



SHOULDER AND ELBOW INJURIES

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WEEK 9 OBJECTIVES

- OBJECTIVES:
 - 1. Review anatomy of the shoulder and elbow.
 - 2. Describe the signs and symptoms of acute and chronic injuries to the shoulder and elbow.
 - 3. Identify common functional and structural issues related to the shoulder and elbow.
 - 4. Perform objective tests on the shoulder and elbow.
 - 5. Perform examination on shoulder and elbow using goniometers, and systematic checklists for exam.

SHOULDER INJURIES

- ANATOMY

- Highly mobile joint that is supported by ligaments, capsule, and glenoid labrum.
- Stabilization comes from the Deltoid and Rotator Cuff muscles.
- Scapula movement is crucial to proper functioning of the shoulder.
- Many stresses placed on the shoulder especially in highly repetitive overhead activities like throwing.
- Relationship of 2:1 after 30 degrees of shoulder abduction to scapular upward rotation. After 60 degrees in shoulder flexion.
- 18 muscles affect the shoulder girdle/joint motion. 11 act on the shoulder joint. 6 act on the shoulder girdle.
- Rotator cuff muscles act to depress the head of the humerus as the deltoid abducts the arm.
- Brachial plexus innervates all shoulder muscles except the trapezius and levator scapulae.

ACUTE INJURIES

- BONE CONTUSIONS
 - Repetitive injury to the acromion process aka Blocker's exostosis or spur.
- MUSCLE CONTUSIONS
 - Repetitive stress to the biceps muscle which creates a hematoma that has not dissipated. This creates a calcification called Myositis ossificans.
- GLENOHUMERAL JOINT SPRAINS
 - Not common due to the already existing laxity. Dislocations or subluxations affect the humeral head more.

- ACROMIOCLAVICULAR JOINT SPRAINS

- Most commonly sprained or separated joint.
- Usually occur from a fall or direct contact with the shoulder or outstretched hand.
 - 1st degree: Localized pain, point tenderness and swelling. Pain with 120 degrees abduction and horizontal Adduction.
 - 2nd degree: Partial tear of ligament with increased pain symptoms, swelling and disability of the arm above 90 degrees of motion. Can affect coracoclavicular ligament with possible elevation.
 - 3rd degree: Complete rupture of the ligament's). Will have severe pain and unwilling to lift the arm. Elevation and swelling at the clavicle.

