



MED437
KING SAUD UNIVERSITY



Anatomy of the Shoulder

Lecture 23

غيداء آل مسمع
عبدالرحمن الحيسوني

Revised by

Please check our [Editing File](#).

هذا العمل لا يغني عن المصدر الأساسي للمذاكرة

{ وَمَنْ يَتَوَكَّلْ عَلَى اللَّهِ فَهُوَ حَسْبُهُ }

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.
-
- Text in **BLUE** was found only in the boys' slides
 - Text in **PINK** was found only in the girls' slides
 - **Text in RED is considered important**
 - Text in **GREY** is considered extra notes

MUSCLES OF SHOULDER REGION

These are muscles connecting
Scapula to **Humerus**.

يعني يطلعون من
ويندخلون في
فدايما تذكروا
Origin: scapula
Insertion: humerus

(move humerus through shoulder joint):

1-Deltoid

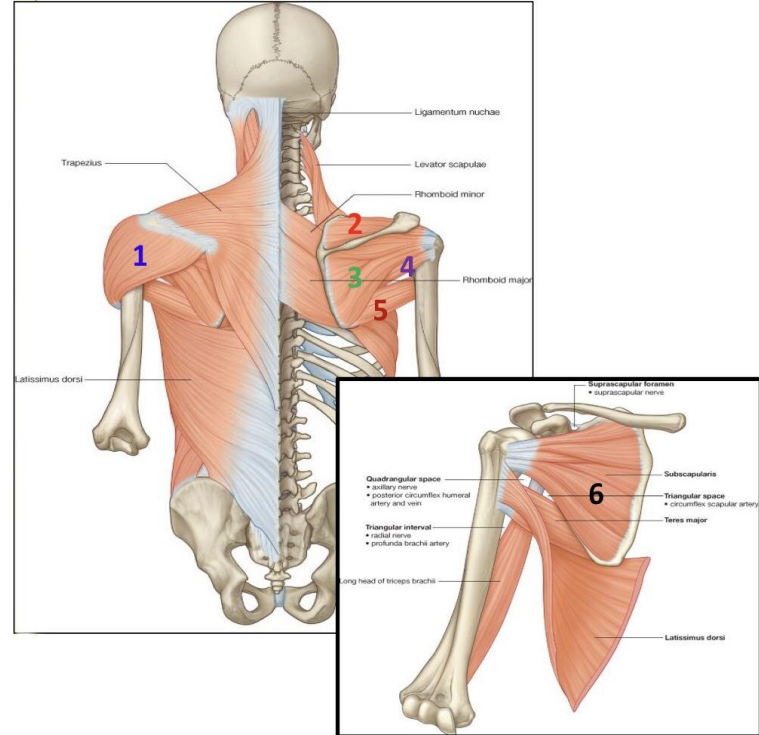
2-Supraspinatus

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** (Anterior Fiber)

Acromion (Middle fibers)

Spine of scapula (posterior Fibers)

(Origin of Deltoid = insertion of trapezius).

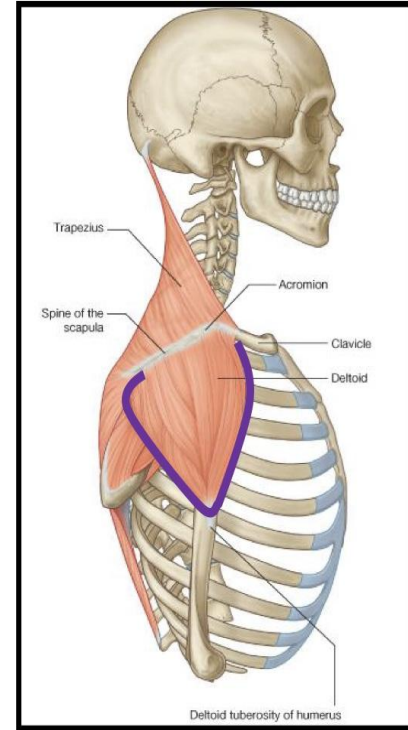
Insertion: deltoid tuberosity of **humerus**.

Nerve supply: **Axillary nerve**. (C5,C6,C7,C8,T1)

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.

