

# SHOULDER REGION

EssamEldin AbdelHady Salama

# Objectives

- Identification of the muscles attached to the scapula.
- Shoulder joint

# Scapular muscles

The Muscles Connecting the Upper Extremity to the Vertebral Column

The Muscles Connecting the Upper Extremity to the Anterior and Lateral Thoracic Walls

The Muscles and Fasciæ of the Shoulder

## The Muscles Connecting the Upper Extremity to the Vertebral Column

- Trapezius.
- Rhomboideus major.
- Latissimus dorsi.
- Rhomboideus minor.
- Levator scapulæ.

# The Muscles Connecting the Upper Extremity to the Anterior and Lateral Thoracic Walls

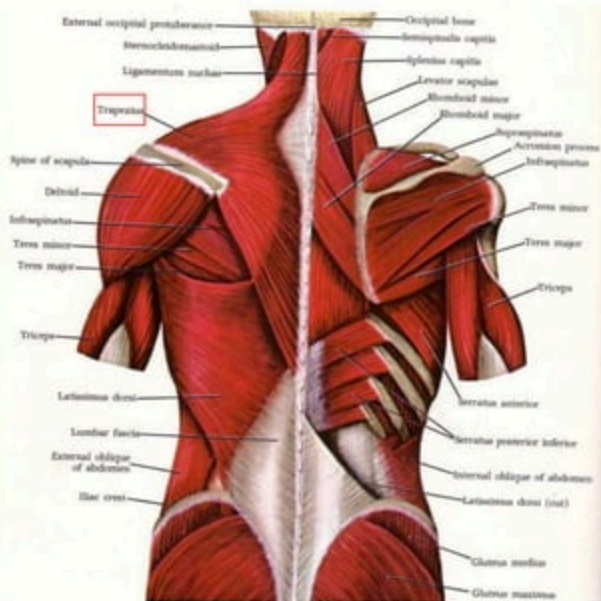
- The muscles of the anterior and lateral thoracic regions are:
- Pectoralis major.
- Subclavius.
- Pectoralis minor.
- Serratus anterior.

# The Muscles and Fasciæ of the Shoulder

- Deltoid.
- Infraspinatus.
- Subscapularis.
- Teres minor.
- Supraspinatus.
- Teres major.

# Trapezius

- **Origin:**
- From Medial 1/3 of superior nuchal line, external occipital protuberance, Ligamentum nuchae, spines of all cervical & all thoracic vertebrae and supraspinous ligament
- **Insertion :**
- Posterior border of lateral 1/3 of the clavicle, medial margin of acromion upper lip of the crest of the spine of the scapula.



# Trapezius

- **Nerve supply:**
- Spinal part of the accessory nerve &
- C 3,4
- **Actions:**
- Upper fibers: elevate the shoulder
- Lower fibers: depress the shoulder.
- Middle fibers: brace back (retraction) of shoulder
- It also, helps in raising the arm above 90° with (serratus anterior).

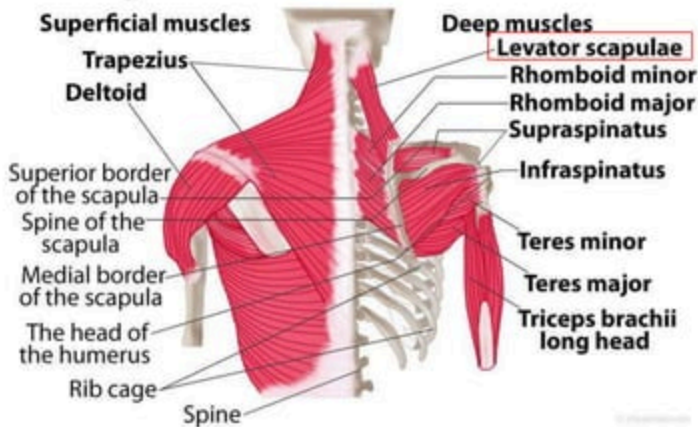




## Levator scapulae

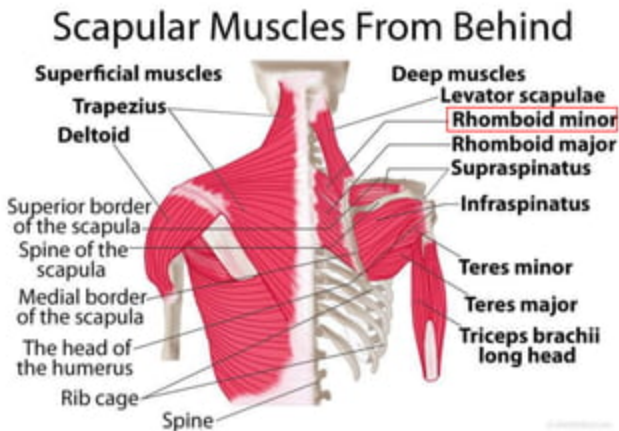
- **Origin:**
- Transverse processes of upper 4 cervical vertebrae.
- **Insertion:**
- Medial border of scapula.
- **Nerve supply:**
- C3,4 & 5
- **Action:**
- Elevate the medial border of the scapula.

