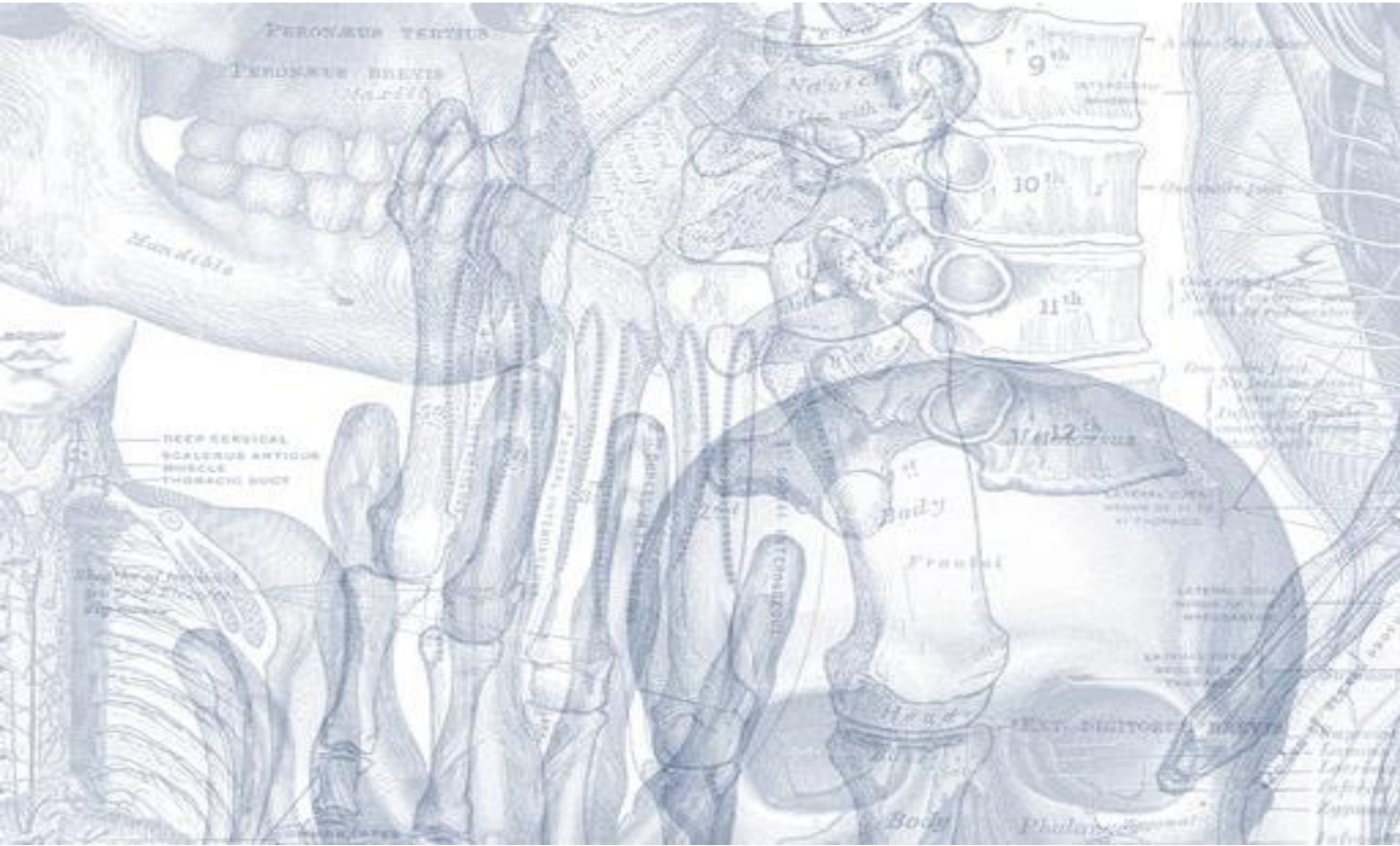


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Pectoral Region and Axilla

[Editing File](#)

Color Code

- Important
- Doctors Notes
- Notes/Extra explanation

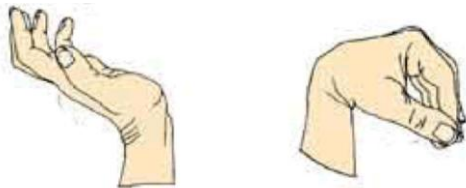
Objectives

- ✓ By the end of the lecture the students should be able to :
- ✓ Identify and describe the muscles of the pectoral region.
 - I. Pectoralis major.
 - II. Pectoralis minor.
 - III. Subclavius.
 - IV. Serratus anterior.
- ✓ Describe and demonstrate the boundaries and contents of the axilla.
- ✓ Describe the formation of the brachial plexus and its branches.

The movements of the upper limb

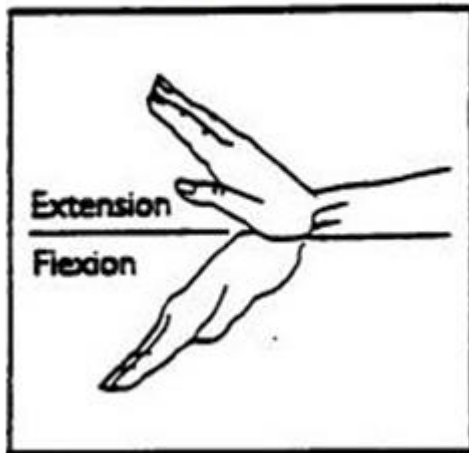
Note: differentiate between the different regions

Flexion & extension of
wrist = hand

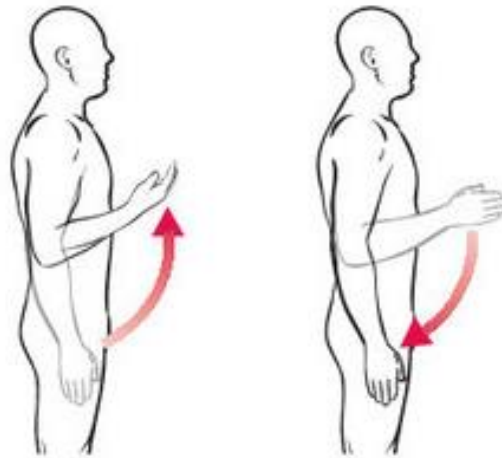


Wrist extension

Wrist flexion



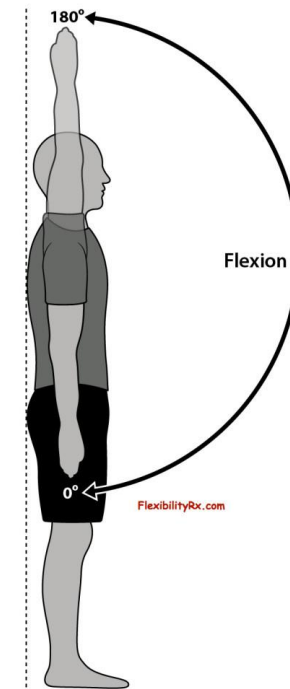
Flexion & extension of
elbow = forearm



Flexion

Extension

Flexion & extension of
shoulder = arm = humerus



Shoulder Flexion Assessment

I. Pectoralis Major

Origin

2 heads

Clavicular head: From Medial ½ of the front of the clavicle.

Sternocostal head: From; **Sternum.**

Upper 6 costal cartilages.

Aponeurosis of the **external oblique muscle.**

Insertion

Lateral lip of bicipital groove (humerus)*

Nerve Supply

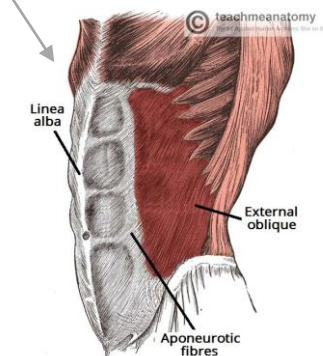
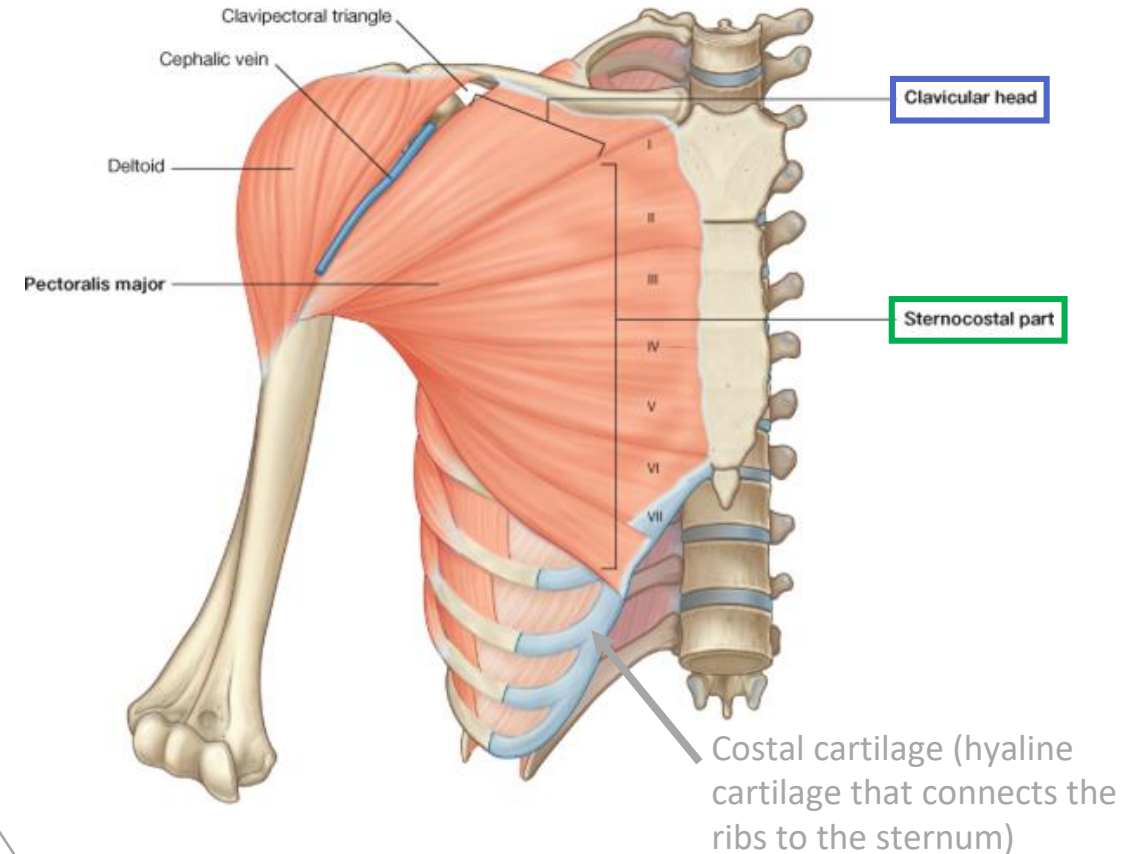
Medial & lateral pectoral nerves.