يعني تسوي كل شي الا Adduction



Supraspinatus & Infraspinatus

Origin: scapula

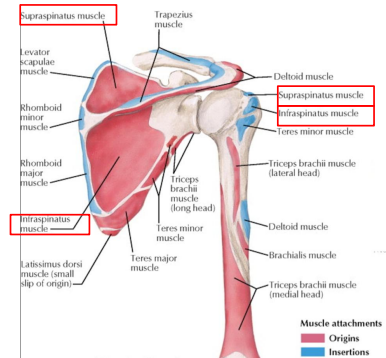
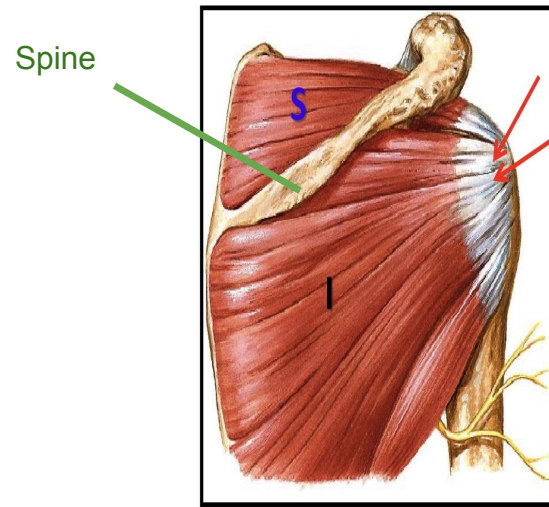
1. **Supra**spinatus: **supra**spinous fossa.
2. **Infra**spinatus: **infra**spinaous fossa.

Insertion: greater tuberosity of **humerus**.

Nerve supply: Suprascapular nerve. (Superior Trunk)

Action:

1. **Supra**spinatus: abduction of humerus from 0° - 15°.
2. **Infra**spinatus: lateral rotation of humerus.



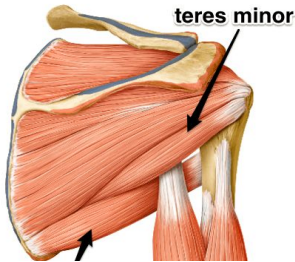
Teres minor

Origin: lateral (axillary) border of **scapula**

Insertion: greater tuberosity of **humerus** (with supra/infraspinatus)

Nerve supply: **axillary nerve**

Action: lateral rotation of humerus



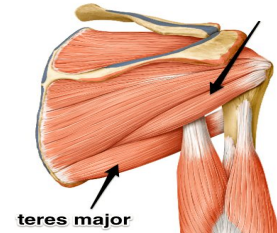
Teres major

Origin: lateral border of **scapula**

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

Nerve supply: **lower subscapular nerve** (Branch of posterior cord)

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



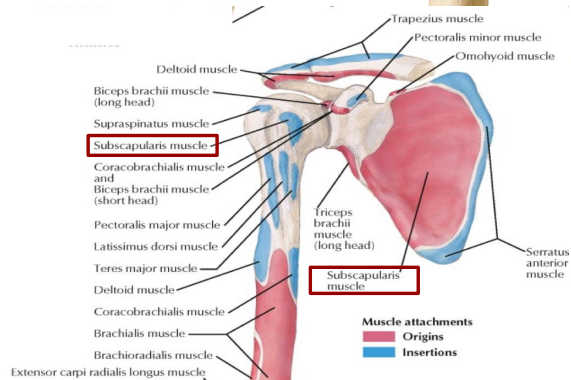
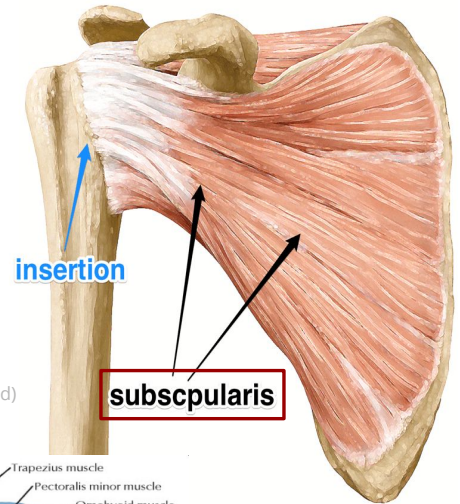
Subscapularis

Origin: **subscapular fossa**.

