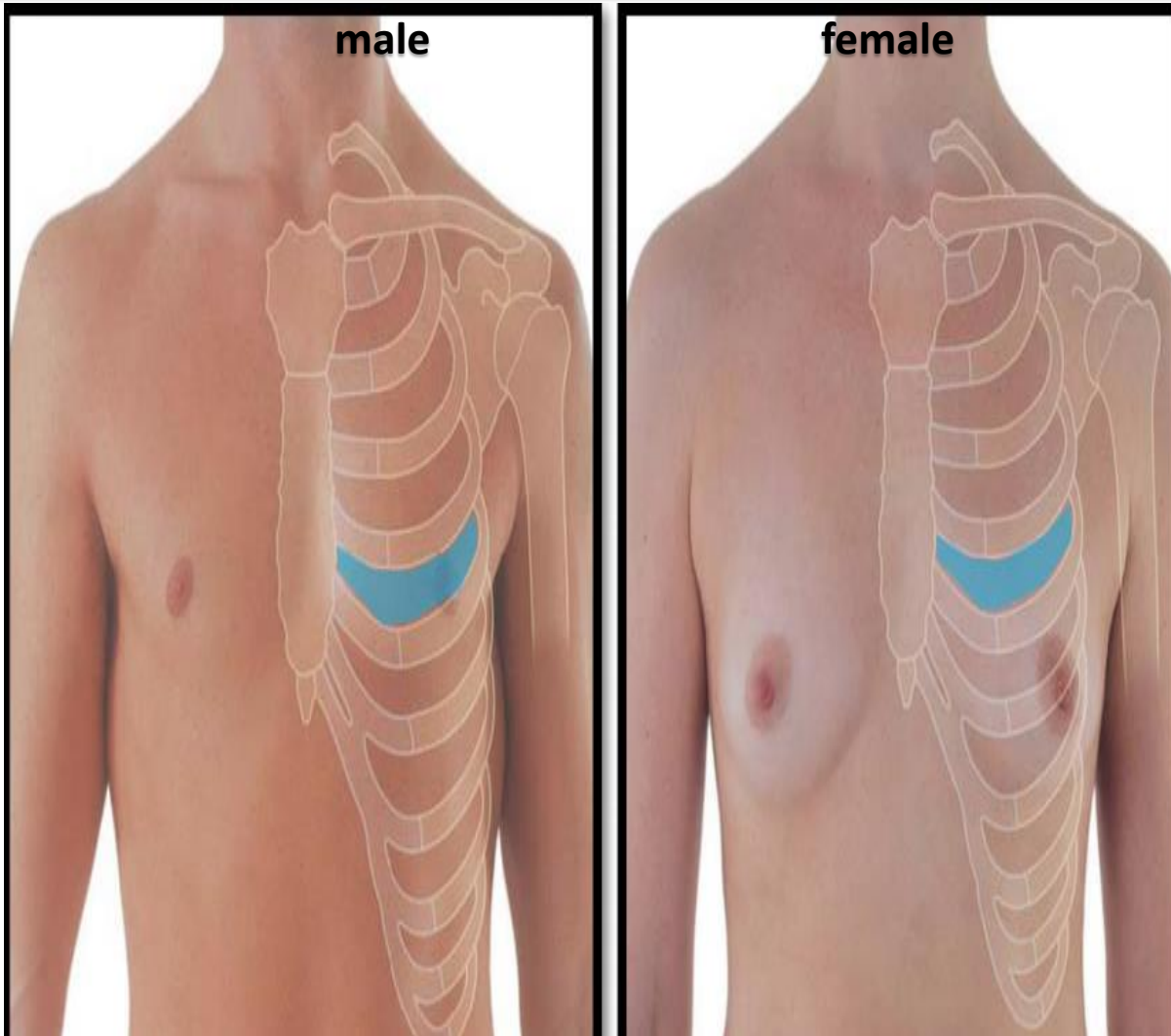
2- Angle of Louis



Its significant:

It lies at the level of 2nd costal cartilage of the second rib by this we can calculate our ribs and intercostal spaces begins with the second rib .





In male usually situated in the 4th intercostal space .

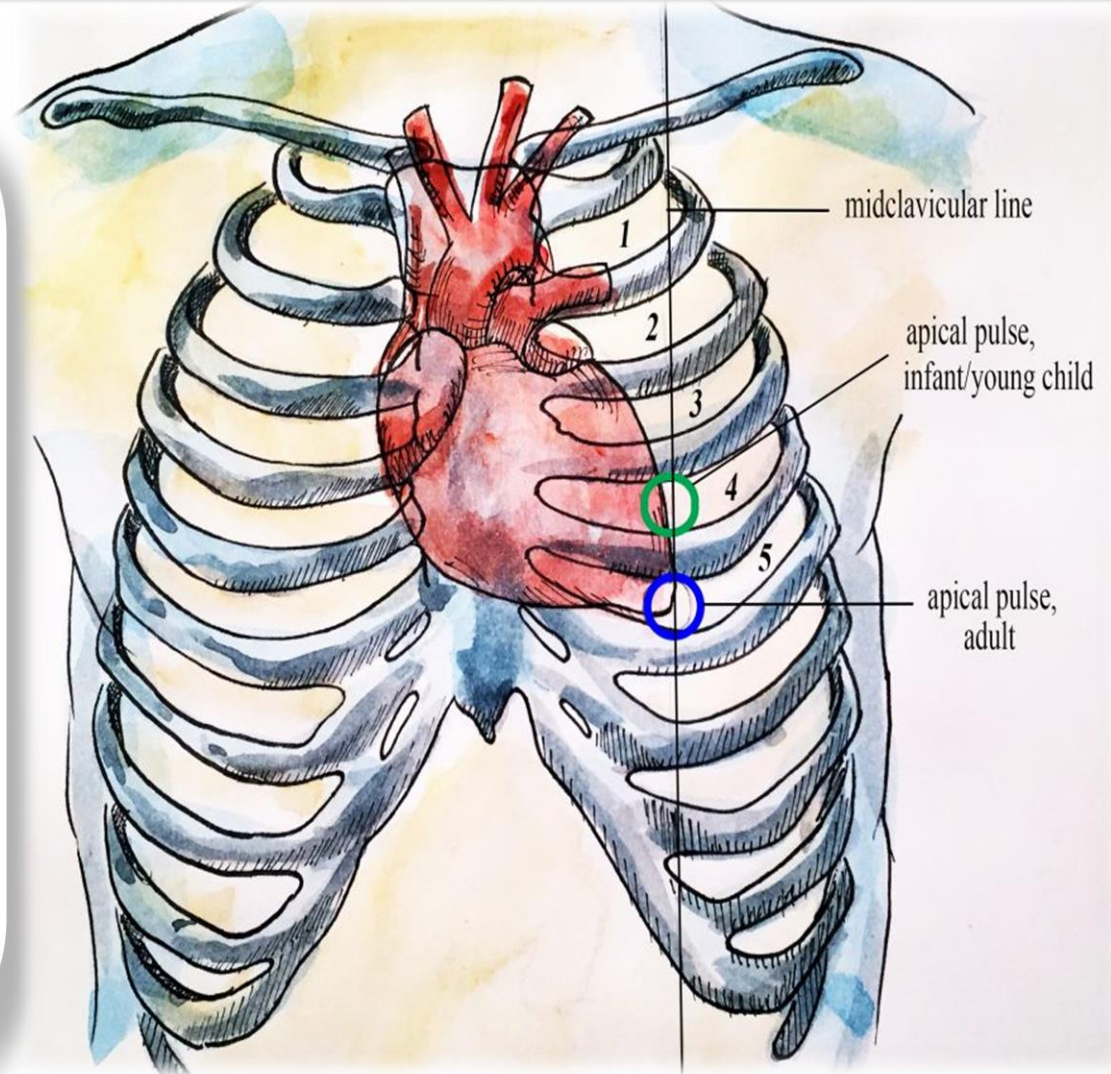
Its significant :

to localize the location of the apex beat of the heart .

In female its situation different according to the size of the breast that extends vertically from the second to the sixth rib.

