Shoulder Joint - Upper Limb

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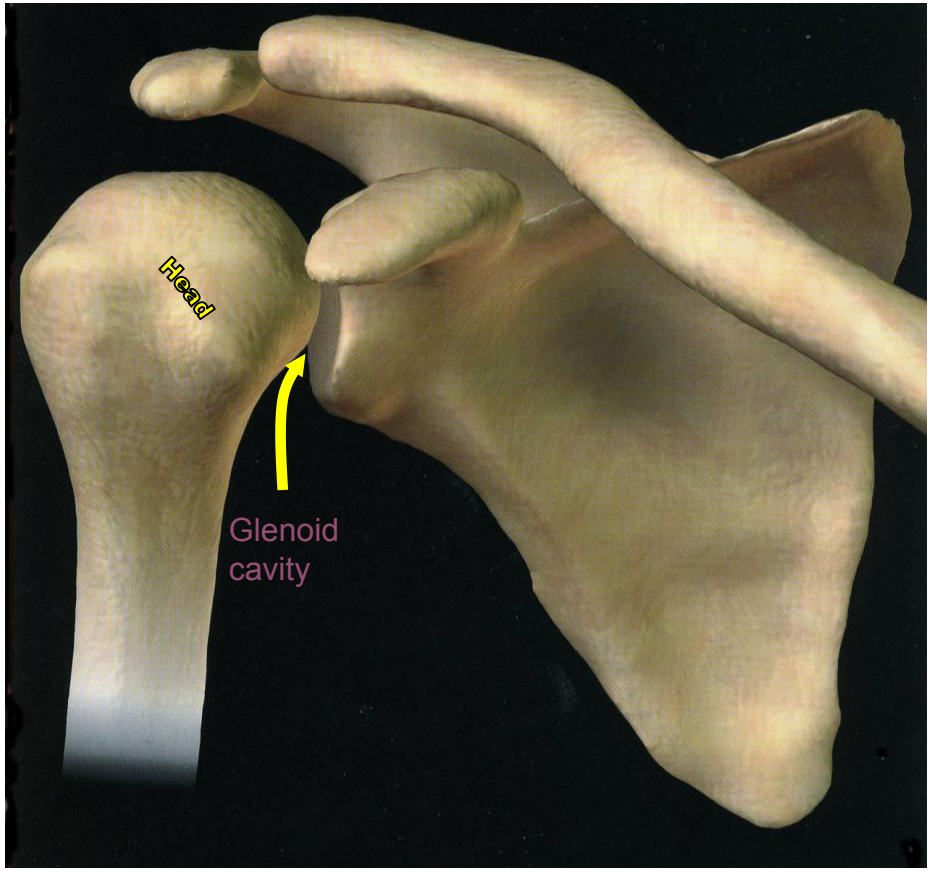
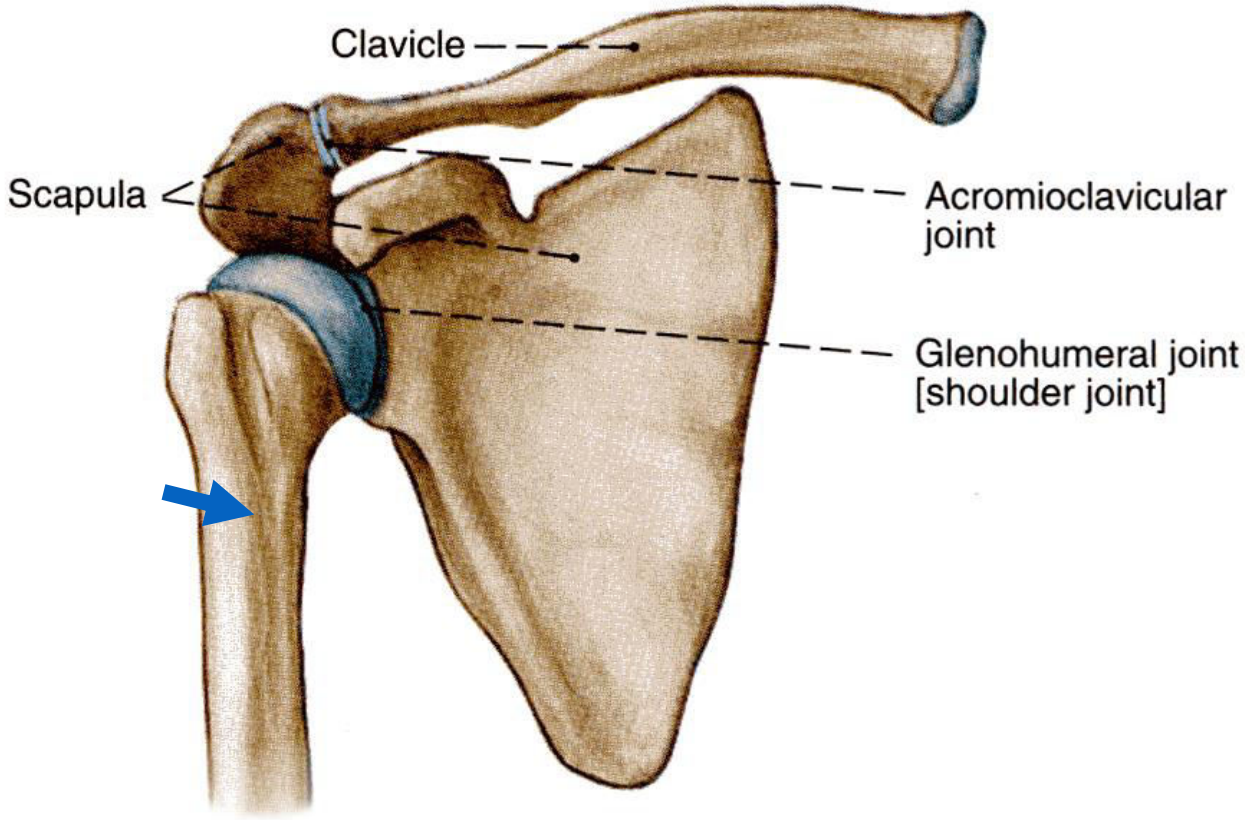
Learning objectives

- Anatomy of shoulder joint
- Formation , type & components
- Rotator cuff
- Relations /nerve & blood supply
- Movements & muscles producing them
- Dislocations /nerve injuries

Articulation - Rounded **head of humerus** &

Shallow , **glenoid cavity** of scapula.