Action

Adduction and medial rotation of the arm.

Only the clavicular head helps in **flexion of arm (shoulder).**

* 3 muscles are attached at the bicipital groove: Latissimus dorsi, pectoral major, teres major

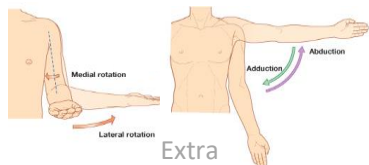


Recall what we took in foundation:

Muscles are attached to bones / ligaments / cartilage by

- 1) tendons
- 2) aponeurosis
- 3) raphe

Extra picture for understanding



II. Pectoralis Minor

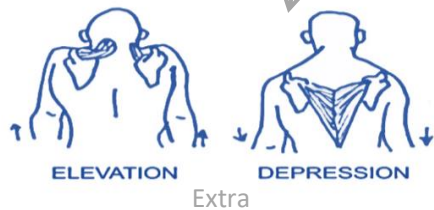
Origin From 3rd, 4th, & 5th ribs close to their costal cartilages.

Insertion Coracoid process (scapula)*

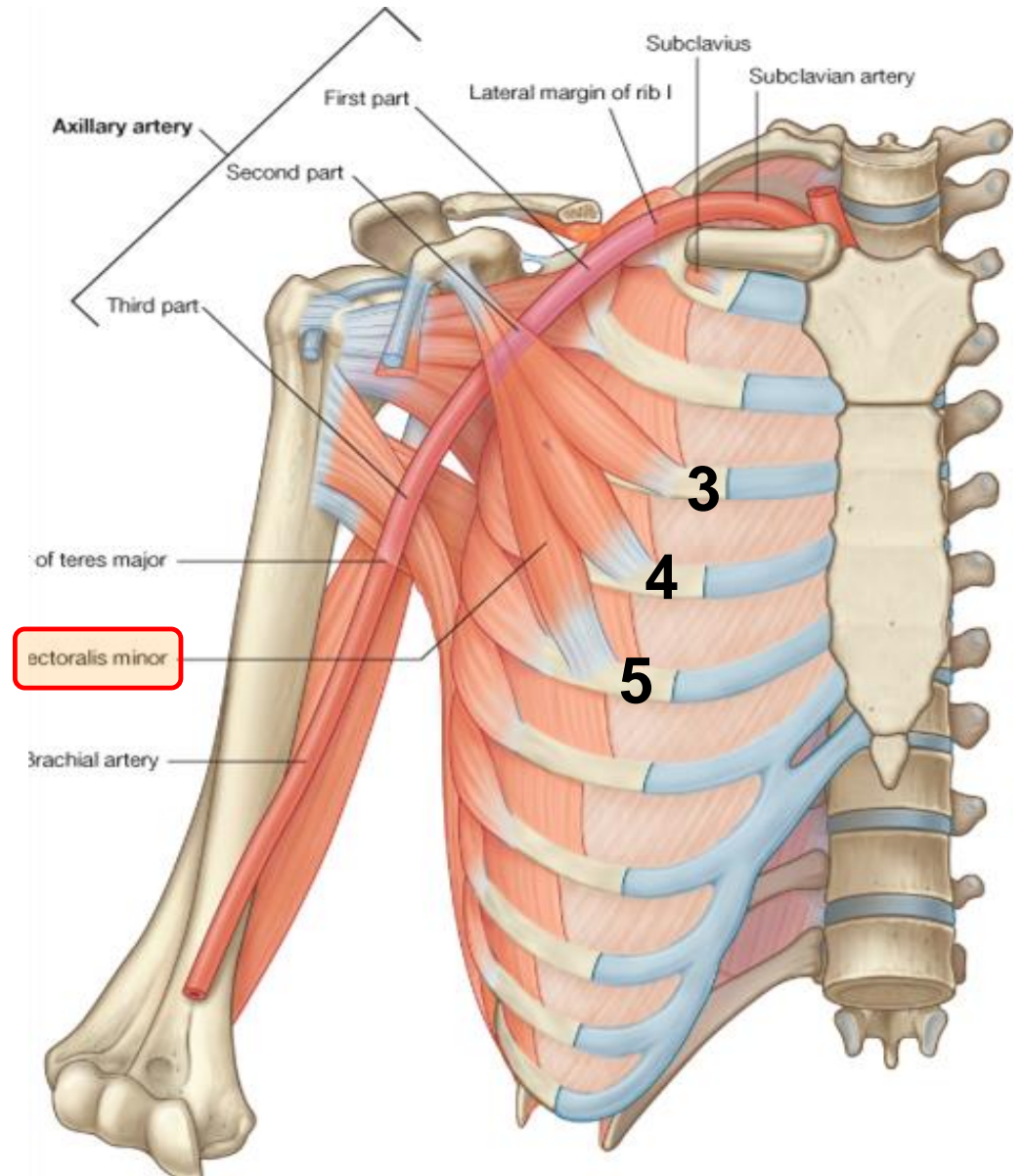
Nerve Supply Medial pectoral nerve.

Action

1. Depression of the **shoulder**.
2. Draw the **ribs upward** and **outwards** during **deep inspiration**.



*Don't confuse the coracoid process on the scapula with the coronoid process on the ulna



III. Subclavius

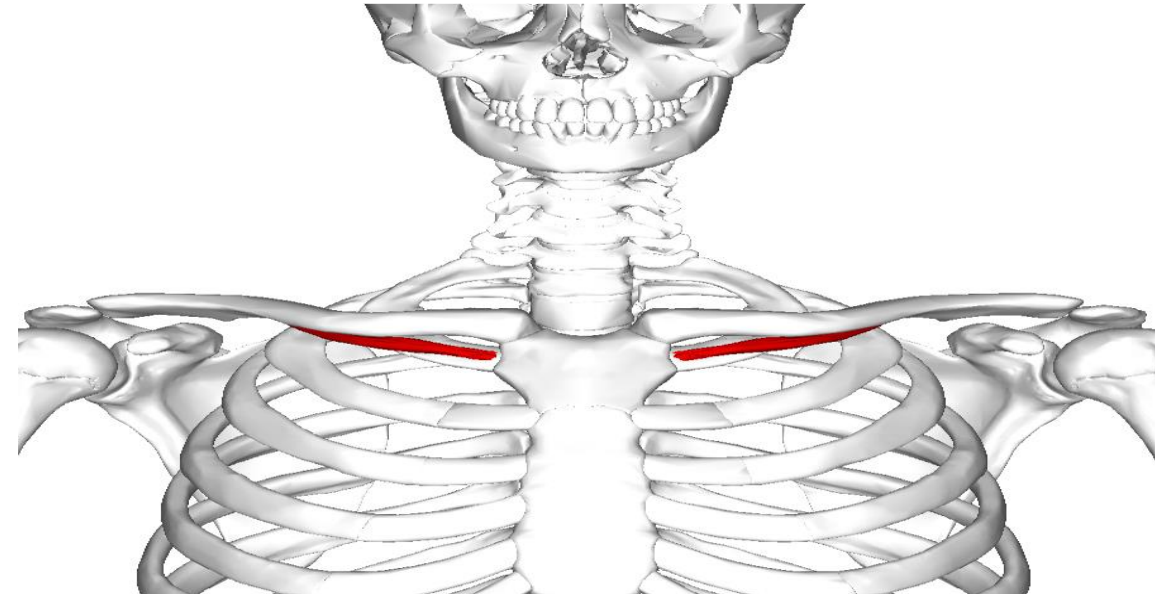
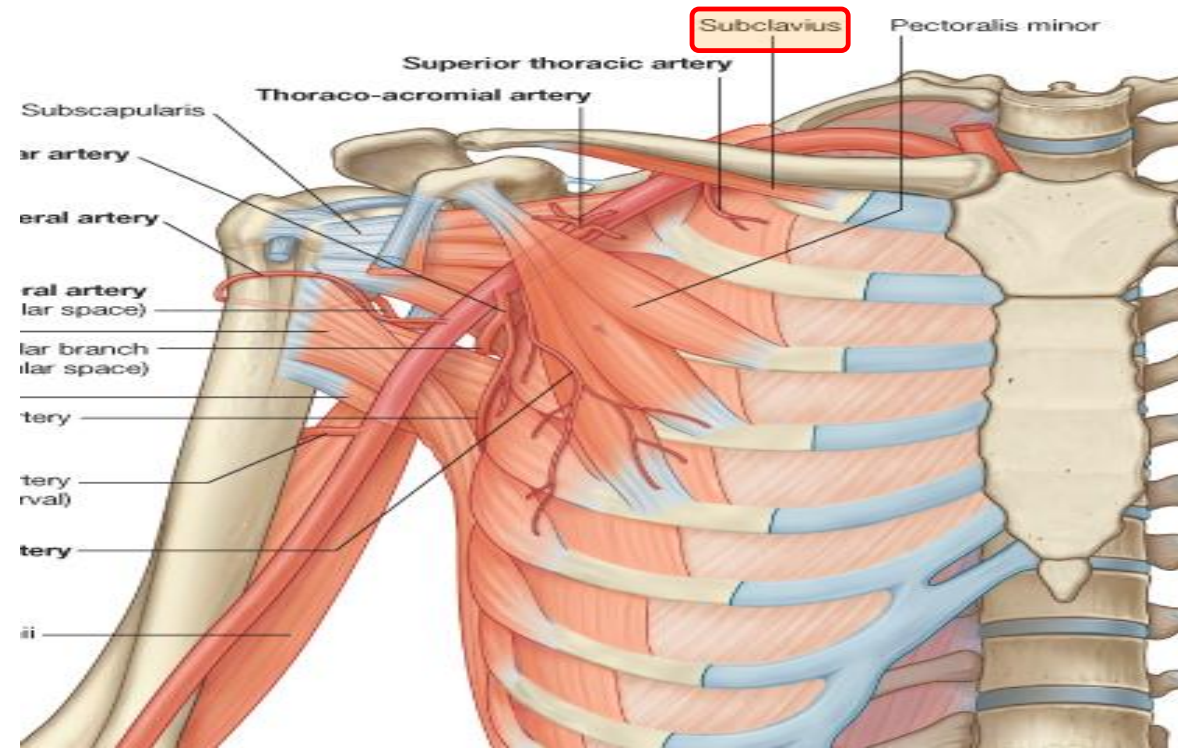
Origin From 1st rib at its junction with the 1st costal cartilage

Insertion Subclavian groove in the **middle 1/3** of the inferior surface of **clavicle**.