## Scapular Muscles From Behind



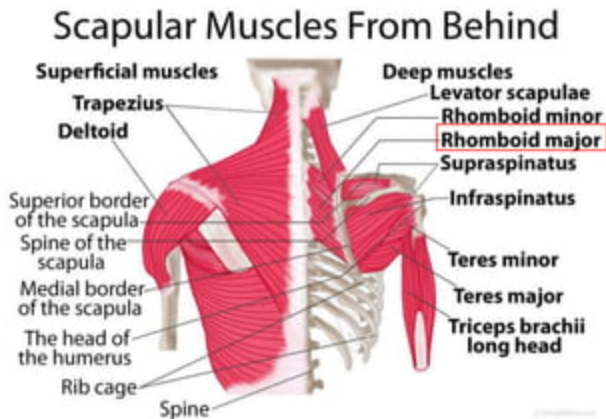
## Rhomboid minor

- **Origin:**
- Ligamentum nuchae & spines of C 7& T1
- **Insertion:**
- Medial border of the scapula.
- **Nerve supply:**
- C4& 5
- **Action:**
- Raises the medial border of scapula upward & medially.



# Rhomboid Major

- **Origin:**
- Spines of T2,T3,T4 & T5.
- **Insertion:**
- Medial border of scapula.
- **Nerve supply:**
- C4 & 5.
- **Action:**
- Raises the medial border of the scapula upward and medially.



# Deltoid

## Origin:

Anterior border of the lateral third of the clavicle

Lateral margin of acromion

Lower lip of the crest of the spine of the scapula

## Insertion:

deltoid tuberosity of the humerus

## Nerve supply:

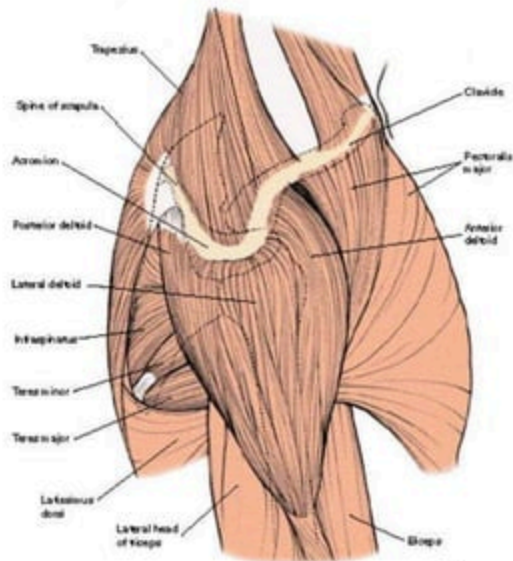
Axillary nerve

## Action:

Anterior fibers, help in flexion and medial rotation of the arm

Abduction of the arm by the acromial fibers

Posterior fibers help extension of the arm



# Supraspinatus

## Origin:

supraspinous fossa.

## Insertion:

top of greater tubercle.

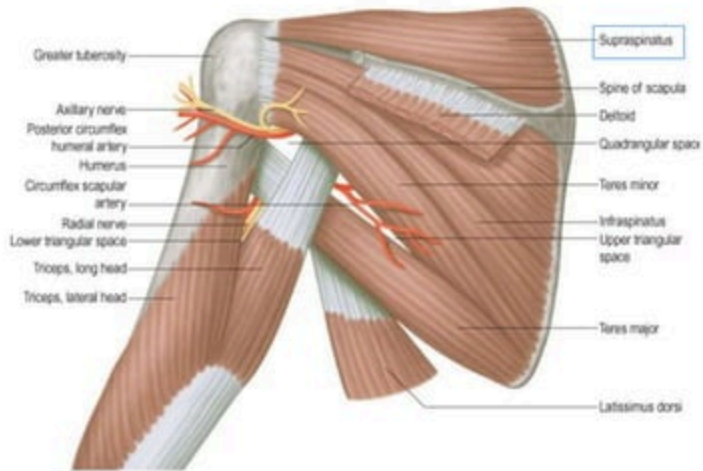
## Nerve supply:

Suprascapular N.

## Action:

Starts abduction from  
0 to 15.

Steadies head of humerus.



# Infraspinatus

## Origin:

infraspinous fossa

## Insertion:

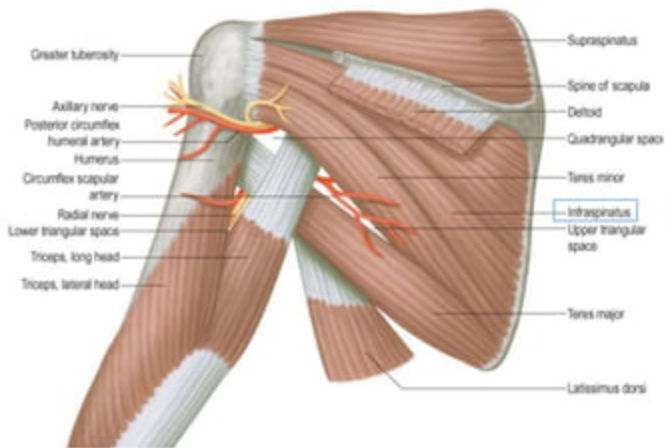
middle impression of greater tubercle.