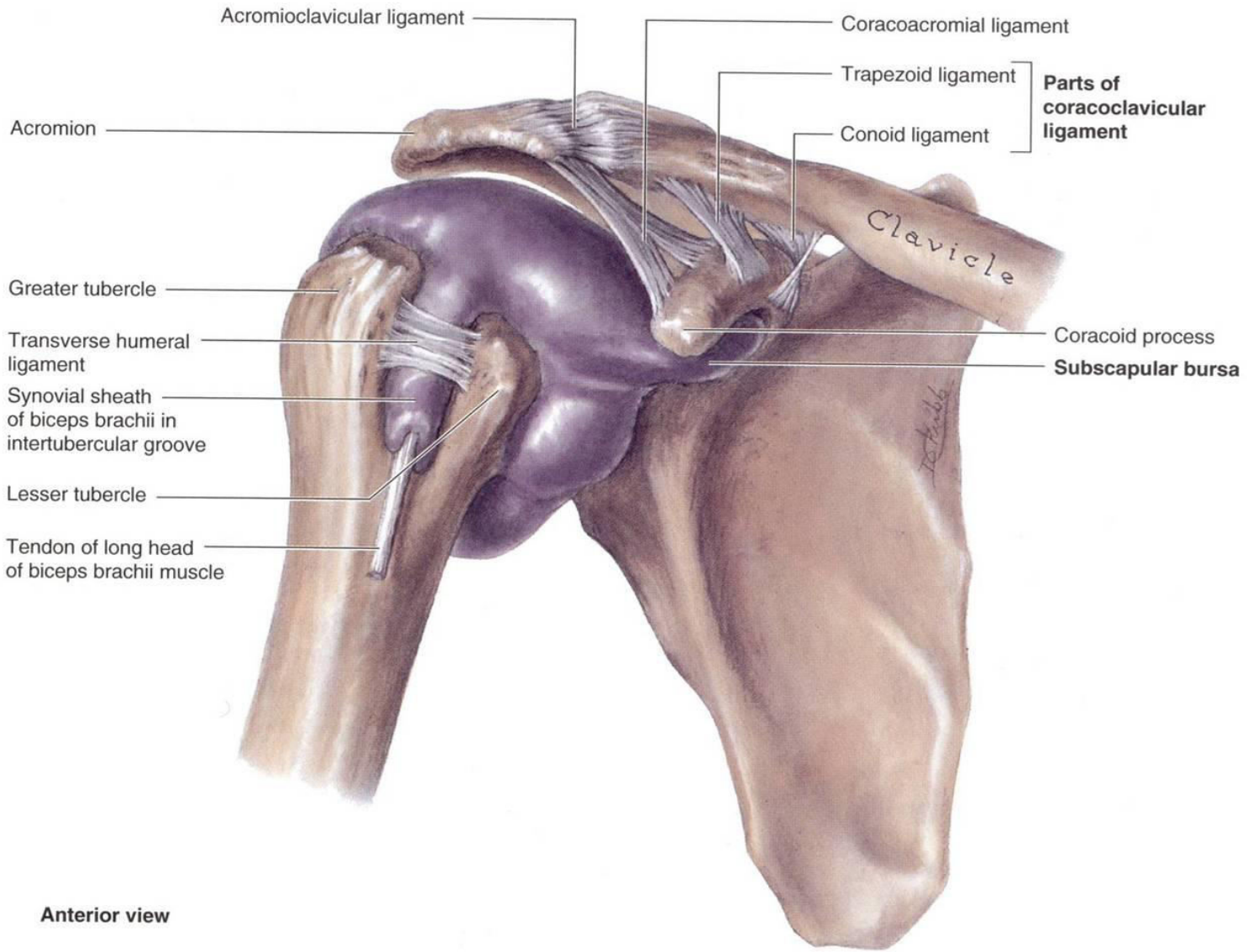


- Articular surfaces are covered by **articular - *hyaline cartilage*.**
- Glenoid cavity is deepened by ***fibro cartilaginous rim*** called **glenoid labrum.**

Synovial membrane

- lines fibrous capsule & **attached to margins of the cartilage** covering the articular surfaces.
- forms a **tubular sheath** around the tendon of the long head of biceps brachii.
- **It extends through anterior wall of capsule** to form **subscapularis bursa** beneath subscapularis muscle.

