The Shoulder Joint

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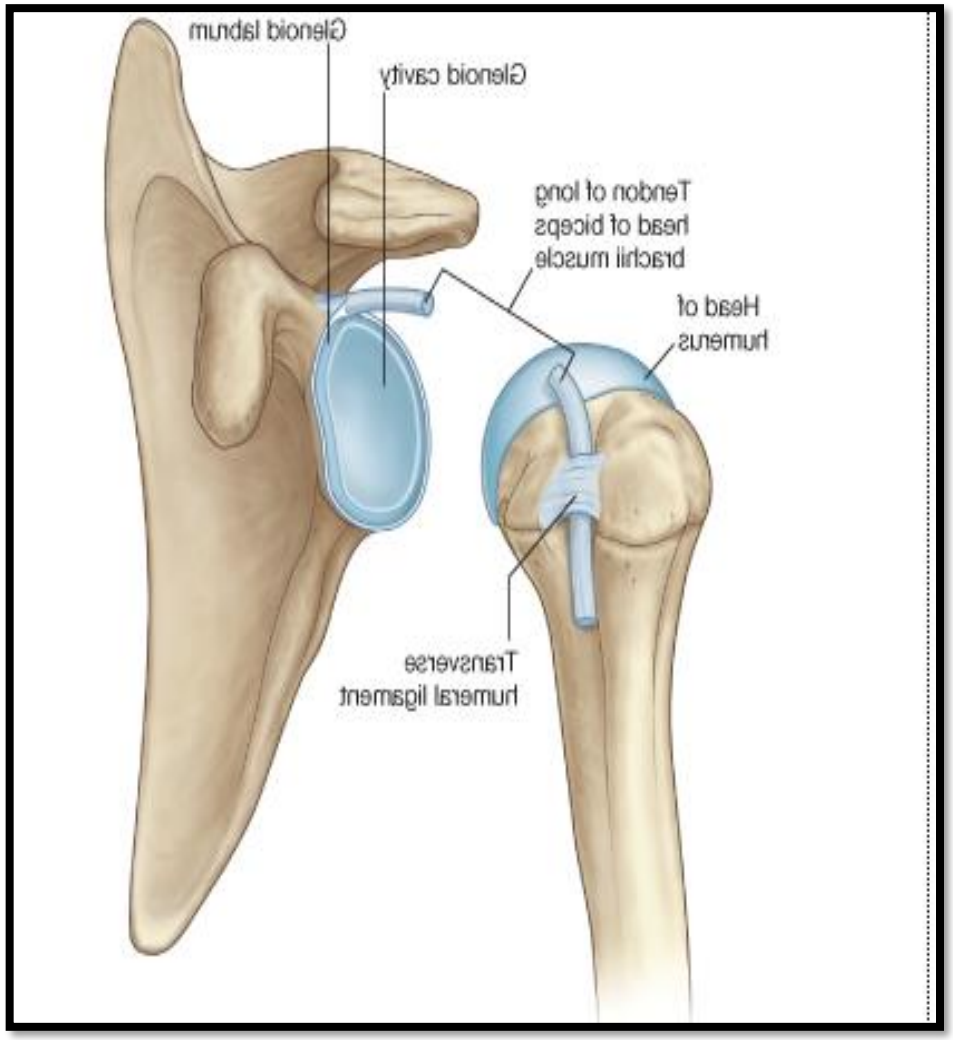
Overview

The **shoulder joint** (or **glenohumeral joint**) is formed between the articular surfaces of the glenoid cavity of the scapula and the head of the humerus.

It is a **ball-and-socket synovial joint**

Allows a wide range of movements in multiple planes.