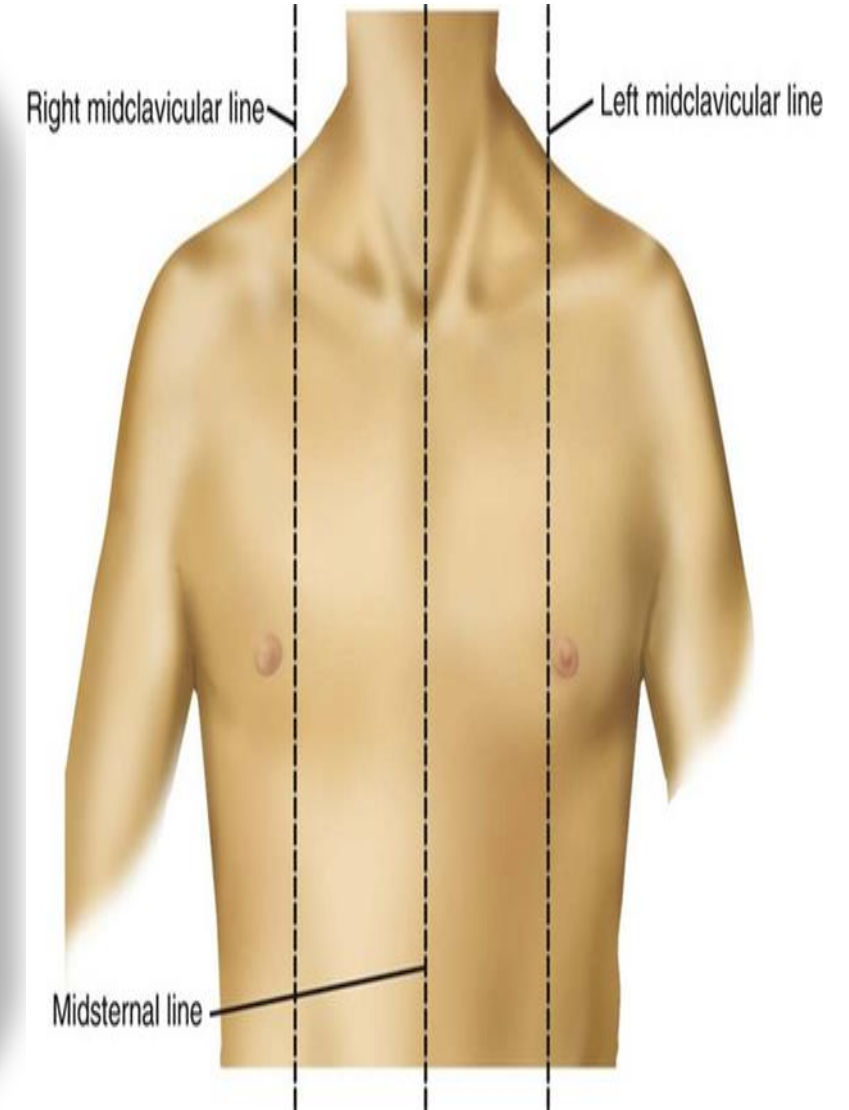
Apex beat

- It is apical cardiac impulse that is the palpable farthest away from the sternum and farthest down on the chest wall, located within midclavicular line in the fifth intercostal space.



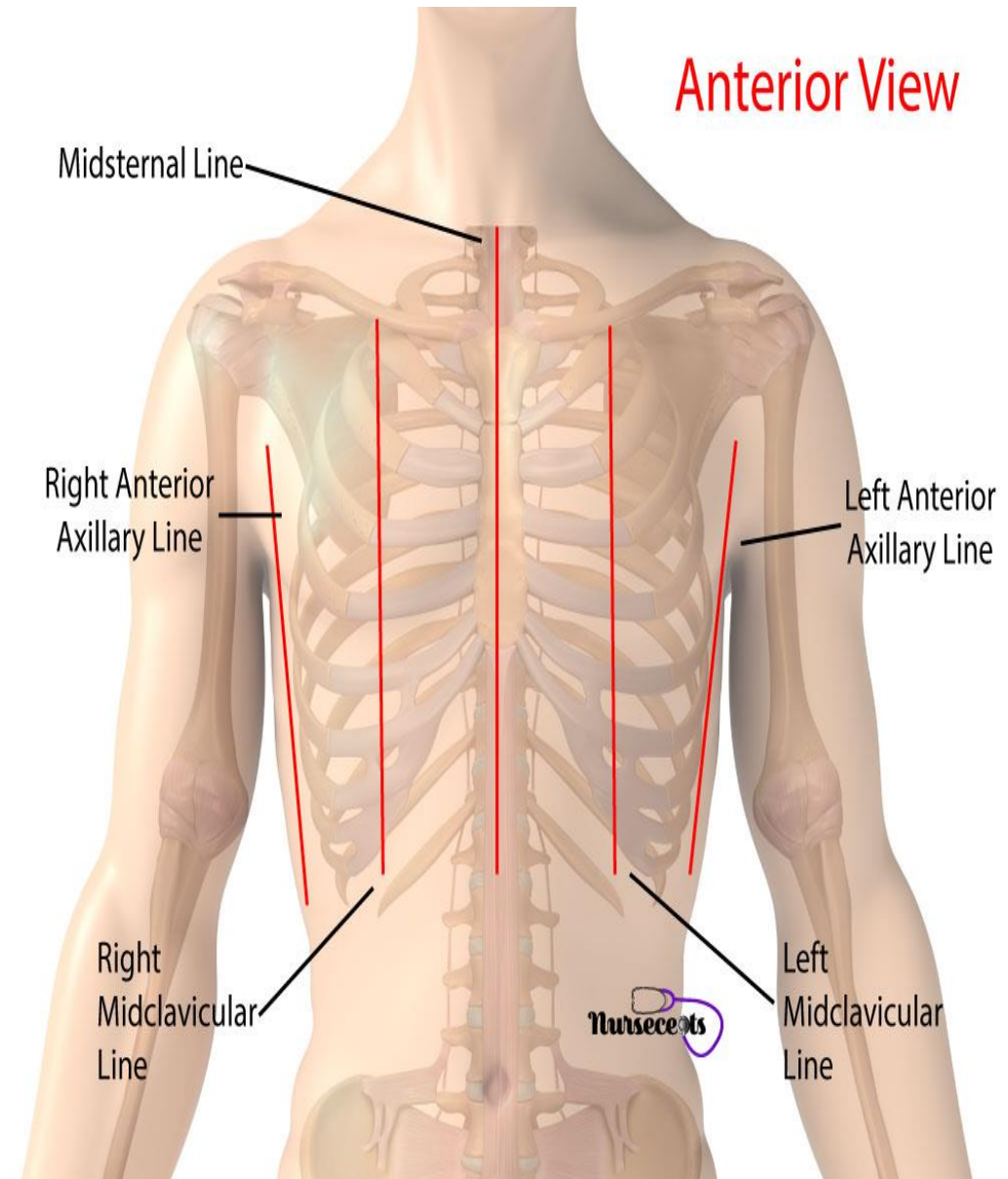
Lines Of Orientation of thorax

An Imaginary lines on the front and back of the thorax used to describe locations of the anatomical structures and play an important role in clinical examination and thoracic surgery.