Insertion: lesser tuberosity of **humerus**

Nerve supply: **upper & lower subscapular nerves** (Branch of posterior cord)

Action: medial rotation of humerus.



Shoulder joint

Type

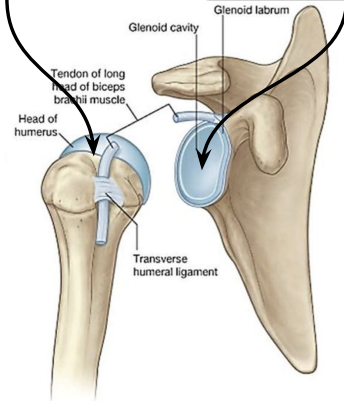
Synovial,
Multiaxial or
polyaxial*
(Ball & Socket)

*Only the Hip and
Shoulder joints are
multiaxial

Articular
surfaces

1- Head of
humerus (Ball)

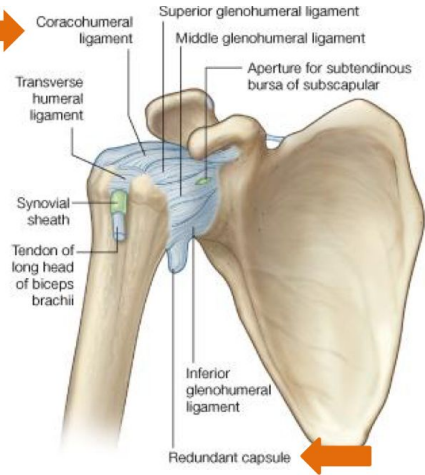
2- Glenoid
cavity of
scapula (Socket)



Stability
(Not stable) because of :

The ↓ Stability the ↑ Range of movement

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.



Rotator Cuff

- Muscles form 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. لهذا اغلب حالات الخلع يكون رأس ال humerus نازل تحت جهة ال axilla
- It is formed of 4 muscles (**SITS**) :

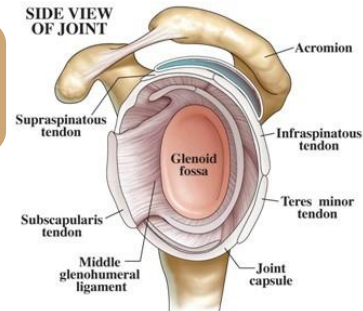
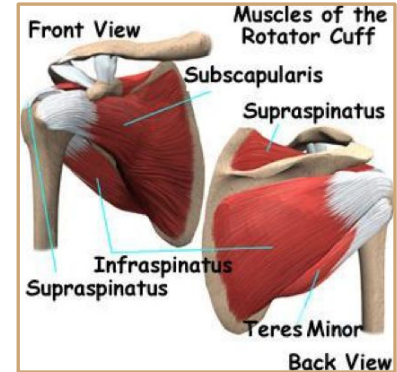
Supraspinatus

Infraspinatus

Teres minor

Subscapularis

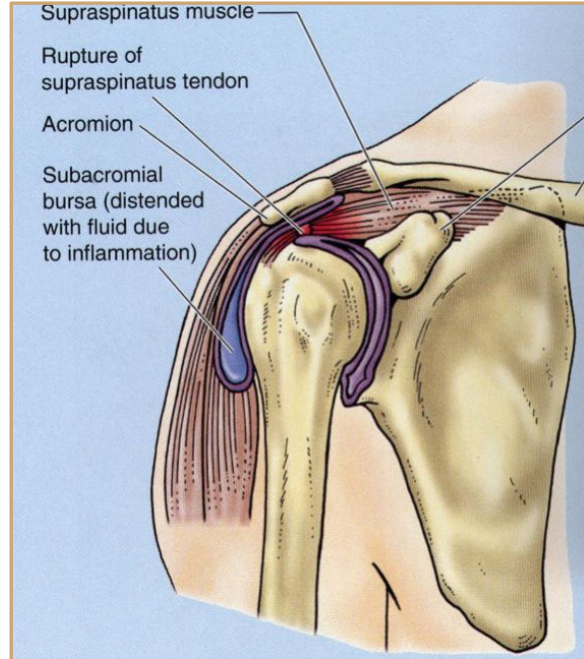
- The **tone** of these muscles help in **stabilizing the shoulder joint**.