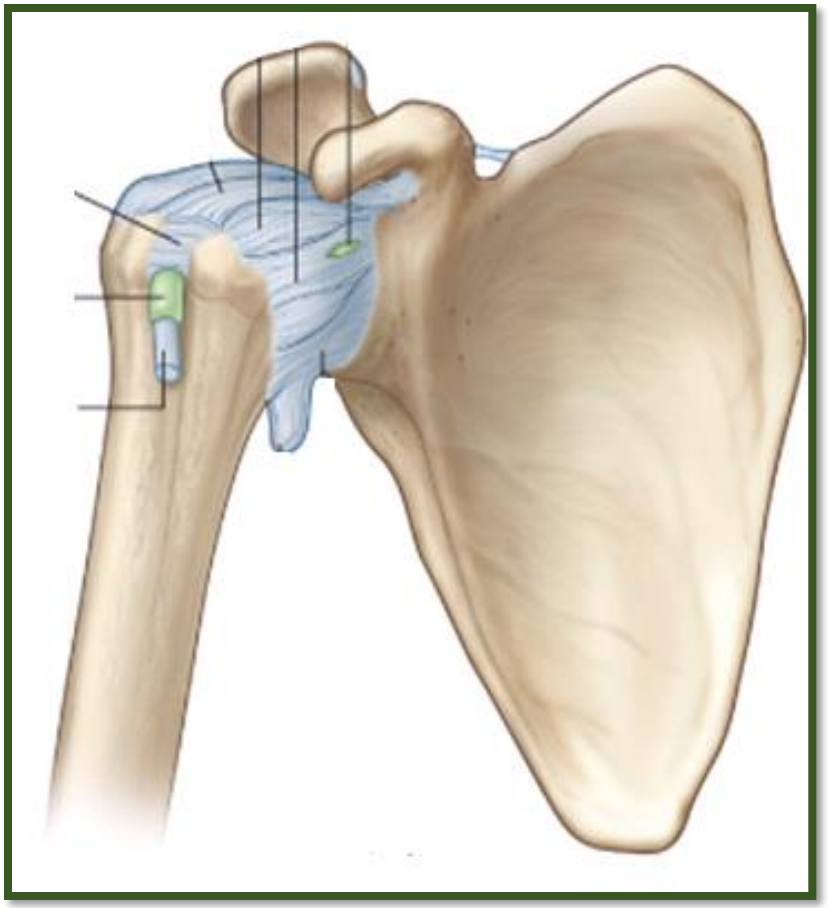
Glenohumeral joint

- The joint is lined by synovium
- enclosed by a fibrous capsule.
- The glenoid cavity is deepened by a rim of fibrocartilage – the **glenoid labrum**
- Despite this, the glenohumeral joint is still unstable. This is due to the shallowness of the glenohumeral joint and the disproportion of articular surfaces.
- Stability is provided by a capsule, various ligaments and the rotator cuff muscles.