Lines Of Orientation

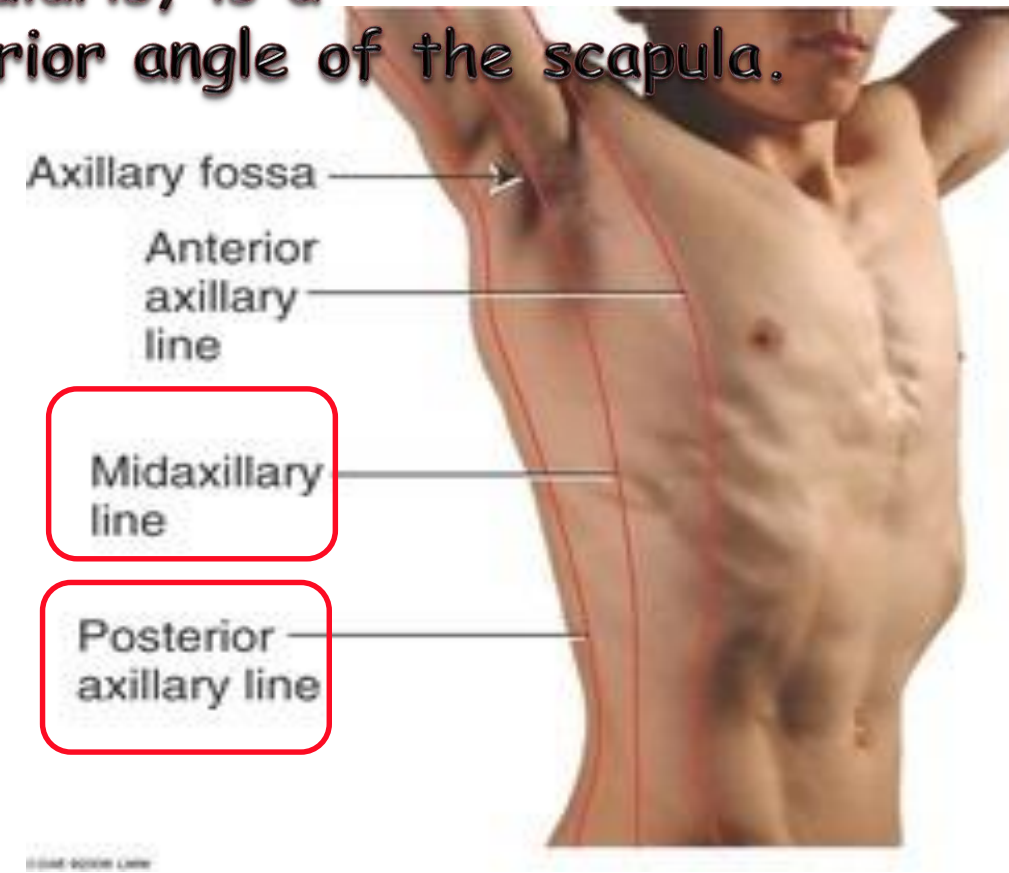
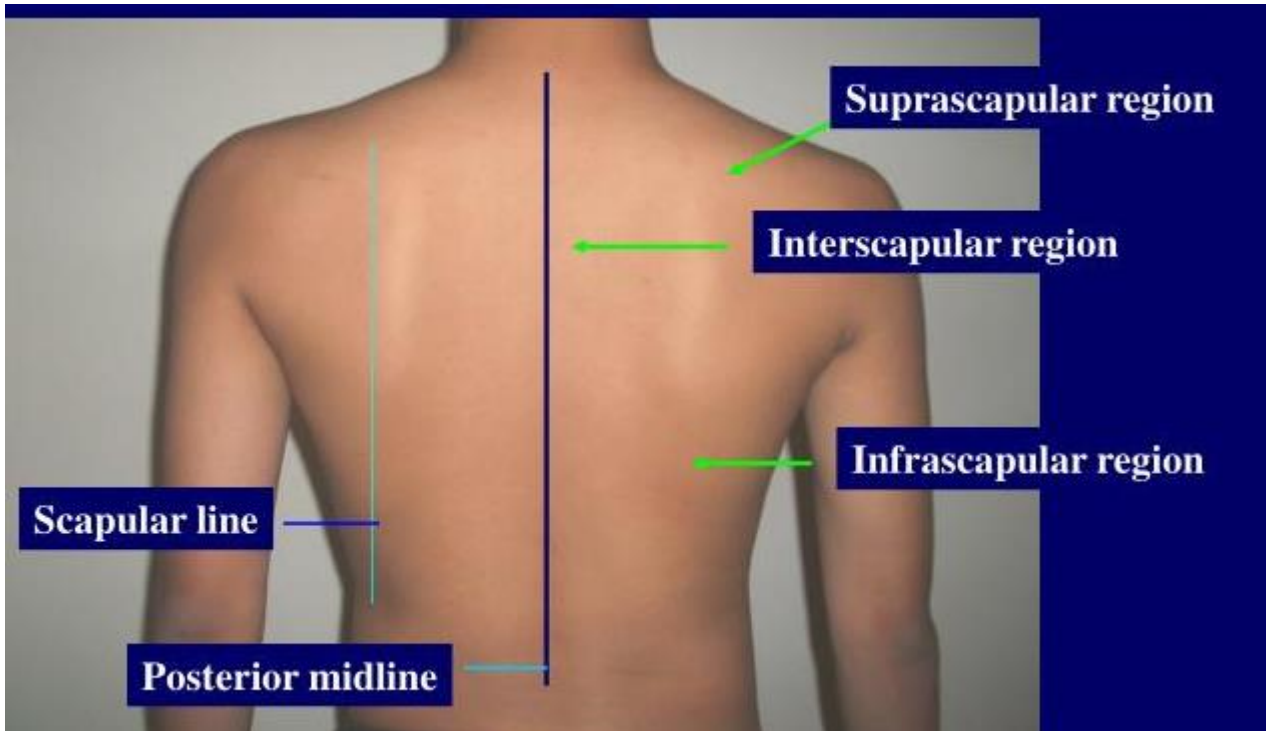
- **Mid sternal line** A vertical line passes within midline of the body (middle of sternum) and downward. .
- **Mid Clavicular line** It is a parasagittal vertical line that passes through middle of the body of the clavicle downward .
- **Anterior axillary line** :Is a vertical imaginary line on the anterior aspect of trunk that passes perpendicularly from anterior axillary fold downward.



Posterior axillary line is an imaginary line that passes perpendicularly from posterior axillary fold downward

Mid axillary line :An imaginary line that passes perpendicularly from the midpoint in between the anterior and posterior Axillary lines.

The scapular line, also known as the linea scapularis, is a vertical imaginary line passing through the inferior angle of the scapula.



Surgical chest scar

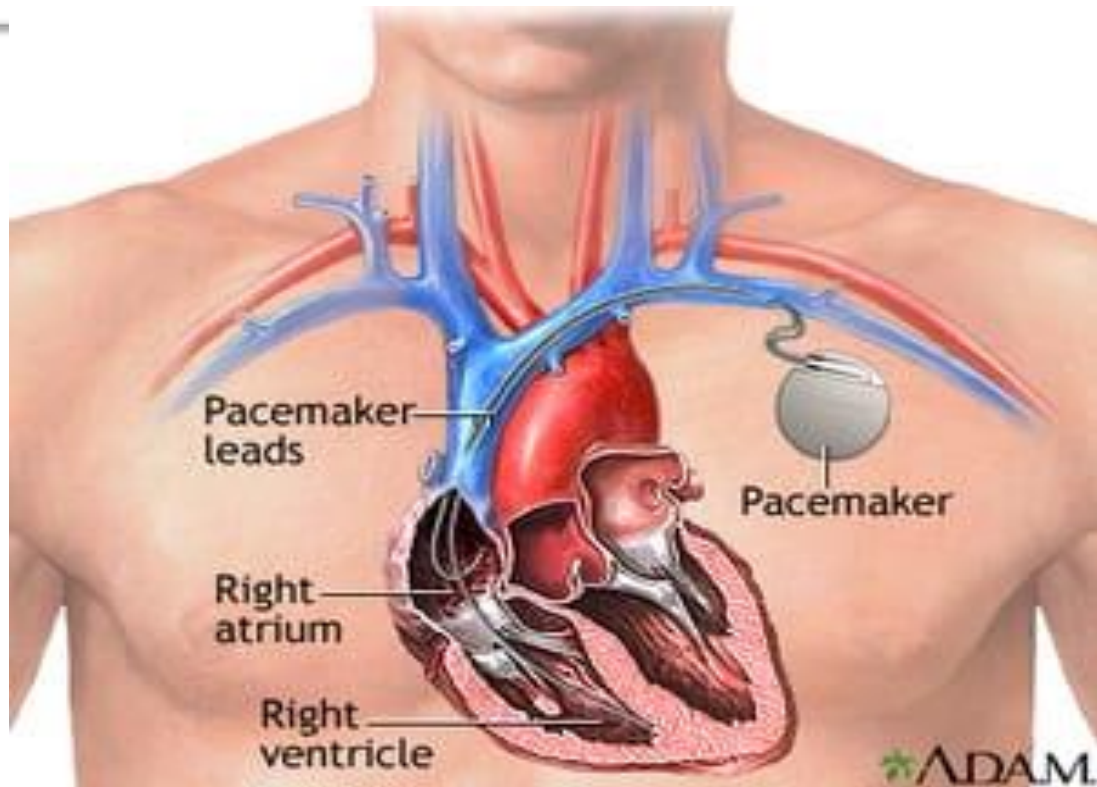
Left sub mammary scar -
Indicates previous mitral
valvotomy ↓↓↓↓



Midline sternotomy scar Indicates previous
coronary artery bypass grafting OR aortic
valve replacement .↓↓↓↓