Rotator Cuff Injury



- 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.** Have almost the same symptoms as a dislocated shoulder
- **Supraspinatus tendon** is the most common site of rotator cuff injury. Because it's the weakest.



BURSAE* IN RELATION TO SHOULDER JOINT

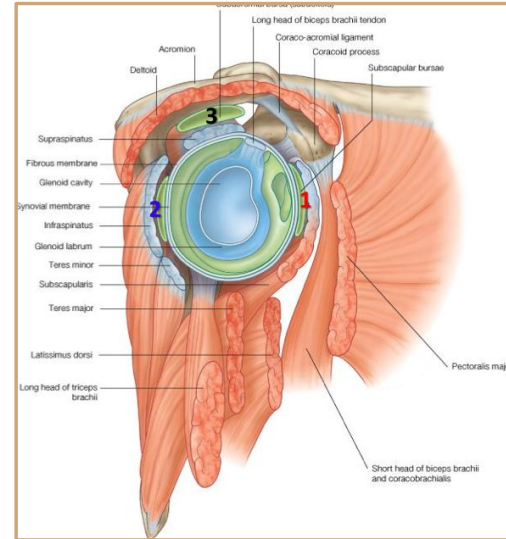
- They **reduce friction** between tendons, joint capsule & bone.
- They are liable to be **inflamed** following injury of rotator cuff muscles.

1* *Subscapularis bursa* **2*** *Infraspinatus bursa* **3*** *Subacromial bursa*

between
subscapularis
tendon & capsule.

between
infraspinatus tendon
& capsule.

between deltoid,
supraspinatus
& capsule.



*Bursae : It's a made up of synovial membrane that produces and contains synovial fluid sac outside of the membrane of the capsule & outside the joint , it has the same function of the capsule.

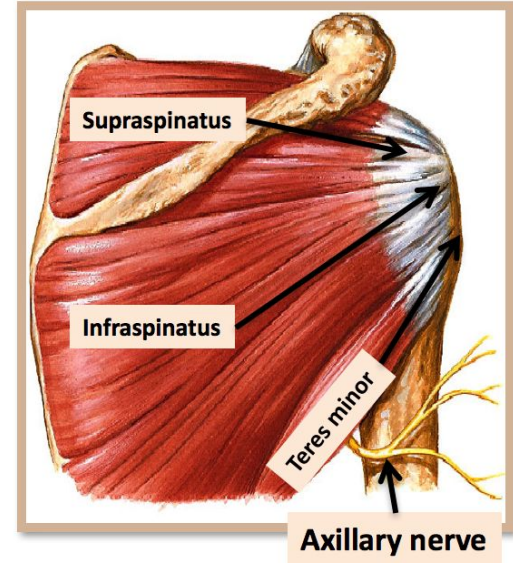
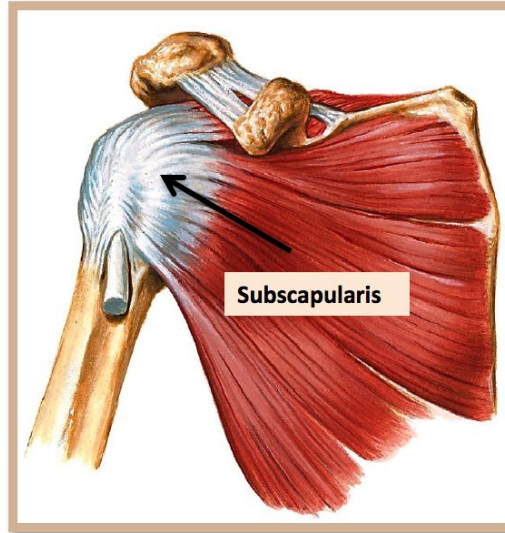
Relations of Shoulder Joint

Anterior: Subscapularis.

Posterior: infraspinatus,
And teres minor.


Superior: Supraspinatus.

Inferior: axillary nerve.