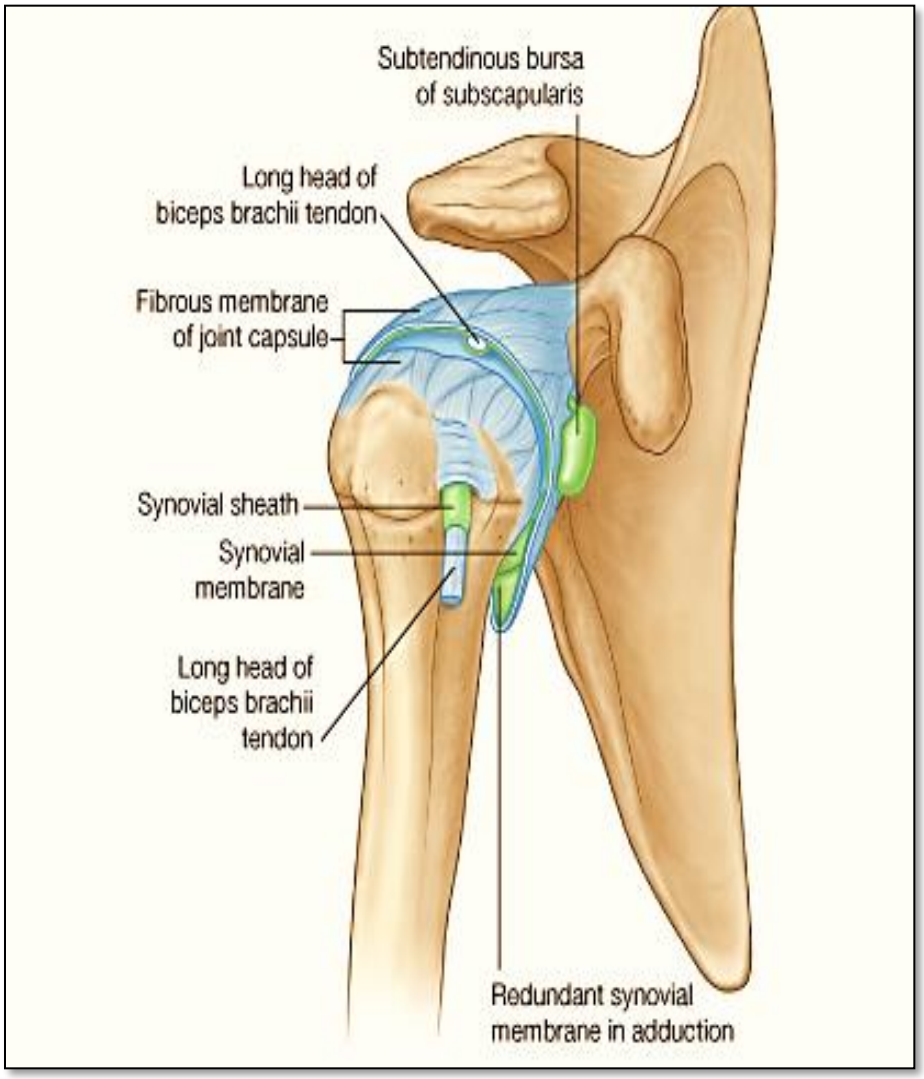
Capsule

The capsule is attached to the glenoid labrum, the scapula and the anatomical head of the humerus.

It is a tough fibrous capsule, but it is relatively lax to allow movement to occur in many planes.



- There is a small opening anteriorly in the capsule where the synovial membrane communicates with the subscapular bursa.
- A bursa is a sack of synovial fluid between two articulating surfaces to reduce friction.
- The subscapular bursa separates the tendon of the subscapularis.
- The second opening is smaller and allows the tendon of the long head of biceps brachii to arise from the supraglenoid tubercle.



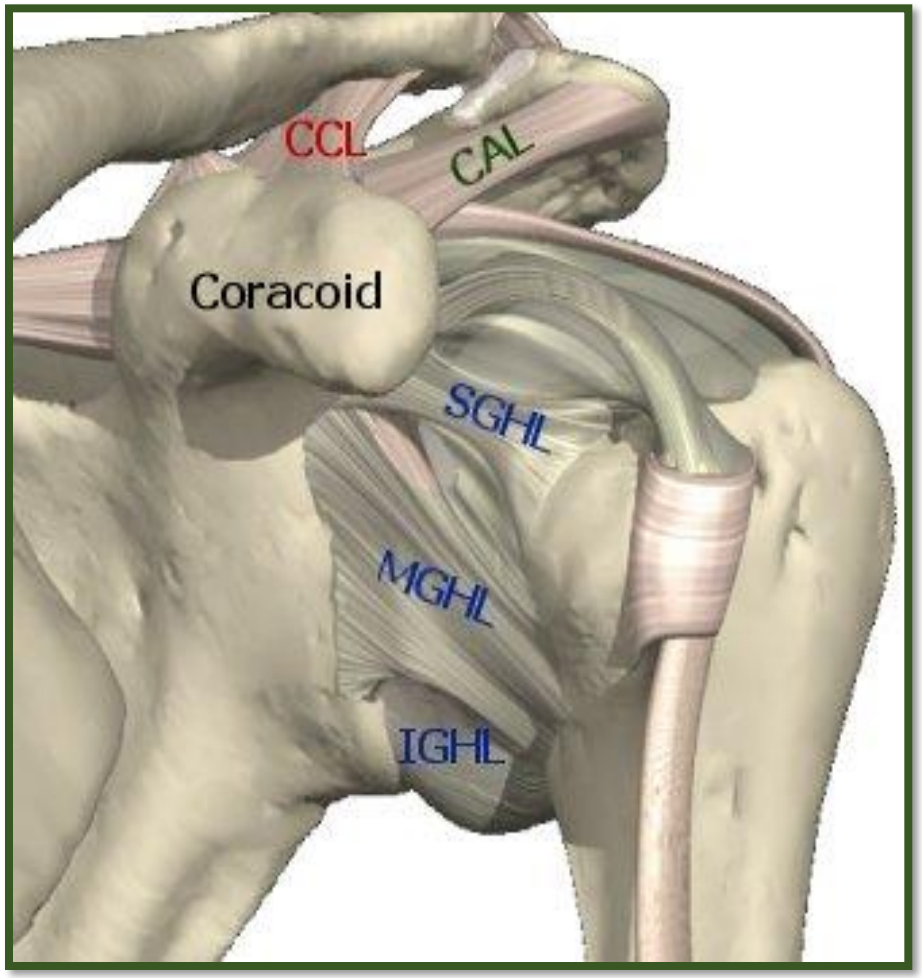
Ligaments

- **Intracapsular ligaments**

There are three intracapsular ligaments which are fibrous bands between the glenoid labrum and the humerus.