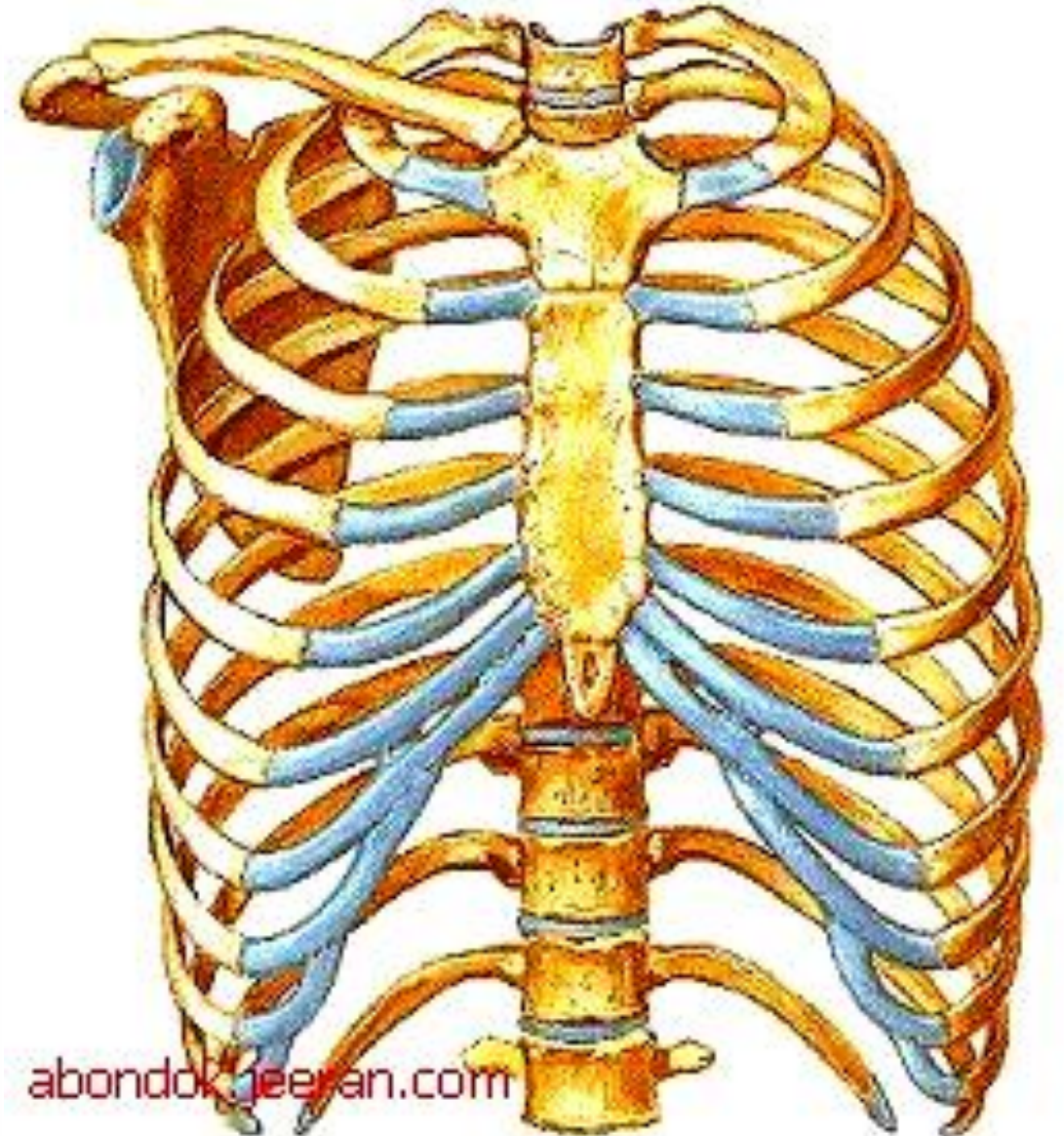
Surgical chest scar



Infraclavicular scar - Indicates previous pacemaker insertion.

Chest Wall

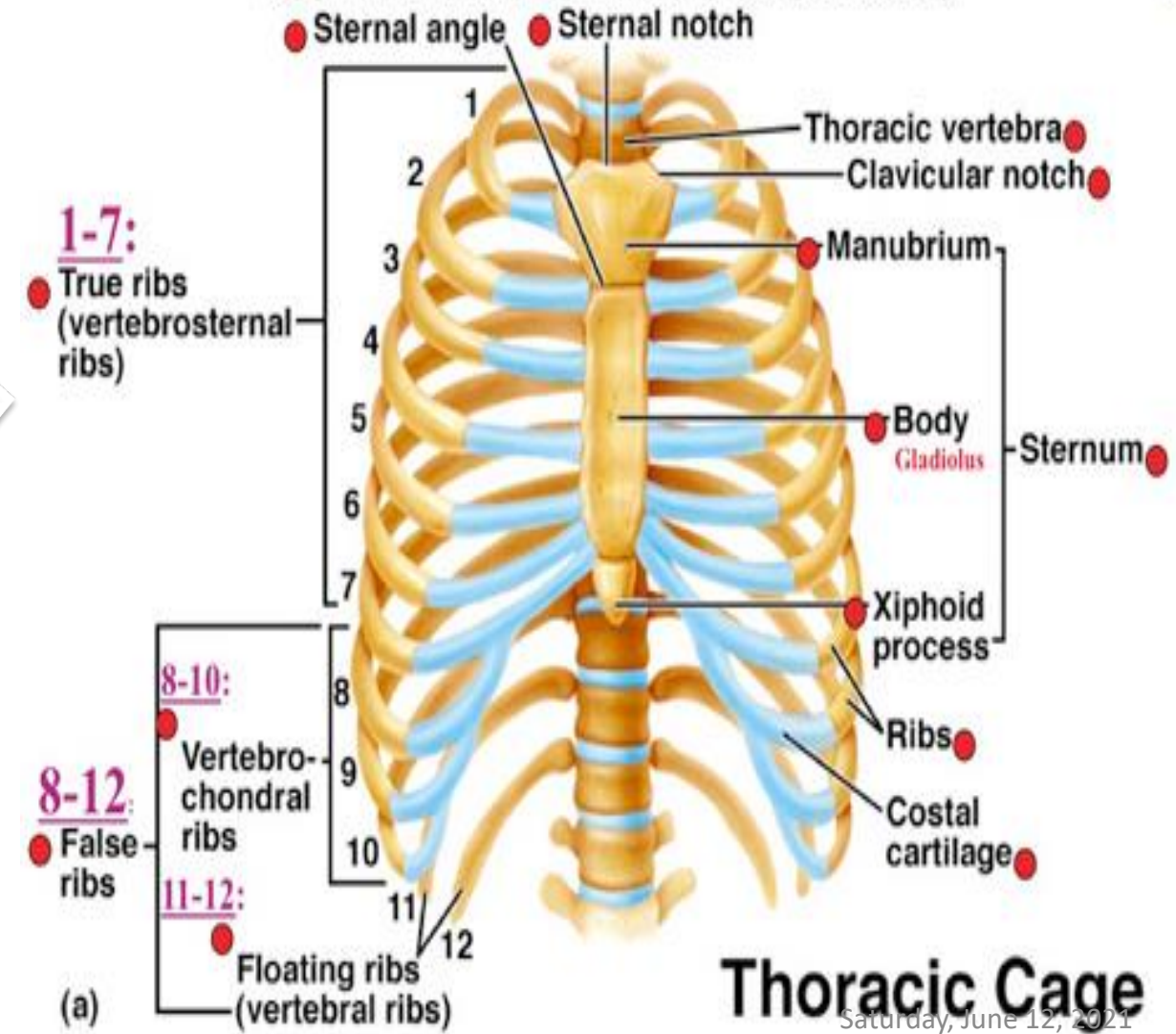
The chest wall is the structure that surrounds the vital organs within the thoracic cavity and consists of skin , fat, muscles, and bone (thoracic cage) supports breathing and stabilizes the shoulder girdle and upper limb during movements.



Thoracic cage

Bones forming thoracic cage are :
Sternum
Ribs
Vertebrae

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Thoracic Cage
Saturday, June 12, 2021

Articulations

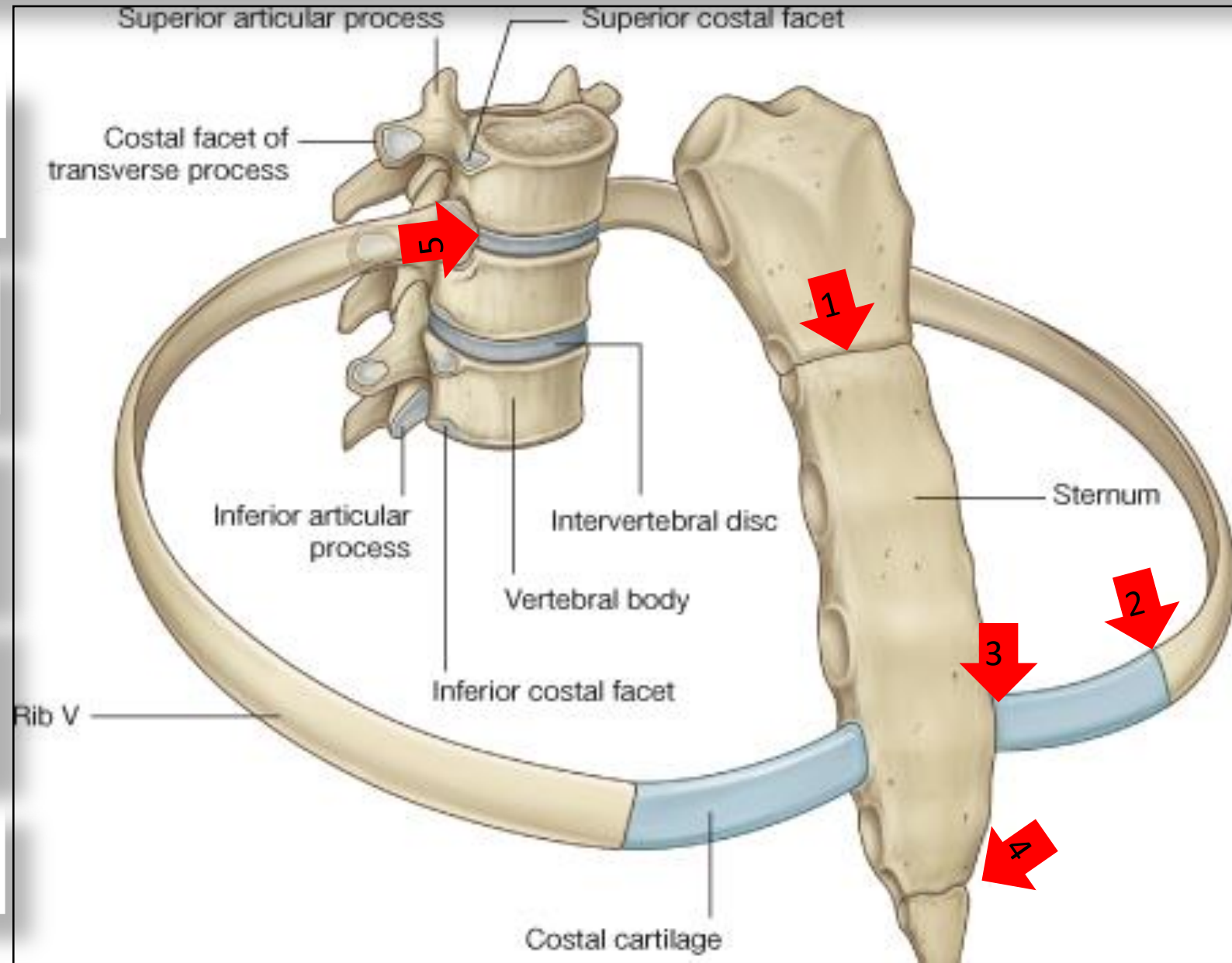
1. Manubriosternal joint
(fibrocartilaginous joint)
Slight Movement possible