Nerve Supply Nerve to subclavius from **upper trunk** of brachial plexus

Action **Fixes** the **clavicle** during movement of shoulder joint.

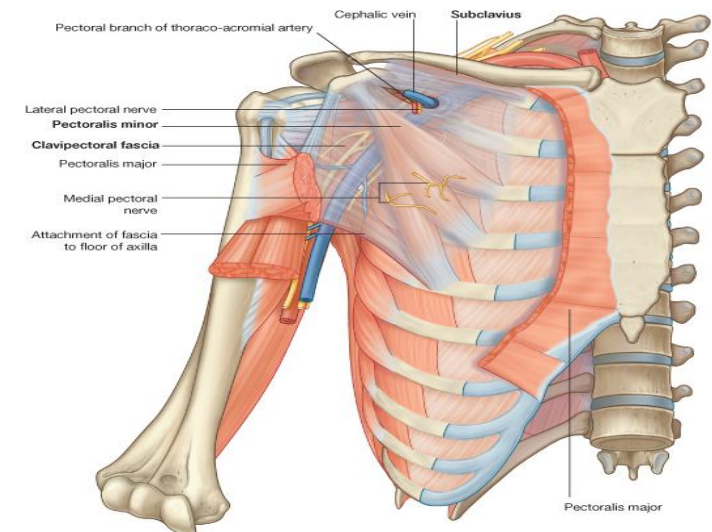
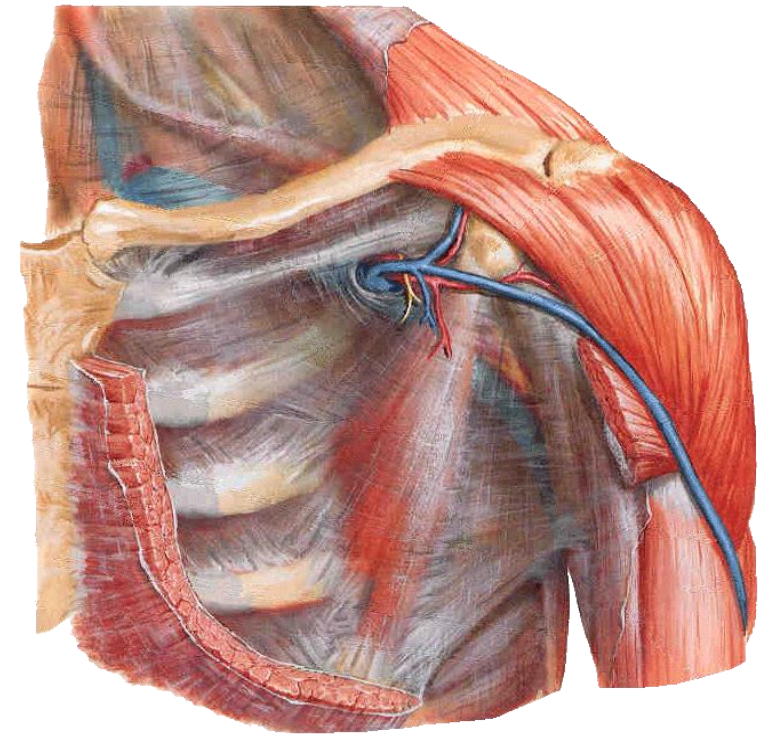
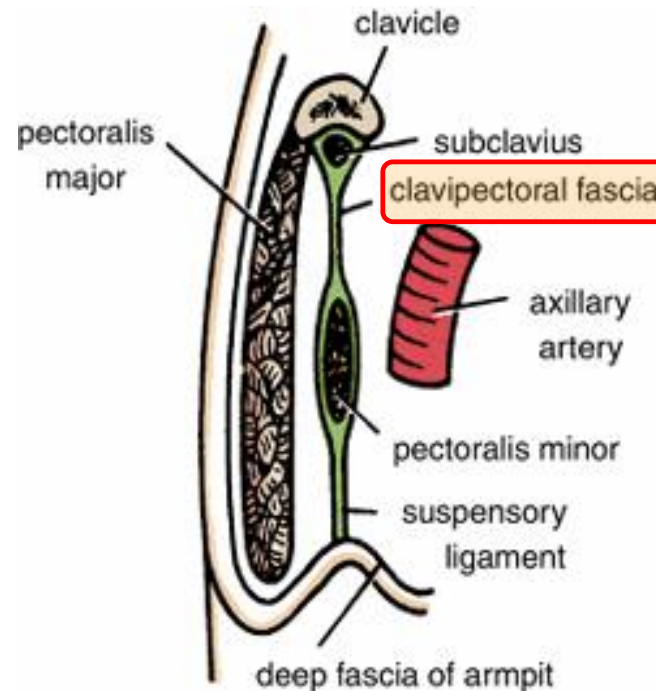
(pulls the clavicle medially to stabilize sternoclavicular joint)



Clavipectoral Fascia

- It is **thickened** membrane of **deep fascia*** (between **subclavius** & **pectoralis minor**).
- It is pierced (متقوب) by :
 - 1- **Lateral pectoral nerve**.
 - 2- **Thoraco-acromial** artery.
 - 3- **Cephalic** vein.
 - 4- Few lymph vessels.

*(fascia = connective tissue)



Extra picture for understanding

IV. Serratus anterior

Origin

Upper **eight ribs**.

Insertion

anterior aspect of the **medial border** and **inferior angle** of **scapula** (the blue part).

Nerve Supply

Long thoracic nerve (from roots of brachial plexus, **C5,6,7**).
(also called nerve of Bell / nerve to serratus anterior)

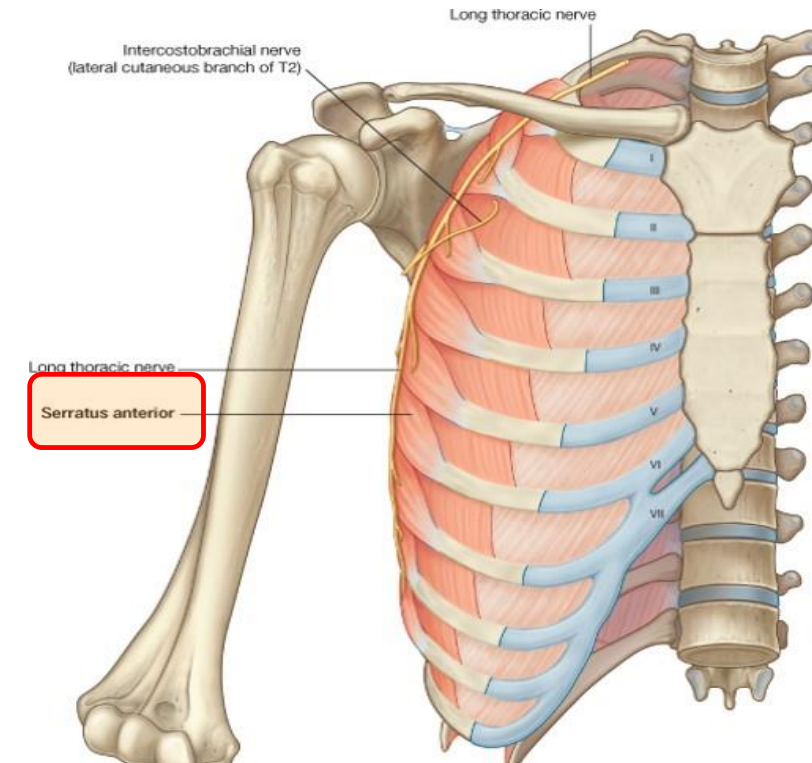
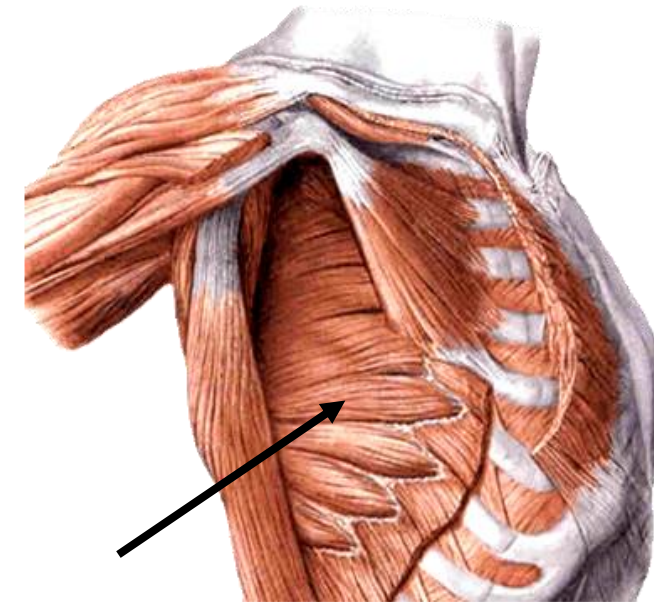
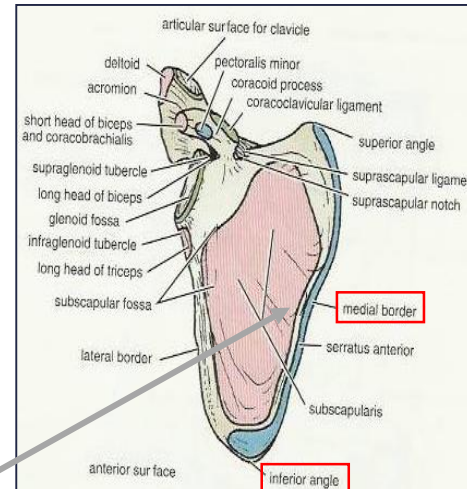
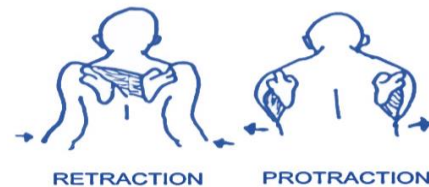
Action

1. Draws the scapula **forward** in boxing (protrusion or **protraction**)*. "**boxer's muscle**"
2. Rotates scapula **outwards** in raising the arm above 90 degree (**Abduction above 90**) with trapezius.