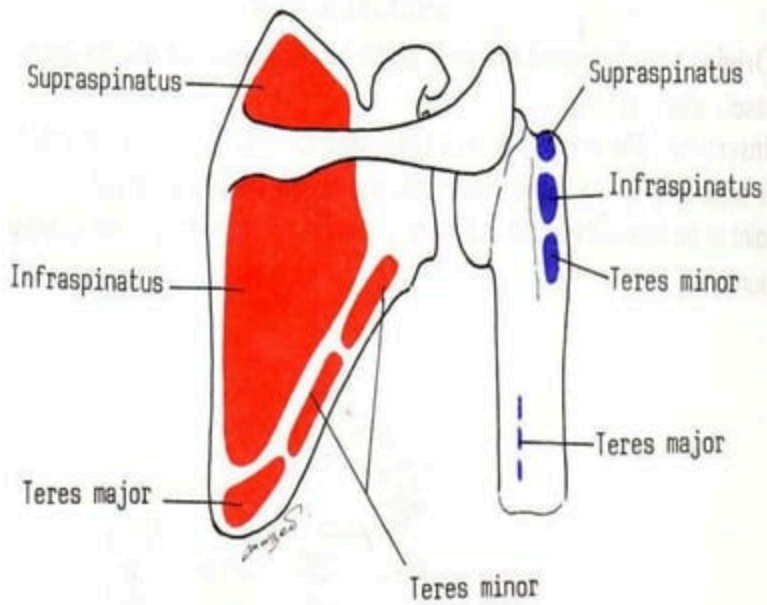
## Nerve supply:

Suprascapular nerve.

## Action:

adduction & Steadies head of humerus





# Teres minor

- **Origin:**

Upper 2/3 of lateral border of scapula

- **Insertion:**

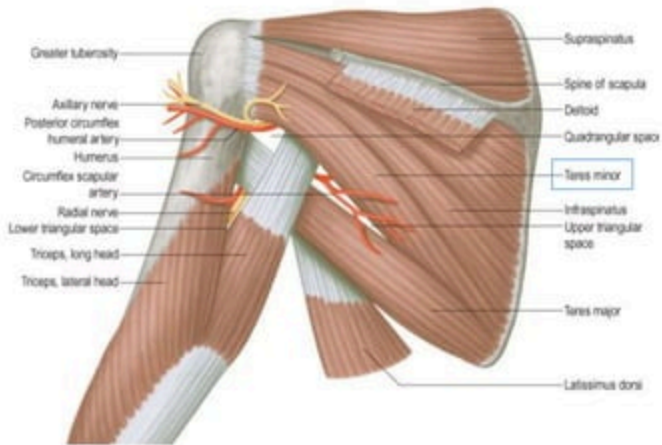
lower impression of the greater tubercle.

- **Nerve supply**

Axillary nerve

- **Action:**

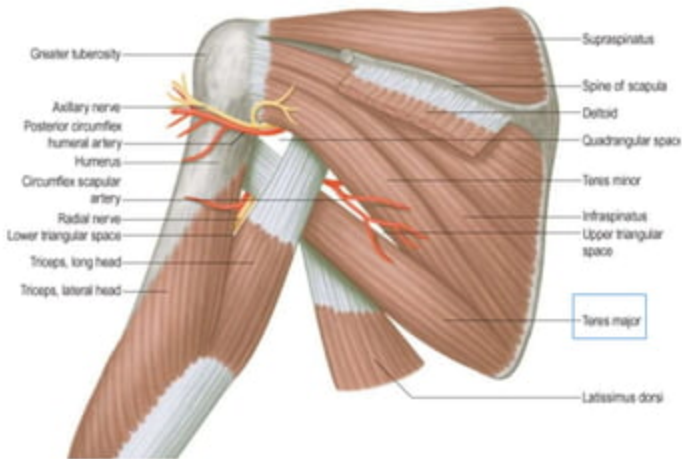
adduction & Lateral rotation.





## Teres Major

- **Origin:**
- lower 1/3 of lateral border of scapula.
- **Insertion:**
- Medial lip of intertubercular groove
- **Nerve:**
- lower subscapular n.
- **Action:**
- Adduction, medial rotation and extension.



# Subscapularis

## Origin:

Subscapular fossa

## Insertion:

Lesser tubercle (tuberosity) of Humerus.

## Nerve supply :

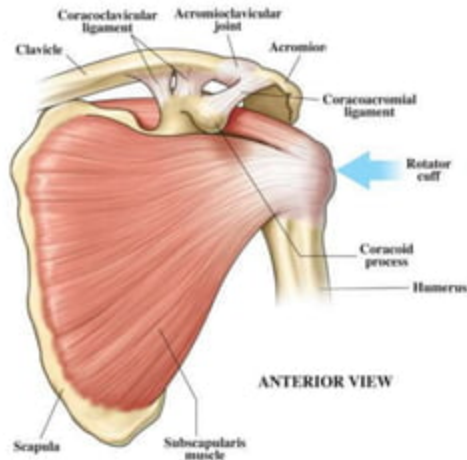
Upper & lower subscapular nerve.

