



MEDICINE
KING SAUD UNIVERSITY



Shoulder Region

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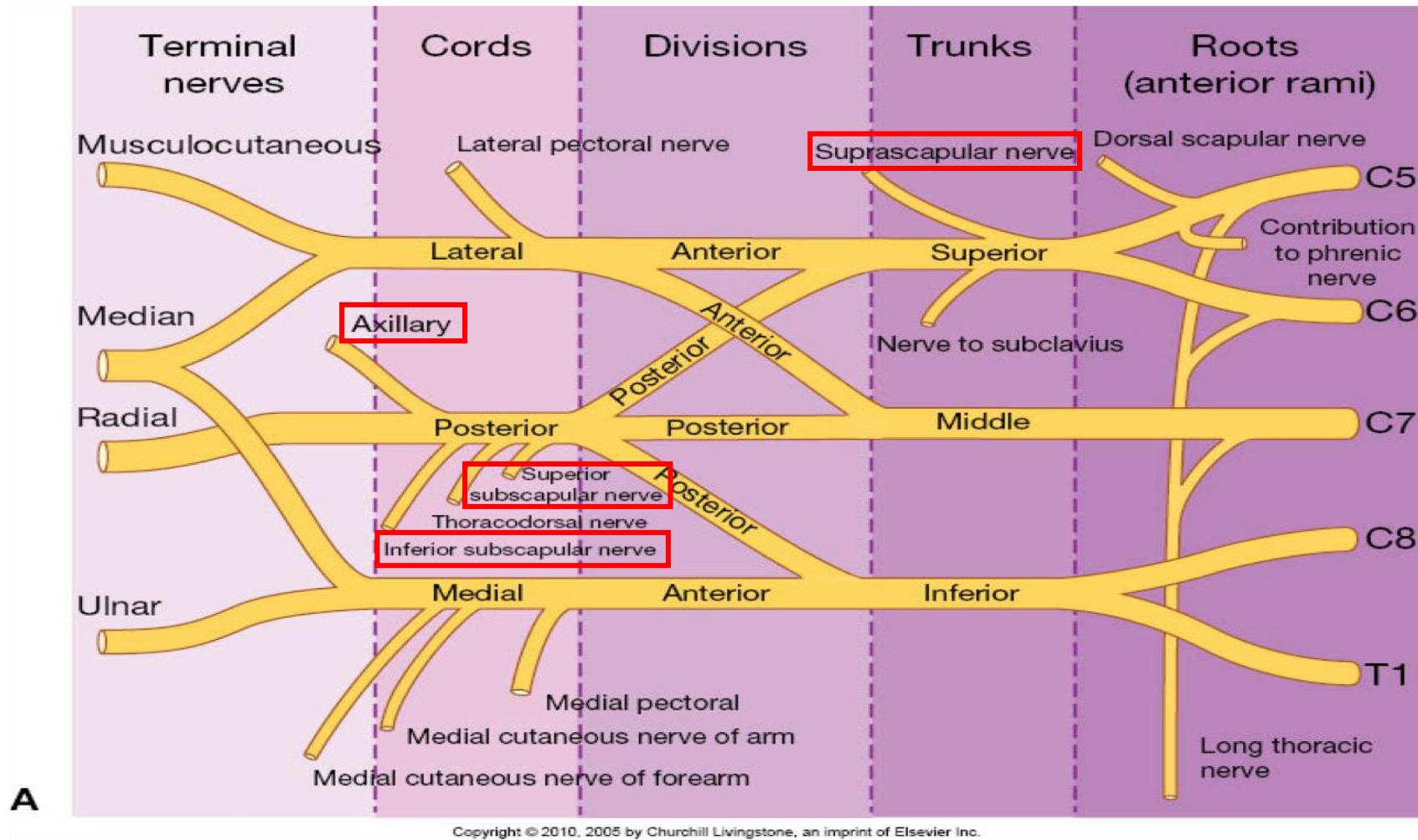
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- **Important**
- **Doctors Notes**
- **Notes/Extra explanation**

Objectives

- ✓ 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.