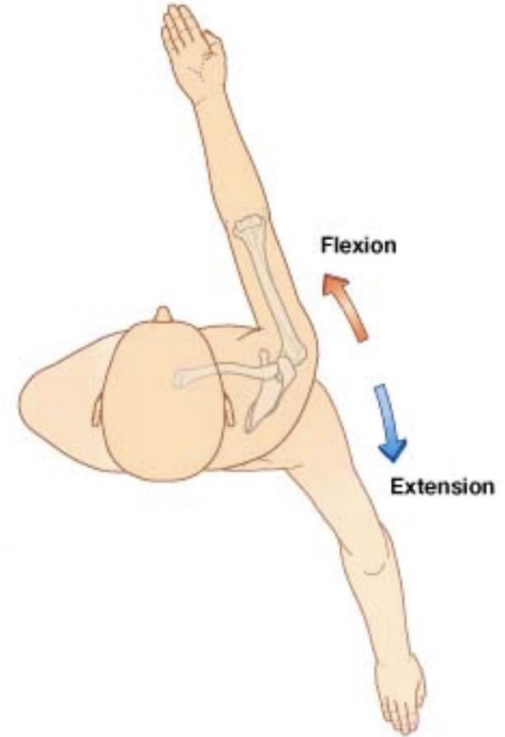
Movements of shoulder Joint

Flexion:

1. Anterior fibers of deltoid.
2. Pectoralis Major. 
3. Coracobrachialis (Muscle of Arm).
4. Short head of biceps brachii (Muscle of Arm)

Extension:

1. Posterior fibers of deltoid.
2. Latissimus dorsi.
3. Teres Major.



Movements of Shoulder Joint

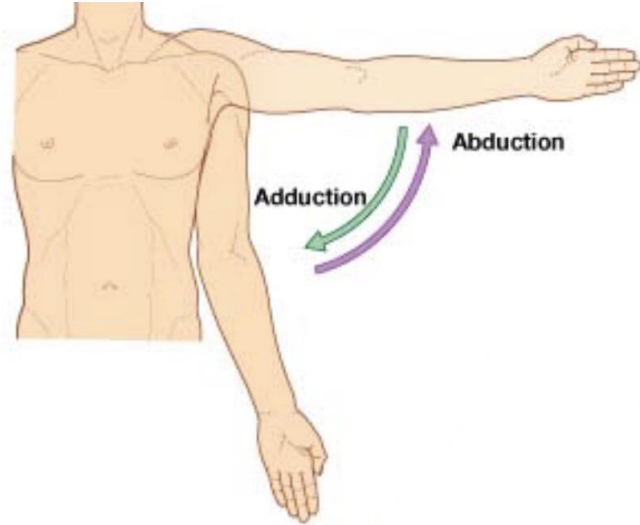
Abduction:

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

Adduction:

1. Pectoralis major.
2. Latissimus Dorsi.
3. Teres Major.

All of them are
inserted in Bicipital
Groove



In case of fracture of the surgical neck of humerus, the most affected movement is Abduction

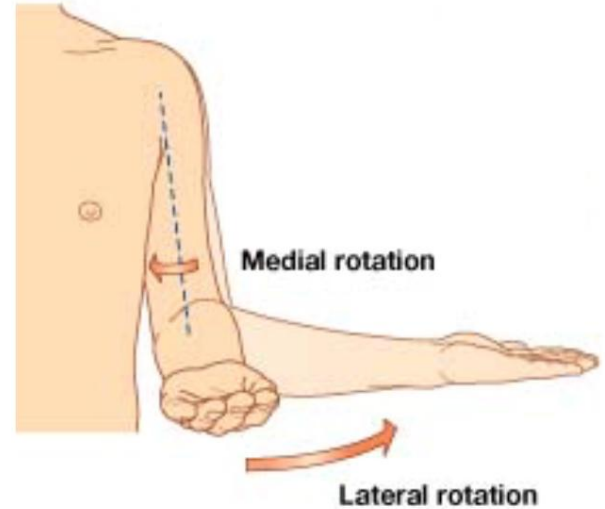
Movements of Shoulder Joint

Medial Rotation:

1. Pectoralis Major.
 2. Latissimus Dorsi.
 3. Teres Major.
- First 3 are inserted in bicipital groove
4. Anterior Fibers of deltoid.
 5. Subscapularis.