## Action:

adduction & medial rotation of shoulder.

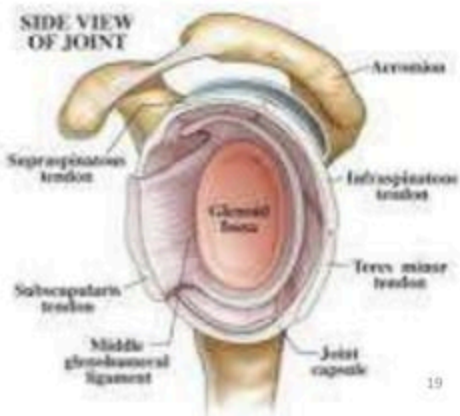
The tendons of Supraspinatus, & infraspinatus, & teres minor, and subscapularis form rotator-cuff.

## NORMAL SHOULDER ANATOMY



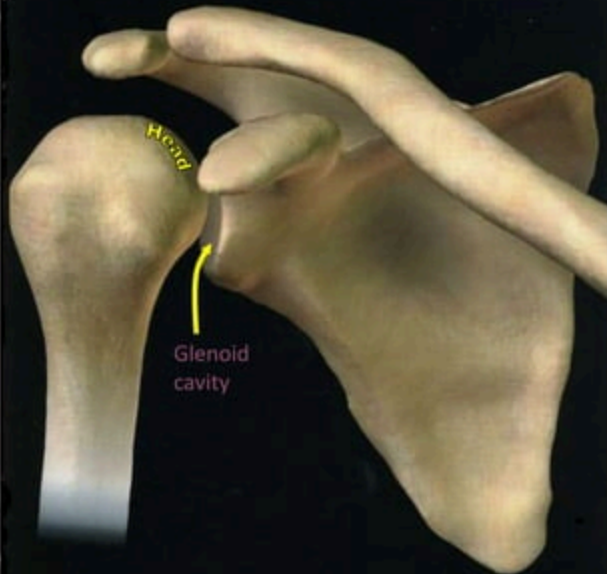
## Rotator cuff:

- 1-Supraspinatus.
- 2- infraspinatus
- 3- Teres minor.
- 4- Subscapularis



# SHOULDER JOINT

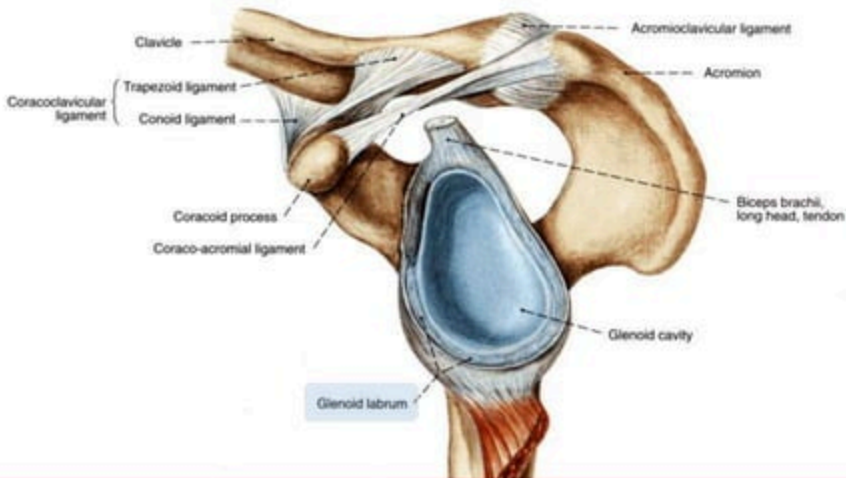
# ARTICULATION



Articulation is

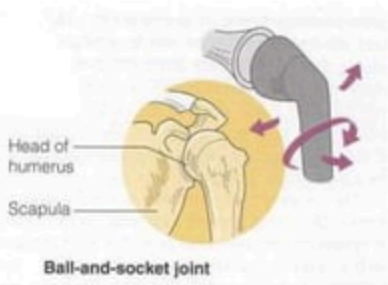
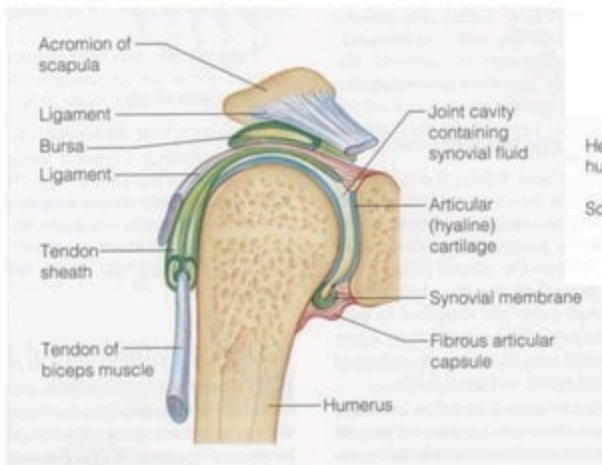
between:

- The rounded **head of the humerus** and
- The shallow, pear-shaped **glenoid cavity of the scapula.**



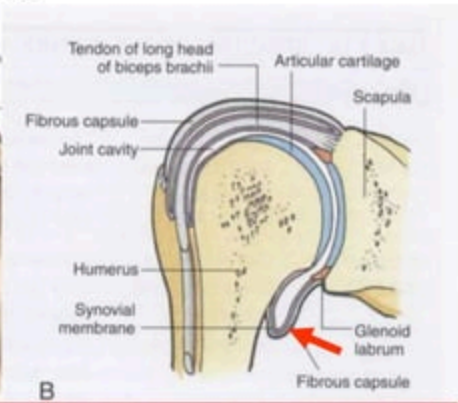
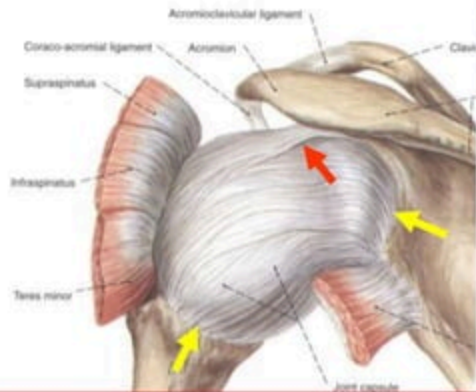
- The articular surfaces are covered by *hyaline cartilage*.
- The glenoid cavity is deepened by the presence of a *fibrocartilaginous rim* called the **glenoid labrum**.

# TYPE



- Synovial
- Ball-and-socket joint

# FIBROUS CAPSULE



- The fibrous capsule surrounds the joint and is attached:  
*Medially* to the margin of the glenoid cavity outside the labrum;  
*Laterally* to the anatomic neck of the humerus.
- **The capsule** is **thin and lax**, allowing a wide range of movement.



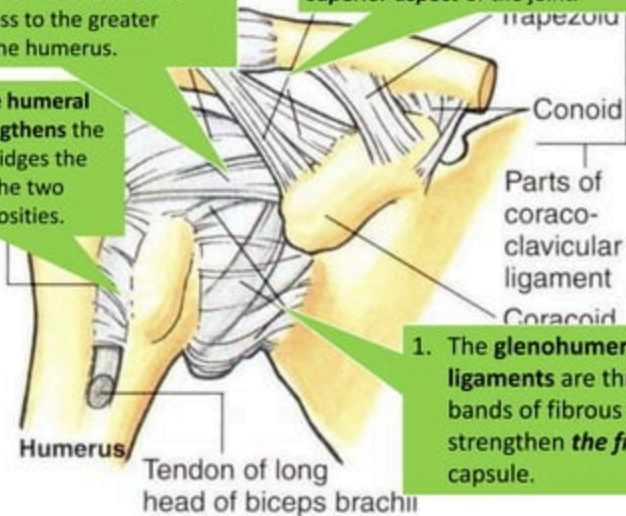
# LIGAMENTS

## Acromioclavicular

3. The **coracohumeral ligament** strengthens the capsule from **above** and stretches from the root of the coracoid process to the greater tuberosity of the humerus.

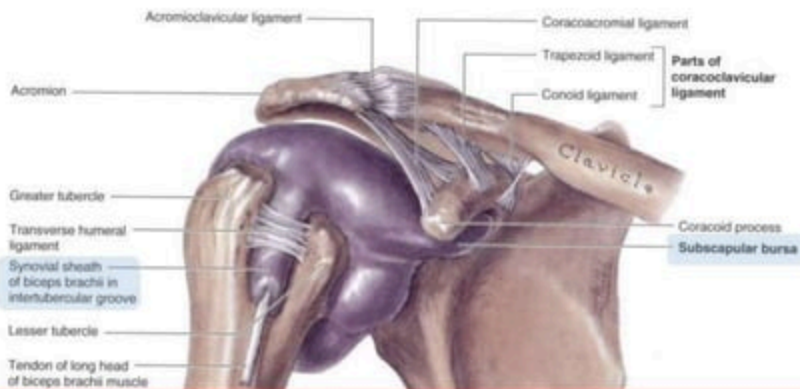
2. The **transverse humeral ligament** strengthens the capsule and bridges the gap between the two humeral tuberosities.

**Accessory ligaments:**  
The **coracoacromial ligament** extends between the coracoid process and the acromion. Its function is to **protect the superior aspect** of the joint.