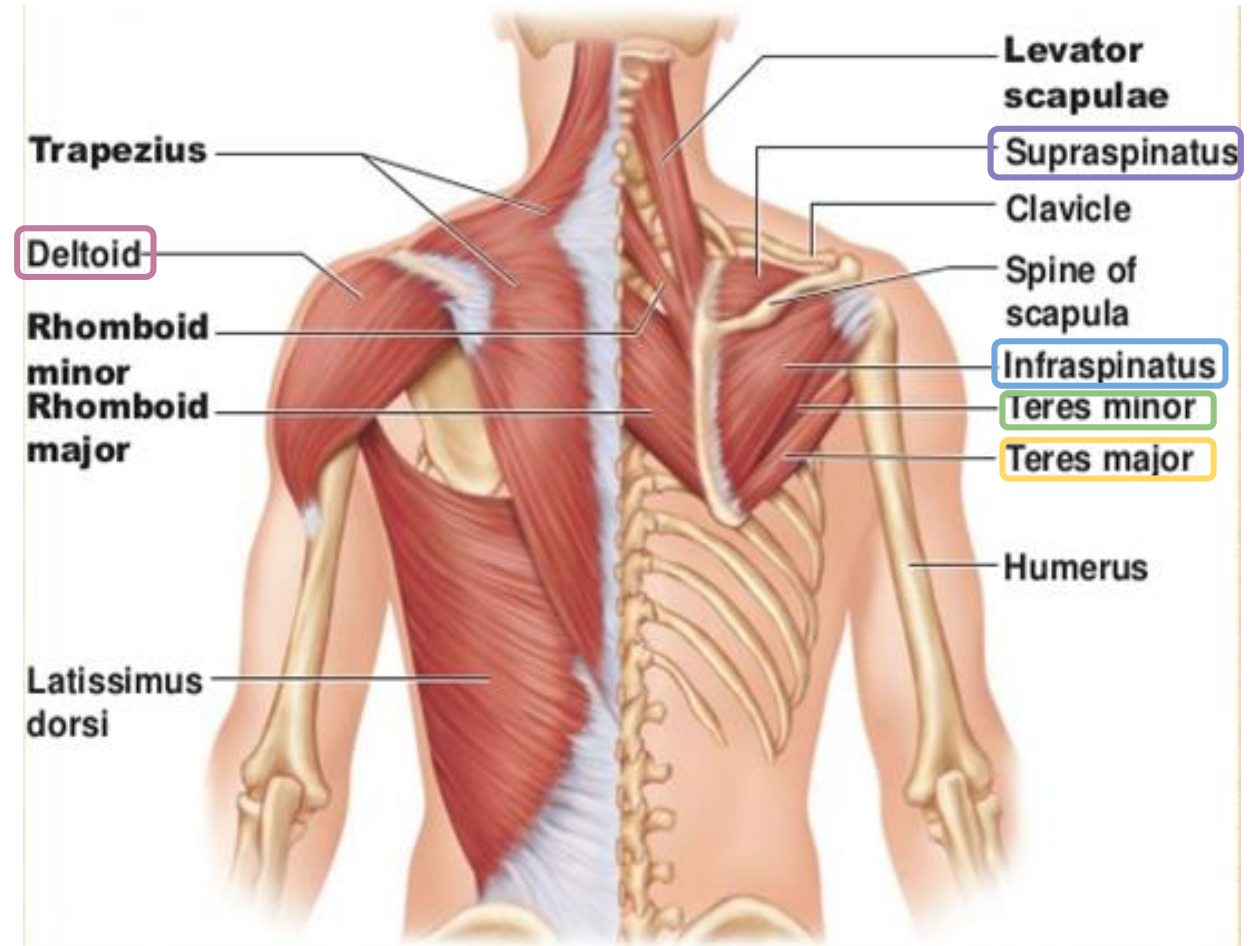
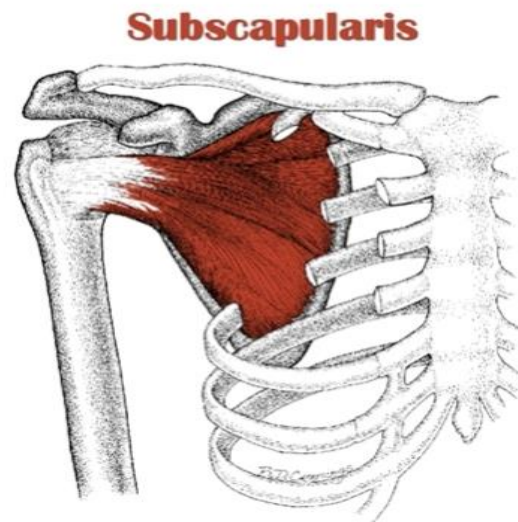
Recall (the brachial plexus)



Muscles of Shoulder Region

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

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



Muscles of Shoulder Region

Deltoid

- A triangular muscle that forms the rounded contour of the shoulder.

Origin: lateral $\frac{1}{3}$ of clavicle (anterior fibers), acromion (middle fibers), and spine of scapula (lateral fibers). (=Insertion of trapezius).

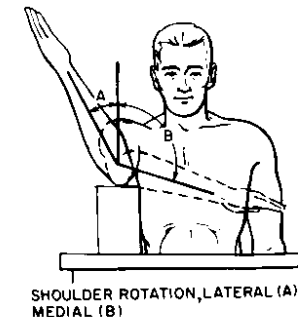
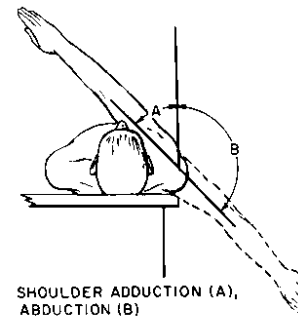
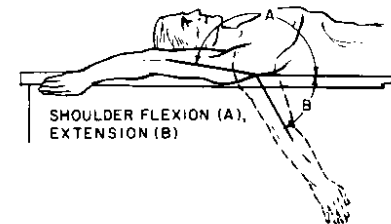
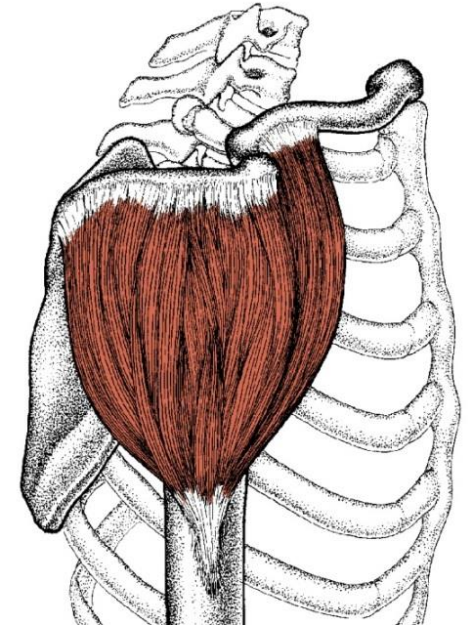
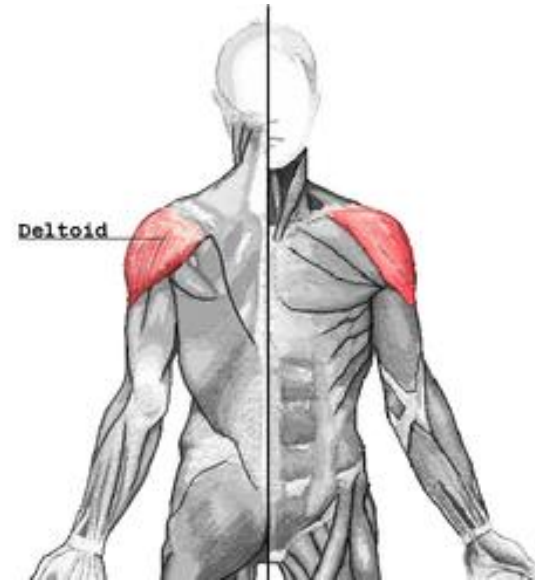
Insertion: deltoid tuberosity of humerus.