- STERNOCLAVICULAR JOINT SPRAIN

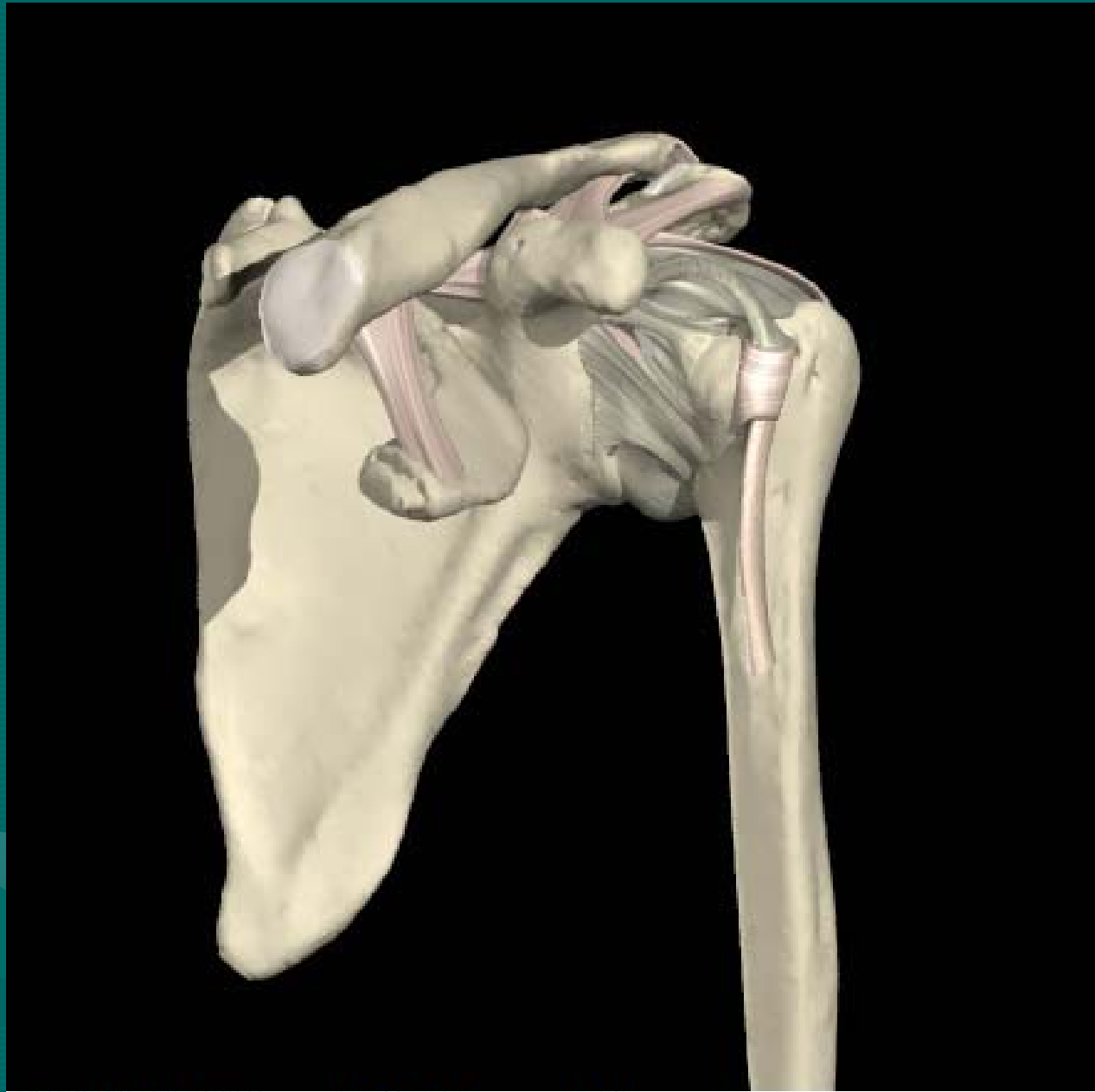
- Very stable joint and infrequent injury to joint.
- Injury occurs with anterior directed force or blow.
- Localized pain, swelling, and point tenderness.

- EXAM

- Visual exam
- Bounce test

- TREATMENT/PREVENTION

- Rest, ice, mobilization



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SHOULDER STRAINS

- ROTATOR CUFF INJURIES
- ANATOMY
 - Injuries occur at the muscle or musculotendinous junction
 - Flexors
 - Extensors
 - Abductors
 - Adductors
 - Internal rotators
 - External rotators
- SYMPTOMS
 - Pain with active or resisted movement
 - Usually occurs with ballistic arm activities
 - Forced concentric contractions during acceleration and excessive eccentric loading
 - Poor conditioning
 - Muscle fatigue
 - 1-3rd degrees of strains
- EXAM
- Resisted flexion, extension, abduction, adduction, external rotation, and internal rotation.
- TREATMENT/PREVENTION
 - Proper warm-up
 - Proper training principles
 - Improvement in form