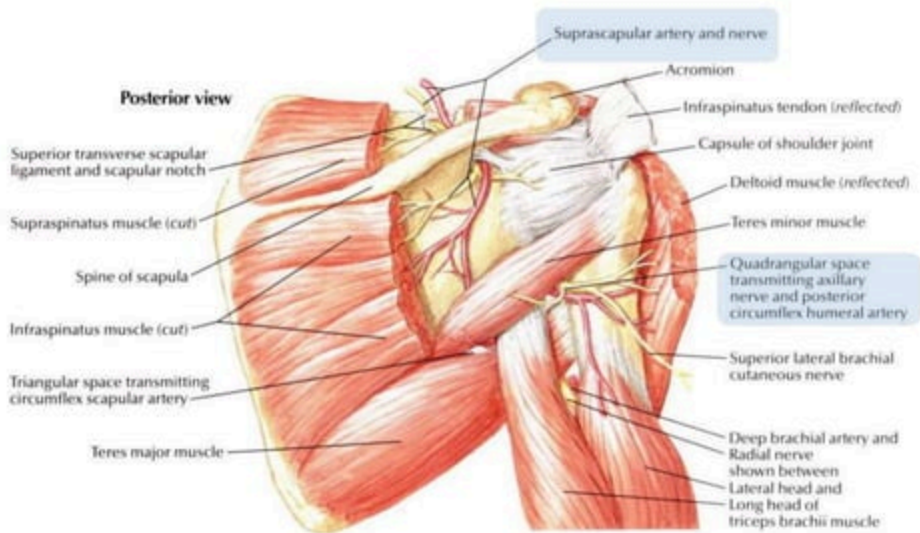
1. The **glenohumeral ligaments** are three weak bands of fibrous tissue that strengthen **the front** of the capsule.

# SYNOVIAL MEMBRANE



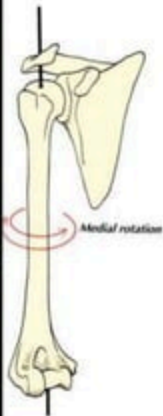
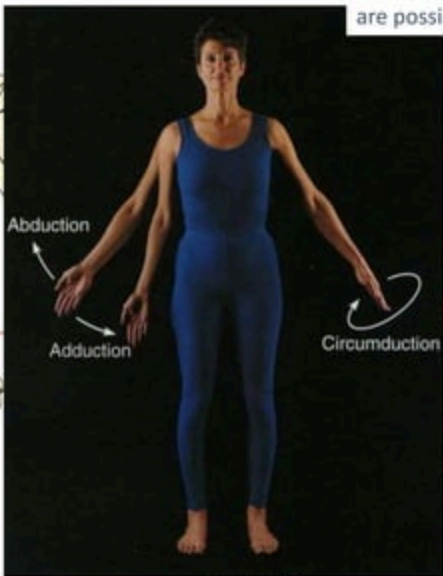
- It lines the fibrous capsule.
- ***It is attached to the margins of the cartilage*** covering the articular surfaces.
- It forms a **tubular sheath** around the tendon of the long head of the biceps brachii.
- ***It extends through the anterior wall of the capsule*** to form the **subscapularis bursa**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

# NERVE SUPPLY



Articular branches of the **axillary & the suprascapular nerves**

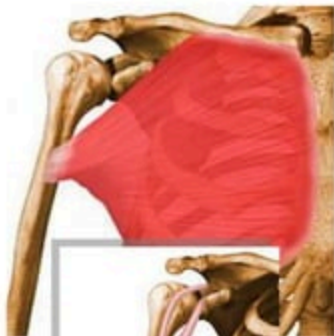
The following movements  
are possible:



- Flexion
- Extension

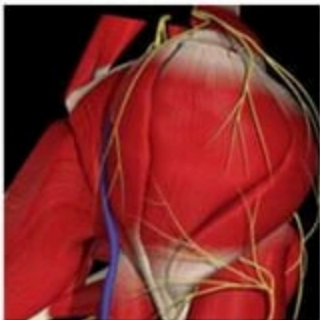
- Adduction
- Circumduction

- Lateral rotation
- Medial rotation



## Flexion

- Normal flexion is about 90°
- It is performed by the:
  1. *Anterior fibers* of the deltoid
  2. Pectoralis major
  3. Biceps brachii
  4. Coracobrachialis



### Extension:

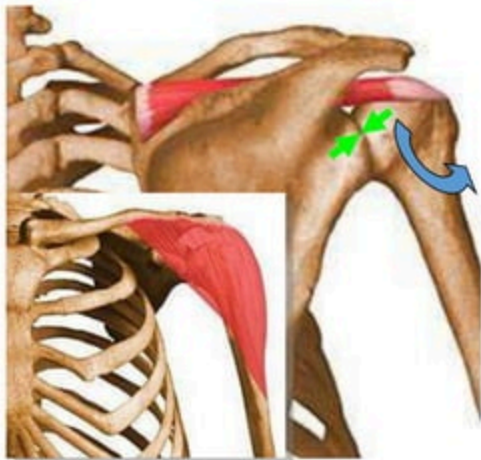
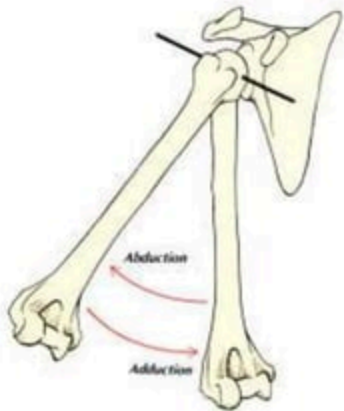
- Normal extension is about 45°
- It is performed by the:
  1. *Posterior fibers* of the deltoid,
  2. Latissimus dorsi
  3. Teres major



### Abduction:

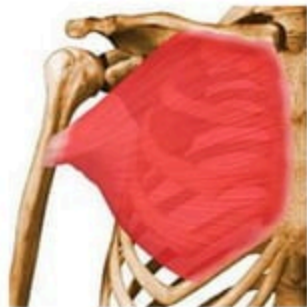
- Abduction of the upper limb occurs both at the shoulder joint and between the scapula and the thoracic wall.
- It is initiated by supraspinatus from 0 to 18
- Then from 19 to 90 by the ***middle fibers*** of the deltoid.
- Then above 90 by rotation of the scapula by 2 muscles ( Trapezius & S.A..)