Nerve supply: Axillary nerve.

Actions:

1. Anterior fibers: flexion and medial rotation of humerus (arm, shoulder joint).
2. Middle fibers: abduction of humerus from 15-90 degrees.
3. Posterior fibers: extension & lateral rotation of humerus.

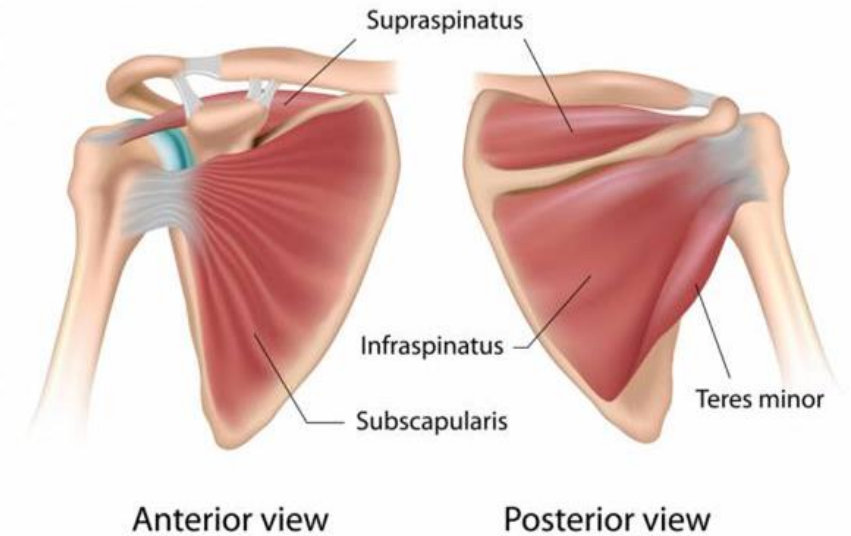
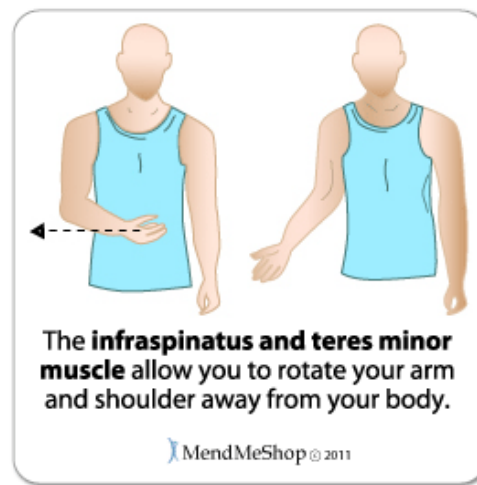
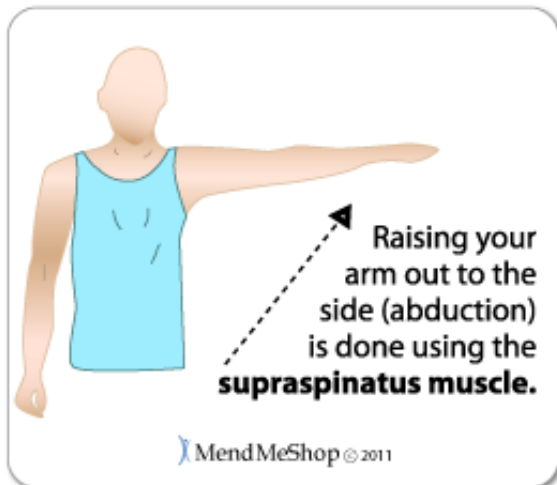
If all the fibers are working together the action is **abduction** (since the flexion and extension cancel each other)



Muscles of Shoulder Region

Supraspinatus & Infraspinatus

	Supraspinatus	Infraspinatus
<i>Origin</i>	Supraspinous fossa	Infraspinous fossa
<i>Insertion</i>	Greater tuberosity of humerus.	
<i>Nerve Supply</i>	Suprascapular nerve.	
<i>Action</i>	Abduction of humerus from 0° - 15°	lateral rotation of humerus.



