

DPT 2ND SEMESTER (SECTION A)

COURSE TITLE: BIOMECHANICS-I

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FINAL TERM ASSIGNMENT

MARKS: 50

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DEPARTMENT: AHS (DPT)

1- Enlist functions of the following muscles

Deltoid, Trapezius, Latissimus dorsi, Rhomboids, Levator scapulae, Serratus anterior

Pectoralis major minor, Teres major.

Ans: **DELTOID MUSCLES:**

Following are the functions of deltoid muscles

1. Deltoid has three muscle fibres anterior, middle and posterior
2. The flexion and medial rotation of the arm is done by the anterior fibres.
3. The middle fibres are attached to the shoulder blade and helps in the abduction of the arm
4. Posterior fibres attach at different parts, extension and lateral rotation are its functions

TRAPEZIUS:

Following are the actions of trapezius muscles

1. Upper fibres can elevate the scapula
2. Middle fibres allows the retraction of the scapula
3. Lower fibres depressed the medial part of the scapula's spine

LATISSIMUS DORSI:

1. Latissimus dorsi helps in the medial rotation of the arm.

2. It works as the stabilizer of the spine.
3. It helps to produce movements as adduction, extension of the arm.

RHOMBOID:

Following are the functions of rhomboid muscles:

1. Both of the rhomboids retract the scapula
2. Rhomboids can also lift the medial border of the scapula to rotate the scapula according to the shoulder joint.
3. It works as a fixer to fix the scapula to the thoracic wall

LEVATOR SCAPULAE:

Following are the actions performed by the levator scapulae:

1. Levator scapulae lifts the scapula and tilts the glenoid cavity by rotating the scapula
2. It also helps to bend the neck laterally

PECTORALIS MAJOR MINOR:

Following are the functions:

1. It helps in the flexion of the humerus
2. Extension of the humerus is done by it
3. Pectoralis major helps in abduction of the scapula
4. Pectoralis minor helps to protract the scapula

SERRATUS ANTERIOR:

Following are serratus anterior muscles

1. It allows the scapula to move laterally
2. It protracts the scapula
3. It works as a stabilizer of the scapula
4. This muscle is vital for the lifting of the arm

TERES MAJOR:

Following are the functions of teres major

1. This muscle depresses the shoulder
2. It abducts and extends the shoulder joint
3. Internal rotation of the humerus

2- Name all the ligaments of Shoulder joint and their functions

Ans: **SHOULDER JOINT LIGAMENTS:**

There are four ligaments of the shoulder joint

1. GLENOHUMERAL LIGAMENT
2. CORACO-ACROMIAL LIGAMENT
3. CORACO-CLAVICULAR LIGAMENT
4. TRANSVERSE LIGAMENT

GLENOHUMERAL LIGAMENT:

There are three glenohumeral ligaments (superior, middle, inferior). The middle gleno humeral ligament works as a stabilizer at 45 to 60 degrees of abduction. During abduction of the arm the superior ligament relaxes because the middle and inferior ligament gets stretched and because of this stretching the articulating surfaces of the joint stays in place. The inferior ligaments works as a stabilizer against anteroinferior dislocation.

CORACO- ACROMIAL LIGAMENT:

This ligament attaches the acromion to the scapula's coracoid process . Coraco acromial ligament plays a vital role in the stability of the shoulder joint, it indirectly stops the displacement of the humeral head. It also transmits or disperses the loads across the scapula. The curvature on the acromion because of the forces put by trapezius and deltoid is narrowed down by the coraco acromial ligament.

CORACO- CLAVICULAR LIGAMENT:

This ligament helps the shoulder to stay in its place while allowing it to perform different movements. It protects the scapula from vertical displacement. The angled space between conoid ligaments and trapezoid allows the rotation of the scapula. Coraco clavicular ligament works as a last break.

TRANSVERSE HUMERAL LIGAMENT:

It passes from lesser to greater tubercle present of the humerus. Its job is to hold the tendon of the head of the biceps brachii in its place, which is between the lesser and greater tubercle. This helps to provide stability to the tendon while the movements are taking place in the shoulder joint. THL is always bounded to the part of the bone which is above the epiphyseal line.