*Don't confuse protraction and retraction.

Retraction (when you wake up and are yawning)

Protraction (when you extend your arm like when punching someone or boxing hence the name boxers muscle)



Causes of **Winging of Scapula**:

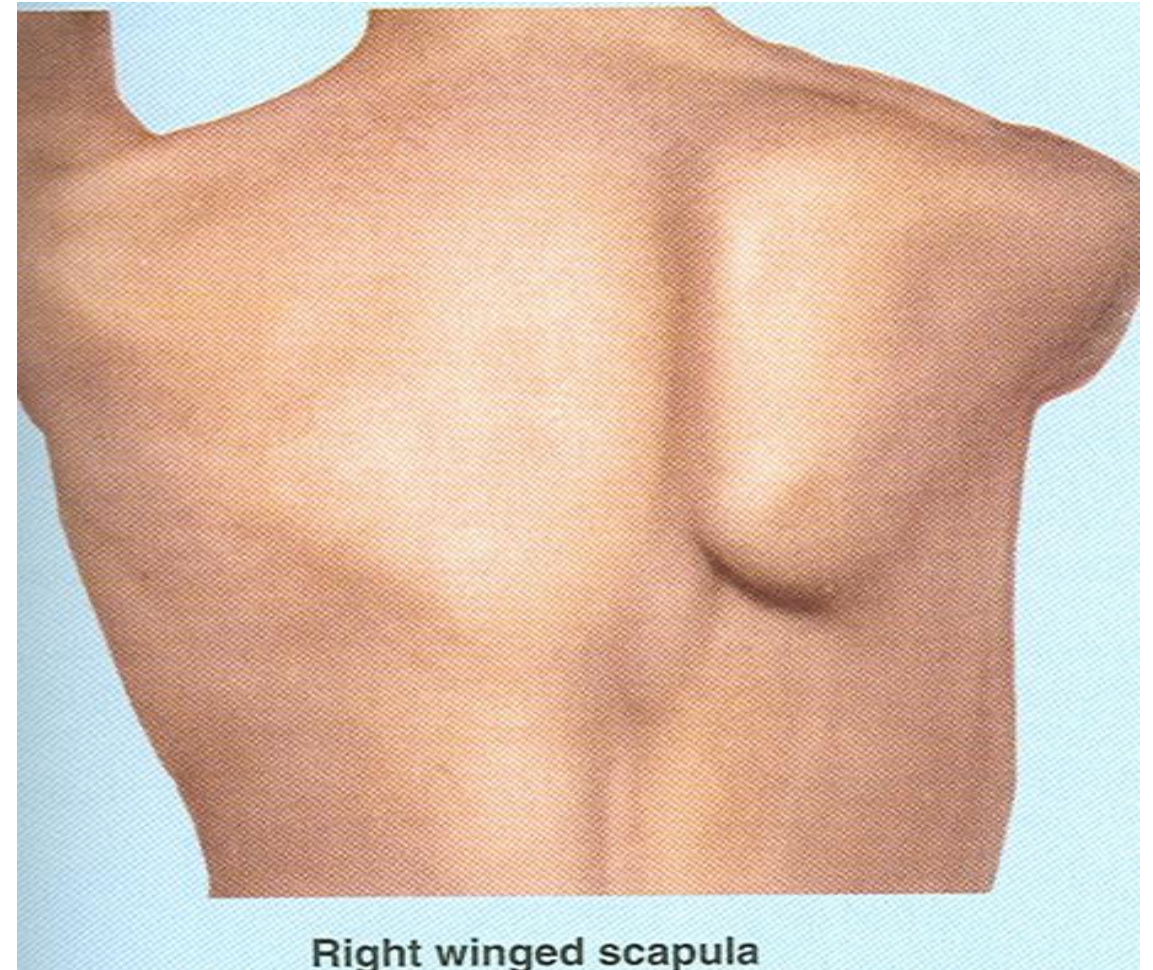
1) Dislocation of shoulder joint.

2) Lesion of **long thoracic nerve** and paralysis of **Serratus anterior muscle** (The long thoracic nerve runs on the anterolateral chest wall usually. It is damaged in radical mastectomy operations or injury of chest wall).

↳ **Radical mastectomy** is a surgical procedure in which the breast, underlying chest muscle, and lymph nodes of the axilla are removed as a treatment for breast cancer.



Fig. 22.15 Multidirectional voluntary dislocation of the shoulder. This 9-year-old boy can voluntarily dislocate his shoulder posteriorly.



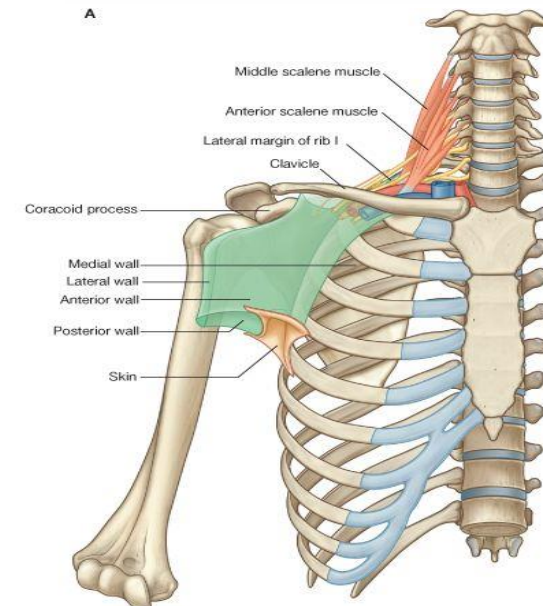
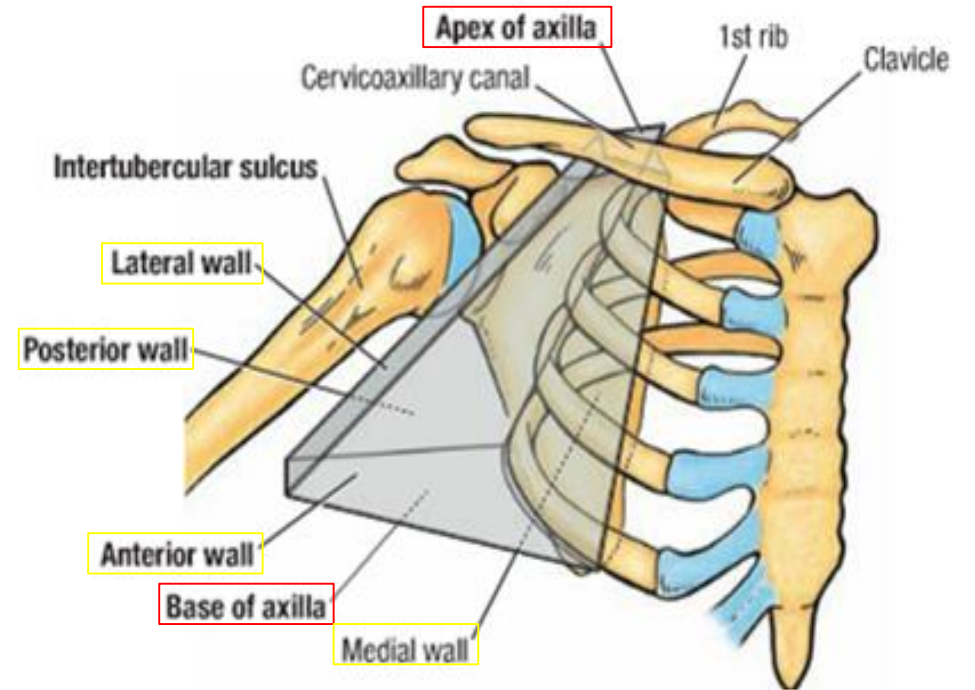
Axilla



- A **pyramid-shaped** space between the upper part of the arm and the side of the chest (منطقة الإبط)
- It's the space through which major **neurovascular** structures pass between neck & thorax and upper limbs.

The Axilla has:

- A. Apex
- B. Base
- C. Four Walls:
 1. Anterior,
 2. Posterior,
 3. Medial,
 4. Lateral wall