Muscles of Shoulder Region

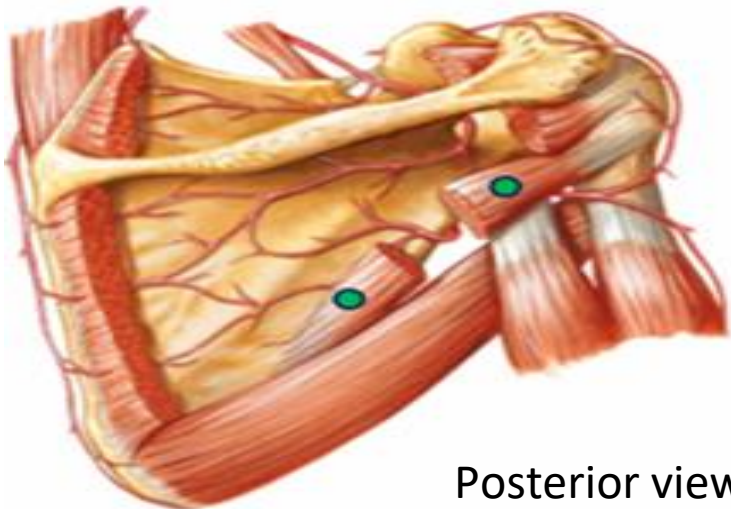
Teres Minor

Origin: lateral (Axillary) border of Scapula.

Insertion: greater tuberosity of humerus.

Nerve supply: axillary nerve.

Action: lateral rotation of humerus.



Posterior view of scapula

Teres Major

Origin: lateral border of scapula.

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 (same 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.



Anterior view of scapula

Shoulder Joint

Type: Synovial, multiaxial (ball and socket)

Articular surfaces:

- Head of humerus (ball)
- Glenoid cavity (socket)

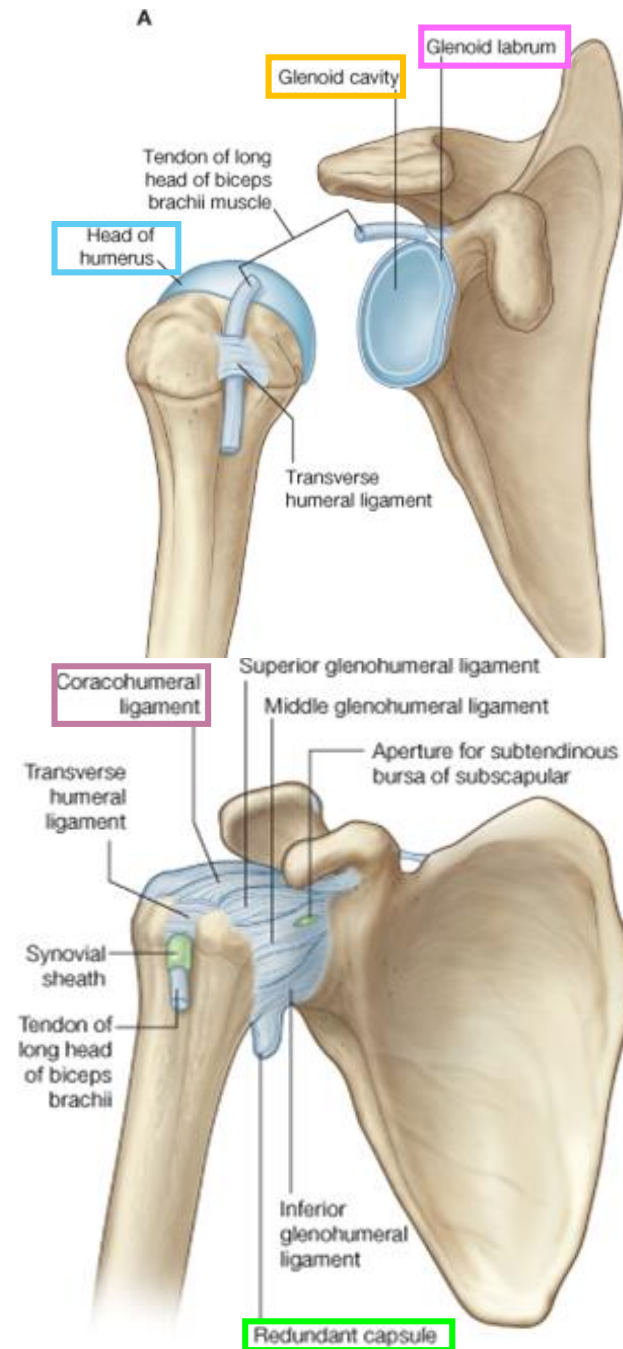
Stability:

Unstable (easy to dislocate سهل الخلع) **because:**

1. Head of humerus is 3 times larger than glenoid cavity
2. Capsule is redundant (مرخية وغير مشدودة)
3. Few ligamentous support: glenoid labrum (frame of fibrocartilage which increases the depth) and coracohumeral
4. **MAIN SUPPORT: muscles around the joint (rotator cuff)** it is the main support because the capsule and the ligaments in this case aren't enough to support the shoulder joint
5. Wide range of movement

Range of movement & stability

علاقة عكسية



Rotator Cuff

Rotator cuff: A tendinous cuff around the shoulder joint covering its Anterior, Posterior and Superior aspects

