SHOULDER REGION

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OBJECTIVES

At the end of the lecture, students should:

- *List the name of muscles of the shoulder region.*
- *Describe the anatomy of muscles of shoulder region regarding: attachments of each of them to scapula & humerus, nerve supply and actions on shoulder joint*
- *List the muscles forming the rotator cuff and describe the relation of each of them to the shoulder joint.*
- *Describe the anatomy of shoulder joint regarding: type, articular surfaces, stability, relations & movements.*

MUSCLES OF SHOULDER REGION

❑ **These are muscles connecting scapula to humerus (move humerus through shoulder joint):**

1. *Deltoid.*
2. *Supraspinatus.*
3. *Infraspinatus.*
4. *Teres minor.*
5. *Teres major.*
6. *Subscapularis.*
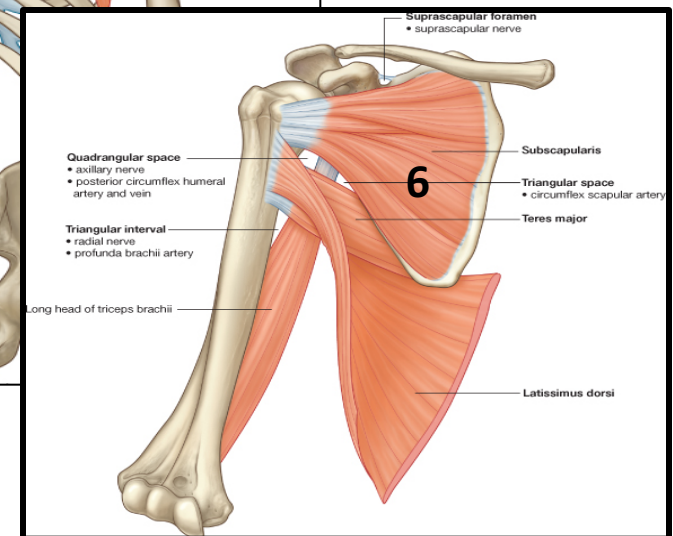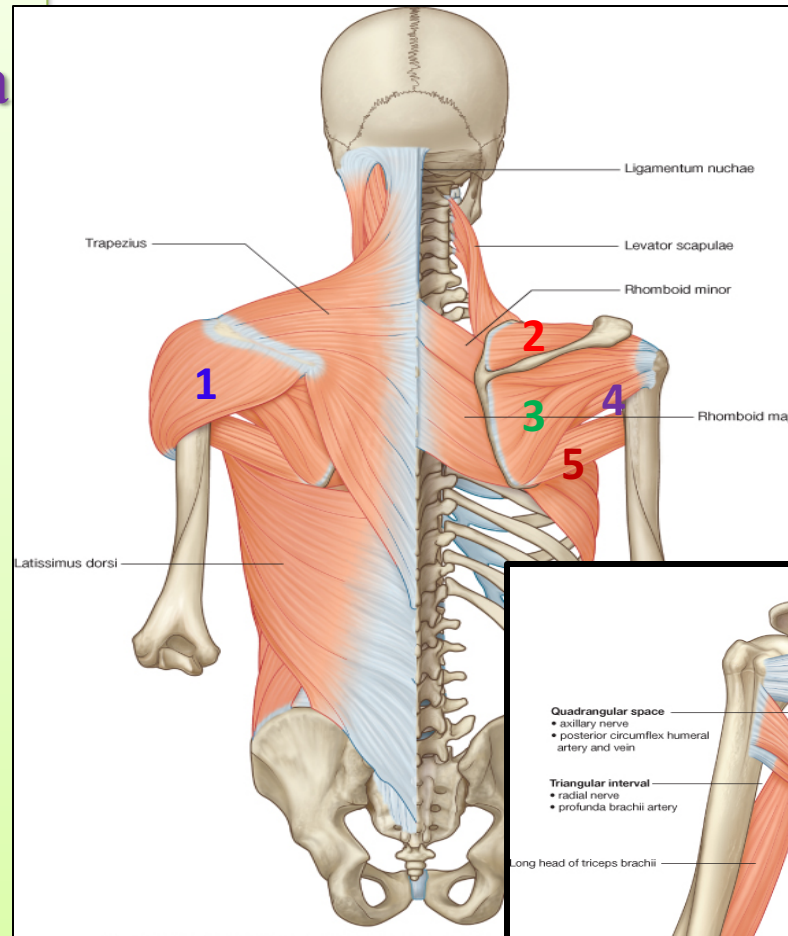
DELTOID

- A **triangular muscle** that forms the rounded **contour of the shoulder.**
- **Origin:** lateral 1/3 of clavicle ,acromion and spine of scapula
- *(= insertion of trapezius).*
- **Insertion:** deltoid tuberosity of humerus.
- **Nerve supply:** axillary nerve.
- **Actions:**
1. *Anterior fibers:* flexion & medial rotation of humerus (arm, shoulder joint).
2. *Middle fibers:* abduction of humerus from **15° - 90 °.**
3. *Posterior fibers:* extension & lateral rotation of humerus.

