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### **Question 1**

**Functions of the following muscles:**

- **Deltoid:**

Anterior Part: Flexion and medial rotation of arm .

Middle Part: Abduction of shoulder

Posterior Part: External rotation and extension of arm.

- **Trapezius:**

Upper Trapezius: Elevation of scapula and upward rotation.

Middle Trapezius: Retraction of scapula.

Lower Trapezius: Depression of scapula and upward rotation.

- **latissimus Dorsi:**

Adduction , extension , internal rotation and depression of scapula

- **Rhomboids:**

Retraction of scapula.

- **Levator scapula:**

Elevation of scapula.

- **Serratus Anterior:**

Protraction of scapula

- **Pectoralis Major:**

Horizontal adduction, Horizontal flexion , Medial Rotation.

- **Pectoralis Minor:**

Protraction of scapula, Elevation of ribs during breathing.

- **Teres Major:**

Adduction , Medial rotation and extension.

## Question 2:

### **ligaments of shoulder joint:**

The ligaments of shoulder joint are:

- **Superior Glenohumeral ligment:**

Restrains the inferior translation of humerus under resting position.

- **Middle Glenohumeral ligament:**

It resists inferior translation during abduction and external rotation.

Restrains anterior translation during abduction 45 degrees

- **Inferior Glenohumeral ligament:**

Resists the motion during anterior , inferior and posterior translation.

- **Coraco humeral ligament:**

Refrains inferior translation in people with under developed superior glenohumeral ligament.

Provides a tunnel for bicepial tendon.

## Question 3:

### **Indiviuual and combine functions of rotator cuff muscles:**

**Rotator cuff muscles:**

- **Supraspiantus**

Abduction of shoulder.

- **Infraspinatus**

Lateral rotation

- **Subscapularis:**

Internal rotation

- **Teres Minor**

lateral rotation.

#### **Combined Functions:**

- The rotator cuff muscles are the dynamic stabilizers and are Glenohumeral joint compressor during elevation.
- They provide support to the glenohumeral joint all around except inferiorly and prevents dislocation of shoulder joint .
- The rotator cuff muscles does not support the glenohumeral joint inferiorly therefore the head of the humerus is usually dislocated inferiorly.

#### **Question 4**

#### **Lateral Epicondylitis:**

The swelling and inflammation of lateral epicondyle and tendon of distal humerus is called lateral epicondylitis.

- lateral epicondylitis is frequently found in tennis players that's why it is called tennis elbow.
- It is caused by the use of improper equipment and poor technique.
- This kind of injury is called the over use injury.
- If the condition is left untreated then the calcium deposits accumulate and ossification of ligaments occurs.

#### **Treatment:**

- **Rest:** The first step of the treatment is proper rest which means avoid participation in sports or any other athletic activity.
- **Ice and compression:** Icing and compressing the elbow can help reduce the inflammation and relieve the pain.
- **Physical therapy:** Specific exercises are required for the strengthening of

the muscles of forearm. Ultrasound, ice massage or muscle stimulating techniques are performed to improve muscle healing.

- **Exercises:** Improving grip strength by building arm muscles can help improve the inflammation.
- 1. **Fist Clench:** Rest your forearm on a table and hold a rolled up towel in your hand, squeeze the towel in your hand for 10 seconds. Repeat ten times.
- 2. **Supination with dumbbell:** Hold a 2 pound dumbbell vertically in your hand. Holding the dumbbell rotate the arm outward, turning up the palm while keeping the upper arm still. Repeat the procedure 20 times.
- 3. **Wrist extension:** Holding a 2 pound dumbbell, face the palm downward and extend the wrist towards your body.
- 4. **Wrist flexion:** By holding a 2 pound dumbbell, face your palm upward and flex your wrist towards your body.
- 5. **Towel Twist:** Keeping your shoulder relaxed and holding a towel in your hand twist it in opposite directions.

**Conclusion:** These exercises will help improve the strength of the forearm muscles. Repeating these exercises and avoiding overuse activities can prevent this issue in the future.

### Question 5:

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

##### **Type 1 :**

1. Also called slow oxidative muscle fibers
2. They have slow myosin ATPase activity therefore they are recruited first.
3. They have high myoglobin content but contain low glycogen levels.
4. They use aerobic glycolysis for ATP synthesis.
5. They contain many mitochondria and capillaries which allows them to have high oxidative capacity that's why they have slow rate of fatigue.
6. They are more efficient for a long period of time.

7. They are mostly used for endurance exercise like long distance running.
8. They have small motor neuron size.
9. They require low force production
10.       Slow contraction time.

**Type 2:**

1. Also called fast oxidative fibers.
2. They are recruited second during exercise because of fast myosin ATPase activity.
3. They also have high myoglobin content but have high or moderate glycogen level.
4. They use anaerobic respiration for ATPase synthesis.
5. They have fast contraction speed.
6. They have large size motor neuron.
7. They fatigue more quickly
8. They require high force production.
9. They have many capillaries and mitochondria.
10.       They have high glycolytic and oxidative capacity.

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**THE END....**