NO muscle inferiorly (deficient) → site of potential weakness

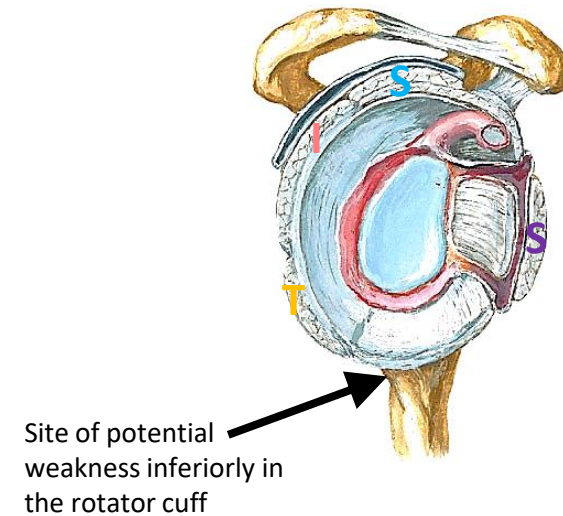
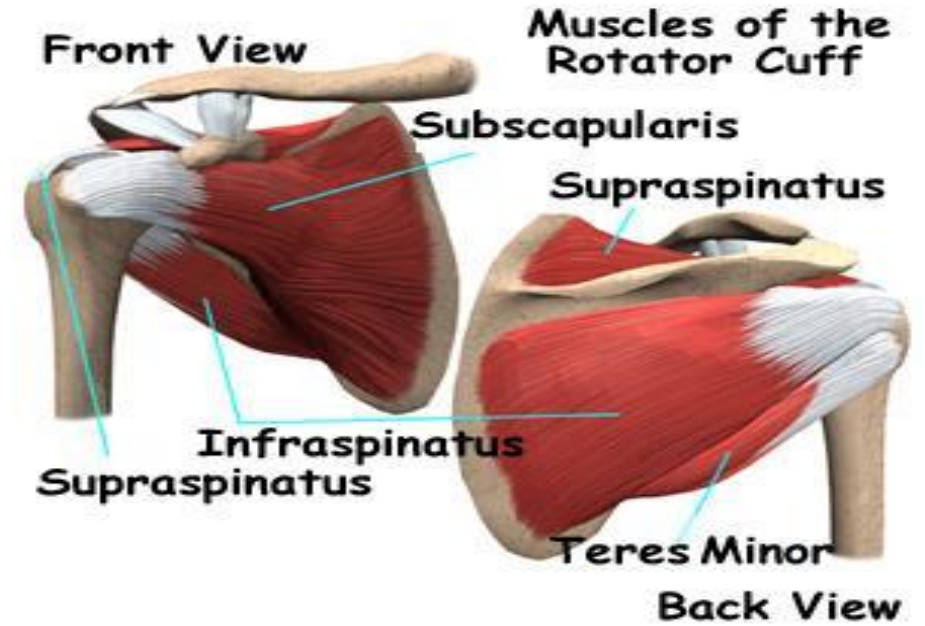
- Usually dislocation of the shoulder is downward which may cause injury of the axillary nerve (that is why dislocation is the common cause for axillary nerve injury).
- The acromion and the coracoid process and the ligament in between them prevent the shoulder from dislocating upward and that is why it is most likely to dislocate the shoulder downward.

It is formed of 4 muscles (**SITS**) 4 out of the six muscles of the shoulder joint:

Supraspinatus, Infraspinatus, Teres minor & Subscapularis

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

Only tone is enough to stabilize the joint... no need for the muscle to contract

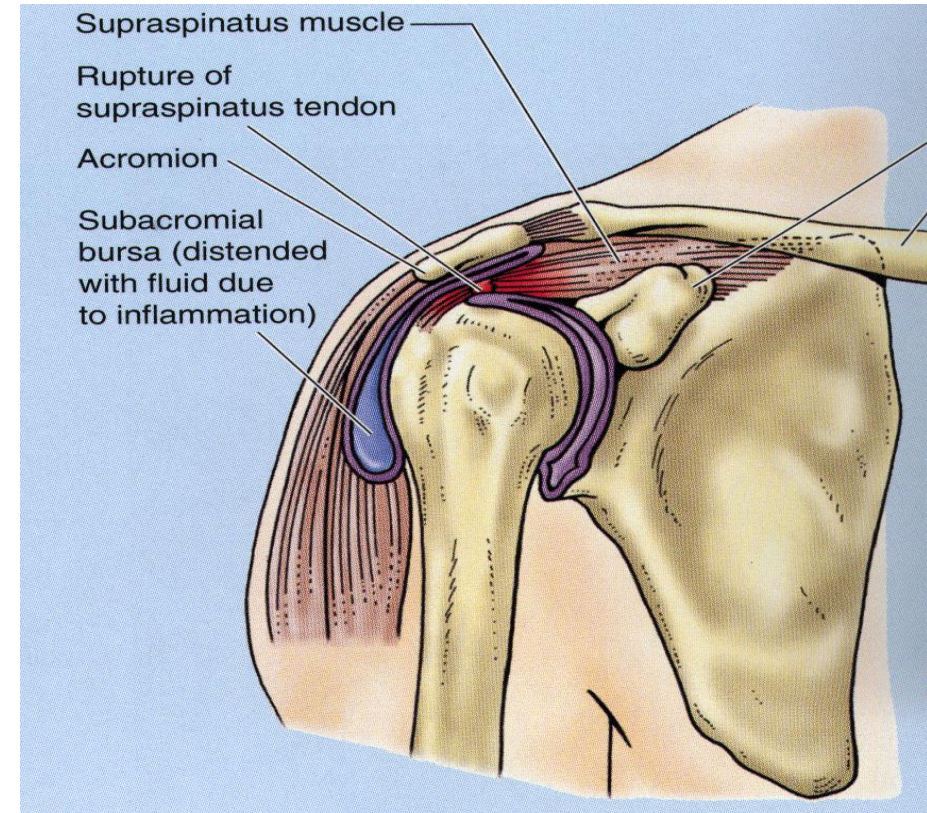
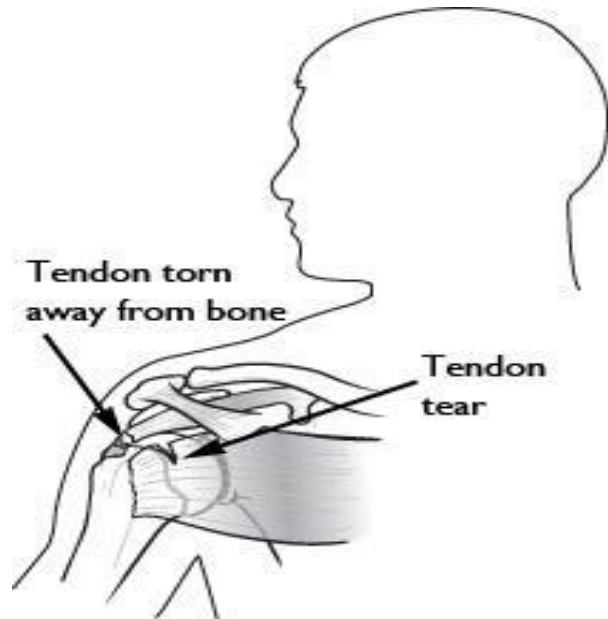


