MEDICAL EDUCATION RESOURCE

Shoulder (Glenohumeral) Joint,Movements of Shoulder Joint

Shoulder (Glenohumeral) Joint

Type

- **Ball-and-socket synovial joint** — the most mobile joint in the body.
- Formed between the **head of humerus** and the **glenoid cavity of scapula**.

Articular Surfaces

- **Head of humerus:** Large, hemispherical, directed medially, upwards, and backwards.
- **Glenoid cavity of scapula:** Small, shallow, directed laterally, upwards, and forwards.
- **Glenoid labrum:**
  - Fibrocartilaginous rim deepening the cavity.
  - Increases articular surface area and provides stability.

Joint Capsule

- Attached to:
  - **Medially:** Margin of glenoid cavity beyond labrum.
  - **Laterally:** Anatomical neck of humerus (except inferiorly – surgical neck).
- Loose and large ? allows **wide range of motion** but **less stability**.
- Strengthened by **tendons and ligaments**.

Ligaments

LIGAMENT	ATTACHMENTS	FUNCTION
Capsular ligament	Surrounds joint	Permits free movement
Coracohumeral ligament	From base of coracoid process ? greater tubercle	Strengthens capsule superiorly
Glenohumeral ligaments (3)	From glenoid margin ? lesser tubercle	Reinforce capsule anteriorly
Transverse humeral ligament	Across intertubercular groove	Holds long head of biceps tendon in place
Coracoacromial ligament	Between coracoid and acromion forming coracoacromial arch	Prevents upward dislocation

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Bursae Associated

1. **Subscapular bursa** ? communicates with joint cavity anteriorly.
2. **Subacromial (subdeltoid) bursa** ? between supraspinatus tendon and acromion/deltoid; does **not communicate** with joint cavity.

Relations

- **Anterior:** Subscapularis, coracobrachialis, short head of biceps.
- **Posterior:** Infraspinatus, teres minor, posterior part of deltoid.
- **Superior:** Coracoacromial arch and supraspinatus tendon.
- **Inferior:** Long head of triceps and axillary nerve.

Nerve Supply

- **Axillary nerve (C5, C6)**
- **Suprascapular nerve (C5, C6)**
- **Lateral pectoral nerve**

Blood Supply

- **Anterior and posterior circumflex humeral arteries**
- **Suprascapular artery**

Stability Factors

1. **Rotator cuff muscles** — *Supraspinatus, Infraspinatus, Teres minor, Subscapularis* (SITS).
2. **Coracoacromial arch** — prevents superior displacement.
3. **Long head of biceps** — acts as intra-articular stabilizer.
4. **Glenoid labrum** — deepens the socket.
5. **Negative intra-articular pressure** — suction effect.

?? Movements of Shoulder Joint

Axes

- **Flexion/Extension** ? Transverse axis
- **Abduction/Adduction** ? Anteroposterior axis
- **Medial/Lateral rotation** ? Vertical axis
- **Circumduction** ? Combination of all above

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1. Flexion

- **Range:** 0–180° (forward movement).
- **Muscles:** Pectoralis major (clavicular head), Anterior deltoid, Coracobrachialis, Biceps brachii (short head).

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2. Extension

- **Range:** Up to 60°.
- **Muscles:** Latissimus dorsi, Posterior deltoid, Teres major, Triceps (long head).

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3. Abduction

- **Range:** 0–180° (combination with scapular movement).
  - **0–15°:** Supraspinatus (initiator)
  - **15–90°:** Deltoid (chief abductor)
  - **90–180°:** Serratus anterior + Trapezius (upward rotation of scapula)
- **Clinical:** *Supraspinatus test* ? empty can test positive in supraspinatus tear.

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4. Adduction

- **Muscles:** Pectoralis major, Latissimus dorsi, Teres major, Subscapularis, Coracobrachialis.

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5. Medial (Internal) Rotation

- **Muscles:** Subscapularis, Pectoralis major, Latissimus dorsi, Teres major, Anterior deltoid.

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6. Lateral (External) Rotation

- **Muscles:** Infraspinatus (chief), Teres minor, Posterior deltoid.

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7. Circumduction

- A combination of flexion, extension, abduction, and adduction ? conical motion of limb.

Scapulohumeral Rhythm

- For every **2° of glenohumeral movement**, there is **1° of scapular rotation**.
- Total abduction of 180° = 120° at glenohumeral + 60° at scapulothoracic joint.

? Dissection of Shoulder Joint

Steps

1. Place the cadaver supine; abduct and laterally rotate the upper limb.
2. Identify and clean **deltoid muscle**, then reflect it from clavicle, acromion, and spine of scapula.
3. Expose the **coracoacromial arch**, **supraspinatus**, and **capsule** beneath.

4. Identify **supraspinatus, infraspinatus, teres minor, and subscapularis tendons** forming the rotator cuff.

5. Trace the **long head of biceps tendon** as it passes within the capsule (in bicipital groove under transverse ligament).

6. Carefully incise the **capsule** to observe:

    - **Head of humerus**
    - **Glenoid cavity** and **labrum**
    - **Subscapular recess** anteriorly.

7. Move the humerus to demonstrate **flexion, abduction, rotation, and circumduction.**

? Clinical Anatomy of Shoulder Joint

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1. Dislocation of Shoulder Joint

- **Most common joint dislocation** in body.
- **Direction:** Usually **anteroinferior** due to weak inferior capsule.
- **Cause:** Fall or forceful abduction & external rotation.
- **Clinical:** Flattened shoulder contour, prominent acromion, humeral head palpable anteriorly.

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2. Recurrent Dislocation

- Due to torn capsule or labrum.
- Common in athletes and throwers.

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3. Rotator Cuff Tear

- Commonly involves **supraspinatus tendon** (degenerative or traumatic).
- Presents with **painful arc syndrome** (pain during 60°–120° abduction).

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4. Subacromial Bursitis

- Inflammation of subacromial bursa ? pain during abduction.
- May result from repetitive overhead activity.

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5. Frozen Shoulder (Adhesive Capsulitis)

- Chronic inflammation and fibrosis of capsule ? restricted all-directional movement.
- Common in diabetics and post-injury.

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6. Axillary Nerve Injury

- May occur with surgical neck fracture or dislocation.
- Causes **deltoid paralysis**, loss of **shoulder contour**, and sensory loss over **regimental badge area**.

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7. Shoulder Impingement Syndrome

- Compression of **supraspinatus tendon** under coracoacromial arch.
- Pain during abduction, positive Neer’s test.

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8. Biceps Tendinitis

- Inflammation of **long head of biceps tendon** in intertubercular groove.
- Causes anterior shoulder pain during flexion and supination.

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9. Subluxation of Biceps Tendon

- Due to rupture of **transverse humeral ligament**, tendon slips medially over lesser tubercle.

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10. “Painful Arc”

- Pain during **60°–120° abduction** ? indicates *supraspinatus or subacromial pathology*.