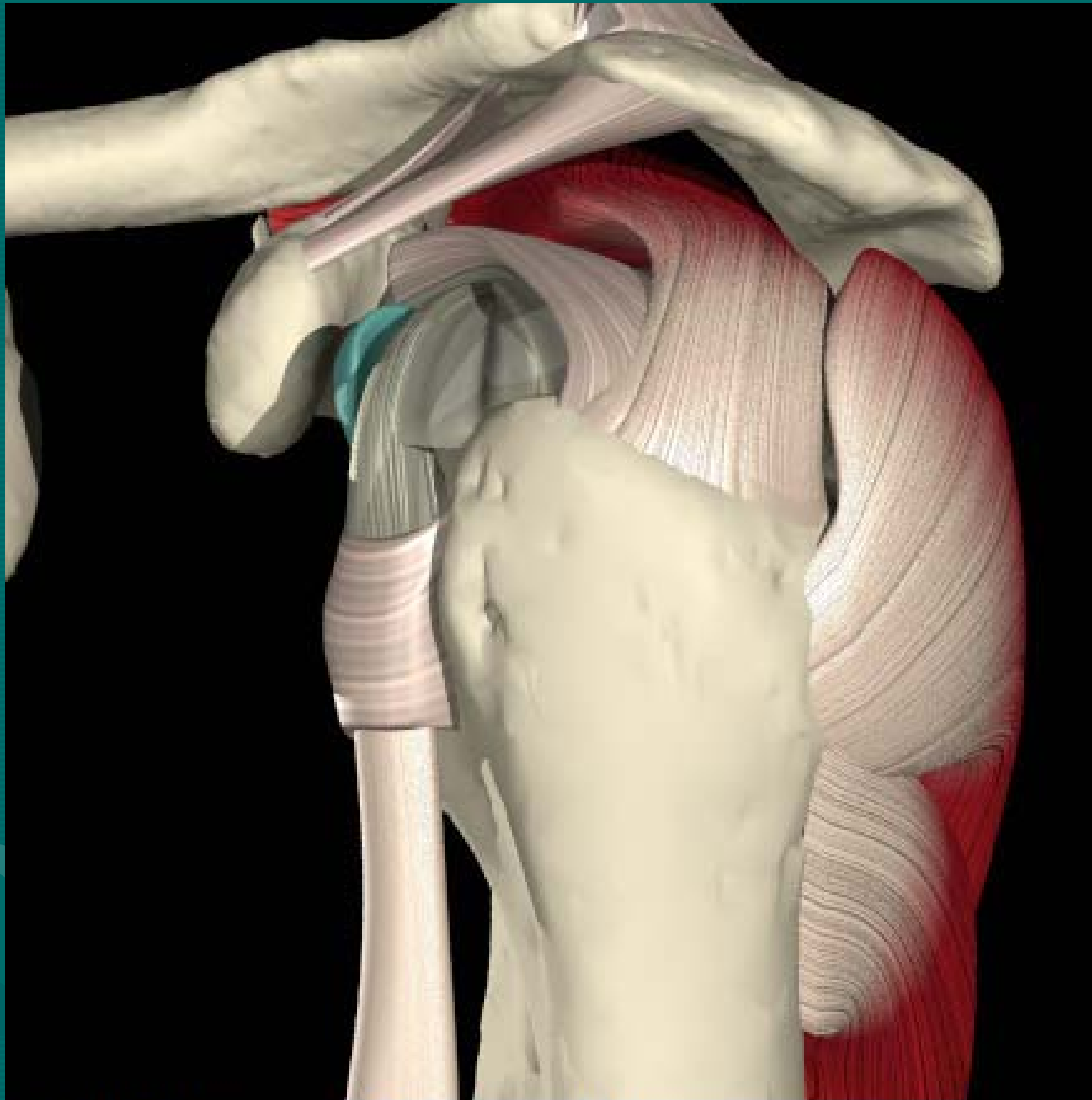
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SHOULDER IMPINGEMENTS

- ANATOMY
 - Impingement of the subacromial space that decreases the space of the Supraspinatus tendon and bursa.
- SYMPTOMS
 - Occurs with repetitive activities overhead in occupations and sports.
 - Can result from age, instability of glenohumeral joint, muscle weakness, inflammation secondary to overuse syndrome, and bony abnormalities.
- EXAM
 - Anatomically the acromion process is curved or hooked.
 - Weak rotator cuff muscles (infraspinatus and supraspinatus) which causes the humeral head to sit more superior and pinch the supraspinatus tendon.
 - Bone spur formations with age
 - Acute injury that leads to inflammation and then impingement.
 - Stage I: younger athletes with edema in rotator cuff. Pain with activity with little or no weakness, ROM good.
 - Stage II: Thickening of the bursa and supraspinatus tendon. Pain with activity or no activity.
 - Stage III: Partial to full tears of rotator cuff. Maybe bony changes in acromion. Constant pain with restricted ROM.