3- Write Individual and combine action of Rotator Cuff muscles

Ans: **ROTATOR CUFF MUSCLES:**

1. Supraspinatus muscles
2. Infraspinatus muscle
3. Subscapular muscle
4. Teres minor

SUPRASPINATUS MUSCLES:

Supraspinatus muscle helps in abduction of the arm. It also helps to keep the shoulder joint stable because it keeps the head of the humerus in its place (against the glenoid fossa) this muscle also assists in the lateral rotation. It works to protect or support the joint superiorly

INFRASPINATUS MUSCLE:

Infraspinatus muscle does the job of stabilizing the shoulder joint just like other three rotator cuff muscles. It is also the primary muscle that rotates the arm externally or laterally infraspinatus works with teres minor to rotate the humerus upwards. The shoulder joint is posteriorly supported by infraspinatus.

SUBSCAPULARIS:

This muscle prevents the dislocation of the head of the humerus and helps to keep the shoulder joint stable. It adducts the humerus. Subscapularis is the primary muscle for rotating the humerus medially. It supports the shoulder joint anteriorly.

TERES MINOR:

The main teres minor function is that it controls the activity of the deltoid muscles. It works with the other three muscles to provide stability to the shoulder joint. This muscle also helps in rotating the arm laterally. Also it assists in the adduction. Teres minor supports the shoulder joint posteriorly.

ROTATOR CUFF MUSCLES COMBINE ACTION:

The rotator cuff muscles work together to stabilize the shoulder joint. They play a vital role in almost every movement of the shoulder joint, they keep the head of the humerus within the glenoid fossa and allow the movements without the dislocation of the humerus. They are active in the neuromuscular control of the shoulder joint when movements are taking place.

4- Define Lateral epicondylitis and explain its physiotherapy treatment

Ans: **LATERAL EPICONDYLITIS:**

It is also known as "tennis elbow". This is a condition which occurs due to the overuse of the elbow or wrist joint, repetitive movements of the arm and the wrists can lead to this painful condition. It is usually common in athletes but other people can also develop it like people whose jobs require the overuse of the arms (plumbers, painters etc) it happens due to the inflammation of the tendon which is attached to the muscles of the forearm outside the elbow, due to epicondylitis the patient feels pain and tenderness in the affected area. There are many treatments of this condition. Physiotherapist and doctors can do the work but if that treatment does not work then surgeries can also be required.

PHYSIOTHERAPY TREATMENT:

Physiotherapy can be the the most helpful treatment to treat this type of condition. The first step is to control the inflammation in the tendon by resting the tendon,ice can also be helpful in reducing the pain and after that you can start with the slow exercises.

FINGER STRETCH:

Touch your fingers to the thumb and wrap are rubber band around them. Slowly open them all the way and then close them. Repeat this process

WRIST TURN:

Bend your elbow forming an L on your side. Hold the hand outward and the palm upward. Now slowly turn your palm in such a way that it faces down

BALLS SQUEEZE:

As the name indicates use a soft ball, hold it in your hand. Now squeeze it again and again. This will strengthen you muscles.

5- Differentiate between type 1 and type 2 muscle fibers

Ans :

<u>TYPE 1 MUSCLE FIBRES</u>	<u>TYPE 2 MUSCLE FIBRES</u>
1. They are also known as slow twitch fibres.	1.They are also known as fast twitch fibres.
2. They perform less powerful activities like running, walking, swimming etc.	2.They perform more powered activities like power lifting, jumping and sprinting etc.
3. They have slow muscle fibres.	3.They have fast muscle fibres.
4. Huge number of mitochondria.	4.They have a small number of mitochondria.
5. They are smaller in size.	5.They are bigger in size than type 1.
6. They have more capillaries.	6.They have less number of capillaries.

7. They are capable of managing long term contractions.	7.They manage short term contractions
8. They can resist fatigue.	8.they are sensitive to fatigue
9. Their oxidative capacity is high.	9.Their oxidative capacity is low.
10. They produce less force	10.They produce great force