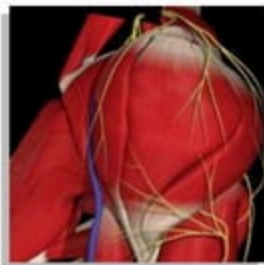
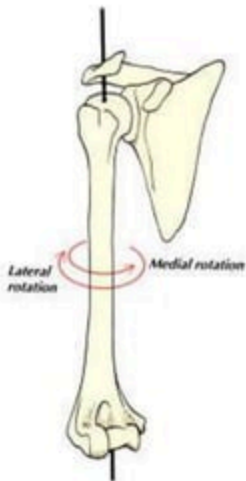
- The supraspinatus muscle:
  - *initiates* the movement of abduction (from 0 to 19) and
  - *holds the head of the humerus* against the glenoid fossa of the scapula;
- This latter function of the supraspinatus **allows** the deltoid muscle to contract and abduct the humerus at the shoulder joint.





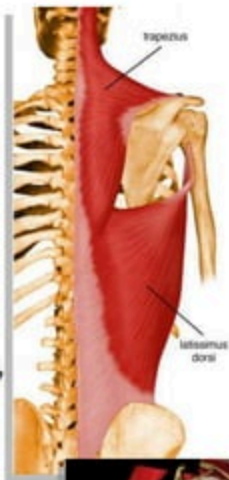
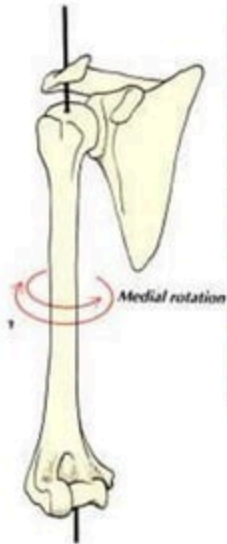
### Adduction:

- Normally the upper limb can be swung 45° across the front of the chest.
- This is performed by:
  1. pectoralis major
  2. latissimus dorsi
  3. teres major
  4. teres minor



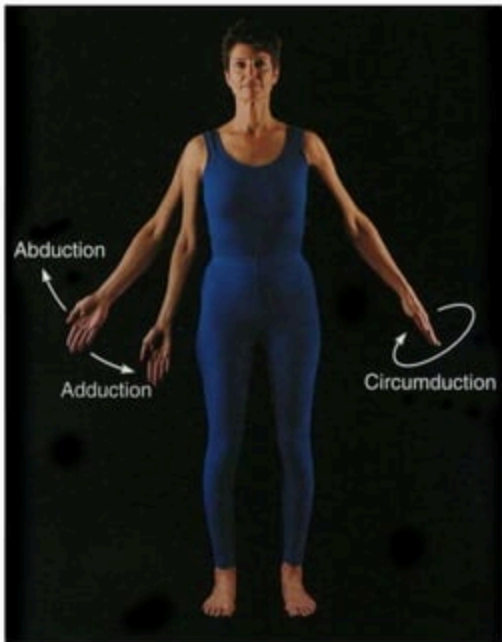
### Lateral rotation:

- Normal lateral rotation is about 40 to 45°.
- This is performed by the:
  1. infraspinatus
  2. teres minor
  3. the **posterior** fibers of the deltoid muscle



### Medial rotation:

- Normal medial rotation is about  $55^{\circ}$ .
- This is performed by the:
  1. subscapularis
  2. latissimus dorsi
  3. teres major
  4. *anterior* fibers of the deltoid.



## Circumduction:

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

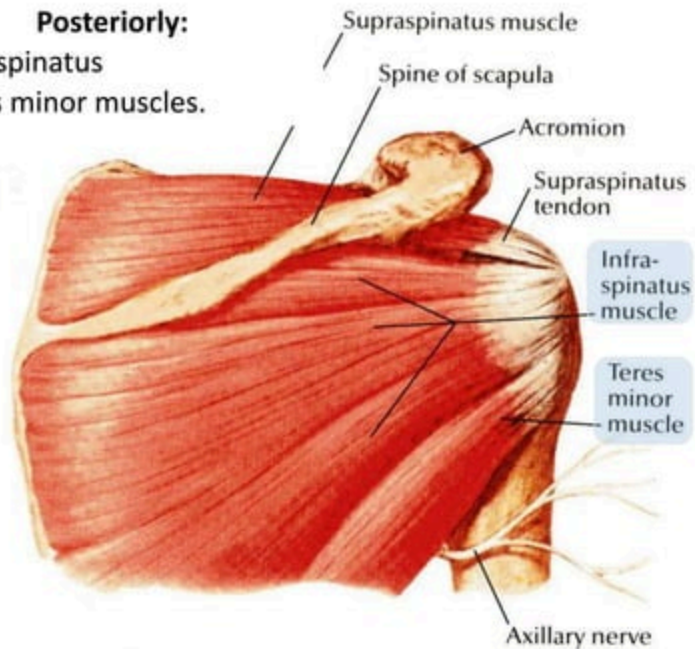
- It is formed by  
flexion,  
abduction,  
extension and  
adduction.