2. Costochondral joint
(cartilaginous joint.)
no movements possible

3. Sternocostal joint
(synovial), mobile EXCEPT first,
which is cartilaginous & fixed

4. Xiphisternal joint
(fibrocartilaginous joint)
Slight movement

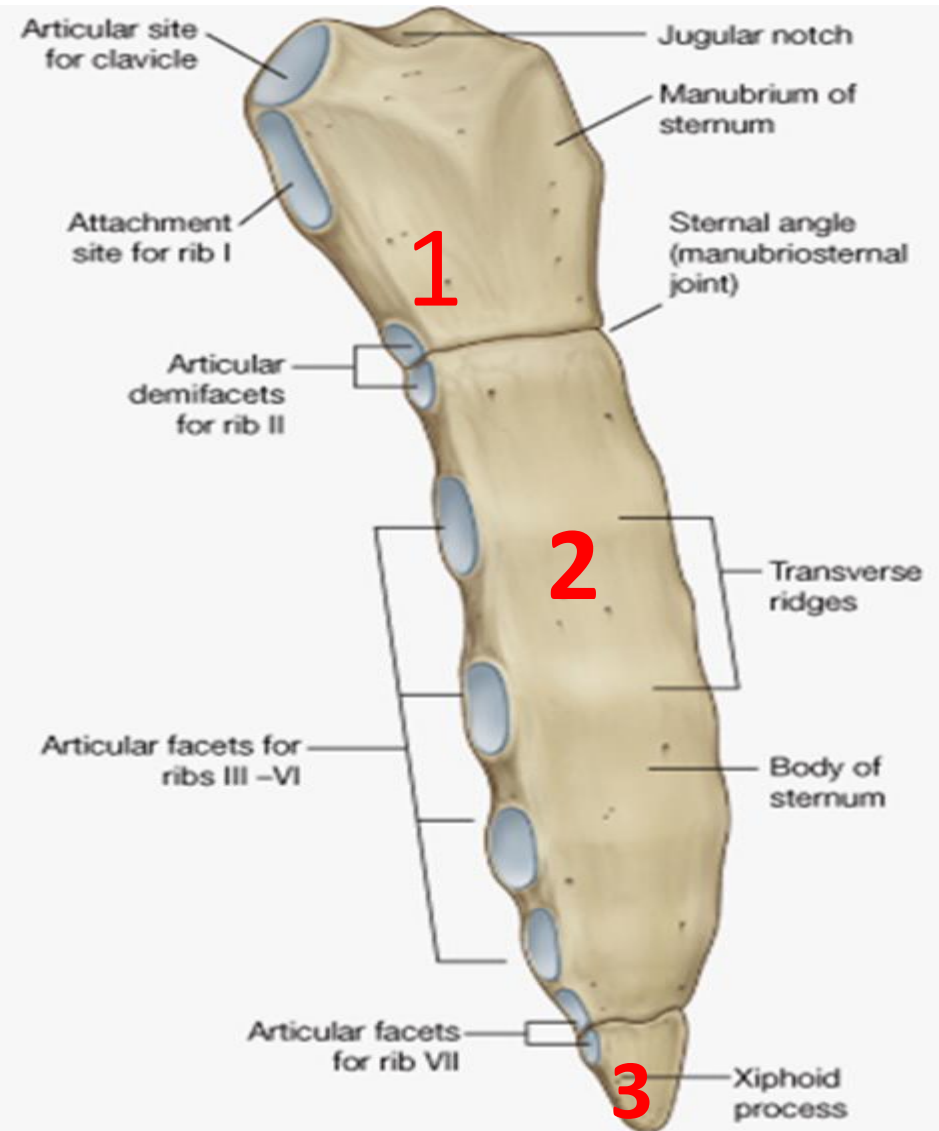
5. Costovertebral joint
(Synovial joint) movable



Sternum

Dagger like flat bone.
Has three parts:

1. Manubrium sterni
2. Body of the sternum
3. Xiphoid process.



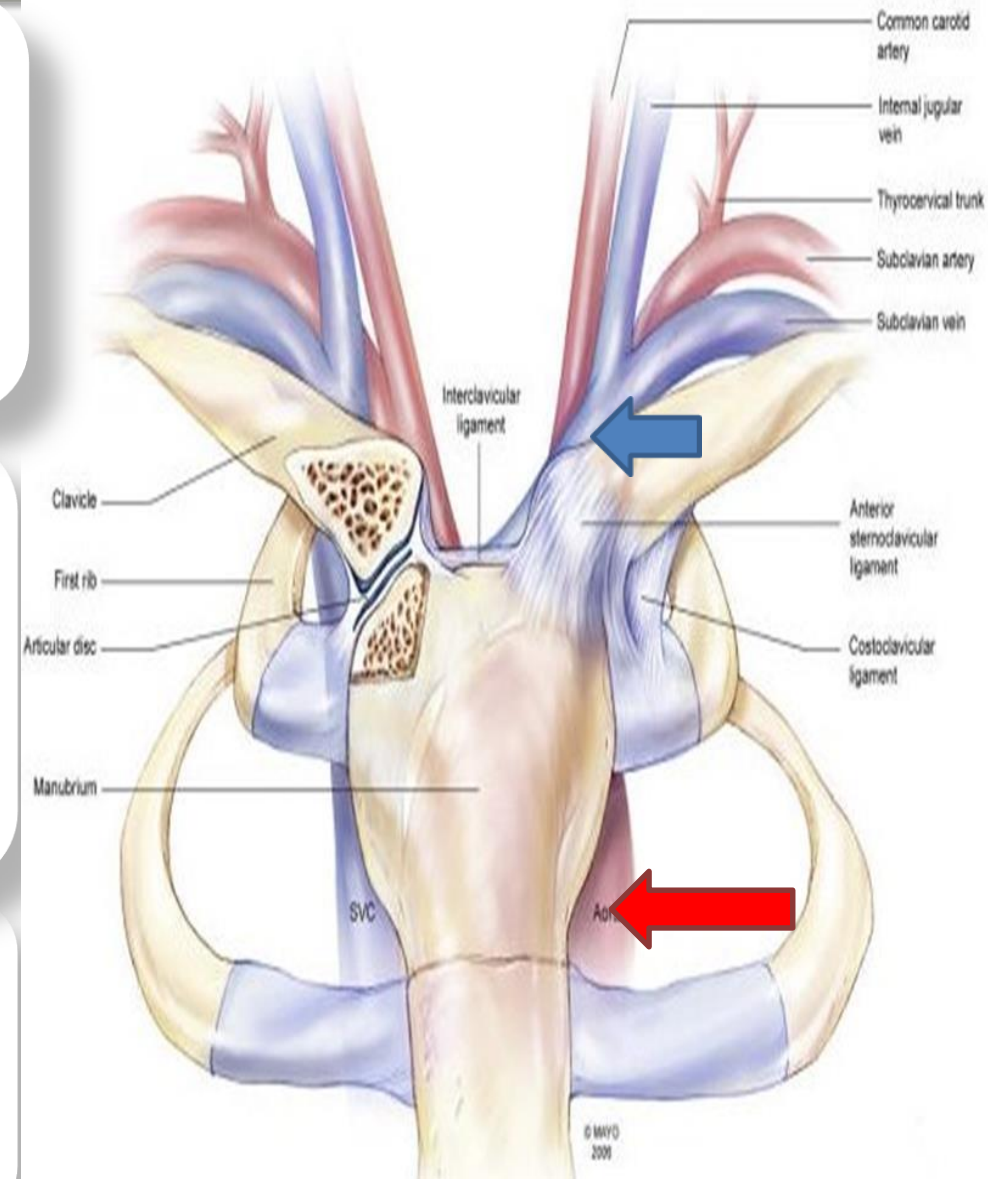
Clinical notes

The sternum is one of the sites used for bone marrow aspiration because it possesses hematopoietic marrow activity throughout life.