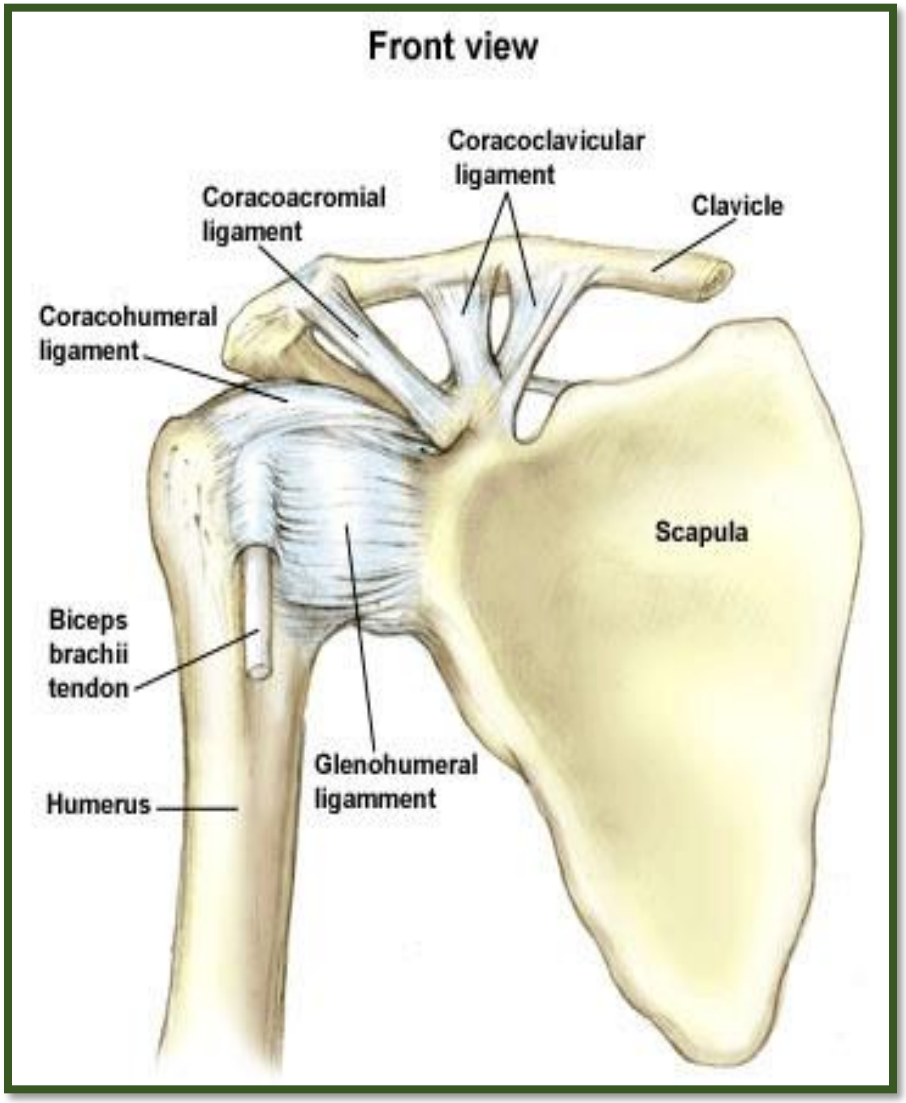
These ligaments are continuous with the fibrous capsule and reinforce the capsule anteriorly. They are:

- **Superior glenohumeral ligament**
- **Middle glenohumeral ligament**
- **Inferior glenohumeral ligament**



Extracapsular ligaments

- There are also three extracapsular ligaments:
  - **Coracoacromial ligament** → links the acromion and the coracoid process
  - **Coracohumeral ligaments** → passes from the coracoid process to the greater tubercle of the humerus
  - **Transverse humeral ligament** → holds the tendon of the long head of the biceps in place during shoulder movement