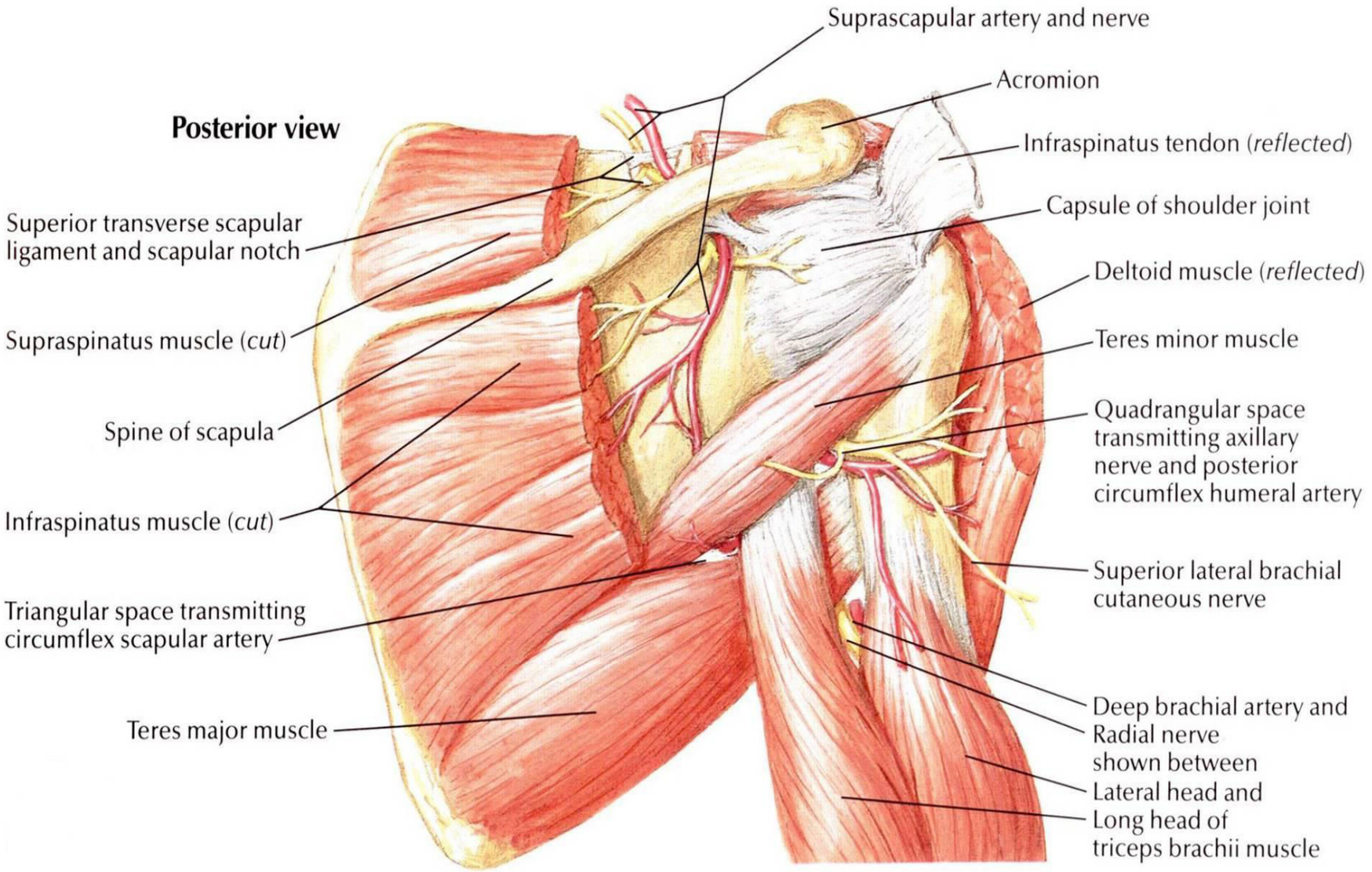
Synovial membrane



Musculotendinious/Rotator cuff

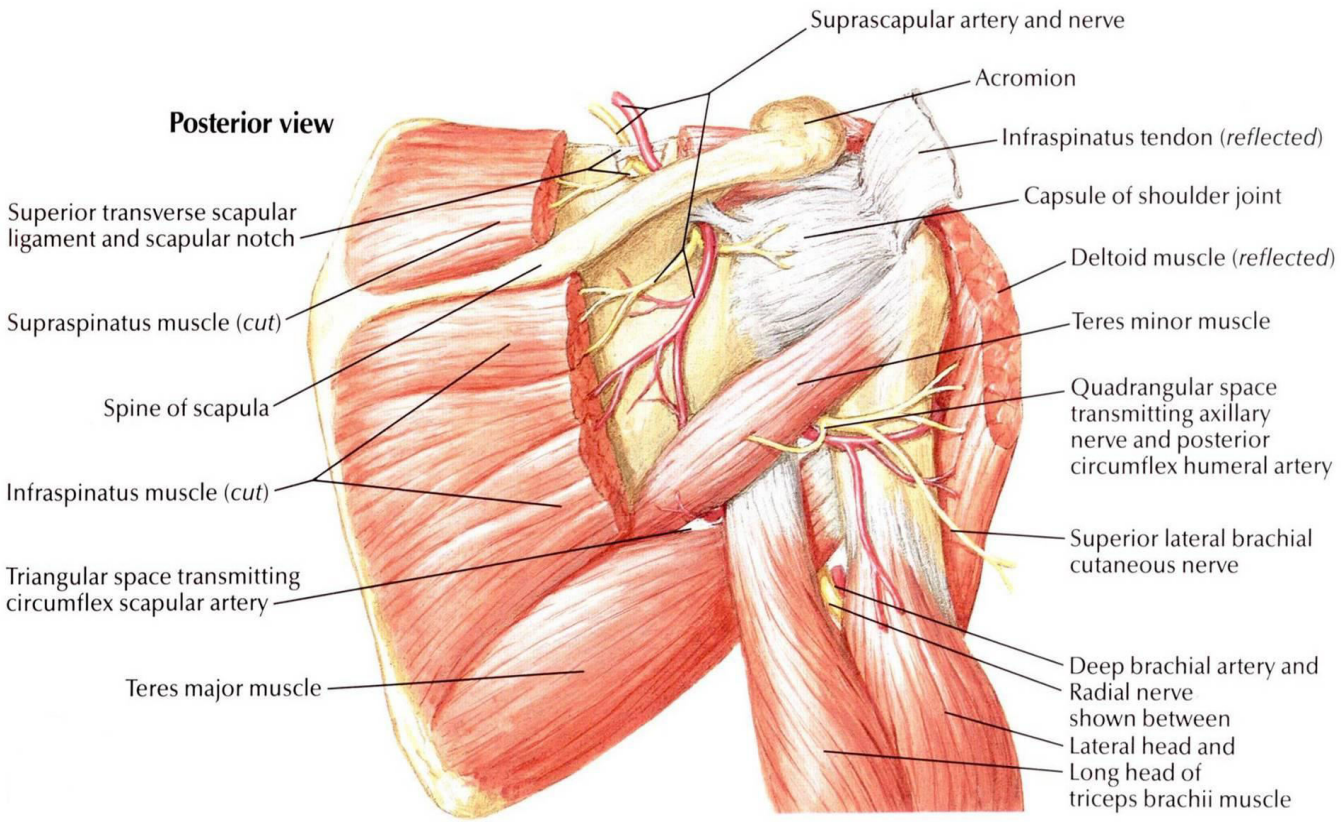
- Supraspinatus – superiorly
- Infraspinatus & Teres minor- posteriorly
- Subscapularis – anteriorly
- Long head of triceps – inferiorly (axillary n & post circumflex humeral artery – lax and least supported) –
- most common dislocations – Inferiorly axillary n palsy –loss of abduction

NERVE SUPPLY of Shoulder joint



NERVE SUPPLY of Shoulder joint

1. axillary n 2. suprascapular n &
3. lateral pectoral nerve.



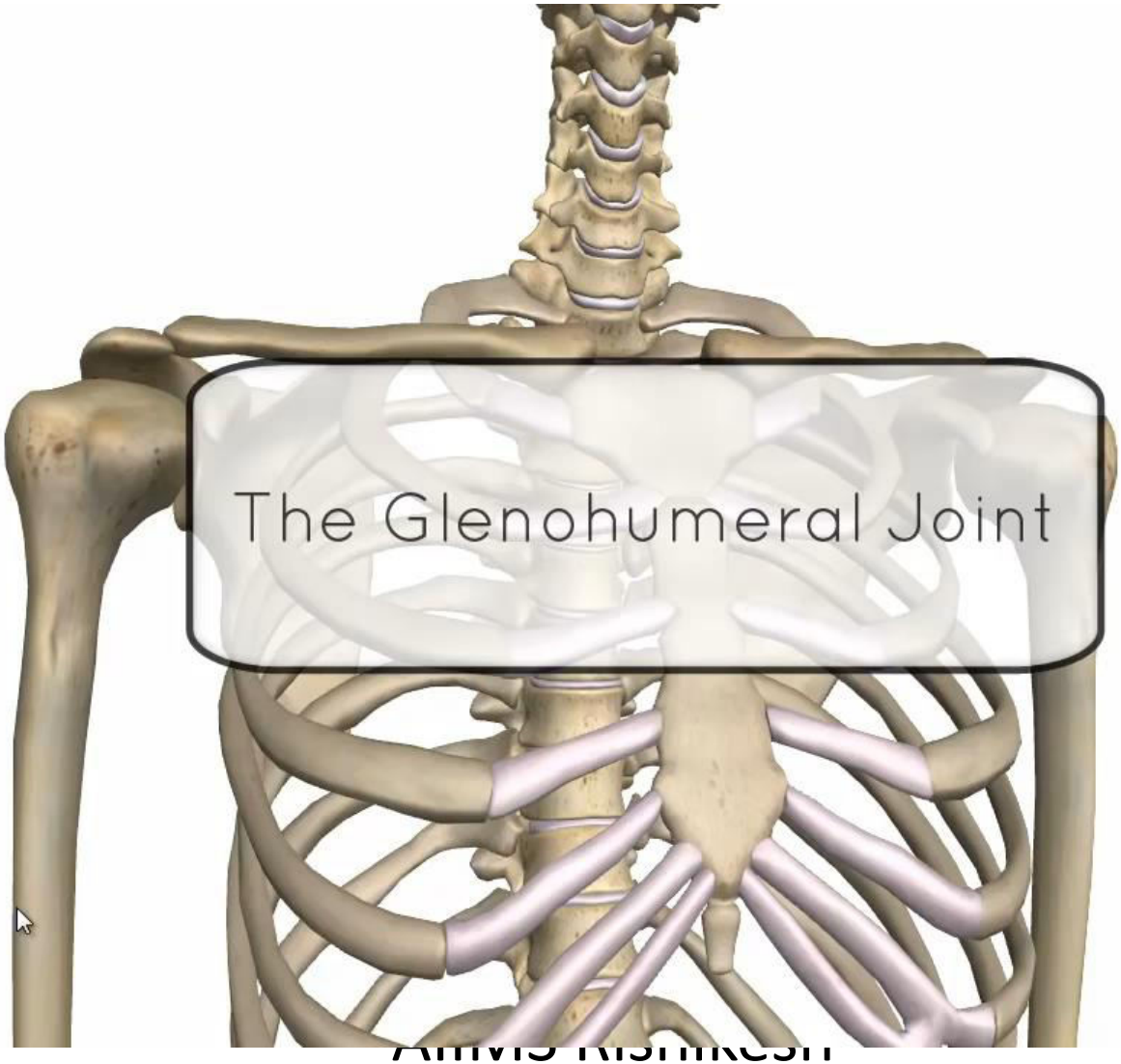
Shoulder joint - spaces

Quadrangular space

- Sup - teres minor
- Inf - teres major
- Medially - long head of triceps
- Laterally – lateral head of triceps (humerus)
- Contents – axillary nerve & posterior circumflex humeral artery

Triangular space

- Sup – teres major
- Medially- long head of triceps
- Laterally – triceps(humerus)
- Contents – in spiral groove Radial nerve & profunda brachii artery



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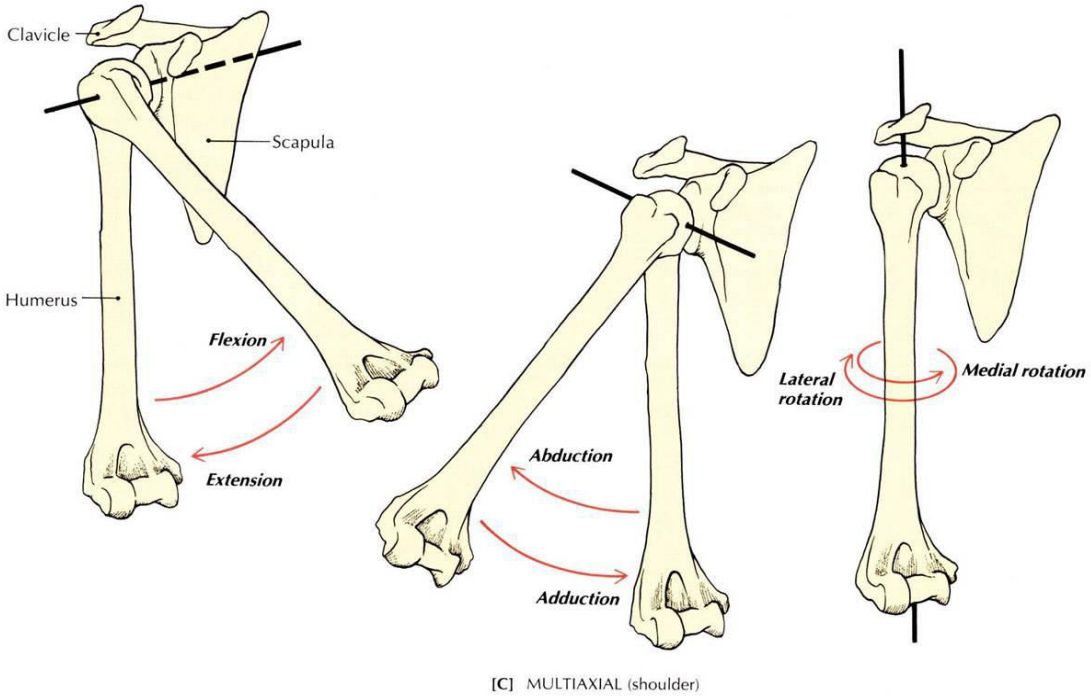
Abduction
Adduction
Circumduction