Trapezius

Spine of the scapula

Acromion

Clavicle

Deltoid

Deltoid tuberosity of humerus
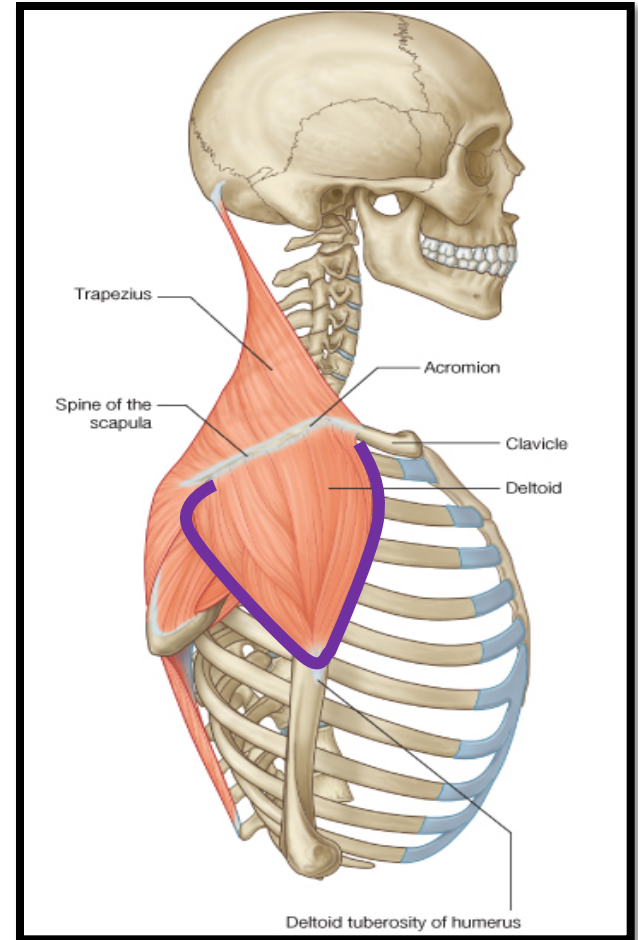
SUPRASPINATUS & INFRASPINATUS
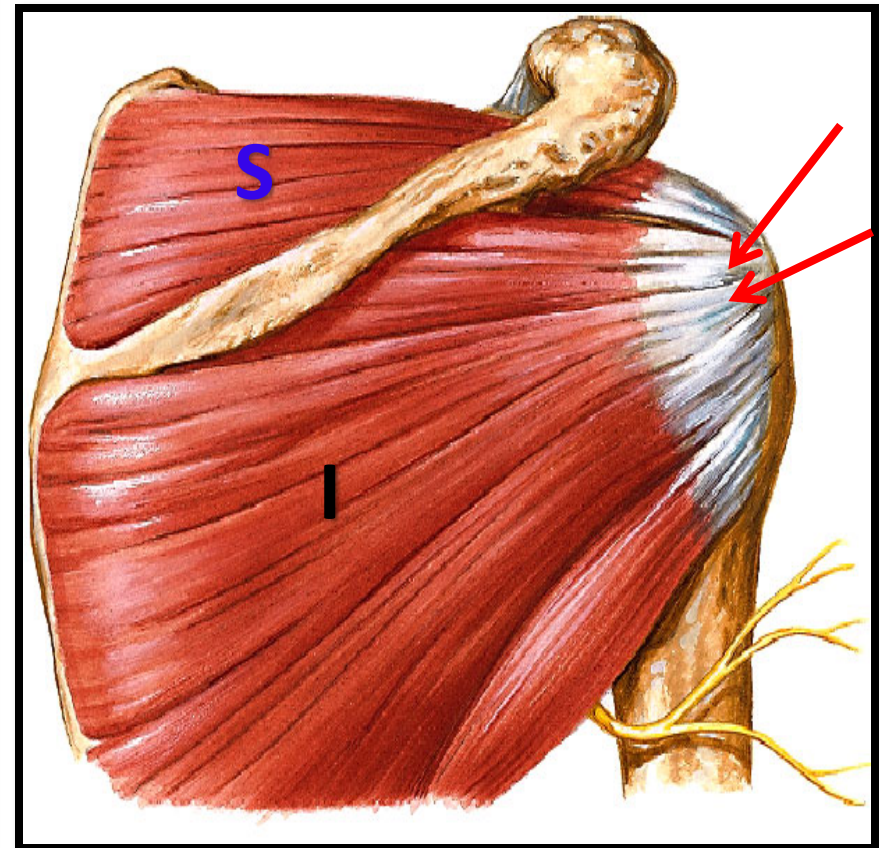
❑ **Origin:**