It is usually carried out at level with the 2nd or 3rd intercostal space in midsternal. **If the sternal puncture is improperly executed, the needle can pierce the structures related to the posterior surface of the manubrium such as:**

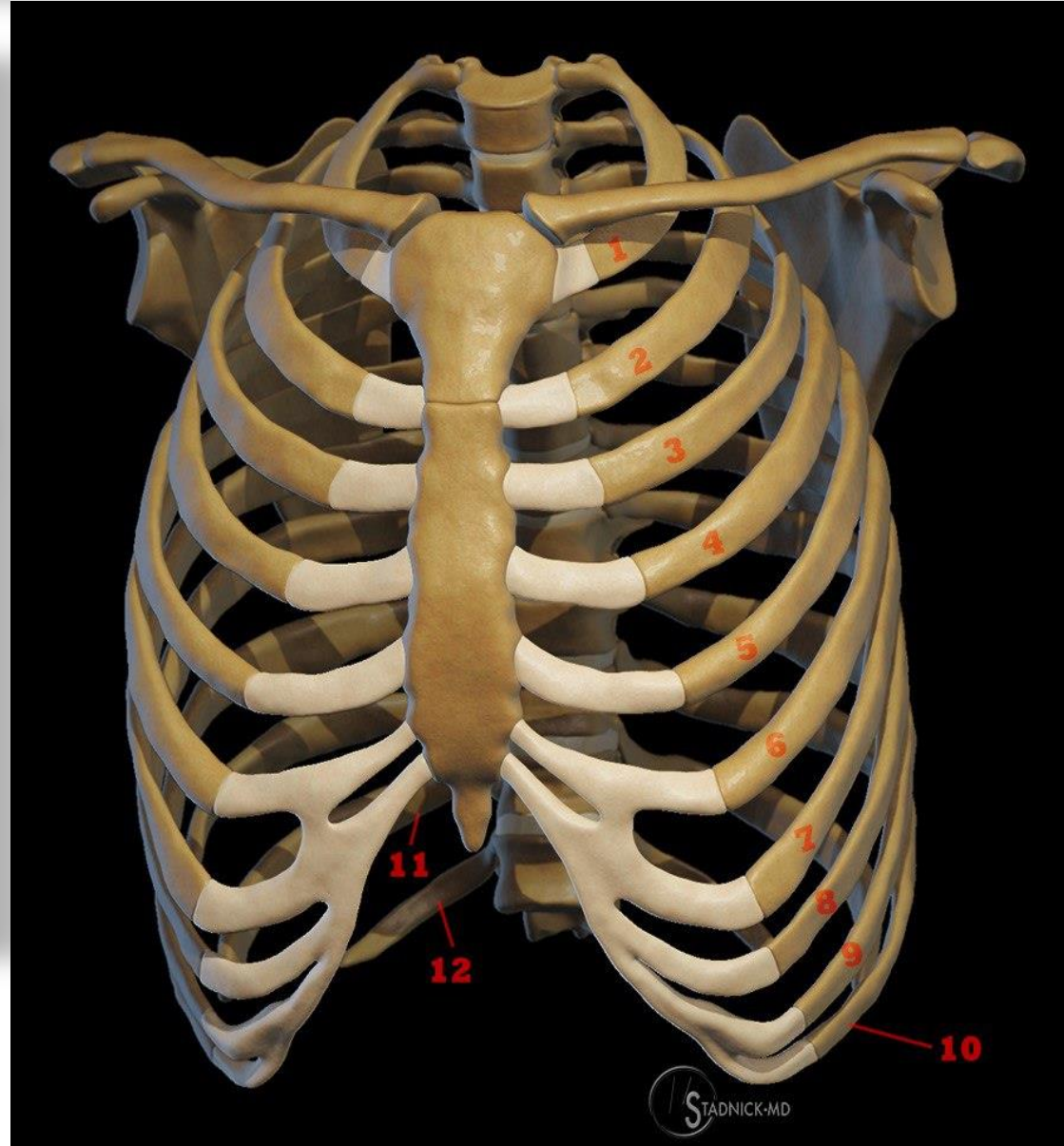
* left brachiocephalic vein in the upper part.

* aortic arch in the lower part.



Ribs

- There are 12 pairs of ribs.
- The ribs are articulated posteriorly with the T1-T12 thoracic vertebrae, and most are attached anteriorly via their costal cartilages to the sternum.

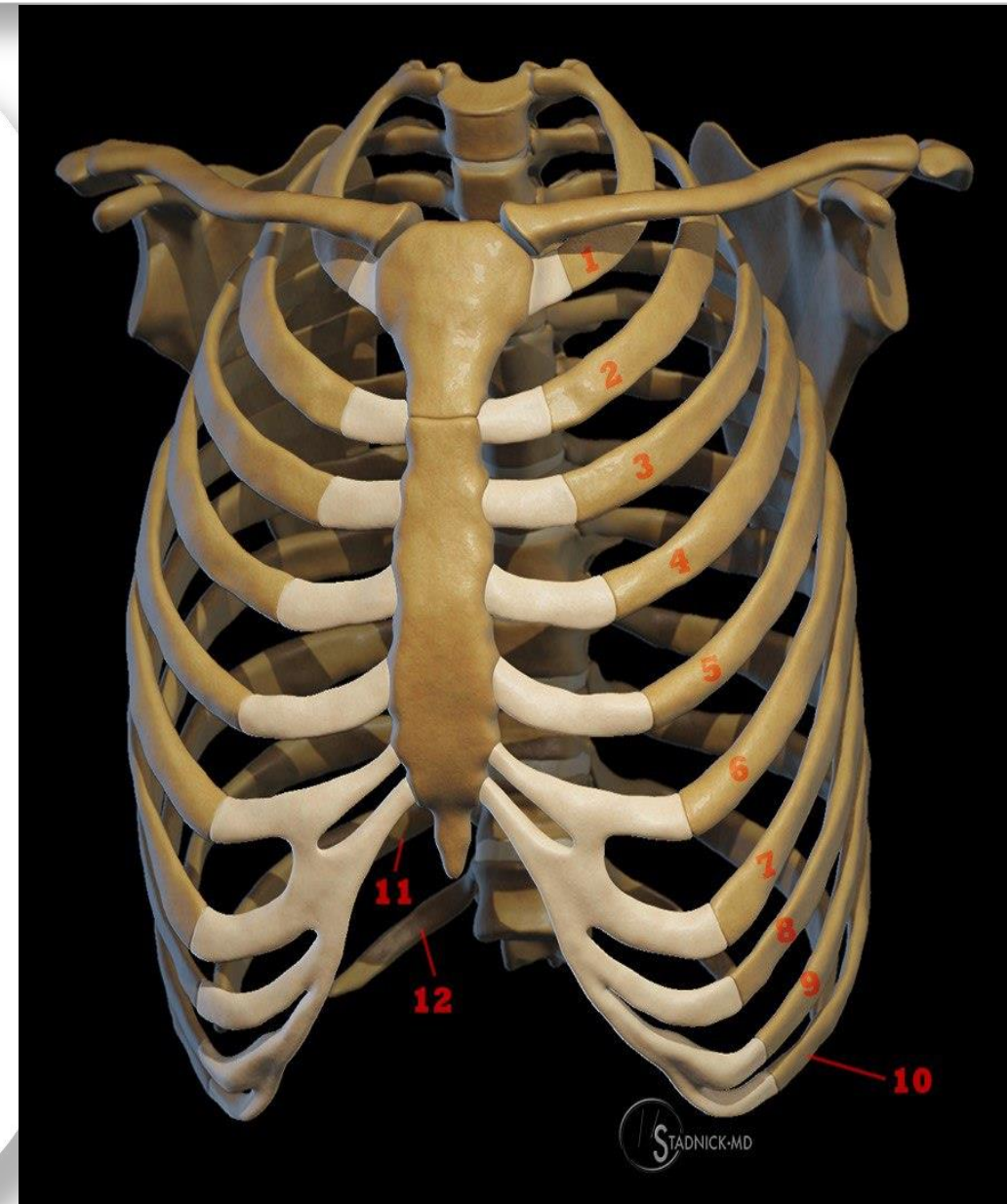


1. Classification of ribs according to their attachments to the sternum :

A: True ribs: (1-7) The costal cartilage from each of these ribs attaches directly to the sternum.