Successively

# Relation

**Posteriorly:**

- Infraspinatus
- Teres minor muscles.

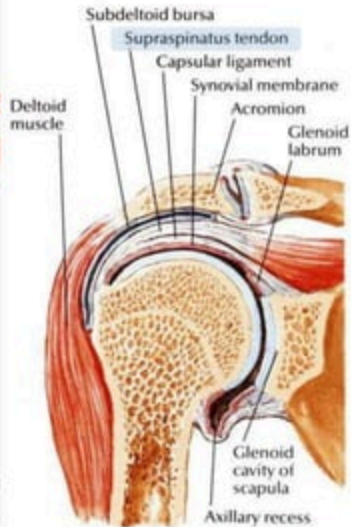


**Posterior view**

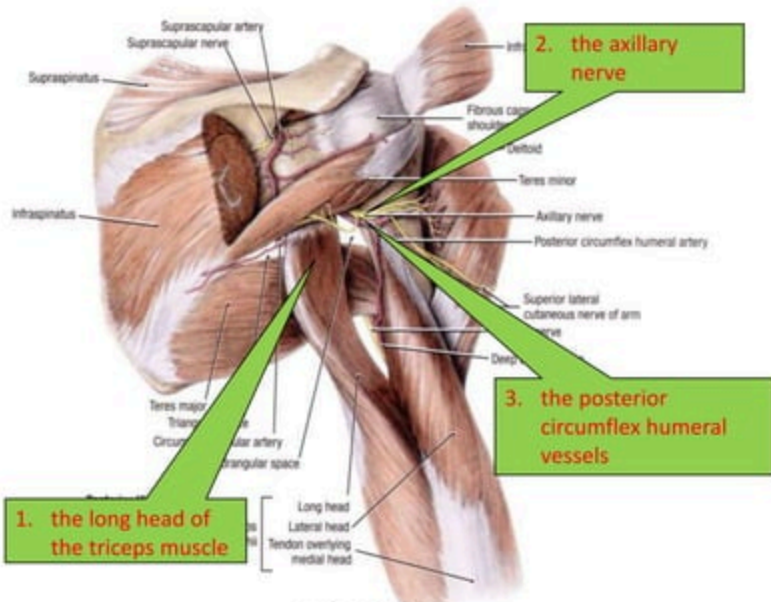


**Superiorly:**

1. Deltoid muscle
2. Coracoacromial ligament
3. Subacromial (subdeltoid) bursa
4. Supraspinatus muscle & tendon



**Coronal section through joint**



**Inferiorly:**



# STABILITY OF THE SHOULDER JOINT

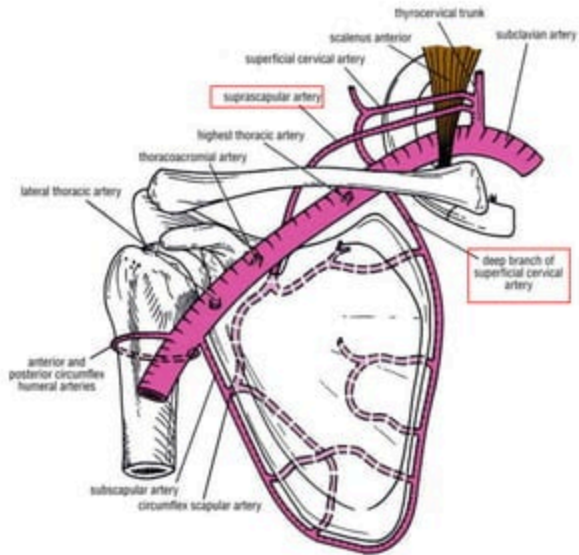


- This joint is **unstable** because of the:
  - **shallowness** of the glenoid fossa
  - **weak ligaments**
- Its strength almost entirely depends on the **tone** of the rotator cuff muscles.
- The tendons of these muscles are fused to the underlying capsule of the shoulder joint.
- **The least supported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

# ANASTOMOSES AROUND THE SCAPULAR REGIONS

The **suprascapular artery**, (branch from 1<sup>st</sup> part of subclavian artery) distributed to the supraspinous and infraspinous fossae of the scapula.

The **deep branch** of the **superficial cervical artery**, that runs down the medial border of the scapula.



The subscapular artery and its *circumflex scapular branch* supply the subscapular and infraspinous fossae of the scapula.

The anterior & posterior circumflex humeral artery.

Both the circumflex arteries form an *anastomosing circle* around the surgical neck of the humerus.