Rotator Cuff Injury

Rotator cuff can be damaged due to:

- **trauma** (during playing baseball)
- **disease** (in older individuals **such as osteoporosis**)

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

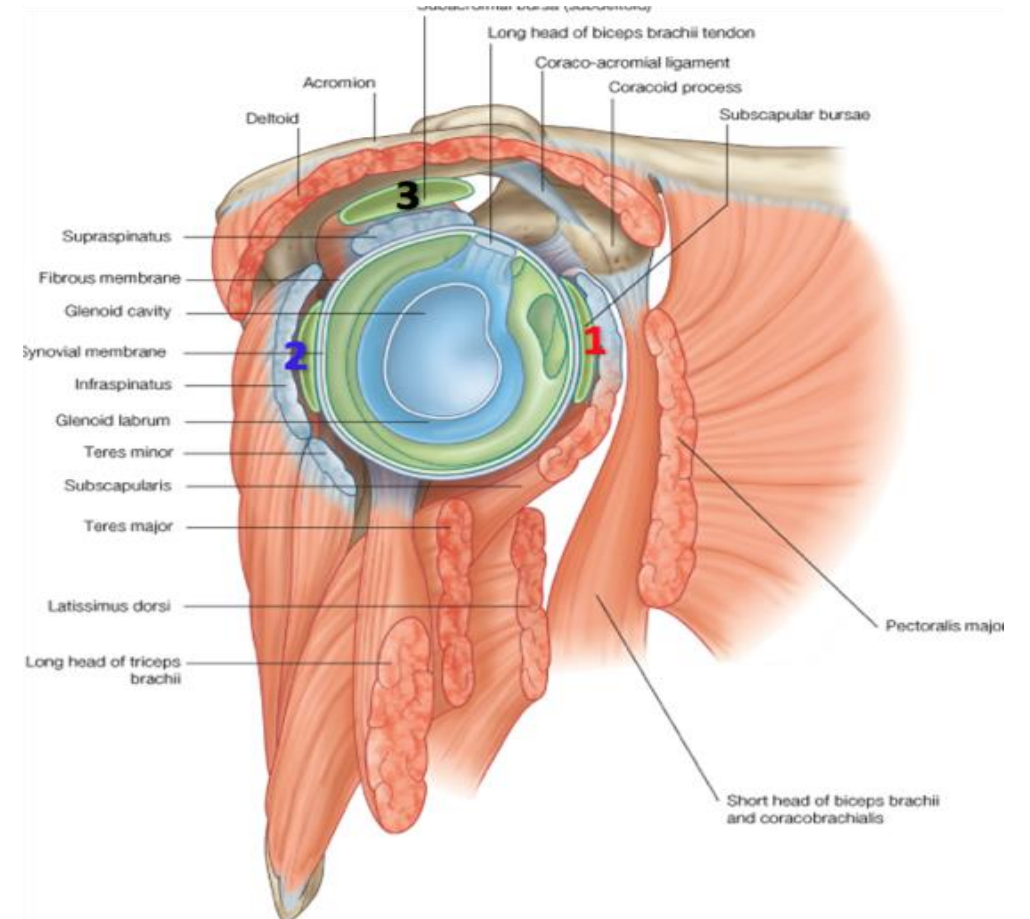
Bursae In Relation To Shoulder Joint

- They reduce friction between tendons, joint capsule & bone.
- They are liable to be inflamed following injury of rotator cuff muscles.

1) Subscapularis bursa:
between subscapularis
tendon & capsule.