1. *Supraspinatus:* **supraspinous fossa.**

2. *Infraspinatus:* **infraspinaous fossa.**

❑ **Insertion: greater tuberosity of humerus.**

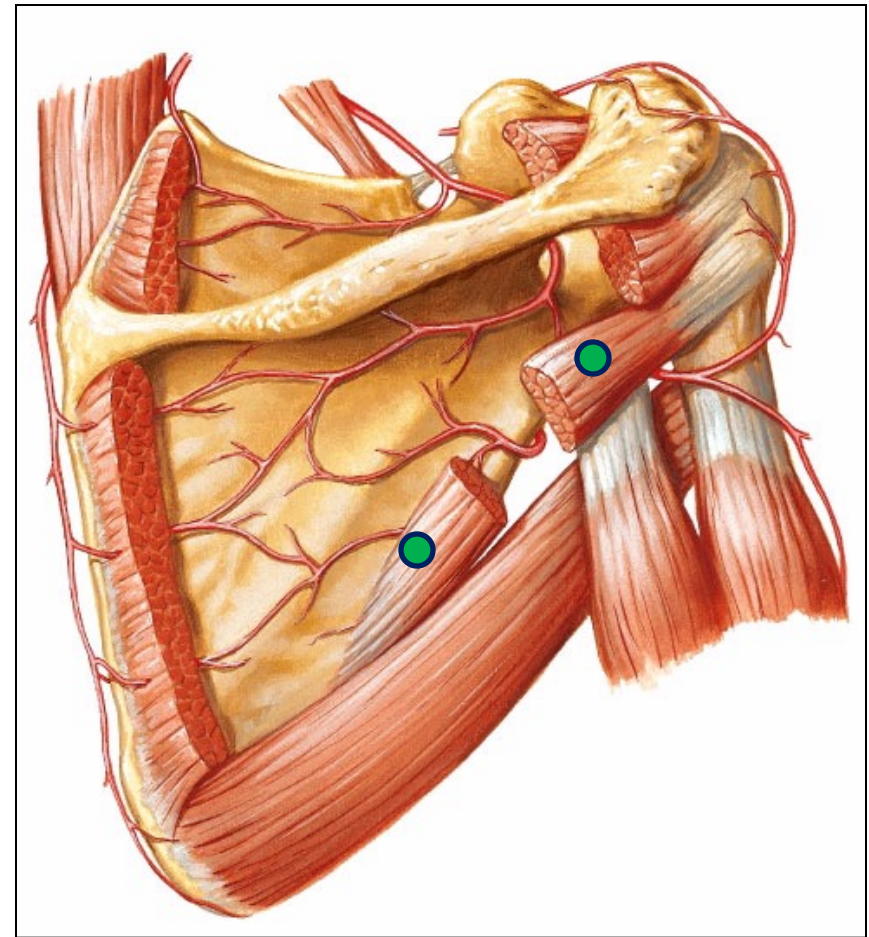❑ **Nerve supply: Suprascapular nerve.**

❑ **Action:**

1. *Supraspinatus:* **abduction of humerus from 0° - 15°.**

2. *Infraspinatus:* **lateral rotation of humerus.**

# TERES MINOR

- **Origin:** lateral (Axillary) border of Scapula.
- **Insertion:** greater tuberosity of humerus.
- **Nerve supply:** axillary nerve.
- **Action:** lateral rotation of humerus.

TERES MAJOR

- **Origin:** lateral border ofscapula.

- **Insertion:** medial lip of bicipital groove of humerus (with *latissimus dorsi & pectoralis major*).

- **Nerve supply:** lower subscapular nerve.

- **Actions:** extension, adduction & medial rotation of humerus (as *action of latissimus dorsi*).
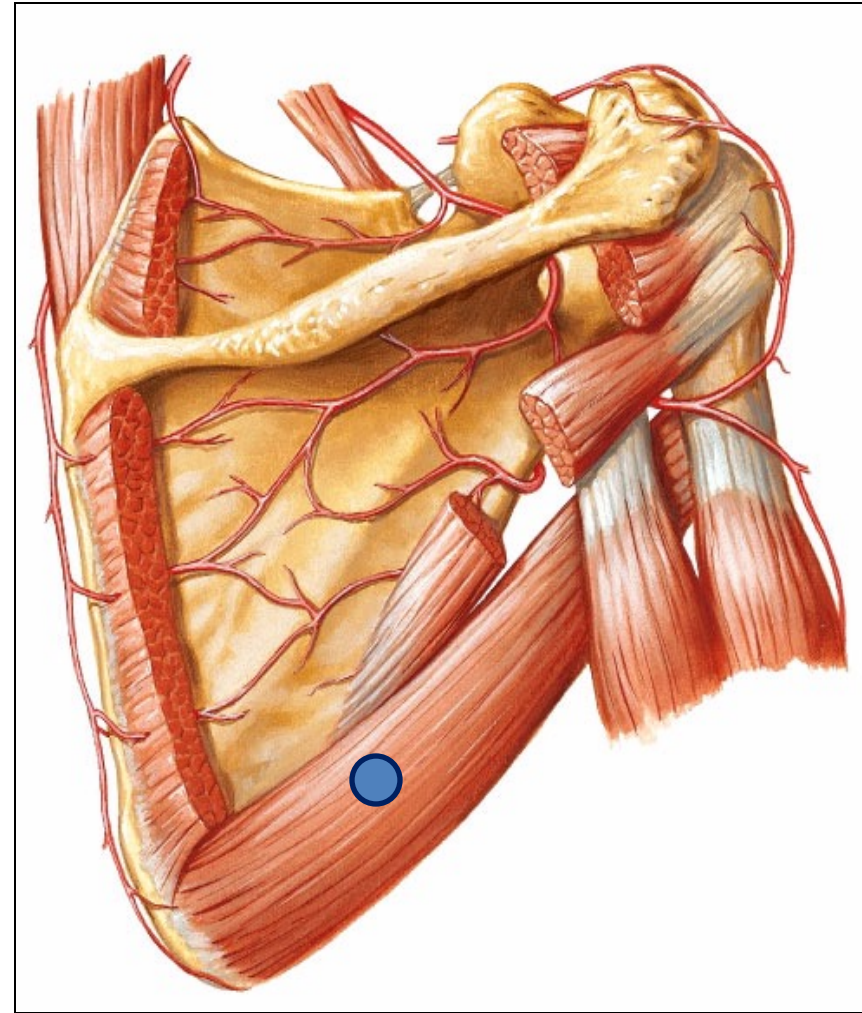
SUBSCAPULARIS

- **Origin:** subscapular fossa.

- **Insertion:** lesser tuberosity of humerus.

