***DPT 2ND SEMESTER (SECTION A)***

**COURSE TITLE: BIOMECHANICS-I INSTRUCTOR: AHMED HAYAT**

**FINAL TERM ASSIGNMENT MARKS: 50**

***Laiba hashmat ID: 16394***

1. Enlist functions of the following muscles

Deltoid, Trapezius. Latissmus dorsi, Rhomboids, Levator scapulae, Serratus anterior

Pectoralis major minor, Tere major.

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| ***Muscle Names*** | ***Function of muscles*** |
| *Deltoid* | *Anterior fiber : it flexes and medially rotates the arm.*  *Middle fiber: It abducts the arm from 15 to 90.*  *Posterior fibres: The function of posterior fiber is extension and lateral rotation of the arm.* |
| *Trapezius* | *Upper: The upper trapezius elevates and upward rotates the scapula.*  *Middle: The middle fibers retract the scapula.*  *Lower: The lower fibers of trapezius pulls the medial end of scapula downward depress the medial part of the spine of scapula.* |
| *Lattismus dorsi* | *It adducts and extend the arm. It help in medial rotation of the arm . It depresses the shoulder girdle through insertion on the humerus.* |
| *Rhomboids :*  *Rhomboid major* | *The function of rhomboid major is to retract the scapula and rotates it to depress the glenoid cvity. It also fixes scapula to the thoracic wall.* |
| *Rhomboid minor* | *It retracts and rotates the scapula and fixes it to thoracic wall.* |
| *Levator scapulae* | *The function of levator scapulae is to elevates the scapula and tilts its glenoid cavity inferiorly by rotating scapula.* |
| *Serratus anterior* | *It protracts the scapula and upwardly rotates the scapula. It help trapezius* |
| *Pectoralis major* | *It horizontally flexes the shoulder and adduction of shoulder and medial rotation of shoulder.* |
| *Pectoralis Minor* | *It protracts the scapula and downwardly rotates the scapula.* |
| *Teres major* | *Its function is medial rotation adduction and extension of the shoulder joint.* |

1. Name all the ligaments of Shoulder joint and their functions

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| --- | --- |
| ***Ligaments names*** | ***Function of ligaments*** |
| *Coraco humera ligament* | *It provides a tunnel for bicep tendon. And it resists inferior translation in shoulders.* |
| *Glenohumeral ligament:*   * *Superior glenohumeral ligament* | *The function of superior glenohumeral joint is to resist inferior translation in rest. It is important in stabilization of glenohumeral jointi in adduction and external rotation .* |
| * *Middle glenohumeral joint* | *Its function is to resist inferior translation in abduction and external rotation.*  *It restrains anterior translation up to 45 degree abduction in external rotation.* |
| * *Inferior glenohumeral ligament* | *Its function is to resist anterior, posterior and inferior translation.It stabilizes the glenohumeral joint whwn the arm is adducted to approximately at 90 degree.* |
| *Interclavicular* | *It attach both clavicles* |
| *Anterior and posterior sternoclavicular* | *Its function is to attach clavicle with sternum* |
| *costoclavicular* | *It attach clavicle to 1st rib.* |
| *Sternocleido mustoid* | *It provide superior stability* |
| *Acromio clavicular* | *It resists axial rotation and posterior motion* |
| *Coraco clavicular* | *It resists superior motion. It attach the clavical corocoid process of scapula. They keep the scapula attach to the clavicle .* |
| *Transverse humeral ligament* | *It holds the tendon of long head of biceps brachii muscle in the groove between the greater and lesser tubercle on the humerus.* |
| *Coraco acromial ligament* | *It links the coracoids to the acromion.* |

1. Write Individual and combine action of Rotater Cuff muscles

***Individual action of rotator cuff muscles:***

* ***Supraspinatus:***
* *It is superior to the spine of scapula.*
* *It is inserted superiorly on the head of humerus.*

***Action:***

* *The function of suprapinatus is the abduction of the arm.*
* *It also helps is stabilization of shoulder joint.*
* ***Infraspinatus:***
* *It is inferior to the spine of scpula.*
* *It is inserted laterally on the head of humerus.*

***Action:***

* *The function of infraspinatus is that it laterally rotates the arm.*
* ***Subscapularis:***
* *It is present on anterior surface of scapula.*
* *It is inserted anteriorly on the head of humrerus.*

***Action:***

* *It medially rotates the arm.*
* ***Teres minor:***
* *It is present on lateral border of scapula near the inferior angle.*
* *It is inserted laterally on the head of humeus.*