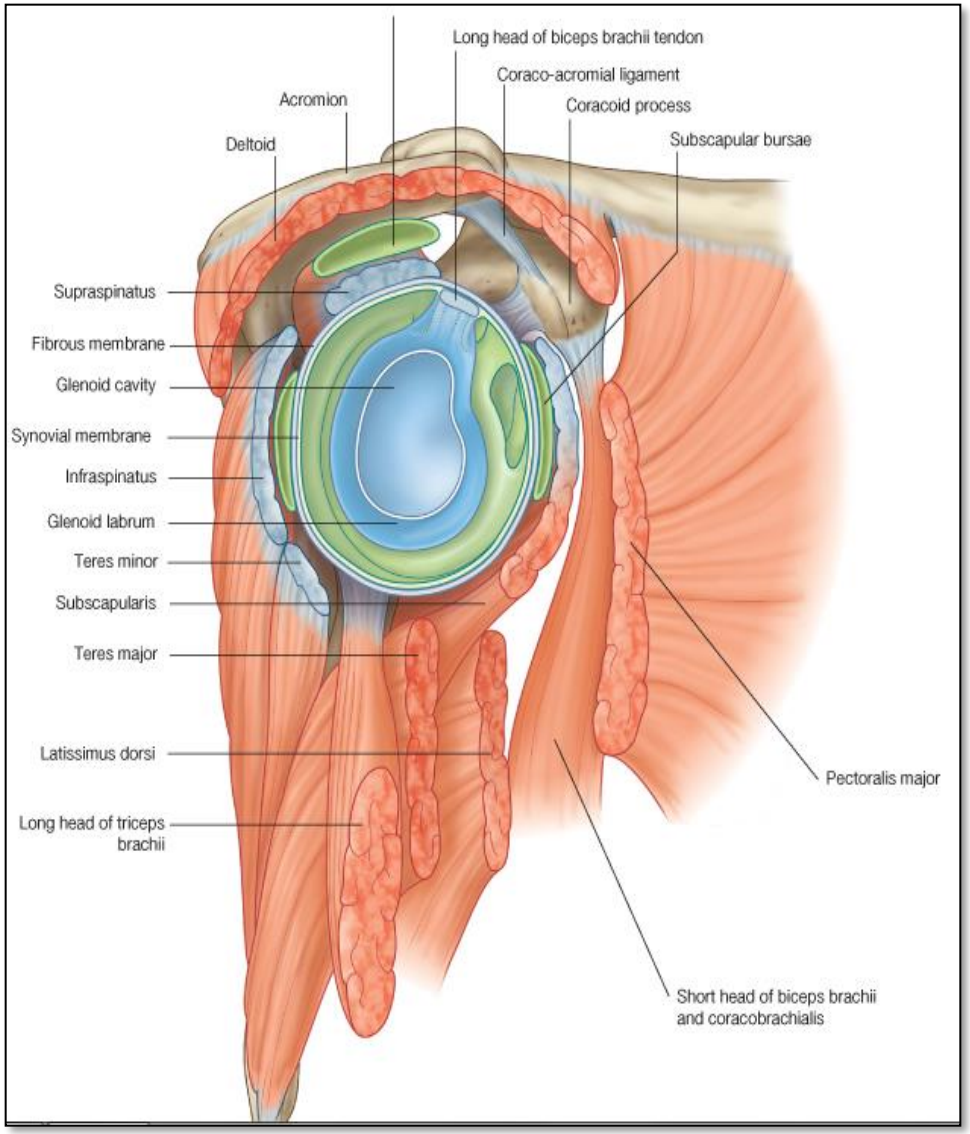


Coraco Acromial Arch

- **The coracoarcomial arch** is a strong, osseoligamentous structure which provides a smooth under-surface of the **acromion**, **the coracoacromial ligament** and the **coracoid process**.
- It overlies the humeral head and prevents the upper displacement of the humerus
- The tendon of the supraspinatus muscle is separated from the coracoacromial arch by the subacromial bursa.
- There is a small space between the acromion and the head of the humerus, within this space are:
  - The subacromial bursa
  - Rotator cuff tendons
  - Tendon of the long head of the biceps
- During abduction there is risk of soft tissue impingement between the head of the humerus and the acromion.