- **Nerve supply:** upper & lower subscapular nerves.
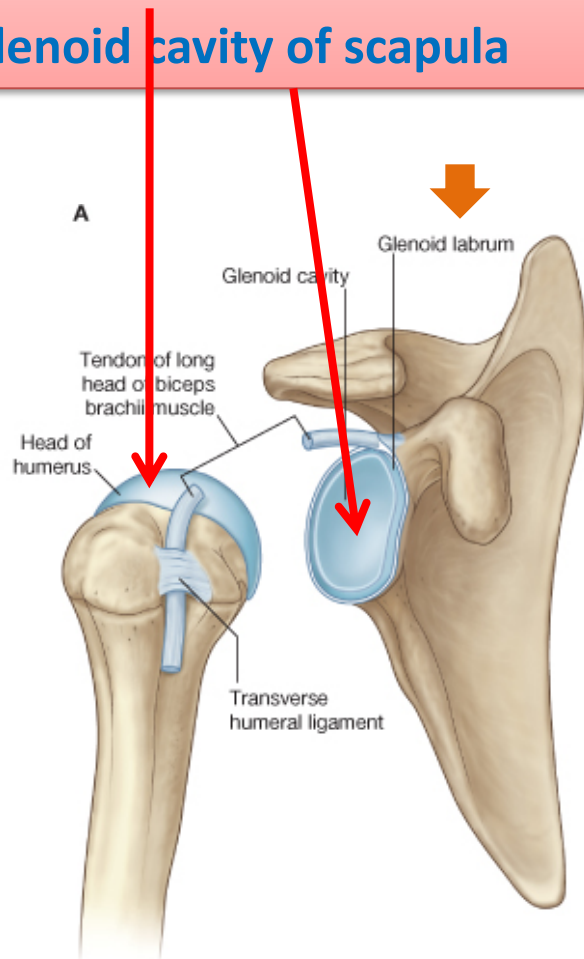
- **Action:** medial rotation of humerus.
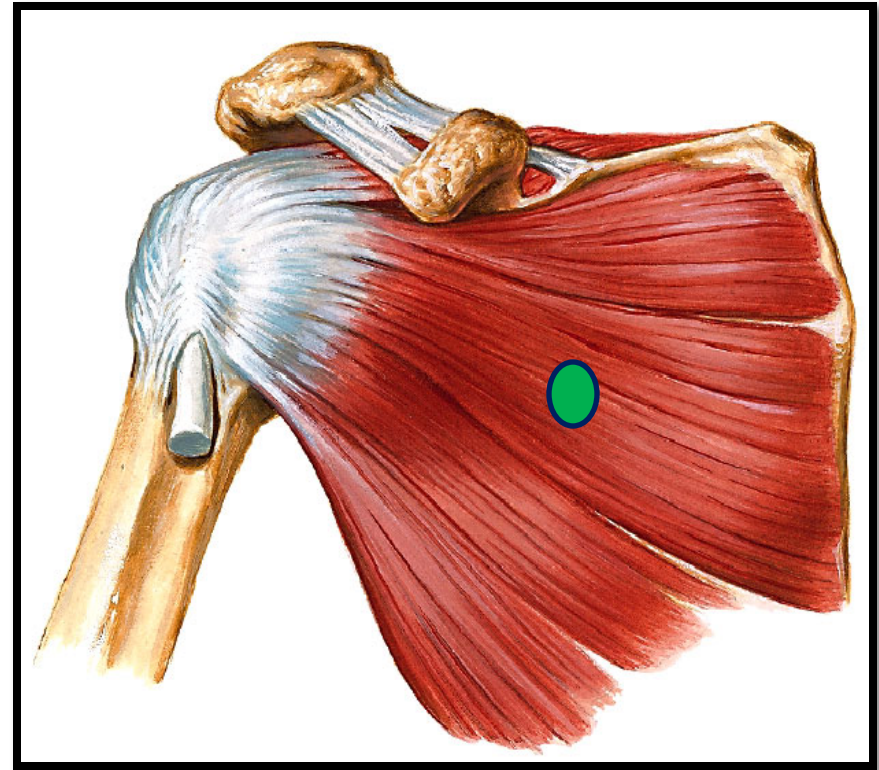
SHOULDER JOINT

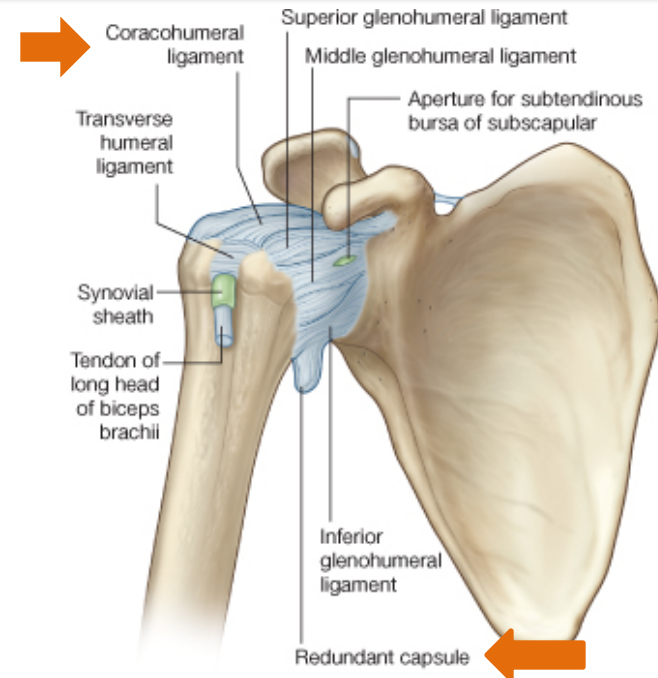☐ **TYPE:**
  Synovial, multiaxial (ball & socket)

☐ **ARTICULAR SURFACES:**
1. Head of humerus
2. Glenoid cavity of scapula

☐ **STABILITY: (NOT STABLE) ?**
1. Head of humerus is 3 times larger than glenoid cavity
2. Capsule is redundant.
3. Few ligamentous support: glenoid labrum, coracohumeral
4. Main Support: muscles around the joint (ROTATOR CUFF)
5. Wide range of movement

A

Glenoid labrum

Glenoid cavity

Tendon of long head of biceps brachii muscle

Head of humerus

Transverse humeral ligament

Coracohumeral ligament

Superior glenohumeral ligament

Middle glenohumeral ligament

Aperture for subtendinous bursa of subscapular

Transverse humeral ligament

Synovial sheath

Tendon of long head of biceps brachii

Inferior glenohumeral ligament

Redundant capsule

ROTATOR CUFF

- **A tendinous cuff around the shoulder joint covering its Anterior, Posterior and Superior aspects.**

- **The cuff is deficient Inferiorly and this is the site of potential weakness.**

- **It is formed of 4 muscles:** *Supraspinatus, Infraspinatus, Teres minor & Subscapularis (SITS).*