Shoulder joint -movements:

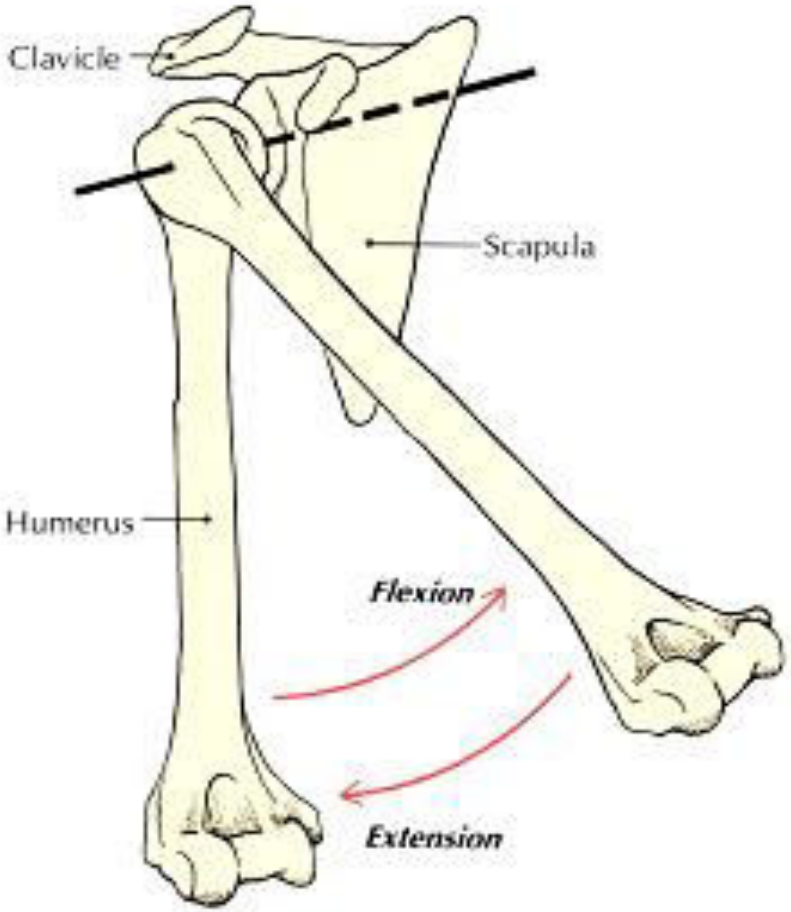


[C] MULTIAXIAL (shoulder)