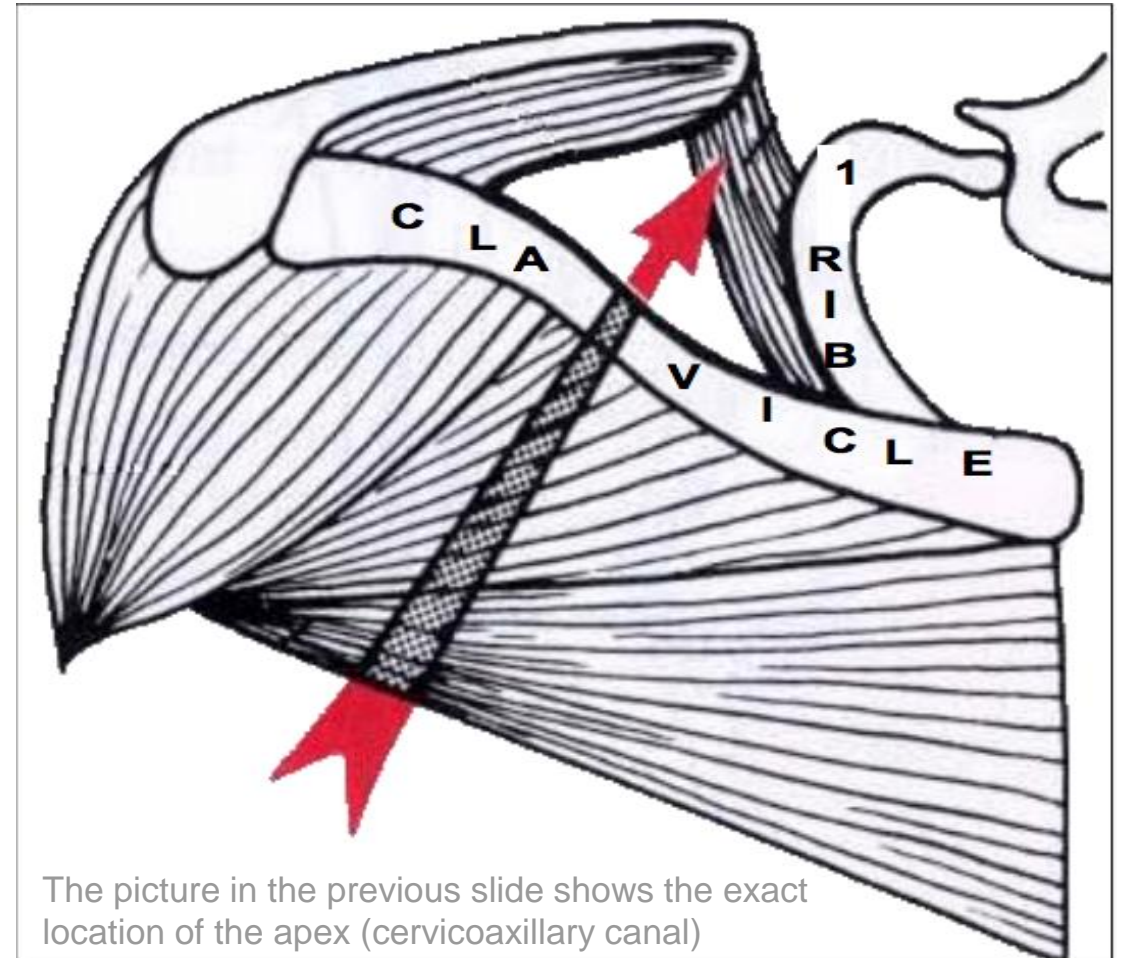


Extra picture for understanding

Boundaries of The Axilla:

A. Apex:

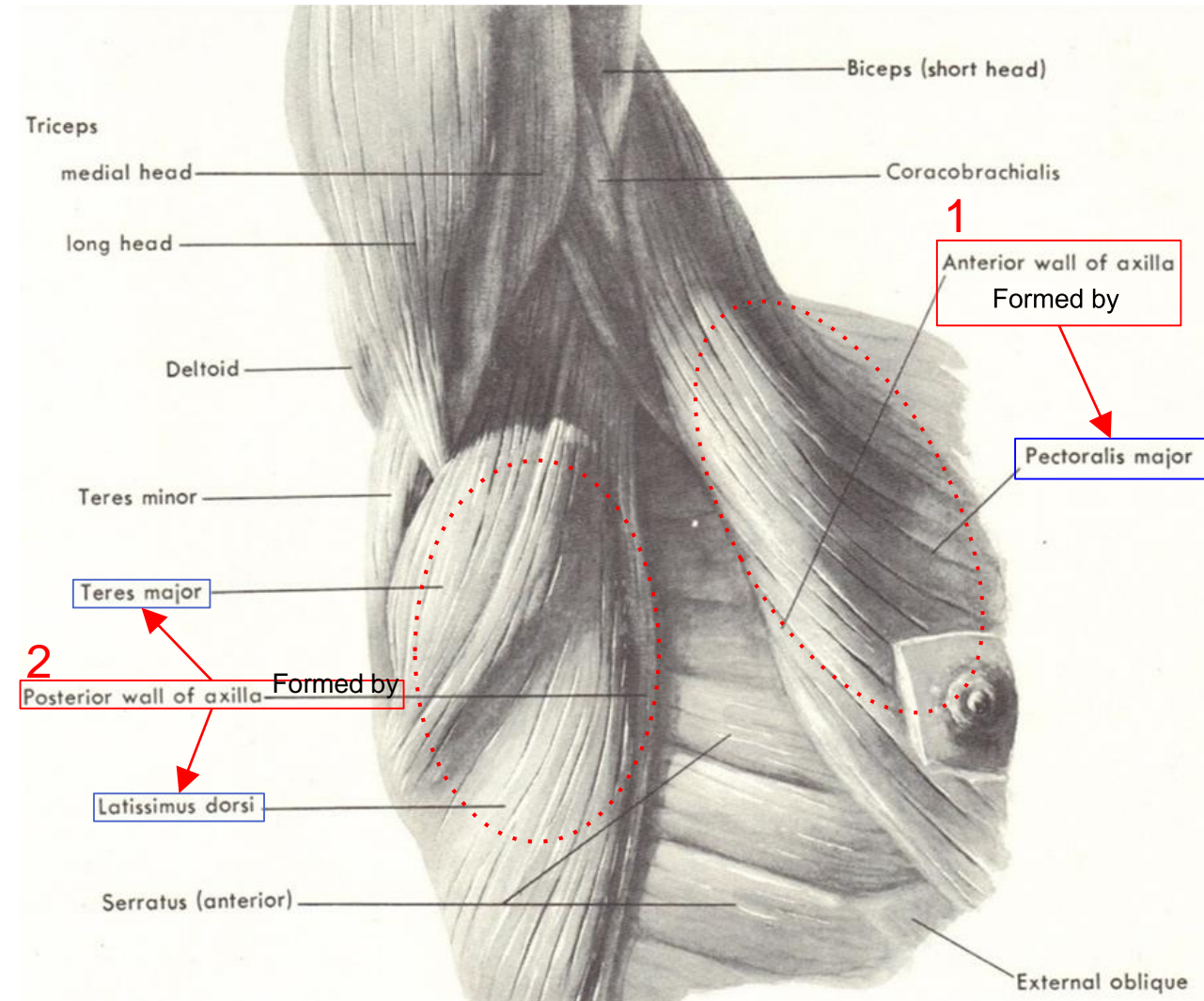
- It's called **Cervicoaxillary canal** (through which the neurovascular structures pass)
- It is directed upwards and medially into the root of the neck.
- The Apex is bounded by 3 bones:
 1. Clavicle **anteriorly**.
 2. Upper border of the scapula **posteriorly**.
 3. Outer border of the first rib **medially**.



Boundaries of The Axilla:

B. Base:

- Formed by skin stretching between the anterior and posterior walls.
- The base is bounded:
 1. **In front** by the **anterior axillary fold** (formed by the lower border of the Pectoralis major).
 2. **Behind** by the **posterior axillary fold** (formed by the tendons of latissimus dorsi and teres major muscles).
 3. **Medially** by upper **4 or 5 ribs** and the chest wall.



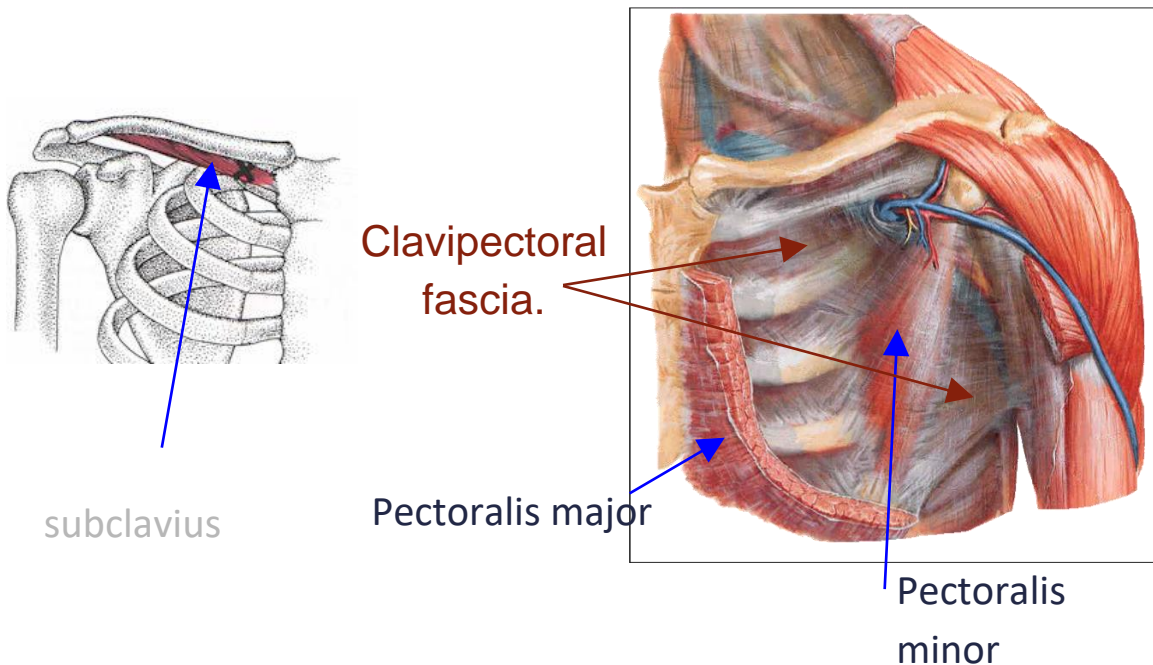
Boundaries of The Axilla:

C. Four Walls:

1. Anterior wall

It is formed by:

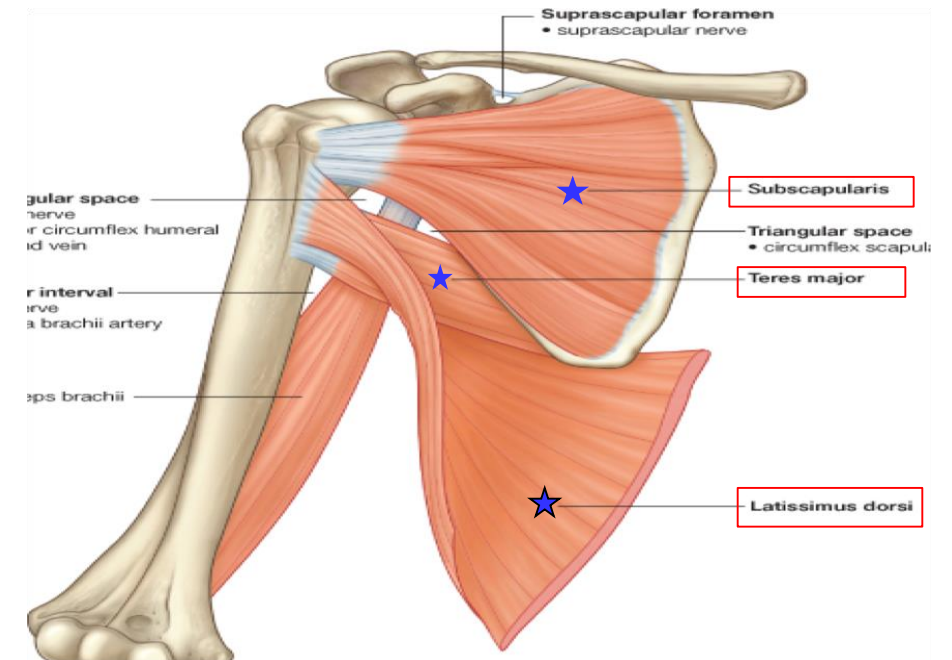
- 1) Pectoralis major
- 2) Pectoralis minor
- 3) Subclavius
- 4) **Clavipectoral fascia**