- **The tone of these muscles help in stabilizing the shoulder joint.**

Muscles of the Rotator Cuff

Front View
Subscapularis
Supraspinatus
Infraspinatus
Supraspinatus
Teres Minor
Back View
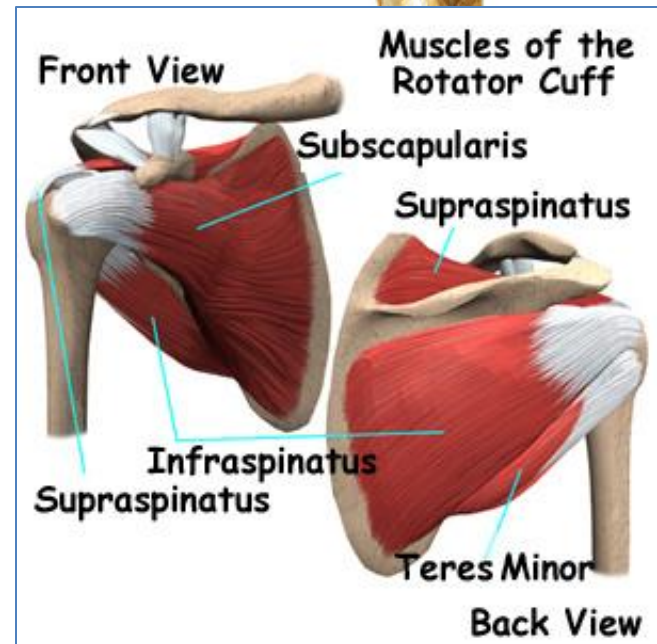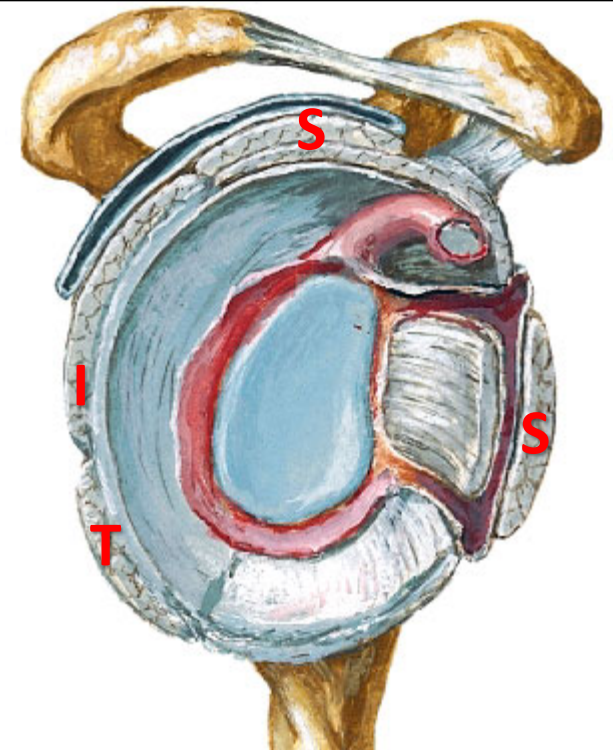
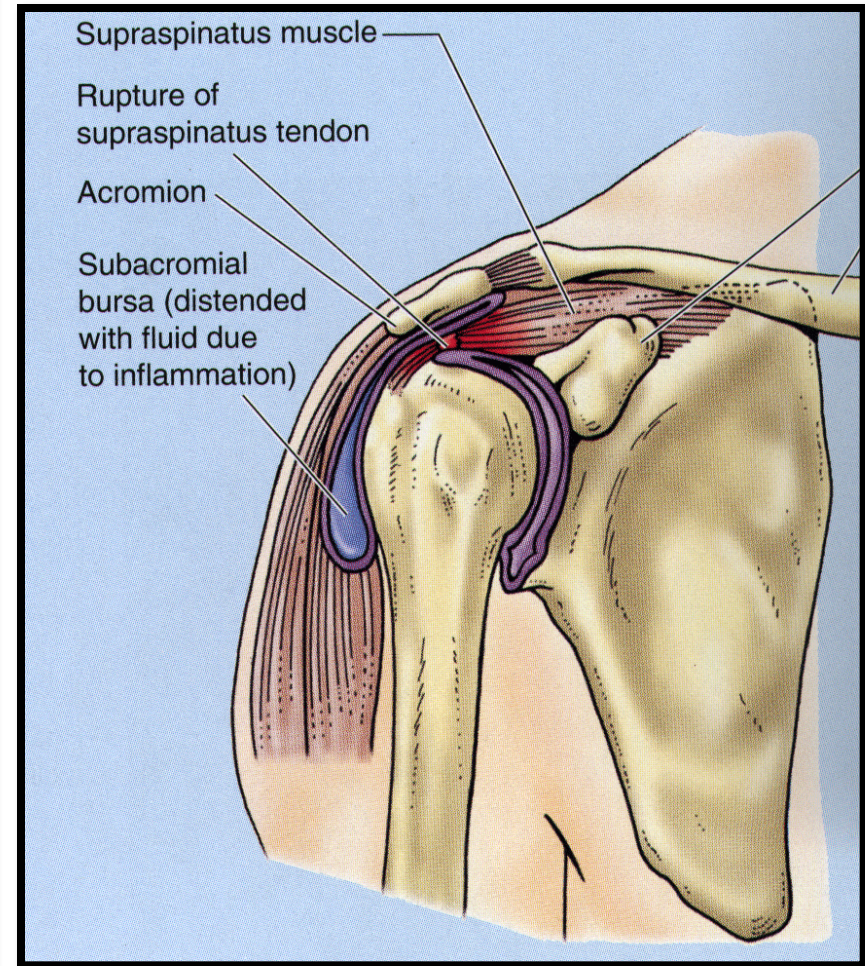- **Rotator cuff can be damaged due to trauma (during playing baseball) or disease (in older individuals).**

- **Trauma can tear or rupture one or more tendon (s) forming the cuff. Patients with rotator injury will present with pain, shoulder instability, and limited range of motion.**

- **Supraspinatus tendon is the most common site of rotator cuff injury.**

Supraspinatus muscle

Rupture of supraspinatus tendon

Acromion

Subacromial bursa (distended with fluid due to inflammation)

BURSAE IN RELATION TO SHOULDER JOINT

❑ They **reduce friction** between tendons, joint capsule & bone.