- **Flexion**
- **Extension**

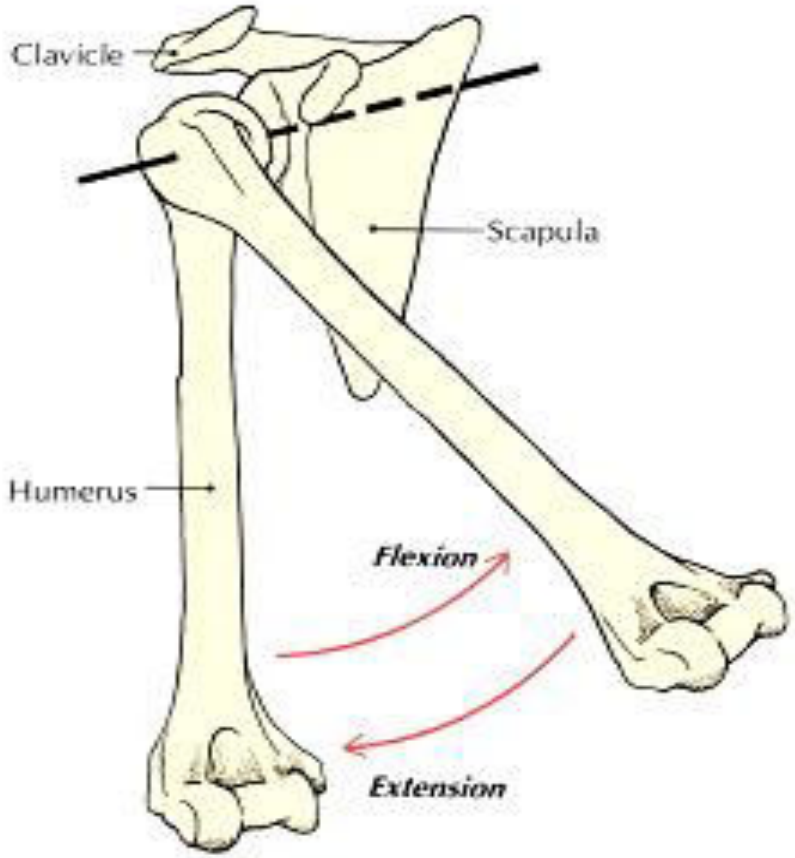
- **Abduction**
- **Circumduction**

- **Lateral rotation**
- **Medial rotation**



Flexion - 90°

1. Deltoid - ant
2. Pectoralis major
3. Biceps brachii
4. Coracobrachialis

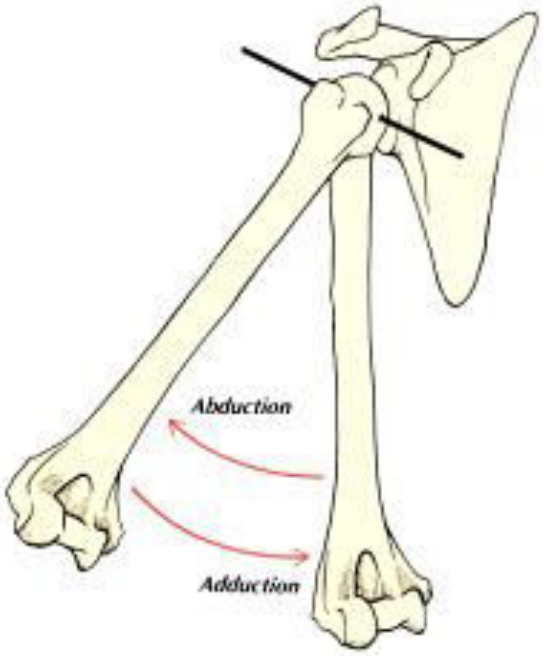


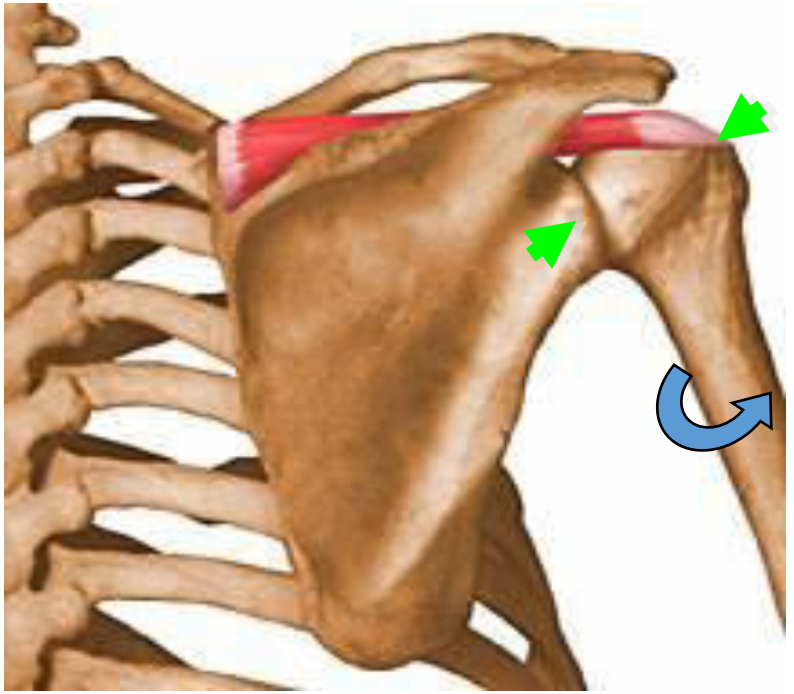
Extension is - 45°

- Deltoid post
- Latissimus dorsi
- Teres major

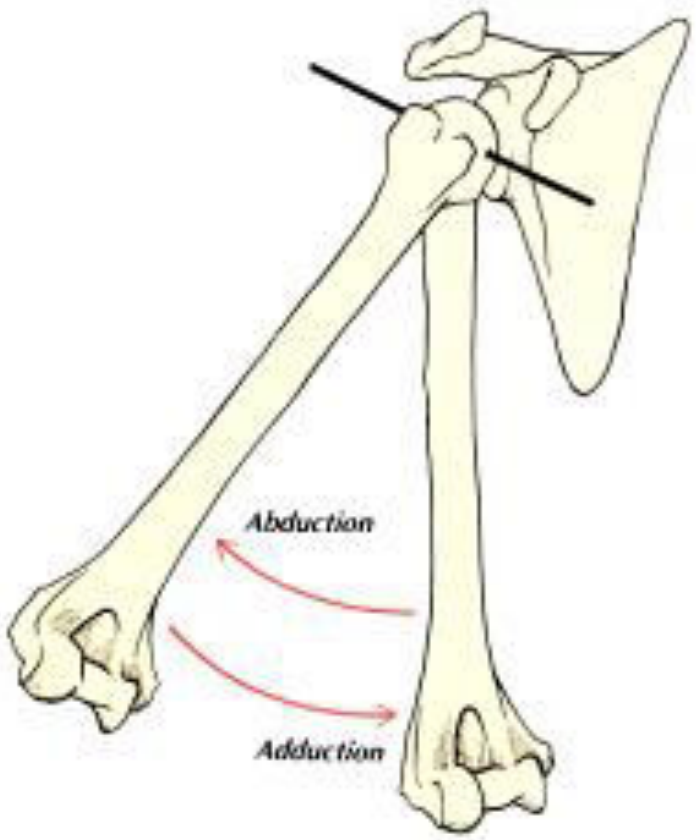
Abduction:

- Initiated - **supraspinatus** → 0 to 18
- 19 →120 - *middle fibers* of **deltoid.**
- Subscapularis
- Infraspinatus
- Teres minor
- Above 90 by rotation of scapula
- Trapezius & Serratus Anterior





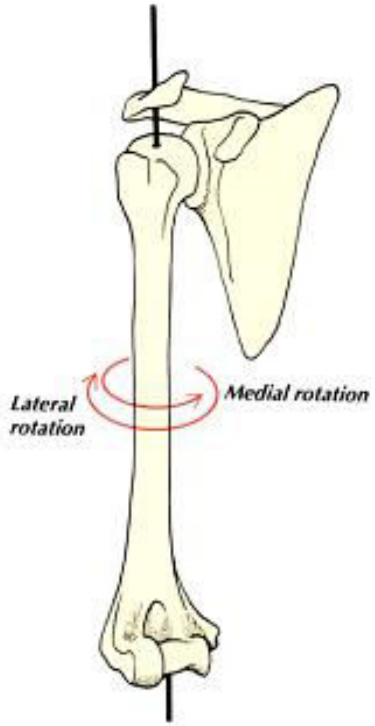
- Supraspinatus: ***initiates abduction***(0 to 15) and ***holds the head of the humerus*** against glenoid fossa of scapula;
- Latter function of supraspinatus **allows deltoid** muscle to contract and abduct humerus at shoulder joint.



Adduction:

Normally upper limb can be swung 45° across front of chest.

- pectoralis major
- latissimus dorsi
- teres major
- teres minor

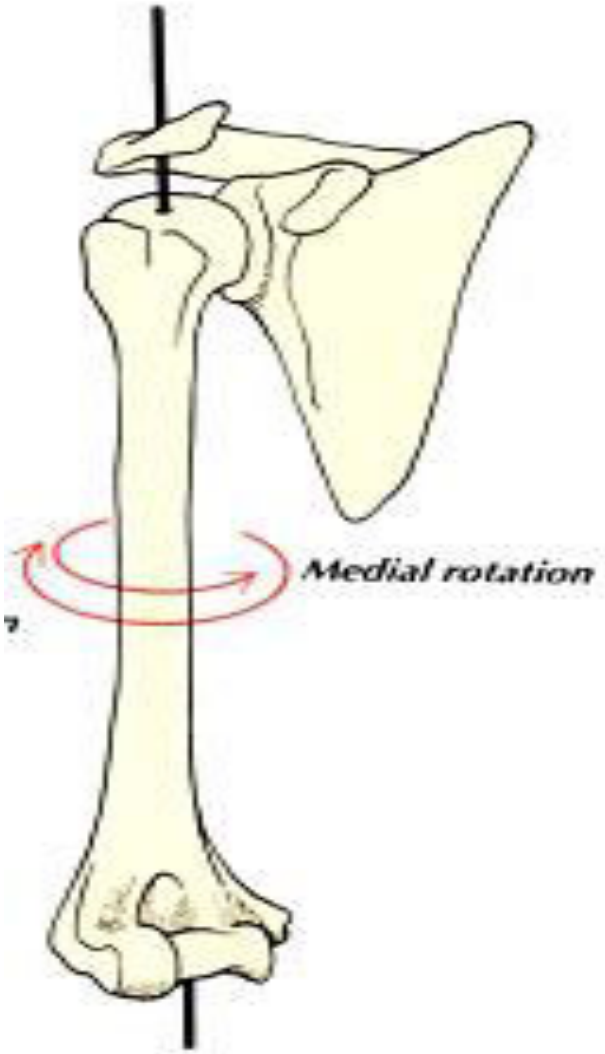


Lateral rotation

Is about 40 - 45°.