Lateral Rotation:

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



SUMMARY

Muscle	Deltoid	Supraspinatus & infraspinatus	Teres minor	Teres major	Subscapularis
Origin	lateral 1/3 of clavicle, acromion and spine of scapula	1- <u>Supraspinatus</u> : supraspinous fossa 2- <u>Infraspinatus</u> : infraspinous fossa	lateral (Axillary) border of Scapula	lateral border of scapula	subscapular fossa
Insertion	deltoid tuberosity of humerus	greater tuberosity of humerus	greater tuberosity of humerus	medial lip of bicipital groove of humerus	lesser tuberosity of humerus
Nerve supply	axillary nerve	Suprascapular nerve	axillary nerve	Lower subscapular nerve	upper & lower subscapular nerves
Action	1- <u>Anterior fibers</u> : flexion & medial rotation of humerus. 2- <u>Middle fibers</u> : abduction of humerus from 15-90°. 3- <u>Posterior fibers</u> : lateral rotation of humerus & extension.	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	medial rotation of humerus

Summary

Muscles of shoulder region:

Origin: scapula

Insertion: humerus

Action: move humerus (SHOULDER JOINT)

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

MCQ's

1. Which of the following muscles has similar actions to latissimus dorsi ?
- a) Teres major
 - b) Subscapularis
 - c) Teres minor

2. Nerve supply of subscapularis by:

- a) Axillary nerve
- b) Upper and lower subscapular nerve
- c) Only lower subscapular nerve

3. Which is false about the shoulder joint?

- a) Is not stable because humerus head is 3x larger than glenoid cavity
- b) Relies on support from the rotator cuff
- c) Is a hinge joint with biaxial movement

5. All of the following relate posteriorly to the shoulder joint except...

- a) Subscapularis
- b) Infraspinatus
- c) Teres minor

4. Which of the following rotator cuff muscles is most susceptible to injury?

- a) Infraspinatus
- b) Supraspinatus
- c) Teres minor

SAQ

6. Name the bursae related to to the shoulder joint.

7. What is the function of the bursae.

8. Name the muscles responsible for medial rotation of the shoulder joint.

Answers: 1. A 2. B 3. C 4. B 5. A

6. Subscapularis bursa, infraspinatus bursa, subacromial bursa

7. They reduce friction between the tendons, joint capsule and bones.

8. Pectoralis Major, Latissimus Dorsi, Teres Major, Anterior fibers of deltoid, and subscapularis

Team Members

Lamia Abdullah Alkuwaiz (Team Leader)

Rawan Mohammad Alharbi

Abeer Alabduljabbar

Afnan Abdulaziz Almustafa

Ahad Algrain

Alanoud Almansour

Albandari Alshaye

AlFhadah abdullah alsaleem

Arwa Alzahrani

Dana Abdulaziz Alrasheed

Dimah Khalid Alaraifi

Ghada Alhaidari

Ghada Almuhanana

Ghaida Alsanad

Hadeel Khalid Awartani

Haifa Alessa

Khulood Alwehabi

Layan Hassan Alwatban

Lojain Azizalrahman

Lujain Tariq AlZaid

Maha Barakah

Majd Khalid AlBarrak

Norah Alharbi

Nouf Alotaibi

Noura Mohammed Alothaim

Rahaf Turki Alshammari

Reham Alhalabi

Rinad Musaed Alghoraiby

Sara AlSultan

Shahad Alzahrani

Wafa Alotaibi

Wejdan Fahad Albadrani

Wjdan AlShamry

Faisal Fahad Alsaif (Team Leader)

Abdulaziz Al dukhayel

Fahad Alfaiz

Akram Alfandi

Saad Aloqile

Saleh Almoaiqel

Abdulaziz Alabdulkareem

Abdullah Almeaither

Yazeed Aldossari

Muath Alhumood

Abdulrahman Almotairi

Abdulelah Aldossari

Abdulrahman Alduhayyim

Hamdan Aldossari

Abdullah Alqarni

Mohammed Alomar

Abdulrahman Aldawood

Saud Alghufaily

Hassan Aloraini

Khalid Almutairi

Abdulmajeed

Alwardi

Abdulrahman Alageel

Rayyan Almousa

Sultan Alfuhaid

Ali Alammari

Fahad alshughaihithy

Fayez Ghiyath

Aldarsouni

Mohammed Alquwayfili

Abduljabbar Al-yamani

Sultan Al-nasser

Majed Aljohani

Zeyad Al-khenaizan

Mohammed Nouri

Abdulaziz Al-drgam

Fahad Aldhowaihy

Omar alyabis