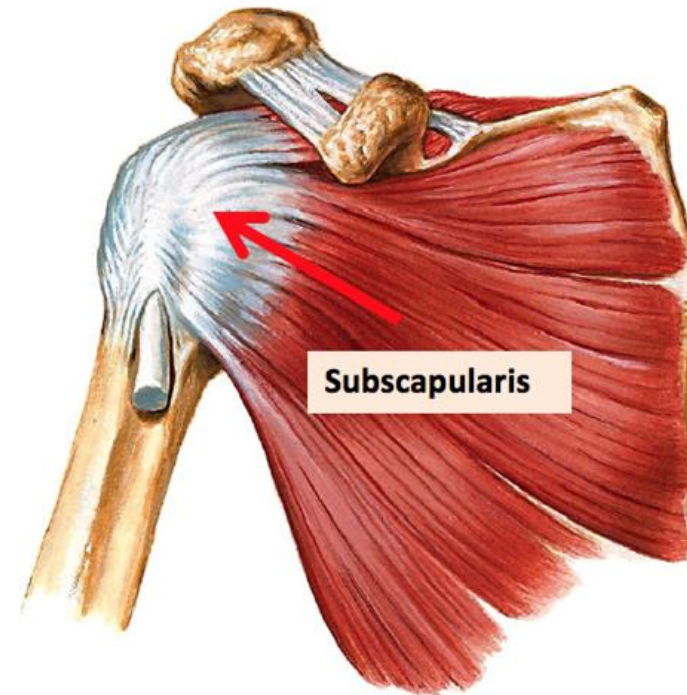
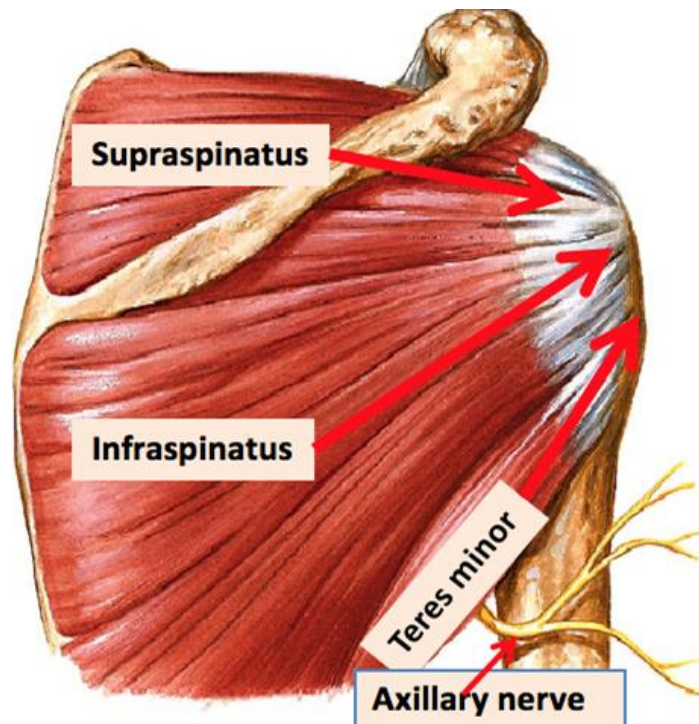
2) Infraspinatus bursa:
between infraspinatus
tendon & capsule.

3) Subacromial bursa:
between deltoid,
supraspinatus and
capsule.



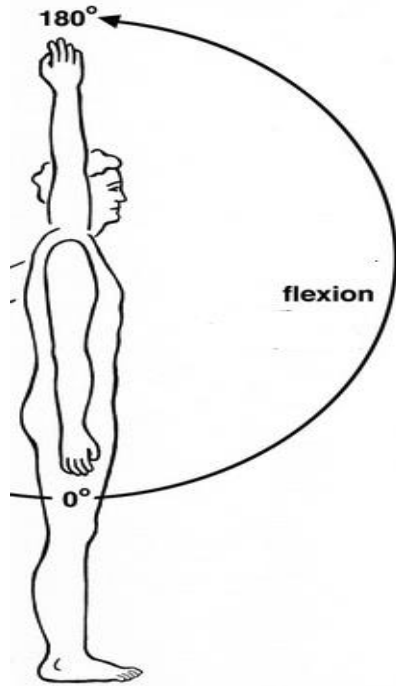
Relations Of Shoulder Joint

ANTERIOR: subscapularis.
POSTERIOR: infraspinatus, teres minor.
SUPERIOR: supraspinatus.
INFERIOR: axillary nerve.



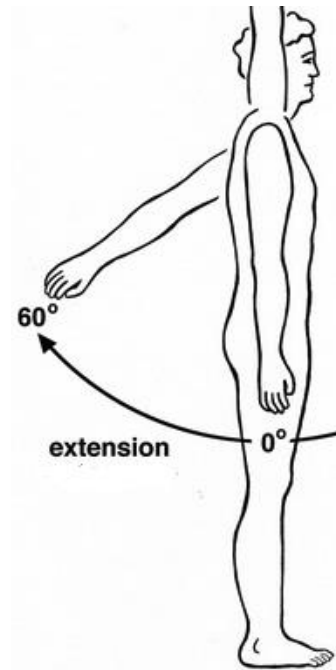
Movements of Shoulder Joint

The shoulder joint can do ALL movements (flexion, extension, abduction, adduction, medial rotation, lateral rotation)



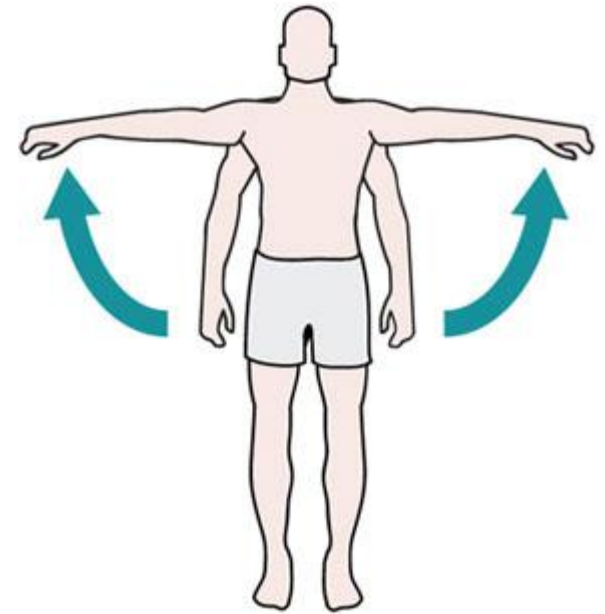
FLEXION

- 1. Anterior fibers of deltoid
 - 2. Pectoralis major
 - 3. Coracobrachialis (muscle of arm)
 - 4. Short head of biceps brachii (muscle of arm)
- MAIN
- ASSIST