POST -

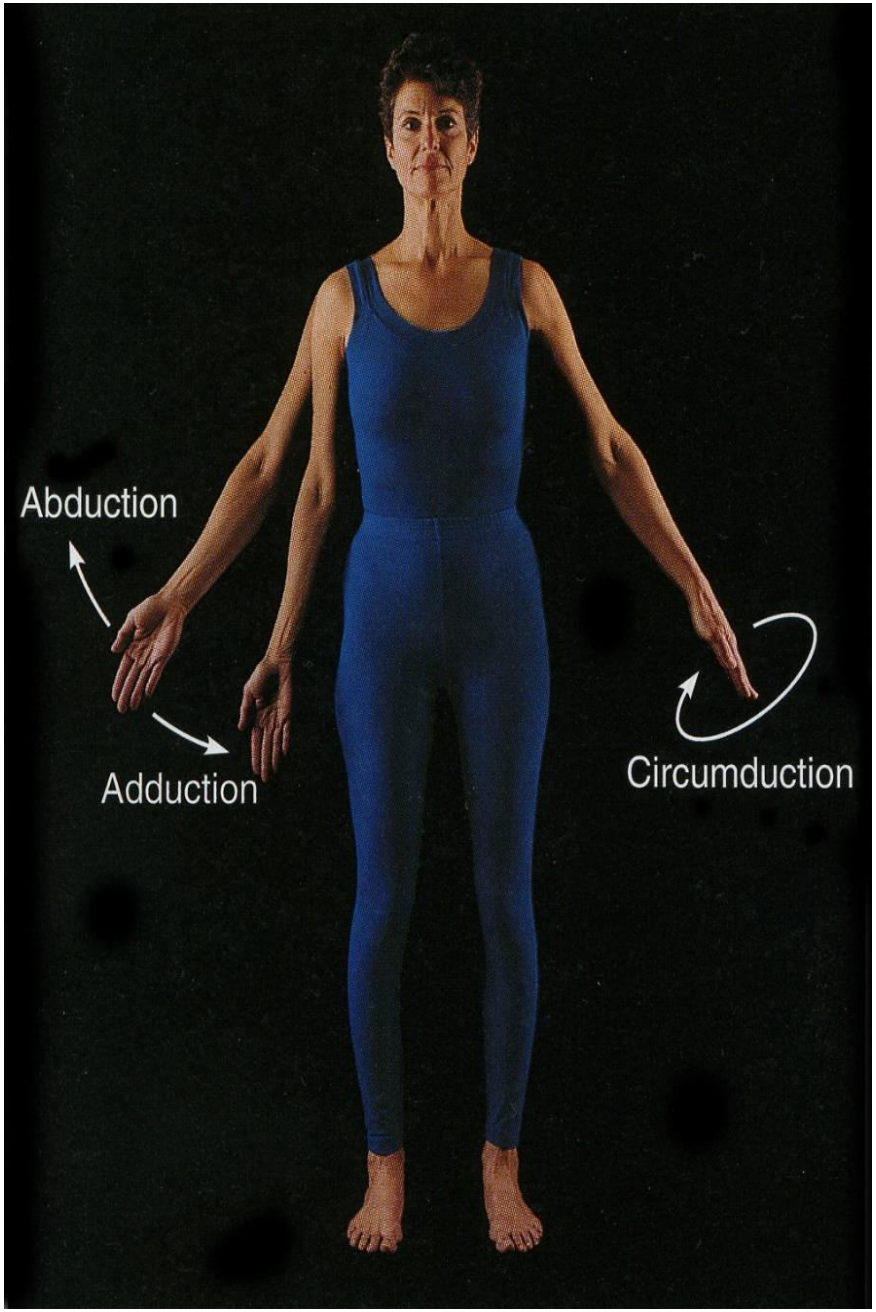
- infraspinatus
- teres minor
- ***posterior*** fibers of the deltoid muscle



Medial rotation:

- Normal medial rotation is about 55°.
- performed by : muscles attached at BG - ANT

- pectoralis major
- Subscapularis
- latissimus dorsi
- teres major
- ***anterior*** fibers of deltoid.



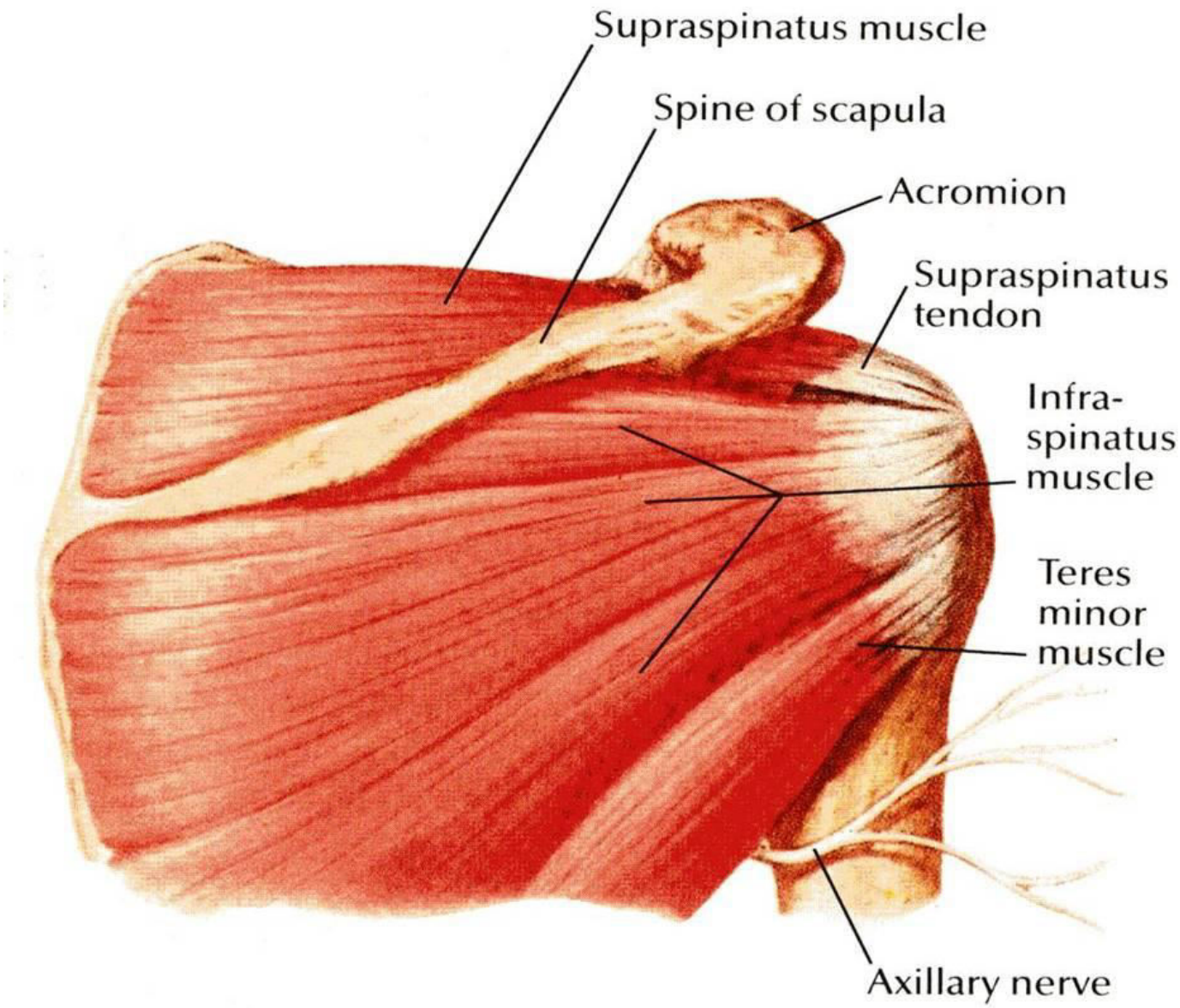
Circumduction:

This is a movement in which distal end of humerus moves in circular motion while proximal end remains stable.