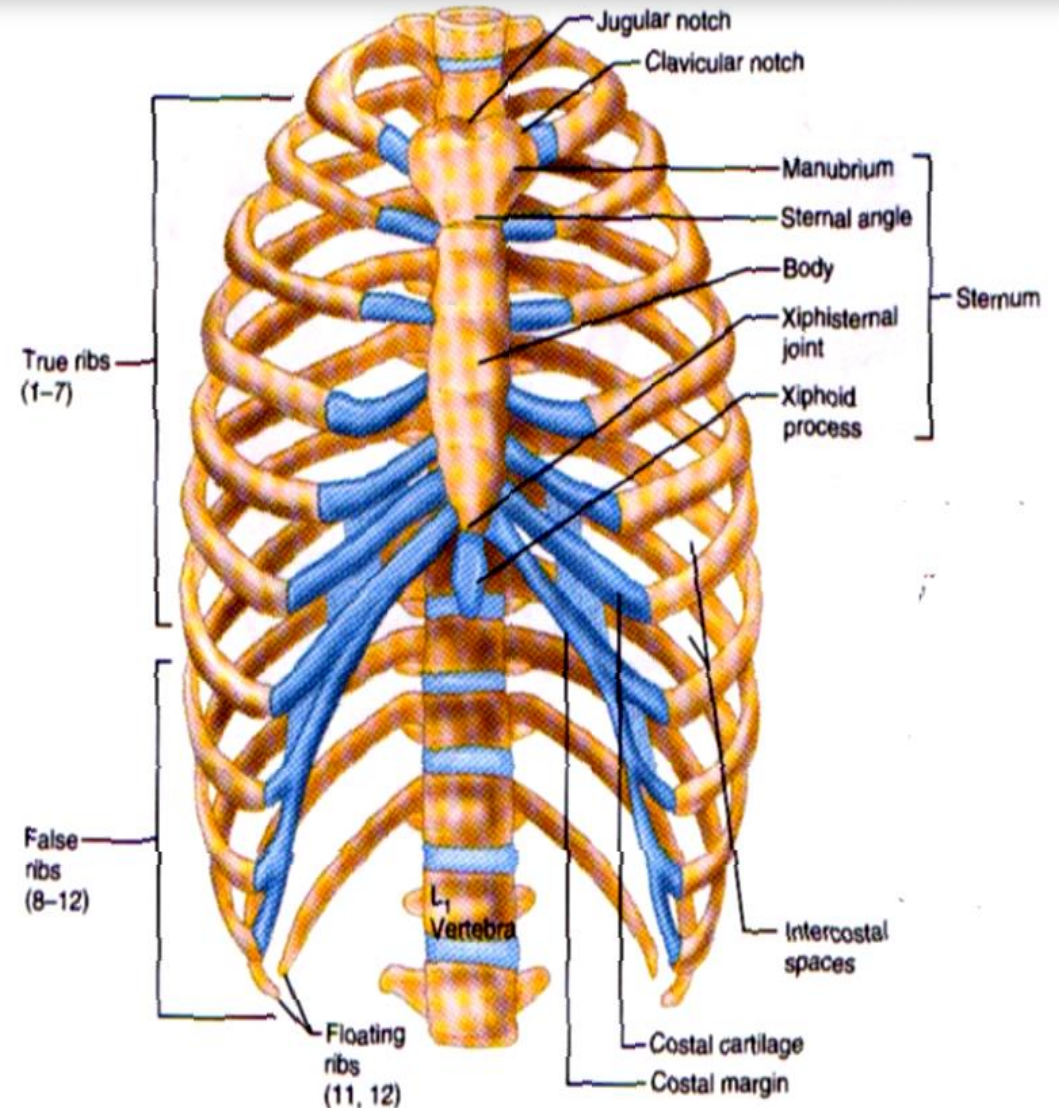
B: False ribs: Ribs 8-10 .The costal cartilages from these ribs do not attach directly to the sternum, but are attached to the cartilage of the next higher rib and then to the costal cartilage of 7th .

C. Floating ribs : The last two false ribs (11-12) are also called floating ribs (vertebral ribs). These are short ribs that do not attach to the sternum at all.



2. Classification of ribs according to their structures

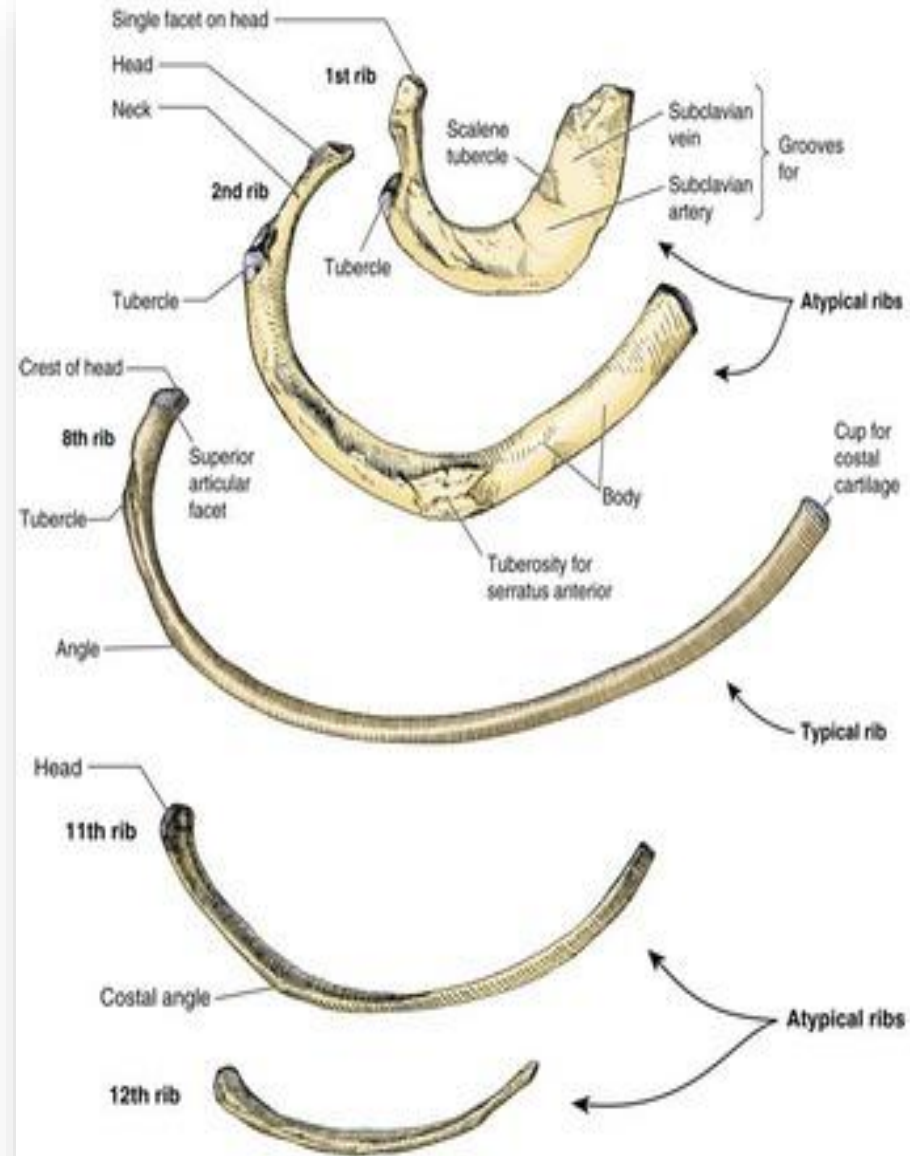
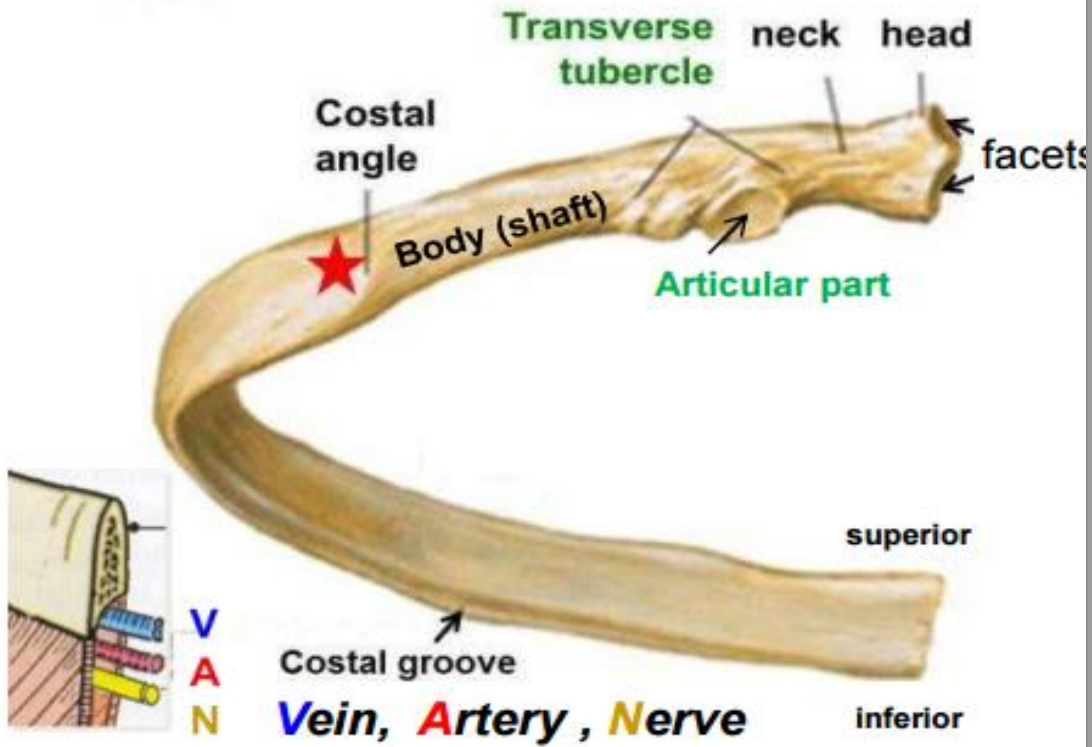
1: Typical: 3rd - 9th ribs
2: Atypical: 1st, 2nd, 10th, 11th, and 12th ribs.