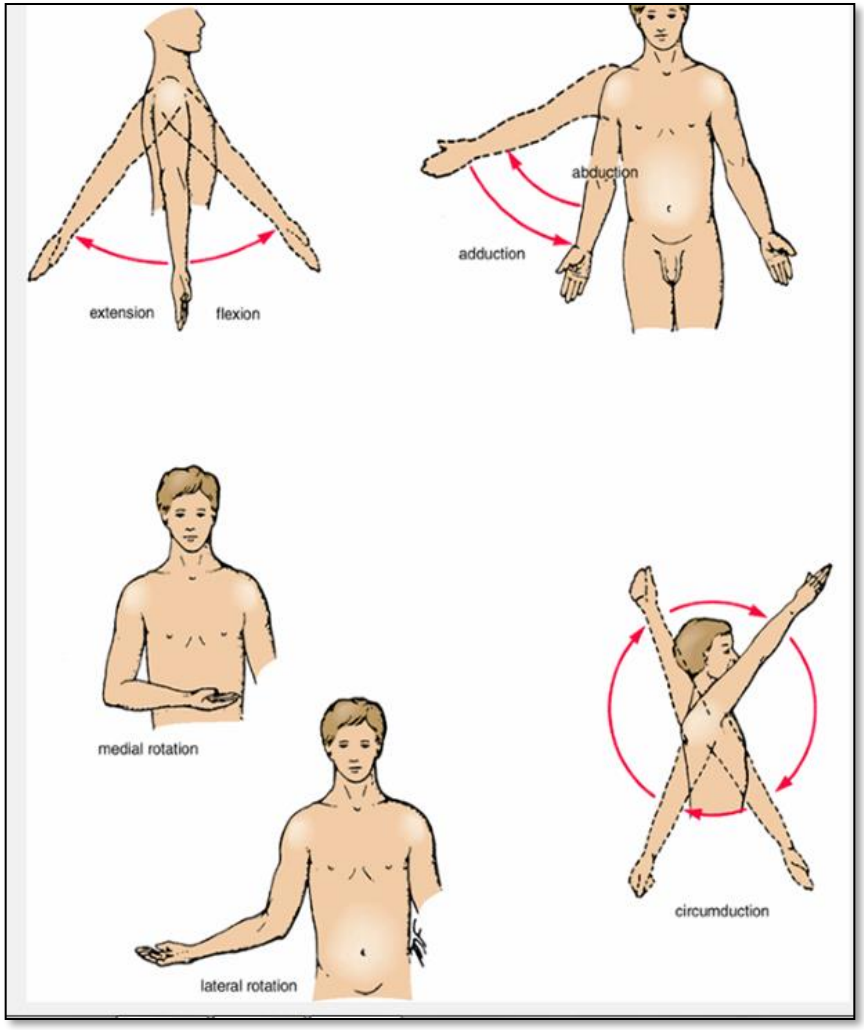
Bursae around the glenohumeral joint

- There is the subscapular bursa, which facilitates the movement of the tendon of the subscapularis over the scapula.
- **A bursa** is a sack of synovial fluid between 2 articulating surfaces to reduce friction on movement.
- The subscapular bursa separates the tendon of the subscapularis from the joint.
- Subacromial bursa facilitates the movement of the supraspinatus tendon under the coracoacromial arch
- Inflammations of the bursa can occur: Subacromial bursitis causes pain on abduction of the arm between 50-130 degrees, which is **painful arch syndrome**