2. Posterior wall

It is formed by:

- 1) Subscapularis
- 2) Latissimus dorsi
- 3) Teres major muscles



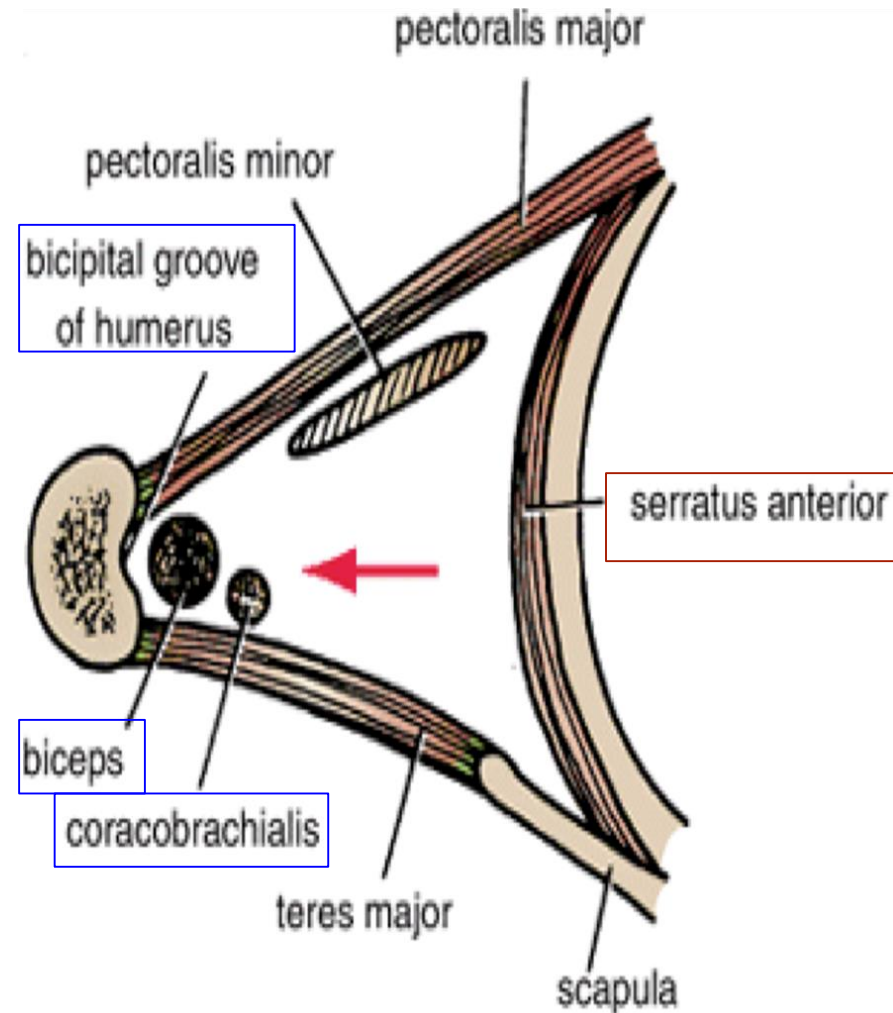
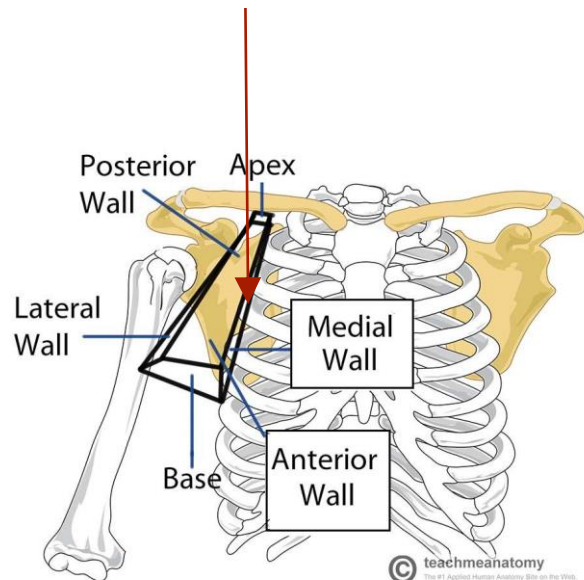
Boundaries of The Axilla:

C. Four Walls:

3. Medial wall

It is formed by:

- 1) Serratus anterior
- 2) Upper 4-5 ribs and intercostal muscle



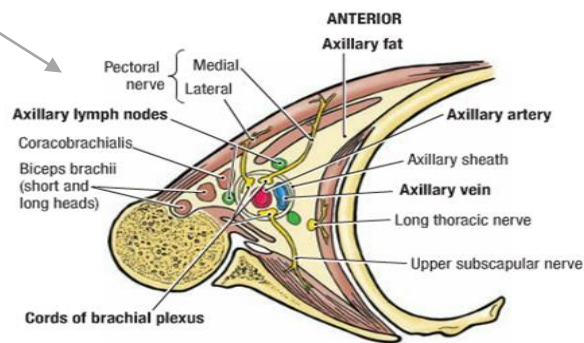
4. Lateral wall

It is formed by:

- 1) Coracobrachialis
- 2) Biceps brachii
- 3) Bicipital/ intertubercular groove of the humerus

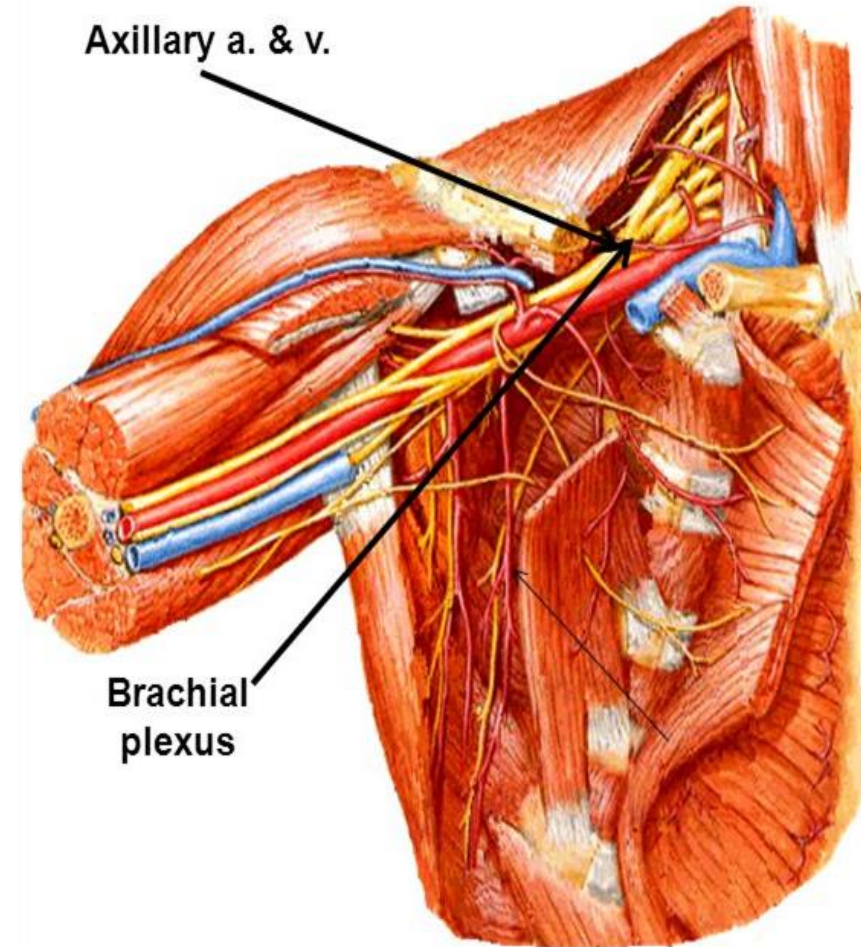
Contents of The Axilla

- Cords and branches of **brachial plexus**
 - Axillary **artery** and its branches
 - Axillary **vein** and its tributaries
 - Axillary **lymph nodes**
 - Axillary **fat**
 - Loose connective tissue
- The **neurovascular bundle** is enclosed in **loose connective tissue sheath**, called **axillary sheath**



C. Transverse Section, Inferior View POSTERIOR

Extra picture for understanding



Brachial Plexus



What is a brachial plexus?

