Shoulder Joint and its Movements

SHOULDER JOINT
(GLENOHUMERAL)

- Shallow glenoid fossa - deepened by glenoid labrum
- Synovial, Ball and socket
- Humeral head is 1/3 hemisphere
- Capsule: Strong & taut superiorly (anti-sag), inferiorly lax and inserted lower to allow wide abduction, flexion and extension
- Synovium: Envelops biceps tendon, communicates with bursae anteriorly and posteriorly

LIGAMENTS:

Opening of subscapular bursa

4: Subscapularis
5: Teres major
6: Supraspinatus
7: Short head biceps
8: Pectoralis minor

Coraco-acromial (strong ++)
Subacromial bursa (large)
Coracohumeral (strong)
Transverse humeral (intertubercular)
Glenohumeral 1,2,3
Anterior: superior, middle, inferior (weak thickenings of capsule)

Blood: circumflex humeral arteries
Nerves: Subscapular, suprascapular, axillary (Hilton's law)
Bursae: Subscapular, subacromial, infraspinatus, supraspinatus
Stability: Bones (poor), Capsule (relatively poor), Muscles +++ ligaments +++
Support: Rotator cuff (subscapularis, supraspinatus, infraspinatus, teres minor), long head biceps, triceps in abduction, muscles from chest to arm
LATISSIMUS DORSI

Origin: Spines & supraspinous ligament T7 down to sacrum, lumbar fascia, posterior third of iliac crest, last 4 ribs & inferior angle of scapula

Insertion: Flat tendon into floor of bicipital groove

Action: Adducts, extends & medially rotates shoulder. Aids both inspiration & expiration

Nerve supply: Thoracodorsal nerve from posterior cord
PECTORALIS MAJOR

Clavicular head

**Origin:** Medial half of clavicle

**Insertion:** Anterior lamina (of trilaminar insertion) & lateral lip of bicipital groove, deep fascia, anterior lip of deltoid tuberosity

Sternocostal head

**Origin:** Anterior & lateral manubrium, body of sternum, aponeurosis of external oblique, upper 7 costal cartilages (not always 1st or 7th)

**Insertion:** Manubrial fibres to intermediate lamina. Sternocostal fibres to posterior lamina with highest fibres into capsule of shoulder

**Action:** Flexion, adduction, internal rotation

**Nerve supply:** lateral & medial pectoral nerves
DELTOID

**Origin:** Lateral third clavicle, acromion, spine of scapula as far as deltid tubercle of scapula

**Insertion:** Deltoid tubercle of humerus

**Action:** Abducts arm. Anterior fibres flex & medially rotate. Posterior fibres extend & laterally rotate

**Nerve supply:** Axillary (C5,6 posterior cord)

---

Special note: There is little doubt that the lateral fibres of deltid helps supraspinatus to initiate abduction of the shoulder but from the images above it is obvious that the anterior and posterior fibres cross the joint more effectively as soon as abduction begins and thus give more power to abduction.
**TERES MAJOR**

**Origin:** Oval area on lower third lateral side of inferior angle of scapula

**Insertion:** Medial lip of bicipital groove

**Action:** Medial rotation, adduction, stabilisation of shoulder

**Nerve supply:** Lower subscapular (posterior cord C5,6)

---

**TERES MINOR**

**Origin:** Middle third lateral border of scapula

**Insertion:** Inferior facet of greater tuberosity & joint capsule

**Action:** Lateral roatation & stabilisation of shoulder

**Nerve supply:** Axillary nerve (C5,6 (posterior cord)
SUBSCAPULARIS

Origin: Medial 2/3 subscapular fossa

Insertion: Lesser tuberosity of humerus, half medial lip of bicipital groove & joint capsule

Action: Medial rotation stabilisation of shoulder

Nerve supply: Upper & lower subscapular (posterior cord C6,7)
SUPRASPINATUS

**Origin:** 3/4 supraspinous fossa & upper spine of scapula

**Insertion:** Superior facet of greater tuberosity of humerus & joint capsule

**Action:** Abducts & stabilises shoulder

**Nerve supply:** Suprascapular (C5,6 upper trunk)

INFRASPINATUS

**Origin:** Medial 3/4 infraspinous fossa & intermuscular septum

**Insertion:** Medial facet of greater tuberosity of humerus & joint capsule

**Action:** Lateral rotation & stabilisation of shoulder

**Nerve supply:** Suprascapular (C5,6 upper trunk)
ABDUCTION AT SHOULDER

- **External rotation:**
  - infraspinatus
  (suprascapular n)

- **Rotation of scapula:**
  - Trapezius (spinal XI)
  - Serratus anterior - lower fibres
  (long thoracic n)

- ** Mostly deltoid (axillary n)**
  - Supraspinatus
  (suprascapular n)

- **Supraspinatus (suprascapular n)**
 & some deltoid (axillary n)
DELTOID

Origin: Lateral third clavicle, acromion, spine of scapula as far as deltoid tubercle of scapula

Insertion: Deltoid tubercle of humerus

Action: Abducts arm. Anterior fibres flex & medially rotate. Posterior fibres extend & laterally rotate

Nerve supply: Axillary (C5,6 posterior cord)

Special note: There is little doubt that the lateral fibres of deltoid helps supraspinatus to initiate abduction of the shoulder but from the images above it is obvious that the anterior and posterior fibres cross the joint more effectively as soon as abduction begins and thus give more power to abduction
ABDUCTION AT SHOULDER

- External rotation: infraspinatus (suprascapular n)
- Rotation of scapula: Trapezius (spinal XI) Serratus anterior - lower fibres (long thoracic n)
- Mostly deltid (axillary n) Supraspinatus (suprascapular n)
- Supraspinatus (suprascapular n) & some deltid (axillary n)
**SERRATUS ANTERIOR**

**Origin:** Upper 8 ribs & intercostal membranes

**Insertion:** Inner, medial border of scapula

**Action:** Protracts & laterally rotates scapula

**Nerve supply:** Long thoracic nerve of Bell
- C5 to slips 1 & 2
- C6 to slips 3 & 4
- C7 to slips 3 & 4

1st slip visible in posterior triangle of neck

![Serratus Anterior Diagram](image-url)
**TRAPEZIUS**

**Origin:** Superior nuchal line & crest, occiput, nuchal ligament, spines & supraspinous ligaments T1-12

**Insertion:** Lateral 1/3 clavicle, medial acromion, spine of scapula around to deltoid tubercle

**Action:** Lateral rotation, elevation, depression & retraction of scapula (lowest fibres elevate body when arm is fixed. Upper fibres extend & laterally flex head & neck. Rotation is aided by serratus anterior)

**Nerve supply:** Spinal root of accessory n (XI)