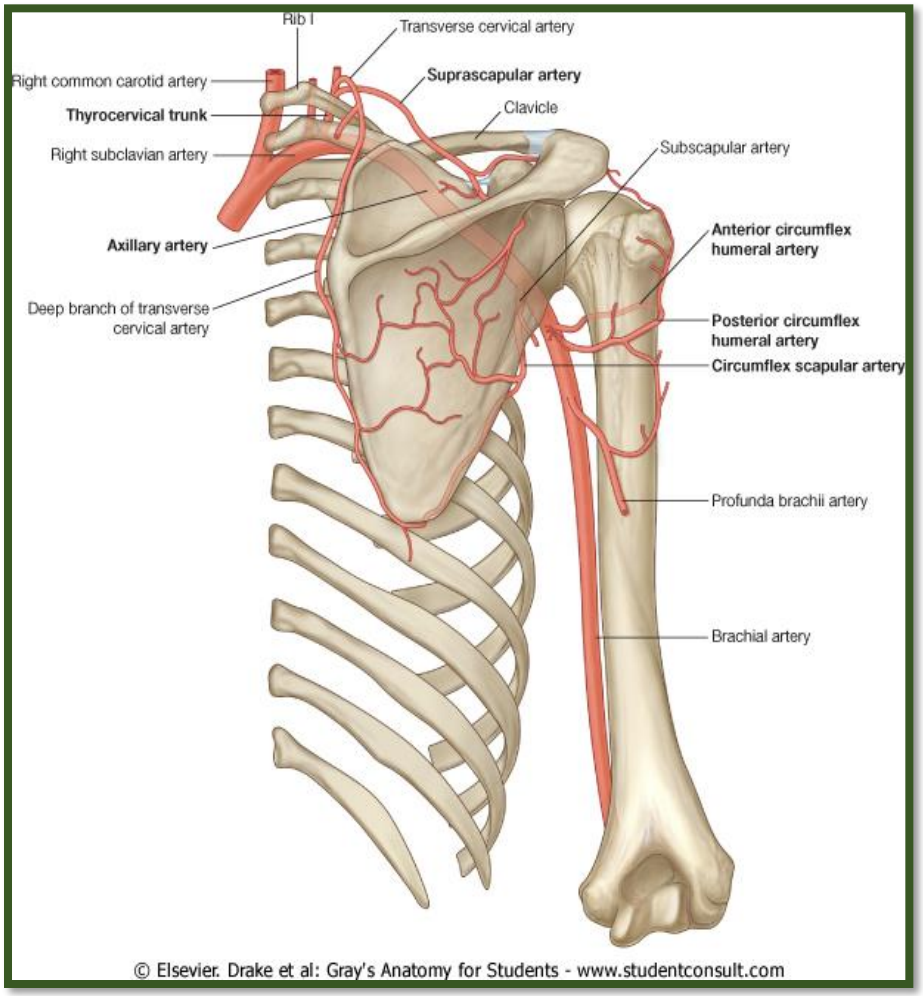
Movements of the Glenohumeral Joint

- **Flexion**→ pectoralis major, anterior fibres of deltoid, coracobrachialis and biceps brachii
- **Extension**→ latissimusdorsi and the posterior fibres of the deltoid
- **Abduction**→ supraspinatus (initiator of abduction up to 15-20 degrees), central deltoid fibres (20-90 degrees of abduction)



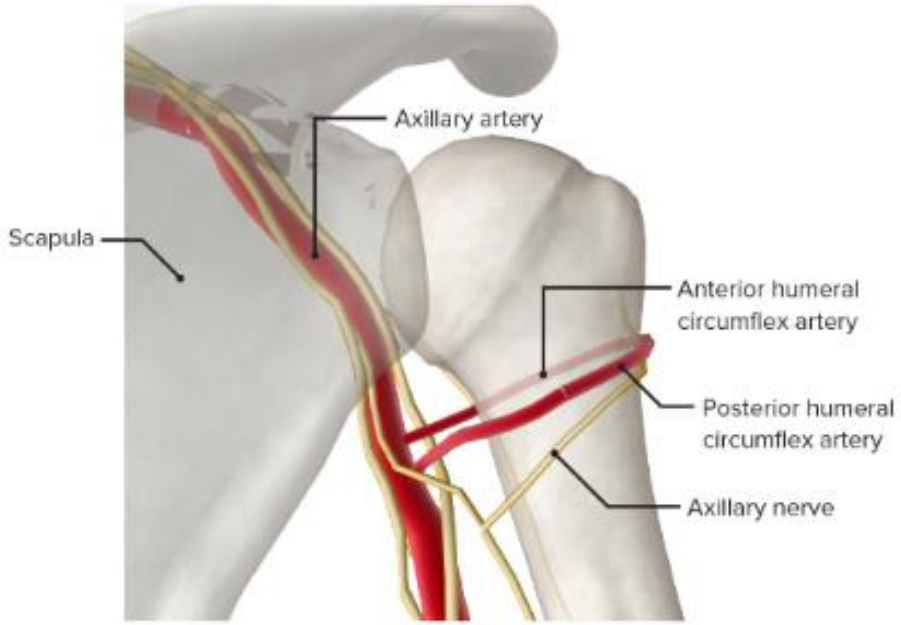
Neurovascular Supply to the Glenohumeral Joint

- The blood supply is via the
- **anterior and posterior circumflex humeral arteries and the suprascapular artery.**
- The joint is innervated by **the suprascapular, axillary and lateral pectoral nerves.**