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- EXAM

- Had a fall on shoulder or outstretched hand
- Drop test (supraspinatus test)
- Empty can test
- Active impingement test
- Neer impingement test
- Hawkins-Kennedy test
- Apley's scratch test
- Impingement relief test
- Thoracic kyphosis

- TREATMENT/PREVENTION

- Control of inflammation
- Find the cause of the impingement
- Scapular positioning and strengthening
- Perform rotator cuff strengthening below 60 degrees
- High repetitions and low weight
- Strengthen and balance internal and external rotators of shoulder
- Flexibility of posterior shoulder muscles
- When pain free move into upper ranges of motion

BICEPS TENDINITIS

- ANATOMY

- The long head of the biceps tendon passes through the bicipital groove and under the transverse humeral ligament to its insertion on the superior glenoid labrum.

- SYMPTOMS

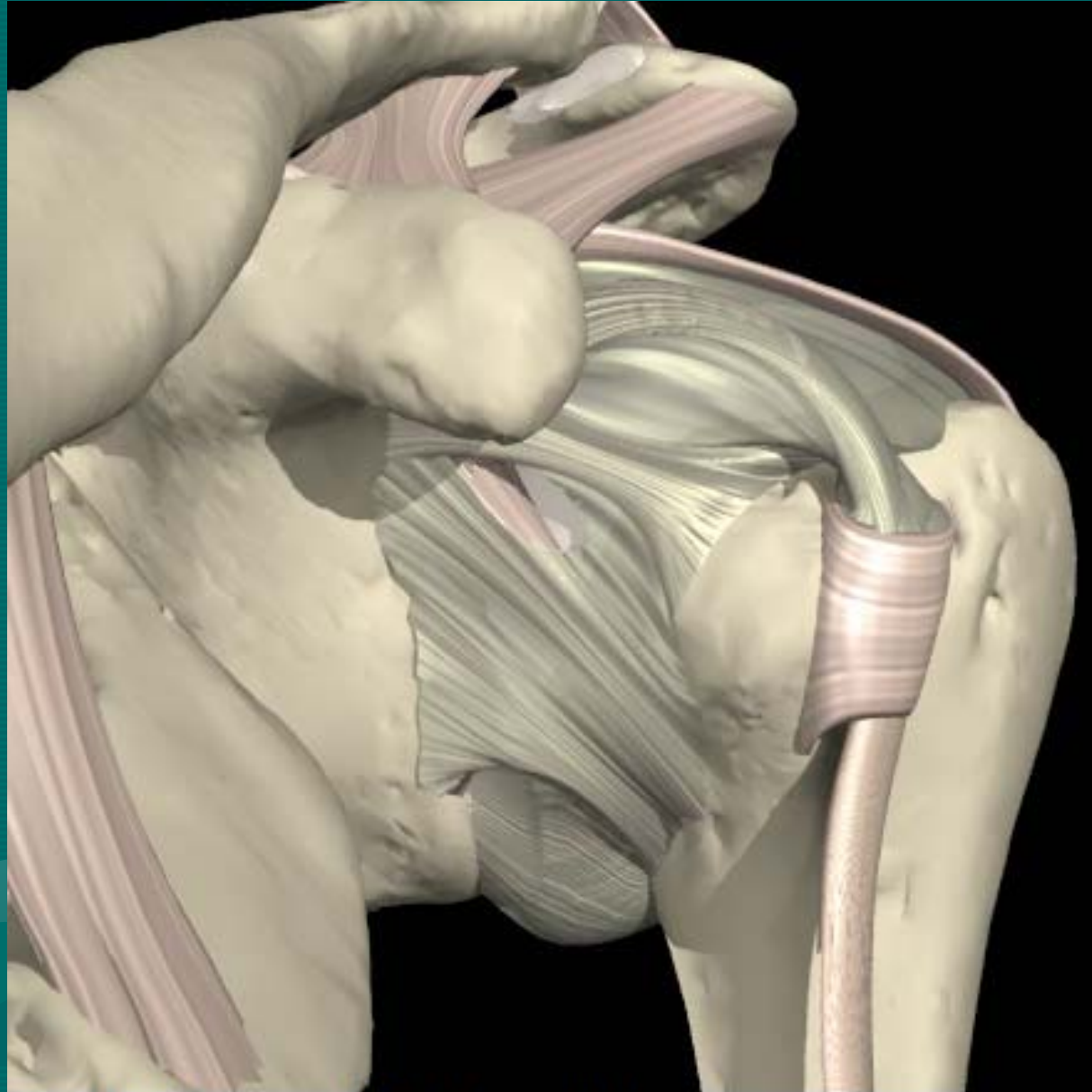
- History of overuse syndrome, direct blow, laxity in ligament, chronic irritation, or shallow or narrow bicipital groove.
- **Not a common injury alone, usually is associated with impingement syndrome of the rotator cuff.
- Anterior shoulder pain
- Pain with passive stretching of tendon and contraction of bicep with resisted supination.
- Throwing may be painful during late cocking and acceleration phase.
- Pain at the end range of a bench press.