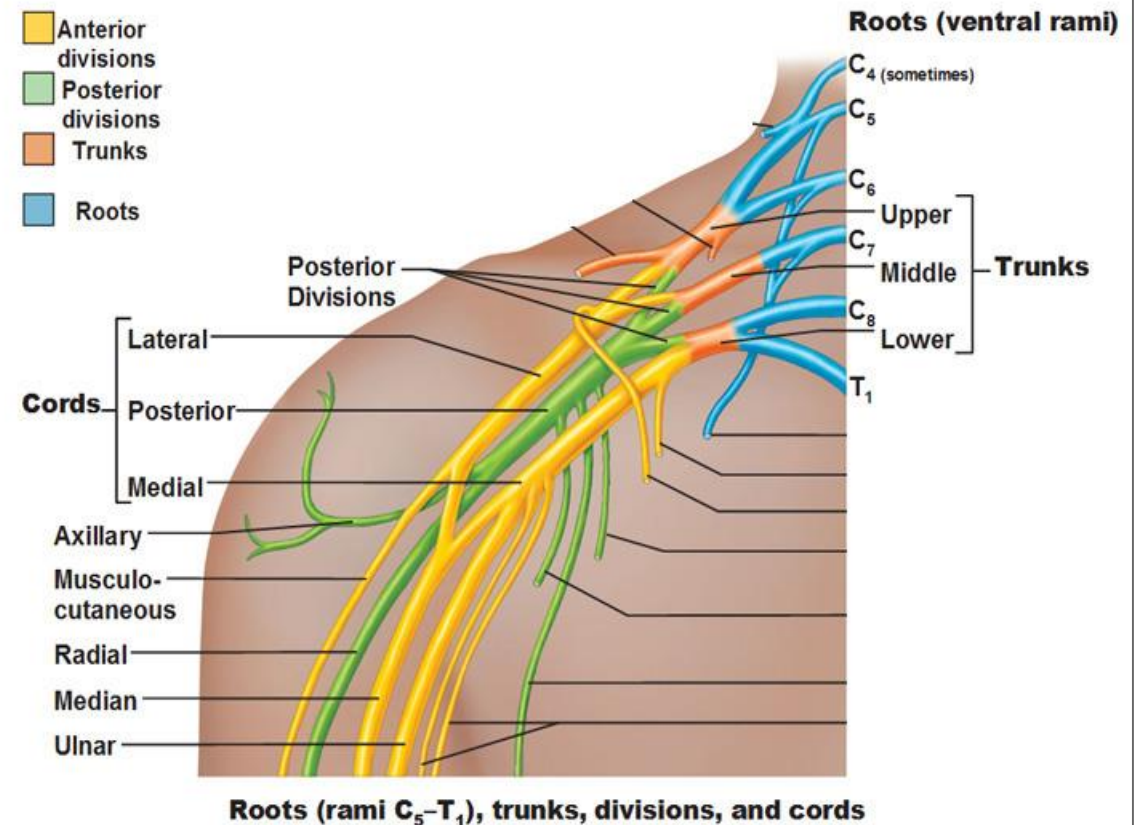
Brachial Plexus is a network of nerves that present at the root of the neck to enter the upper limb.

Location & Formation:

- It is present in the **posterior triangle** of the neck & axilla.
- It is formed by the union of the **anterior Rami** of the **C 5th, 6th, 7th, 8th**, and the **1st thoracic spinal nerve**.

The posterior triangle consists of: 1) clavicle
2) sternocleidomastoid muscle 3) trapezius

Organization of the Brachial Plexus

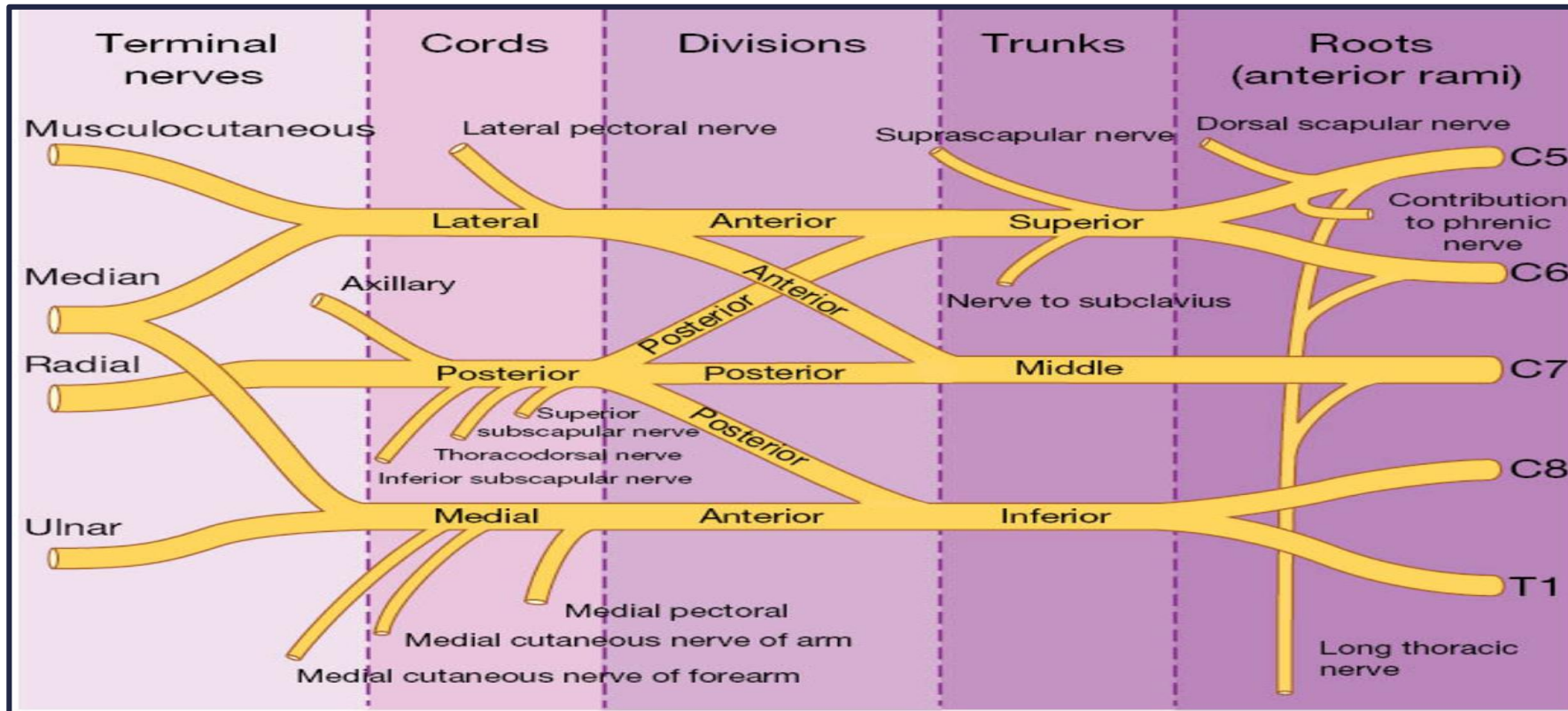


Remember in the spine we only have 7 cervical vertebra **BUT** there are 8 cervical spinal nerves.

Brachial Plexus



Note:
The first 2 stages lie in the **posterior triangle**, while the last 2 stages lie in the **axilla**.



Brachial Plexus

Stages:-

Roots of **C5** & **C6** unite to form \longrightarrow **Superior trunk**

Roots of **C7** continues as the \longrightarrow **Middle trunk**

Roots of **C8** & **T1** unite to form \longrightarrow **Inferior trunk**

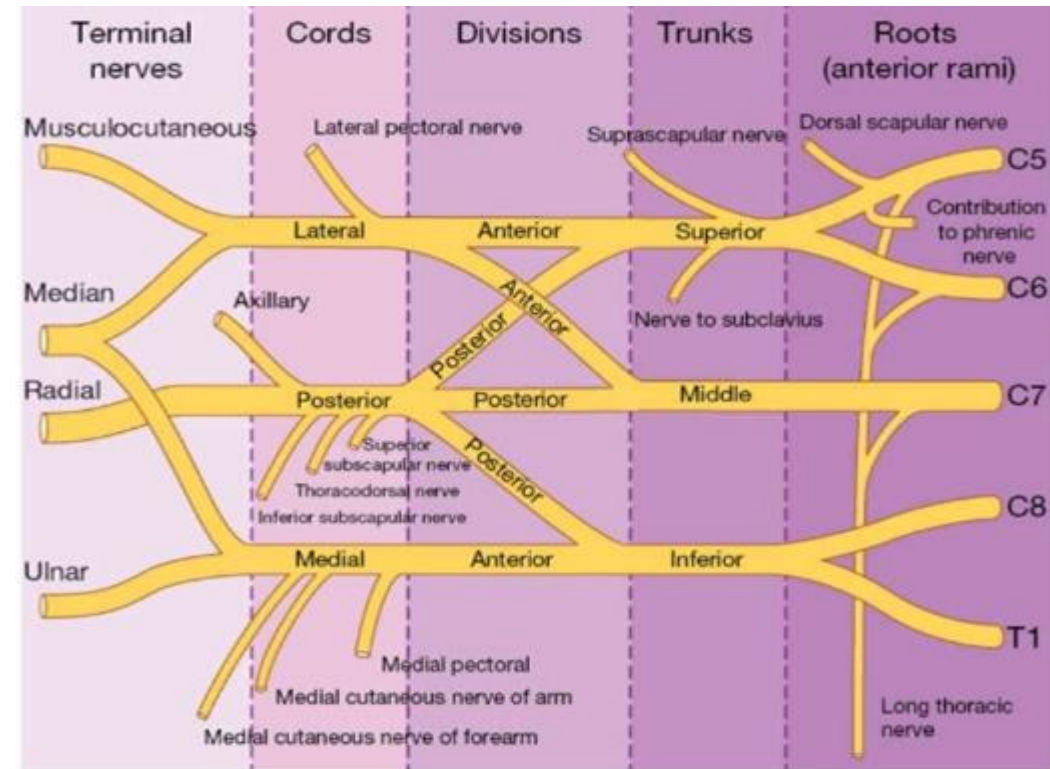
Each trunk will branch into anterior and posterior division

-The **anterior divisions** of the **upper and middle trunks** unite to form the **Lateral cord**.

-The **anterior division** of the **lower trunk** continues as the **Medial cord**.

-All the posterior divisions of **three trunks** join to form the **Posterior cord**.

Cords are named according to their relation to the 2nd part of the axillar artery.