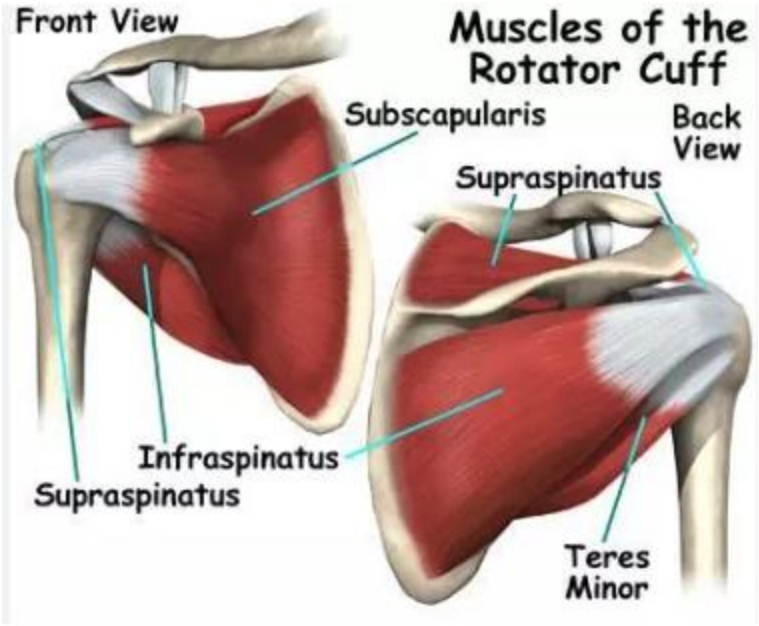


Neurovascular relations and clinical application

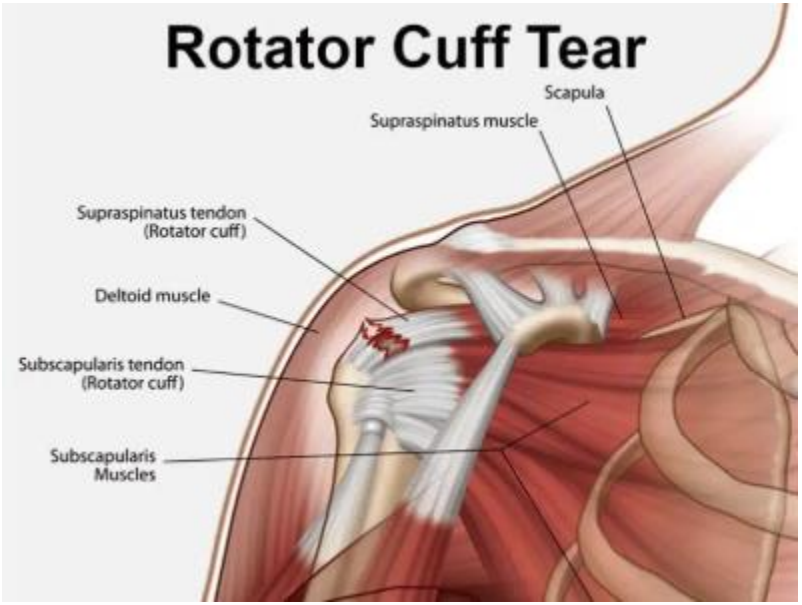
- **Axillary nerves and circumflex artery** are vulnerable when administering an intramuscular injection and during shoulder dislocation.



- **Rotator cuff problems:**
  - Tendons rubbing under coracoid acromion arch
  - Causes irritation and inflammation of tendons


Front View
Muscles of the Rotator Cuff
Subscapularis
Back View
Supraspinatus
Infraspinatus
Supraspinatus
Teres Minor


SUPRASPINATUS MUSCLE
CLAVICLE
ROTATOR CUFF TEAR
SUBSCAPULARIS MUSCLE (FRONT OF SHOULDER)
INFRASPINATUS MUSCLE (BACK OF SHOULDER)
HUMERUS
TERES MINOR MUSCLE (BACK OF SHOULDER)


Rotator Cuff Tear
Scapula
Supraspinatus muscle
Supraspinatus tendon (Rotator cuff)
Deltoid muscle
Subscapularis tendon (Rotator cuff)
Subscapularis Muscles

Stability of the shoulder joint provided by:

- Tendons of the rotator cuff (anteriorly, posteriorly and superiorly)
- Gleno humeral intracapsular ligaments (anteriorly, inferiorly)
- Coraco-humeral ligament (superiorly)
- Coracoacromial arch (superiorly)
- Deepening of the glenoid cavity by the glenoid labrum
- Splinting effect of the long head of the biceps above and the long head of the triceps below

Dislocation of the glenohumeral joint

- Dislocation in the inferior direction, this is clinically defined as an anterior dislocation because the humeral head locates anteriorly due to powerful adductors.
- The capsule and the rotator cuff tendons may tear, if they heal poorly recurrent dislocation may be experienced

Frozen Shoulder

- Adhesive fibrosis and scarring between:
  - The inflamed capsule
  - Rotator cuff
  - Subacromial bursa
  - Deltoid
- Difficulty in abducting the arm

Characterized by stiffness and pain in the shoulder joint.