- EXAM

- Speed's test
- Ludington's test
- Resisted supination

- TREATMENT/PREVENTION

- Ice
- Hands on practitioner work including massage and modalities
- Improve eccentric loading of the rotator cuff muscles
- Flexibility
- Increase speed of contraction
- Strengthen of the scapular muscles
- Thoracic spine extension



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INSTABILITY INJURIES

- ANATOMY

- Definition: inability to maintain the humeral head centered in the glenoid fossa.
- Fatigue with Pectoralis major, subscapularis, lats, teres major create an anterior weakness and the anterior ligaments go under stress which allows the head of the humerus to move anterior. This creates tightness and shortening posteriorly which pushes the humerus more anterior.
- Increased subluxation or dislocation with abduction and external rotation of the shoulder.
- Can be caused by direct trauma.
- Posterior, anterior, and inferior dislocations

- SYMPTOMS

- Apprehension, grinding or popping occur.
- Pain with repetition especially in abduction and overhead activities.
- Complaints of joint slippage
- Weakness, numbness, and tingling
- Impingement symptoms arise

- EXAM

- Apprehension test
- Load and shift test
- Anterior drawer test
- Posterior drawer test
- Inferior drawer test (Feagin)
- Sulcus sign
- Clunk test
- If suspected the individual needs to see practitioner

- TREATMENT/PREVENTION

- Rest, ice, and possible immobilization and surgery
- Strengthen the rotator cuff
- Strengthen scapular muscles (including serratus anterior, upper traps)
- Flexibility of subscapularis and posterior shoulder muscles
- NO work in external rotation, abduction, or extension for at least 6 weeks.

SCAPULAR WINGING

- ANATOMY
 - Medial border of scapula moves away from vertebral column.
- SYMPTOMS
 - Can create shoulder pain and impingement syndrome.
- EXAM
 - Visually the scapula “wings” outward.
 - Could have a history of nerve damage.
- TREATMENT/PREVENTION
 - Strengthening of the serratus anterior and trapezius muscles.

ELBOW INJURIES

The background is a solid teal color. A faint, semi-transparent silhouette of a hand holding a pen is visible, positioned behind the text. The hand is on the right side, with the pen pointing towards the left. The overall aesthetic is clean and professional.