❑ They are liable to be **inflammed** following injury of rotator cuff muscles.

1. **Subscapularis bursa:** between subscapularis tendon & capsule.

2. **Infraspinatus bursa:** between infraspinatus tendon & capsule.

3. **Subacromial bursa:** between deltoid, supraspinatus and capsule.
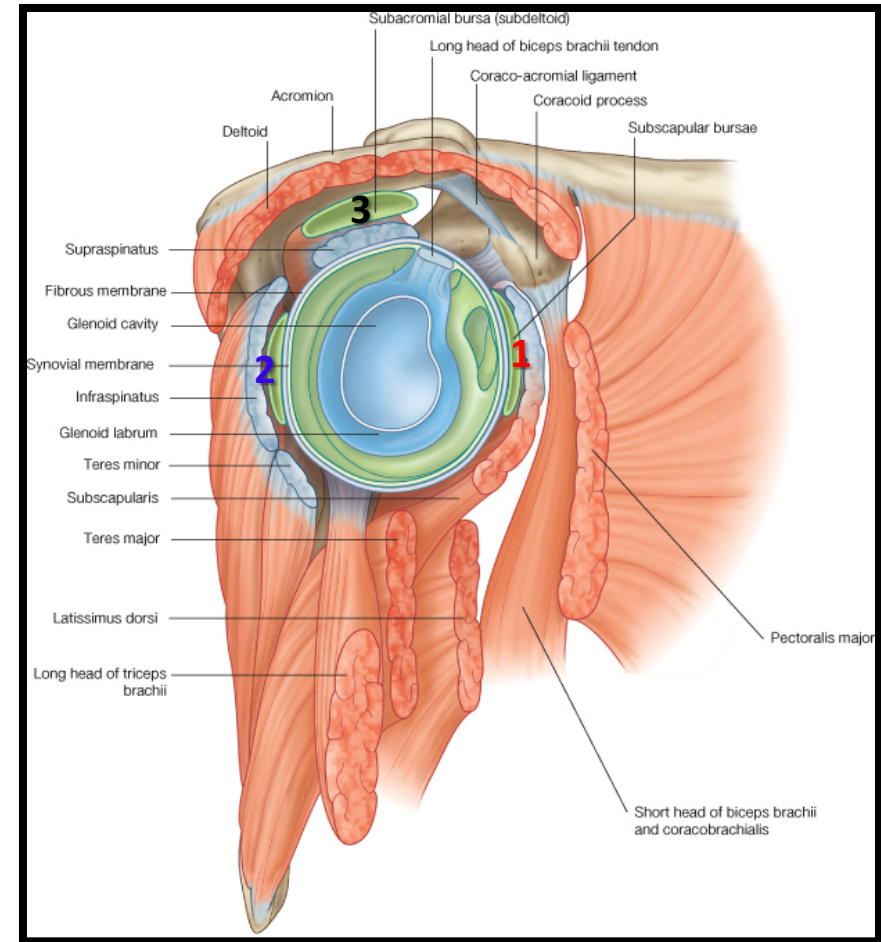
RELATIONS OF SHOULDER JOINT
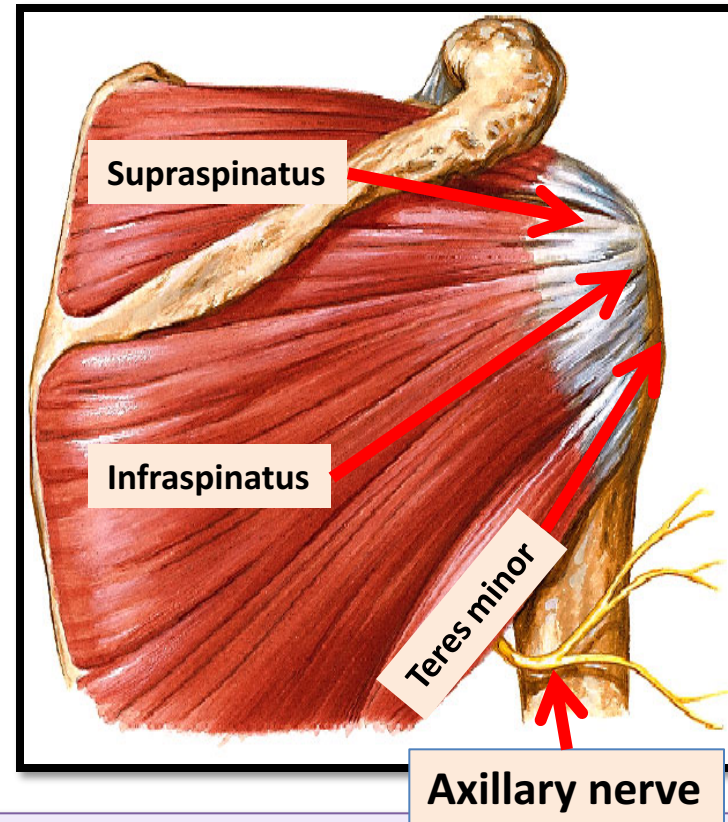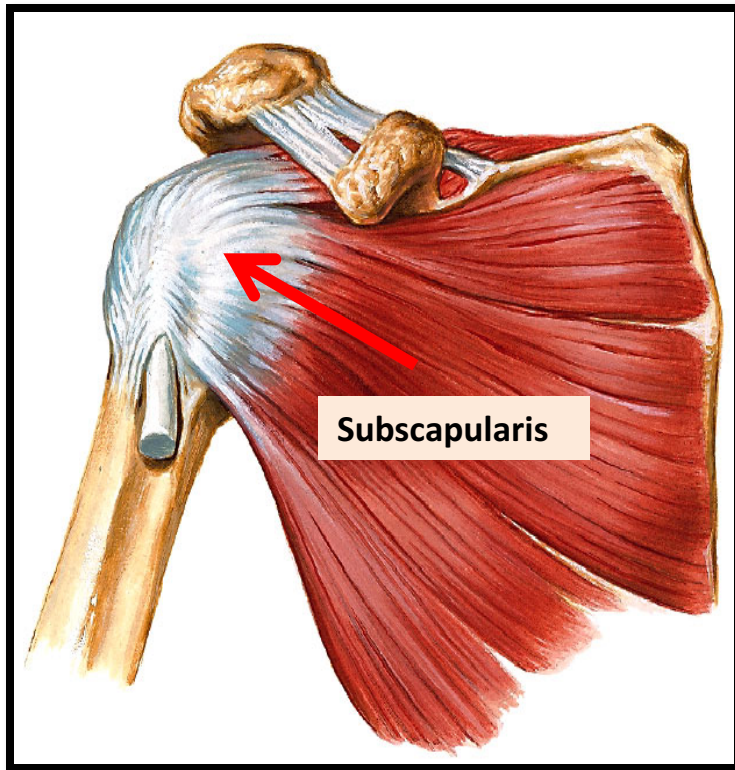
- ❑ **ANTERIOR:** subscapularis
- ❑ **POSTERIOR:** infraspinatus, teres minor
- ❑ **SUPERIOR:** supraspinatus
- ❑ **INFERIOR:** axillary nerve