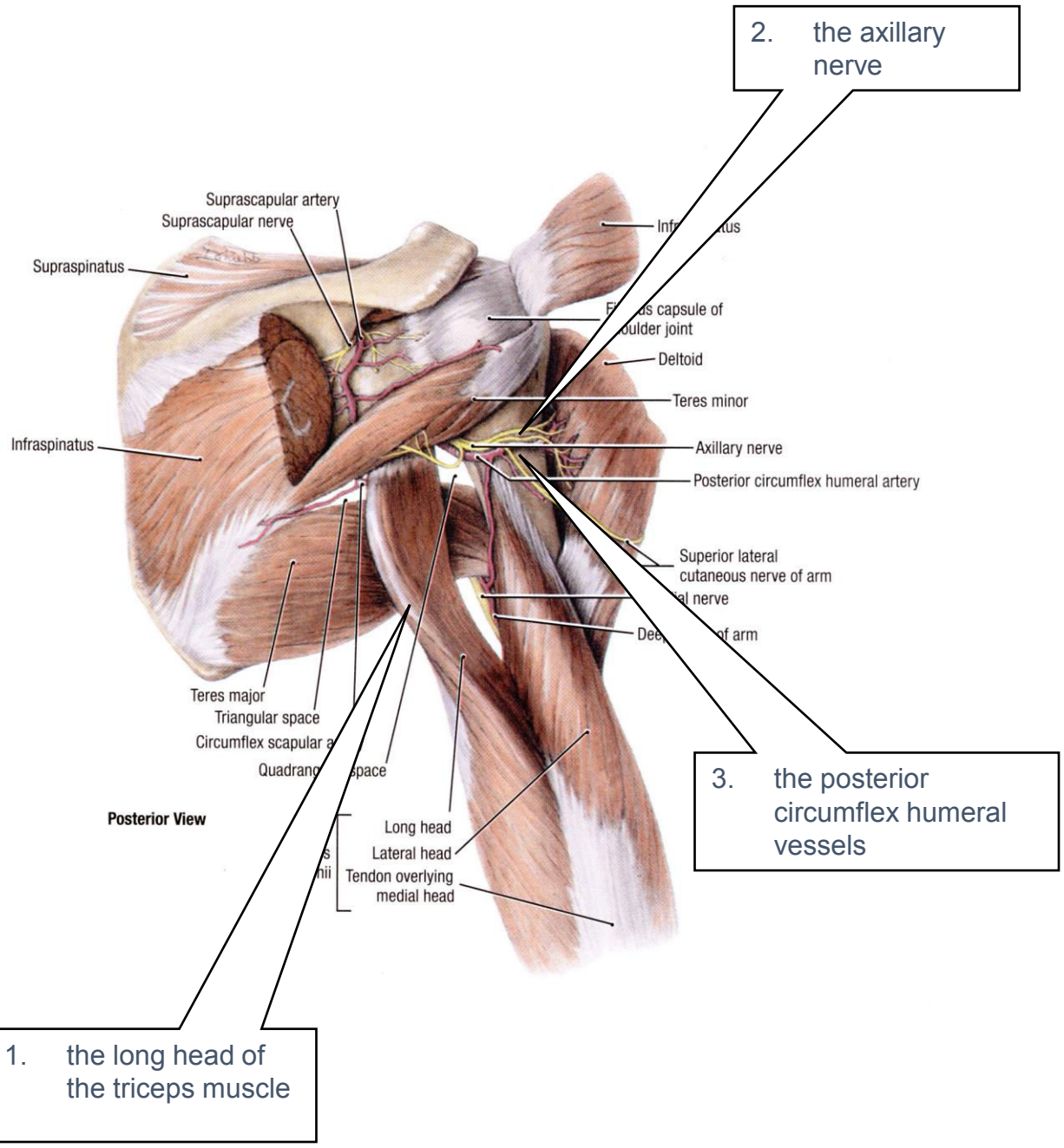
- It is -

1. Flexion,
2. Abduction,
3. Extension &
4. Adduction

Successively

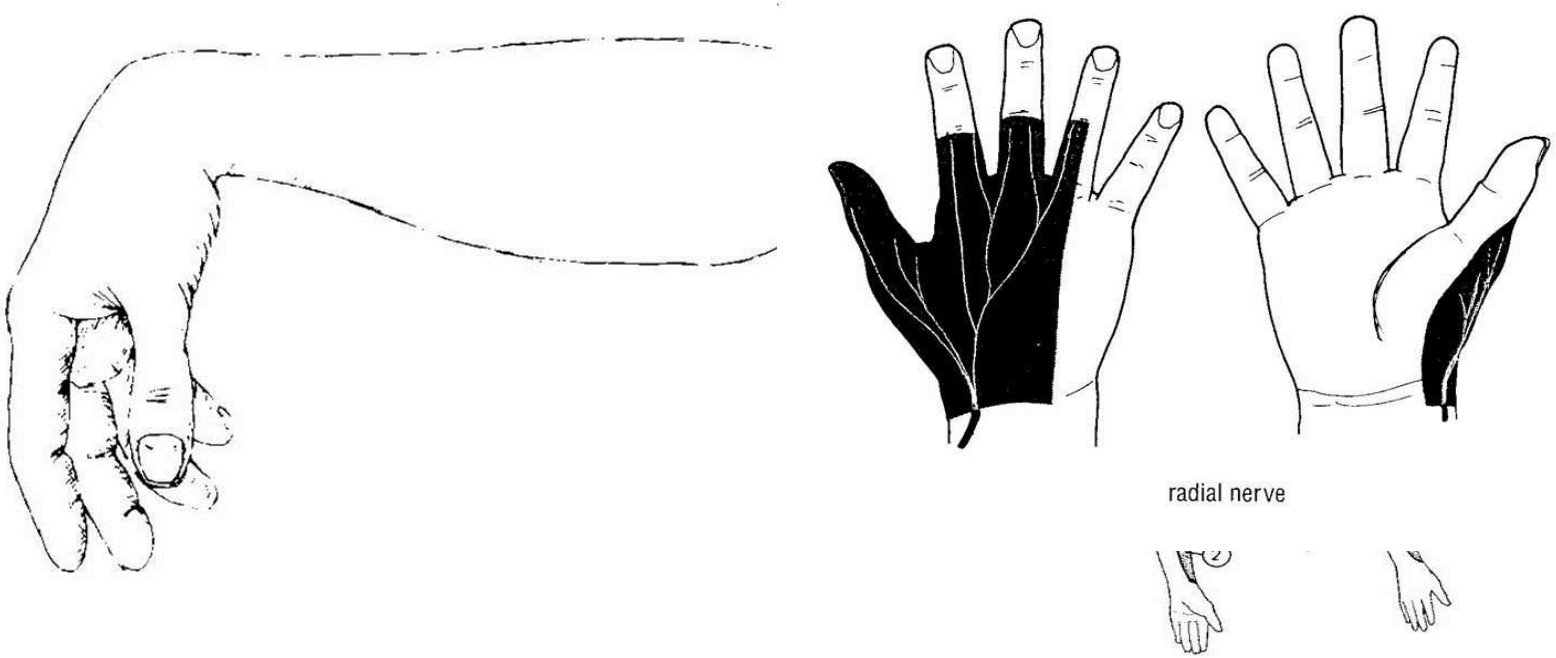


Posterior view


2. the axillary nerve
Suprascapular artery
Suprascapular nerve
Supraspinatus
Infraspinatus
Deltoid
Teres minor
Axillary nerve
Posterior circumflex humeral artery
Superior lateral cutaneous nerve of arm
Teres major
Triangular space
Posterior View
Long head
Lateral head
Tendon overlying medial head
3. the posterior circumflex humeral vessels
1. the long head of the triceps muscle

Stability of the shoulder joint

- This joint is **unstable** because of :
  - ***shallowness*** of glenoid fossa
  - ***weak ligaments***
- Its strength almost entirely depends on **tone** of rotator cuff muscles.
- Tendons of these muscles are fused to underlying capsule of shoulder joint.
- ***Least supported part of joint*** lies in **inferior** location, where it is unprotected by muscles.



- A ***subglenoid*** displacement of the head of the humerus into the quadrangular space can cause **damage to the axillary nerve.**
- This is indicated by *paralysis of the deltoid muscle* and ***loss of skin sensation*** over the lower half of the deltoid.
- Downward displacement of the humerus can also **stretch and damage the radial nerve**.