EXTENSION

- 1. Posterior fibers of deltoid
- 2. Latissimus dorsi
- 3. Teres major

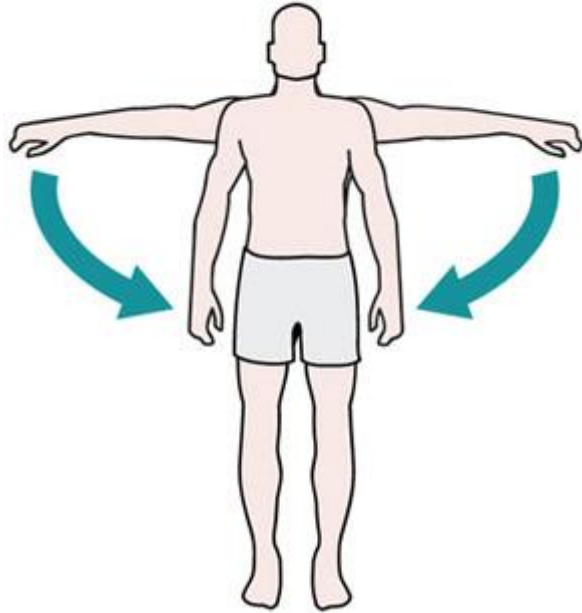


ABDUCTION

- 1. From 0° - 15°:
Supraspinatus
- 2. From 15° - 90°:
Middle fibers of deltoid

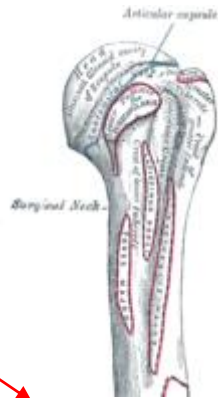
Movements of Shoulder Joint

The shoulder joint can do ALL movements (flexion, extension, abduction, adduction, medial rotation, lateral rotation)



ADDUCTION

1. Pectoralis major
2. Latissimus dorsi
3. Teres major



Pectoralis major, latissimus dorsi, and teres major are all inserted in the bicipital groove
 Pectoralis **major** – lateral lip
 Latissimus dorsi – groove
 Teres **major** – medial lip



MEDIAL ROTATION

1. Pectoralis major
2. Latissimus dorsi
3. Teres major
4. Anterior fibers of deltoid
5. Subscapularis

MAIN

ASSIST

To Remember:
 A Lady between 2 Majors



LATERAL ROTATION

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

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*).

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

<i>Muscle</i>	Deltoid	Supraspinatus & Infraspinatus	Teres Minor	Teres Major	Subscapularis
<i>Origin</i>	lateral 1/3 of clavicle ,acromion and spine of scapula (= insertion of trapezius).	1.Supraspinatus: supraspinous fossa. 2.Infraspinatus: infraspinaous fossa.	lateral (Axillary) border of Scapula.	lateral border ofscapula.	subscapular fossa.
<i>Insertion</i>	deltoid tuberosity of humerus.	greater tuberosity of humerus.	greater tuberosity of humerus.	medial lip of bicipital groove of humerus (with latissimus dorsi & pectoralis major).	lesser tuberosity of humerus.
<i>Nerve supply</i>	axillary nerve.	Suprascapular nerve.	axillary nerve.	lower subscapular nerve.	upper & lower subscapular nerves.
<i>Action</i>	1. <u>Anterior fibers</u> : flexion & medial rotation of humerus (arm, shoulder joint). 2. <u>Middle fibers</u> : abduction of humerus from <u>15° - 90 °</u> . 3. <u>Posterior fibers</u> : extension & lateral rotation of humerus.	1. <u>Supraspinatus</u> : abduction of humerus from 0° - 15°. 2. <u>Infraspinatus</u> : lateral rotation of humerus.	lateral rotation of humerus.	extension, adduction & medial rotation of humerus (as action of latissimus dorsi).	medial rotation of humerus.

Questions

1. Which one of the following muscles is inserted into the lesser tuberosity of the humerus?
 - A. Subscapularis
 - B. Deltoid
 - C. Teres major
 - D. Infraspinatus
2. Which one of the following muscles is part of the rotator cuff?
 - A. Subscapularis.
 - B. Deltoid.
 - C. Teres major.
 - D. Rhomboid minor.
3. Regarding the shoulder joint, which one of the following statements is correct?
 - A. It is a stable joint.
 - B. It is a synovial joint of hinge variety.
 - C. Latissimus dorsi muscle adducts shoulder joint.
 - D. Downward dislocation of shoulder joint may cause injury to the radial nerve.
4. Bursae _____ friction between tendons, joint capsule & bone.
 - A. Increase.
 - B. Reduce.
 - C. Doesn't affect.
5. Which of the following is related to shoulder joint inferiorly?
 - A. Subscapularis.
 - B. Teres minor.
 - C. Axillary nerve.
6. A patient injured his suprascapular nerve. Which of the following actions will be completely lost?
 - A. Abduction (0° - 15°)
 - B. Abduction (15° - 90°)
 - C. Lateral rotation
 - D. Medial rotation
7. The subacromial bursa is between?
8. A little boy came to the emergency department after falling from a tree. An xray showed that he dislocated his shoulder. List the muscles of the rotator cuff.

Answers:

1. A
2. A
3. C
4. B
5. C
6. A

Answers:

7. Deltoid, supraspinatus and capsule.
8. Supraspinatus, Infraspinatus, Teres minor & Subscapularis



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