MOVEMENTS OF SHOULDER JOINT

MOVEMENTS OF SHOULDER JOINT

☐ **FLEXION:**

1. **Anterior fibers of deltoid**

2. **Pectoralis major**

3. **Coracobrachialis (mu**

4. **Short head of biceps**

☐ EXTENSION:
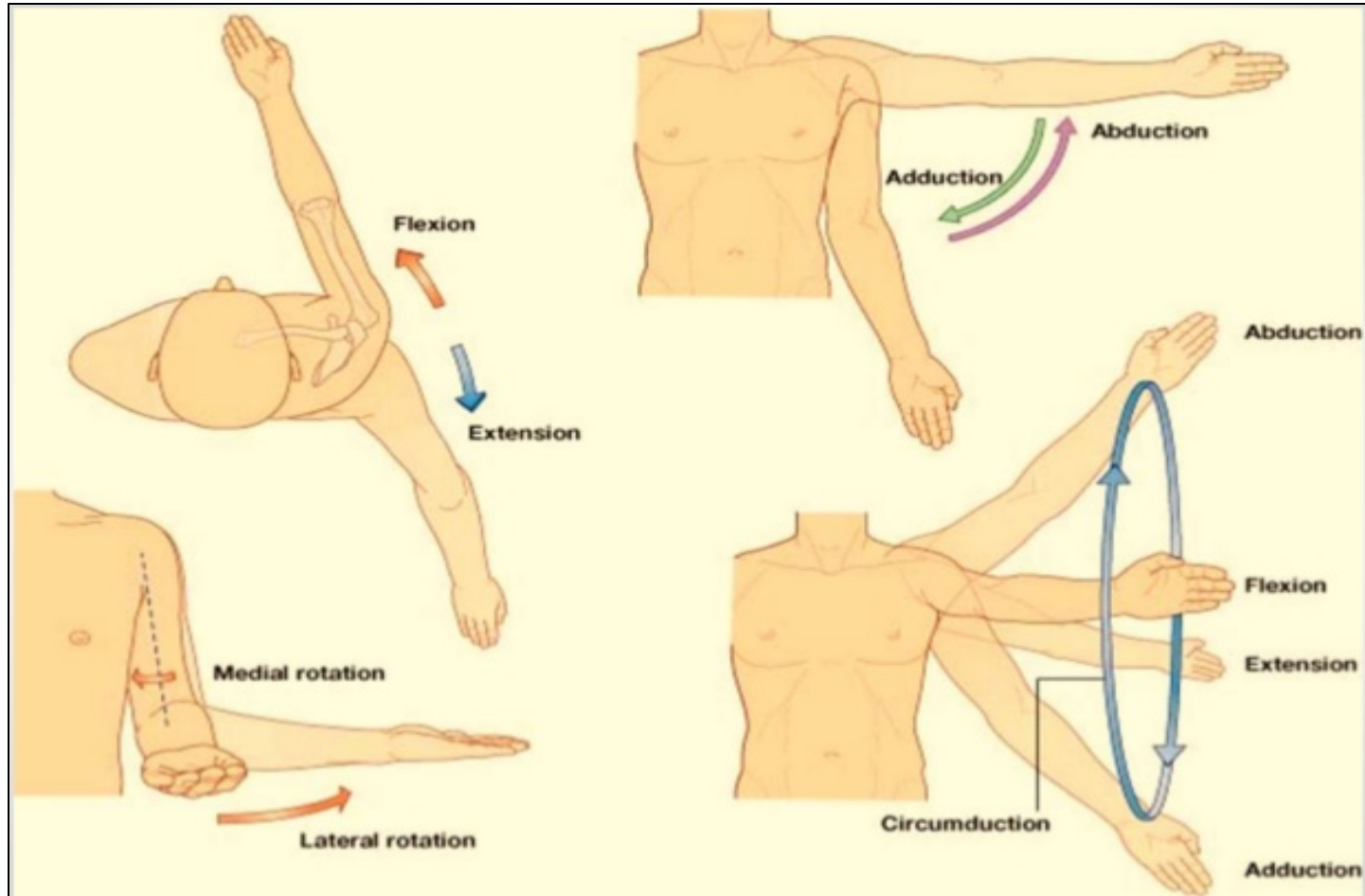
1. **Posterior fibers of deltoid**