***Action:***

* *Its action is that it laterally rotates the arm.*

***Combine action of rotator cuff muscles:***

* *The rotator cuff muscles provide support to the capsule of the shoulder joint.*
* *They provide support all around except inferiorly.*
* *Subscapularis supports the joint anteriorly, superiorly by supraspinatus, and infraspinatus and teres minor supports the joint posteriorly.*
* *The rotator cuff muscles hold the head of humerus in correct position.*
* *They help in rotation of the arm.*
* *The head of the humerus is dislocated inferiorly as it is not protected inferiorly.*

1. Define Lateral epicondilitis and explain its physiotherapy treatment

***Lateral epicondilitis:***

* *It is also known as tennis elbow.*
* *It is the most common syndrome in the elbow.*

***Tendinopathy injury:***

* *It is tendinopathy injury involving the extensor muscles of the forearm. In most cases insertion of carpi radialis brevis is involved.*

***Origin:***

* *These muscles originates on the lateral epicondylar region of the distal humerus.*
* *Contractile overloads that chronically stress the tendon near the attachment on the humerus are primary cause of epicondlitis.*
* *It occurs in upper extremity activities such as computer use, heavy lifting, forceful forearm pronation and supination.*
* *It involves swelling, or micro damage to the tissues on the lateral side of distal humerus including the tendinous attachment of the extensor tendon.*

***Causes:***

* *The most common cause of lateral epicondilitis is pain.*
* *This pain can be produced by palpation on the extensor muscles origin on the lateral epicondyle.*
* *The pain can radiate upward upward along the upper arm and downward along the outside of the forearm and to the third and forth fingers in rare cases.*
* *Inflammation is also the cause but it is present in the earliest stage.*

***Physiotherapy treatment for lateral epicondilitis:***

* *The first step of treating tennis elbow are reducing inflammation and resting the irritated muscles and tendons.*
* *Ice and compression may also help reduce inflammation and pain.*

***1.Rest given to arm:***

*> The first step is to given your arm proper rest and stop participation in sports or other activities.*

***2.Anti inflammatory medicines:***

***>*** *Anti inflammatory medicines is given to patient like aspirin to reduce pain.*

***3.physical therapy:***

***>*** *specific exercise will be helpful for strengthening the muscles of forearm.*

***4.steroid injection:***

*> steroids such as cortisone are very effective anti inflammatory medicines.*

*> doctor will decide to inject the painful area with steroid to relieve your ymptoms.*

***5.check equipment:***

*> your doctor will check the equipment if you participate in sports.*

***6. Extracorporeal shock waves therapy:***

*The shock wave therapy sends sound waves to the elbow.*

*These sounds produce the body natural healing process.*

* *The physiotherapist advice the patient for wrist range of motion.*
* *And to stretch the wrist*
* *It also include pronation and supination of forearm.*
* *they recommend elbow range of motion.*
* *They give the patient wrist flexion exercise.*
* *And also wrist extension exercise is given to patient.*
* *Forearm pronation and supination is recommended.*

1. Differentiate between type 1 and type 2 muscle fibers

***Answer:***

***Difference between type 1 and type 2 muscle fibers:***

|  |  |  |
| --- | --- | --- |
| ***Type 1*** | ***Type 2 a*** | ***Type 2 b*** |
| ***Contraction time:***  *The contraction time is slow for type 1 fibers.* | *The contraction time is moderately fast for type 2 a fibers.* | *The contraction time is very fast for type 2 b fibers.* |
| ***Ressistance to fatigue:*** *The resistance to fatigue is high.* | *The resistance to fatigue is fairly high.* | *The resistance to fatigue is low.* |
| ***Activity used for:***  *It is used for aerobic activity.* | *It is used for long term anaerobic activity* | *It is used for short term anaerobic activity.* |
| ***Power produced:***  *The power produced is low.* | *The power produce is medium.* | *The power produce is very high.* |
| ***Mitochondrial density:***  *The mitochondrial density is very high* | *The mitochondrial density is high.* | *The mitochondrial density is low* |
| ***Diameter:*** *The diameter of type 1 fiber is small.* | *The diameter is intermediate.* | *The diameter is large.* |
| ***Glycolytic enzyme concentration:***  *The glycolytic enzyme concentration is low.* | *The glycolytic enzyme concentration is intermediate.* | *The glycolytic enzyme concentration is high.* |
| ***ATPase concentration:***  *The ATPase concentration is low.* | *The ATPase concentration is high.* | *The ATPase concentration is high.* |