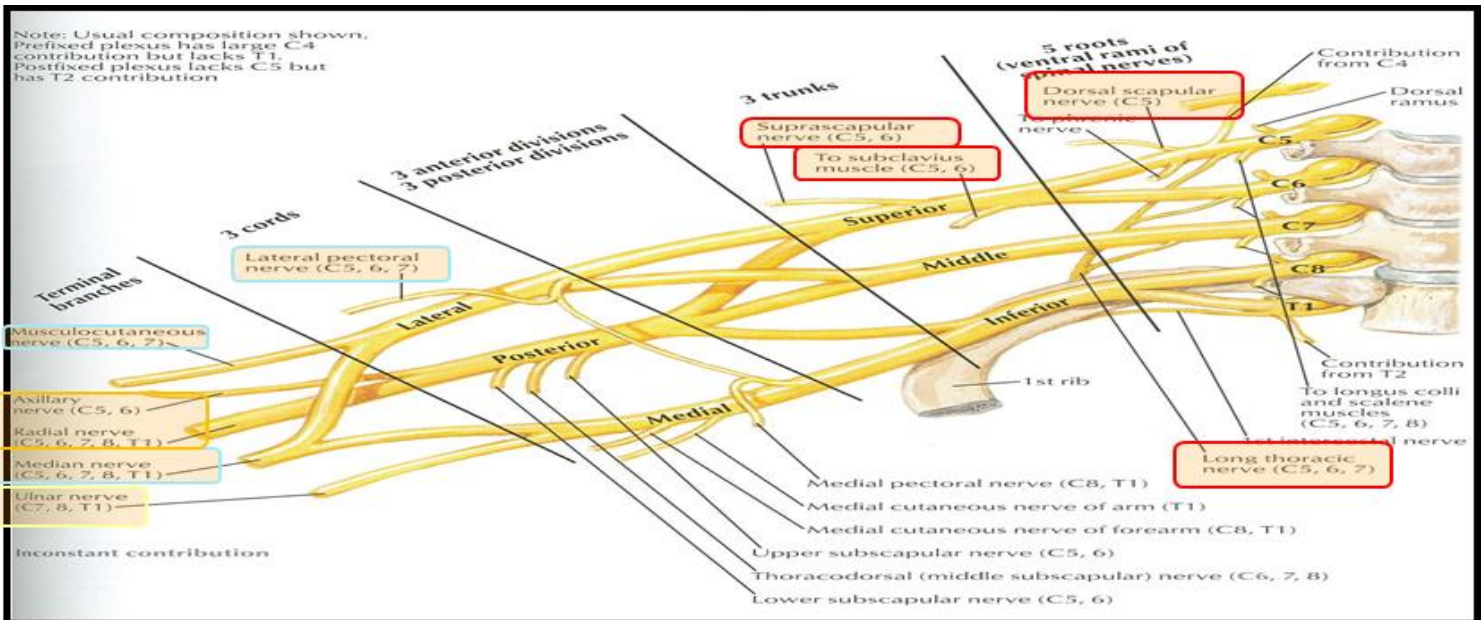


Brachial Plexus

The brachial plexus branches from the

Roots	Trunks	Cords		
		Lateral cord (3)	Medial Cord (5)	Posterior Cord (5)
Dorsal scapular nerve (C5)	Suprascapular nerve (C5,C6)	Lateral pectoral nerve	Medial pectoral nerve	Axillary nerve.
Long thoracic nerve	To subclavius muscle (C5,C6)	Musculocutaneous nerve	Ulnar nerve	Radial nerve
		Median nerve (lateral root).	Median nerve (medial root)	Upper & lower subscapular nerves
			Medial cutaneous nerve of arm & forearm	Thoracodorsal or N. to latissimus dorsi

Note: what is in the boxes should be memorized



Mnemonic (Team 433)

- Lateral Cord Branches: LLM "Lucy Loves Me"
Lateral pectoral, Lateral root of the median nerve, Musculocutaneous.
- Medial Cord Branches: MMUM "Most Men Use Morphine"
Medial pectoral, Medial cutaneous nerve of arm and forearm, Ulnar, Medial root of the median nerve.
- Posterior cord branches STAR
Subscapular (upper and lower), Thoracodorsal, Axillary, Radial

Questions

- 1- Which of the following statements is NOT correct:
 - A- The base of axilla is bounded posteriorly by the pectoralis major.
 - B- The base of axilla is bounded medially by the 4 or 5th rib.
 - C- The apex of the axilla is bounded by 3 bones (clavicle, scapula and the 1st rib).
 - D- The apex is called cervicoaxillary canal.
- 2- The lateral wall of the axilla does not contain:
 - A- biceps brachii
 - B- upper 4-5 ribs and intercostal muscles
 - C- bicipital groove of the humerus
 - D- coracobrachialis
- 3- Which of the following is located between subclavius and pectoralis minor?
 - A- Serratus anterior
 - B- Axilla
 - C- Clavipectoral Fascia
 - D- Brachial Plexus
- 4- What is the nerve supply of Serratus anterior?
 - A- Lateral pectoral nerve.
 - B- Long thoracic nerve.
 - C- Musculocutaneous nerve.
 - D- Ulnar nerve.
- 5- Which wall is formed (partly) by the clavipectoral fascia?
 - A- Anterior
 - B- Posterior
 - C- Medial
 - D- Lateral
- 6- In the brachial plexus all the posterior divisions of the three trunks join to form _____.
 - A- Lateral cord
 - B- Posterior cord
 - C- Lateral root
 - D- Posterior root
- 7- Which cord gives rise to the musculocutaneous nerve?
 - A- Anterior cord
 - B- Posterior cord
 - C- Medial cord
 - D- Lateral cord
- 8- A patient presents to the ER with inability to depress his shoulders. The physician suspects nerve involvement, which nerve is most likely damaged?
 - A- Medial pectoral nerve
 - B- Lateral pectoral nerve
 - C- Anterior pectoral nerve
 - D- Posterior pectoral nerve

Answers:

- 1- A
- 2- B
- 3- C
- 4- B
- 5- A
- 6- B
- 7- D
- 8- A

Questions

9- List the main terminal nerves of the brachial plexus.

10- A boxer presented to the ER with inability to punch. Which muscle is most likely affected and what nerve supplies this muscle?

11- Name one muscle responsible for depression of the shoulder, and mention its origin and insertion.

12- What are the contents of the axilla?

13- A Soldier was shot on the chest and the shot has effected a nerve , what might happen to him?

Answers:

9- Median, ulnar, radial, axilla and musculocutaneous.

10- Serratus anterior supplied by long thoracic nerve.

11- Pectoralis minor. Origin (Close to the costal cartilage of ribs 3, 4, 5) Insertion (coracoid process)

12- 1) Cords and branches of brachial plexus

2) Axillary artery and its branches

3) Axillary vein and its tributaries

4) Axillary lymph nodes

5) Axillary fat

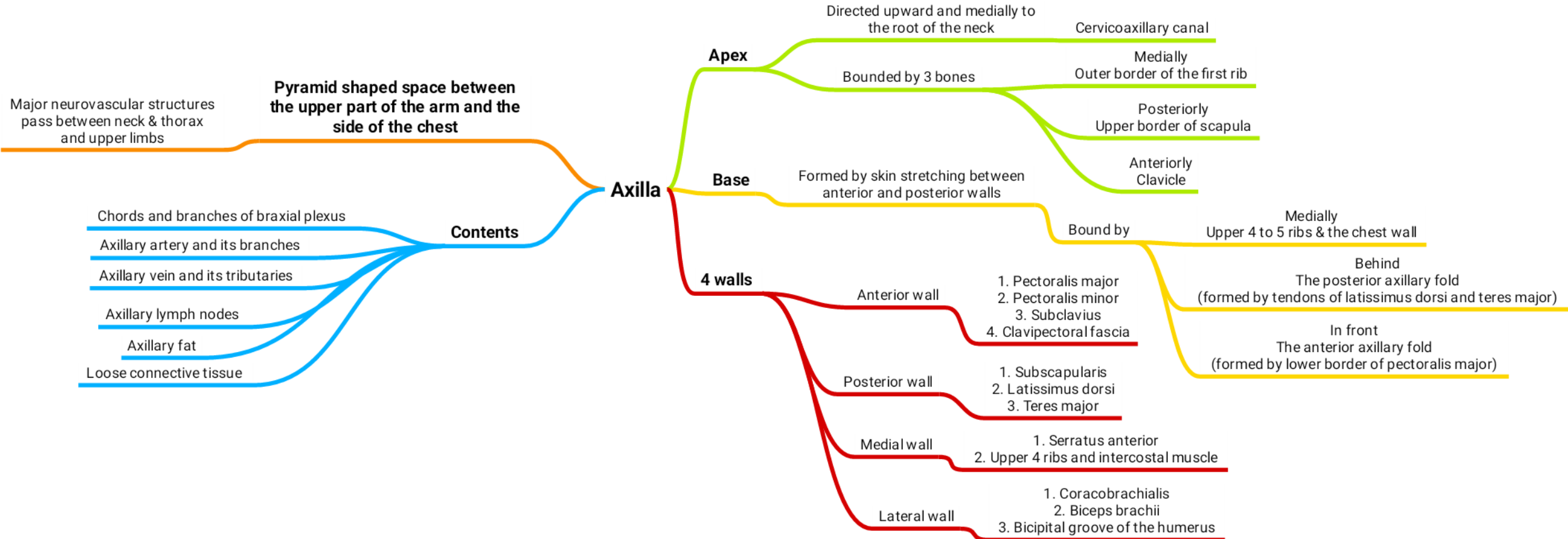
6) Loose connective tissue

13- Winging of scapula

Summary (Pectoral Region)

Muscle	Origin	Insertion	Nerve supply	Action
<i>Pectoralis Major</i>	<p><u>Clavicular head</u>: From; (1) Medial ½ of the front of the clavicle.</p> <p><u>Sternocostal head</u>: From; - Sternum. - Upper 6 costal cartilages. - Aponeurosis of the external oblique muscle.</p>	Lateral lip of bicipital groove (Humerus).	<u>Medial & lateral pectoral nerves</u>	<p>(1) Adduction of the arm (2) medial rotation of the arm. (3) Clavicular head helps in <u>flexion of arm (shoulder)</u>.</p>
<i>Pectoralis Minor</i>	From 3 rd , 4 th , & 5 th ribs close to their costal cartilages.	Coracoid process (scapula).	<u>Medial pectoral nerve</u>	<p>(1) Depression of the shoulder. (2) Draw the ribs upward and outwards during deep inspiration.</p>
<i>Subclavius</i>	From 1 st rib at its junction with 1 st costal cartilage.	Subclavian groove in the middle 1/3 of the inferior surface of clavicle.	Nerve to subclavius from <u>upper trunk</u> of brachial plexus.	(1) Fixes the clavicle during movement of shoulder joint
<i>Serratus anterior</i>	Upper eight ribs.	(1) anterior aspect of the <u>medial border of inferior angle of scapula</u> .	Long thoracic nerve (from roots of brachial plexus, C5,6,7).	<p>(1) Draws the scapula forward in boxing, (protrusion or protraction). <u>"boxer's muscle"</u> (2) Rotates scapula outwards in raising the arm above 90 degree (Abduction above 90)</p>

Summary (Axilla)



We HIGHLY recommend you visit these websites

<http://teachmeanatomy.info/>

http://www.med.umich.edu/lrc/coursepages/m1/anatomy2010/html/courseinfo/mich_quiz_index.html

To download Essential Anatomy 5

https://twitter.com/Med_436/status/807971055524515841



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