Ribs

Typical rib

TYPICAL RIBS: Ribs 3-9



Atypical Ribs (Superior Views)

1st rib: shortest; broadest; most sharply curved; grooves for subclavian vessels; one articular facet on head (T1 vertebrae)

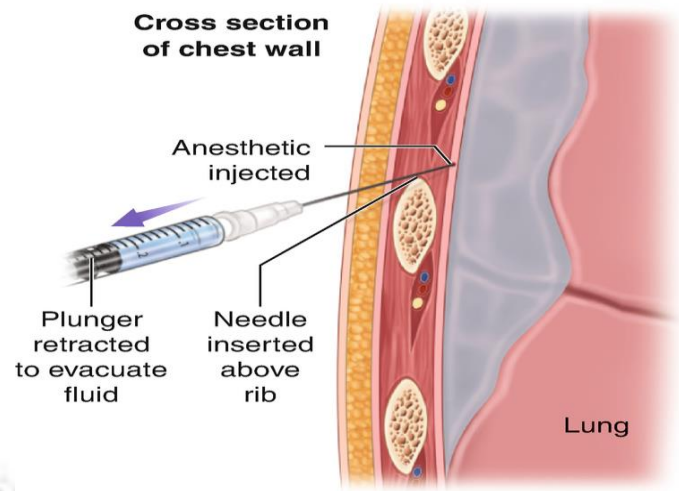
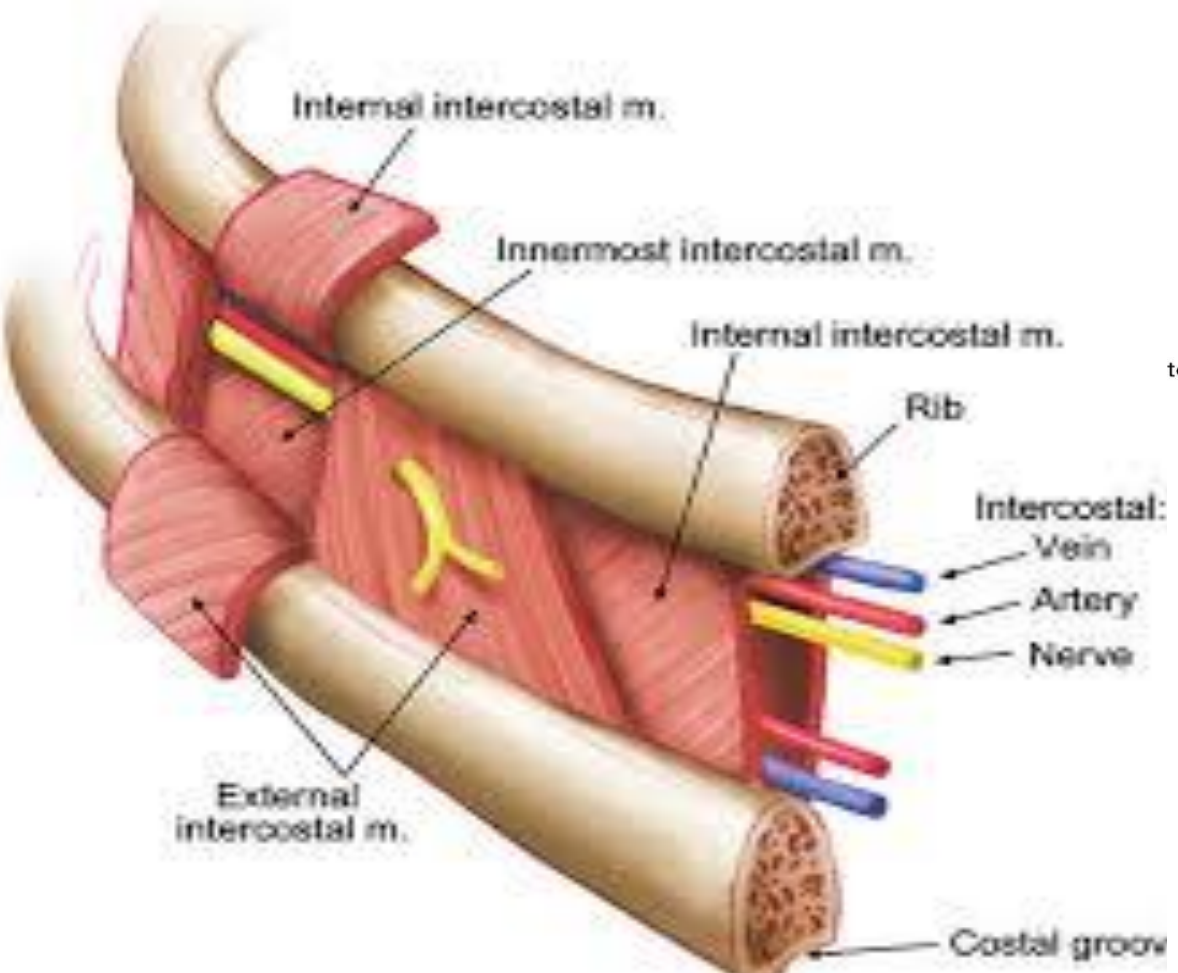
2nd rib: short and broad; rough superior tuberosity

Ribs 10-12: only one articular facet on head

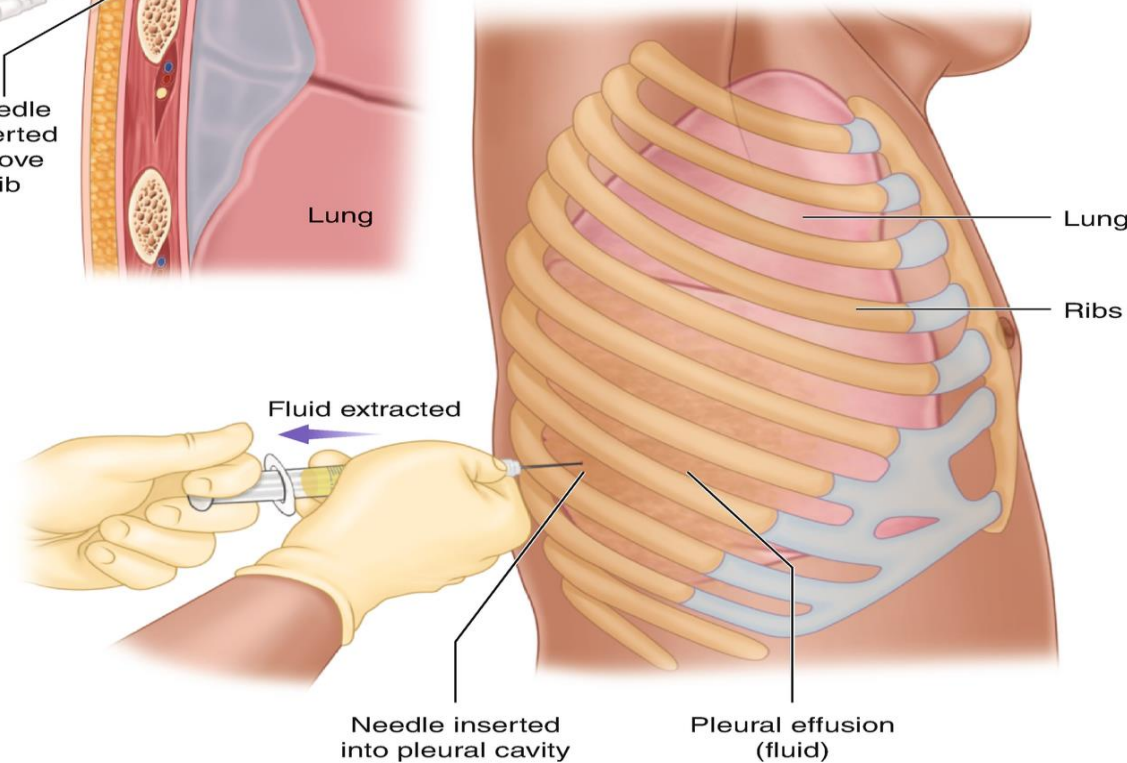
Ribs 11 and 12: short; no articulation with sternum

Clinical notes

To obtain a sample of pleural fluid or drain pus or blood from the pleural cavity, the needle or drain is passed through the intercostal space just above the upper border of the rib to avoid the neurovascular bundle in subcostal groove



Thoracentesis



Thoracic vertebrae

12 thoracic vertebrae and they are intermediate in size between the cervical and lumbar vertebrae.