2. **Latissimus dorsi**

3. **Teres major**

Superficial shoulder muscles

Middle deltoid
Anterior deltoid
Pectoralis major (clavicular)
Pectoralis major (sternal)
Anterior deltoid and pectoralis major

Pectoralis major
Middle deltoid
Latissimus dorsi
Latissimus dorsi, pectoralis, and deltoid, lateral view

Supraspinatus
Middle deltoid
Infraspinatus
Posterior deltoid
Teres major
Teres minor
Posterior muscles of the shoulder (glenohumeral) joint

MOVEMENTS OF SHOULDER JOINT

ABDUCTION:

1. From 0° - 15°: Supraspinatus

2. From 15° - 90 °: Middle fibers of deltoid

ADDUCTION:

1. Pectoralis major

2. Latissimus dorsi ← **Insert** ... **ve**

3. Teres major

MOVEMENTS OF SHOULDER JOINT

❑ **MEDIAL ROTATION:**

1. **Pectoralis major**
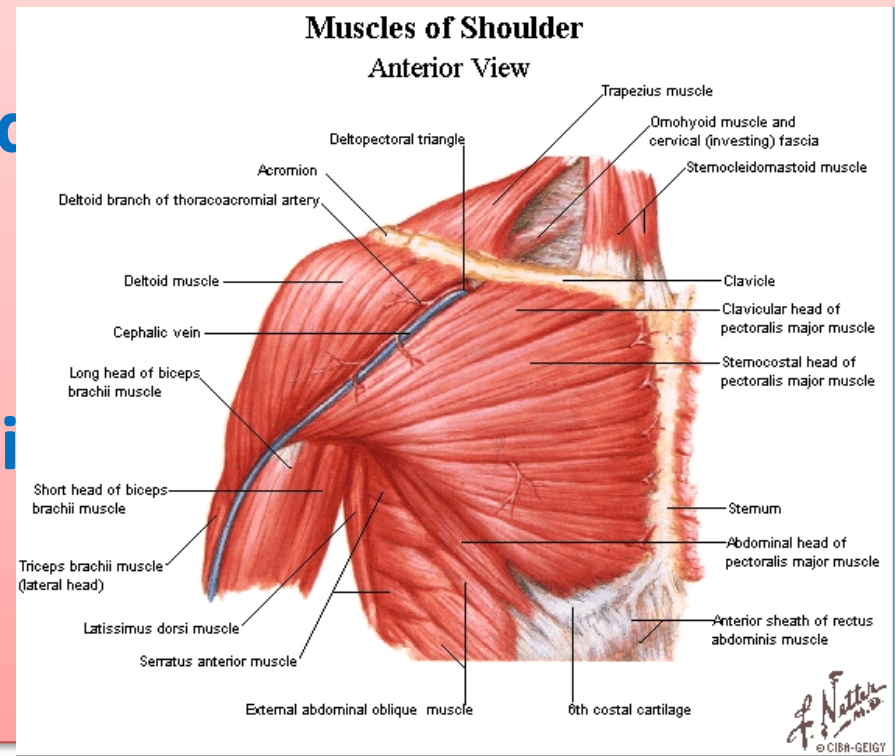2. **Latissimus dorsi** ← **Inserted in bicipital groove**
3. **Teres major**
4. **Anterior fibers of deltoid**
5. **Subscapularis**

❑ **LATERAL ROTATION:**

1. **Posterior fibers of deltoid**
2. **Infraspinatus**
3. **Teres minor**

Muscles of Shoulder
Anterior View

- Deltopectoral triangle
- Acromion
- Deltoid branch of thoracoacromial artery
- Deltoid muscle
- Cephalic vein
- Long head of biceps brachii muscle
- Short head of biceps brachii muscle
- Triceps brachii muscle (lateral head)
- Latissimus dorsi muscle
- Serratus anterior muscle
- External abdominal oblique muscle
- Trapezius muscle
- Omohyoid muscle and cervical (investing) fascia
- Sternocleidomastoid muscle
- Clavicle
- Clavicular head of pectoralis major muscle
- Sternocostal head of pectoralis major muscle
- Sternum
- Abdominal head of pectoralis major muscle
- Anterior sheath of rectus abdominis muscle
- 6th costal cartilage

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SUMMARY

☐ **MUSCLES OF SHOULDER REGION:**

1. **Origin**: scapula.

2. **Insertion**: humerus.

3. **Action**: move humerus **(SHOULDER JOINT)**

4. **Nerve supply**: anterior rami of spinal nerves through brachial plexus.

☐ **ROTATOR CUFF:** 4 muscles in scapular region surround and help in stabilization of shoulder joint *(supraspinatus, infraspinatus, teres minor, subscapularis).*

SUMMARY

Shoulder joint:

1. **Type:** synovial, ball & socket
2. **Articular surfaces:** head of humerus & glenoid cavity of scapula
3. **Stability:** depends on rotator cuff
4. **Relations:** rotator cuff and axillary nerve
5. **Movements:** flexion, extension, abduction, adduction, medial & lateral rotation

QUESTION 1

☐ **Which one of the following muscles is inserted into the lesser tuberosity of the humerus?**

1. **Subscapularis**
2. **Deltoid**
3. **Teres major**
4. **Infraspinatus**

QUESTION 2

□ **Which one of the following muscles is part of the rotator cuff?**

1. **Subscapularis.** ⬅
2. **Deltoid.**
3. **Teres major.**
4. **Rhomboid minor.**

QUESTION 3

□ **Regarding the shoulder joint, which one of the following statements is correct?**

1. It is a stable joint.

2. It is a synovial joint of hinge variety.

3. Latissimus dorsi muscle adducts shoulder joint. ⟵

4. Downward dislocation of shoulder joint may cause injury to the radial nerve.