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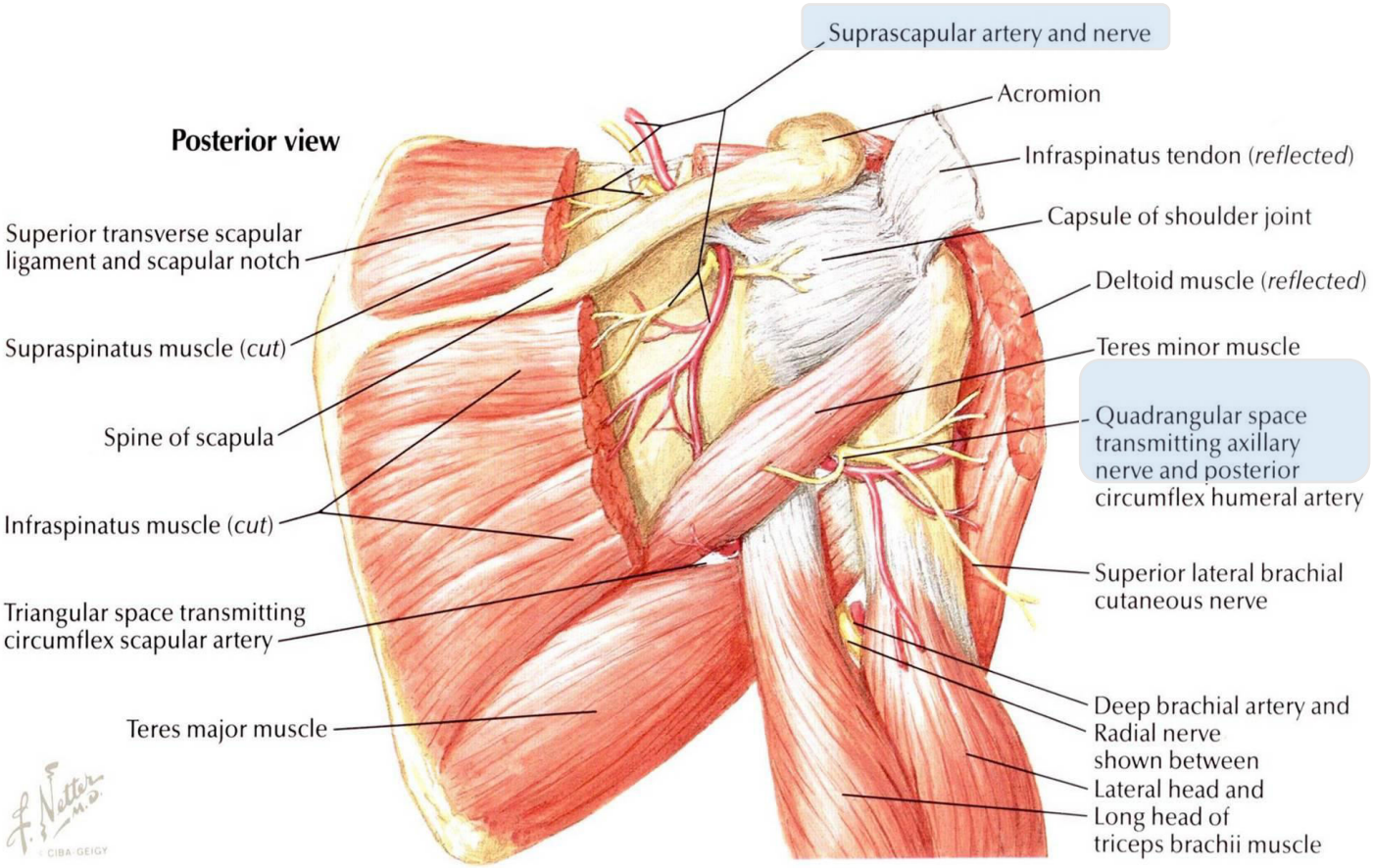
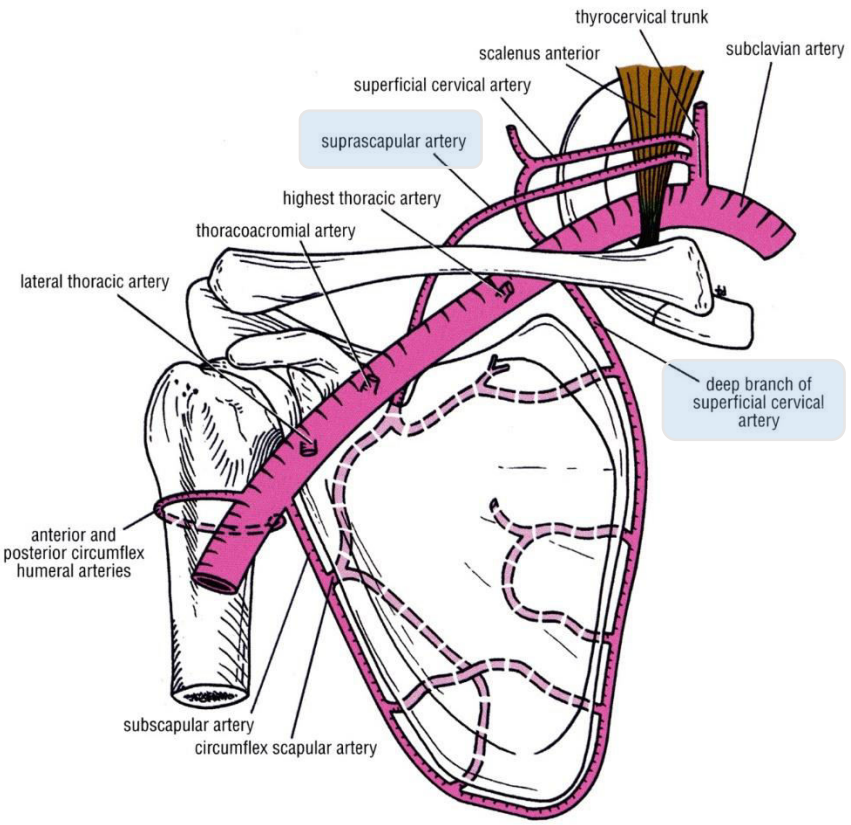
Shoulder pain

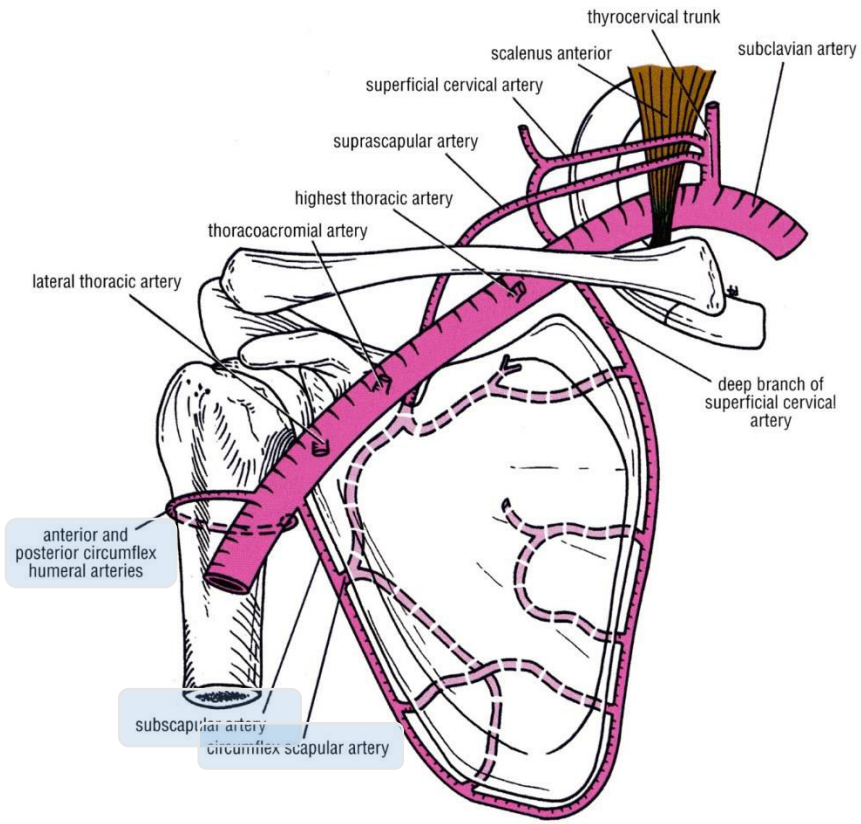


Branches from 1st part of subclavian artery



- **suprascapular artery,** **(**branch from 1st part of subclavian artery) distributed to supraspinous and infraspinous fossae of scapula.
- **superficial cervical artery,** which gives off a ***deep branch*** that runs down medial border of scapula.

Branches from 3rd part of axillary artery



- **subscapular artery** and its ***circumflex scapular branch*** supply subscapular and infraspinous fossae of scapula.
- **anterior & posterior circumflex humeral artery.**
- Both circumflex arteries form an ***anastomosing circle*** around surgical neck of the humerus.

Thank you