ACUTE INJURIES

- CONTUSIONS

- Occur in the forearm and superficial bony areas. Symptoms include swelling, bleeding, and tenderness.
- Injuries to ulnar nerve due to its surface location can complain of radiating pain down the arm, hand, and 4-5 fingers.
- Pain will occur with active muscle contractions.

- SPRAIN

- Medial Collateral Ligament
 - Injured by excessive valgus stresses (most common)
- Lateral Collateral Ligament
 - Injured by excessive varus stresses
 - Injured more often in hyperextension with supination

- STRAINS

- Extensor and supinator groups
- Flexor and pronator groups

- BURSITIS

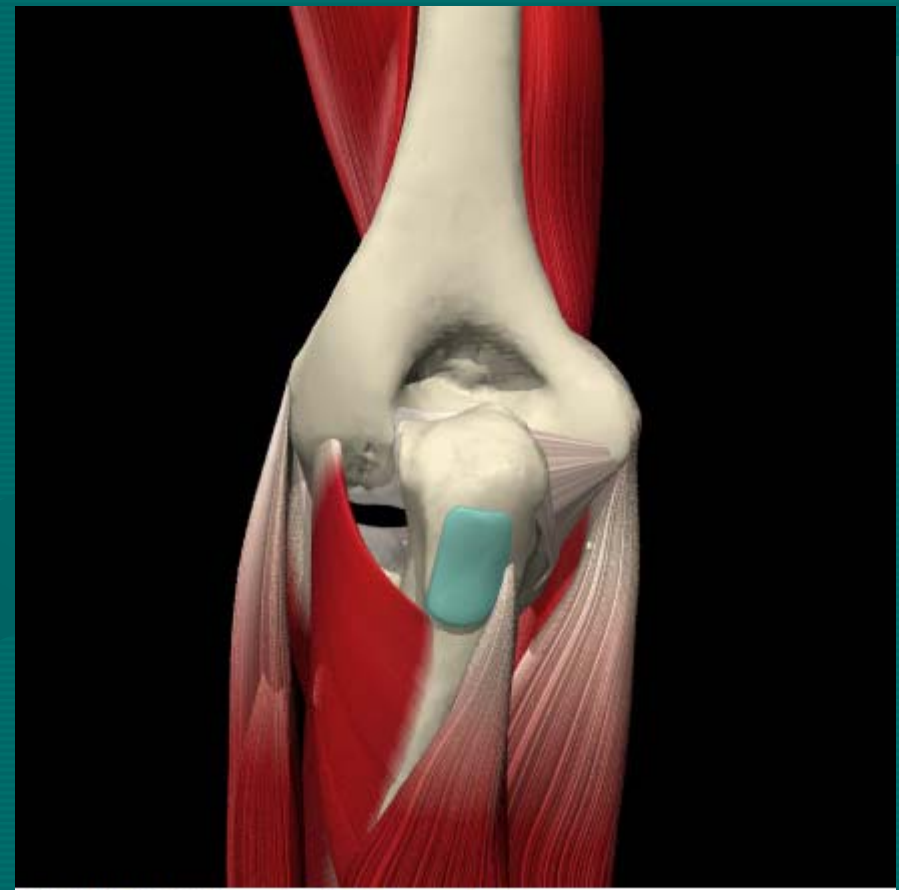
- Occurs over the bursa overlying the olecranon process
- Common in football and wrestling

- FRACTURES

- Distal humeral fractures (occur in children more often)
- Olecranon fractures (blow to posterior elbow)
- Radial fractures (fall on outstretched arm with it pronated) Pronation and supination will be painful.
- Forearm fractures (falls from outstretched arms, direct blow)



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MEDIAL EPICONDYLITIS

(Golfer's elbow)

- ANATOMY

- The elbow joint is very stable and supported by medial and lateral collateral ligaments. Injuries that occur traumatically can affect nerves and blood supply due to the proximity of these vessels.
- Stress injuries occur more often than traumatic.
- Medial injuries occur from the flexor-pronator group.

- SYMPTOMS

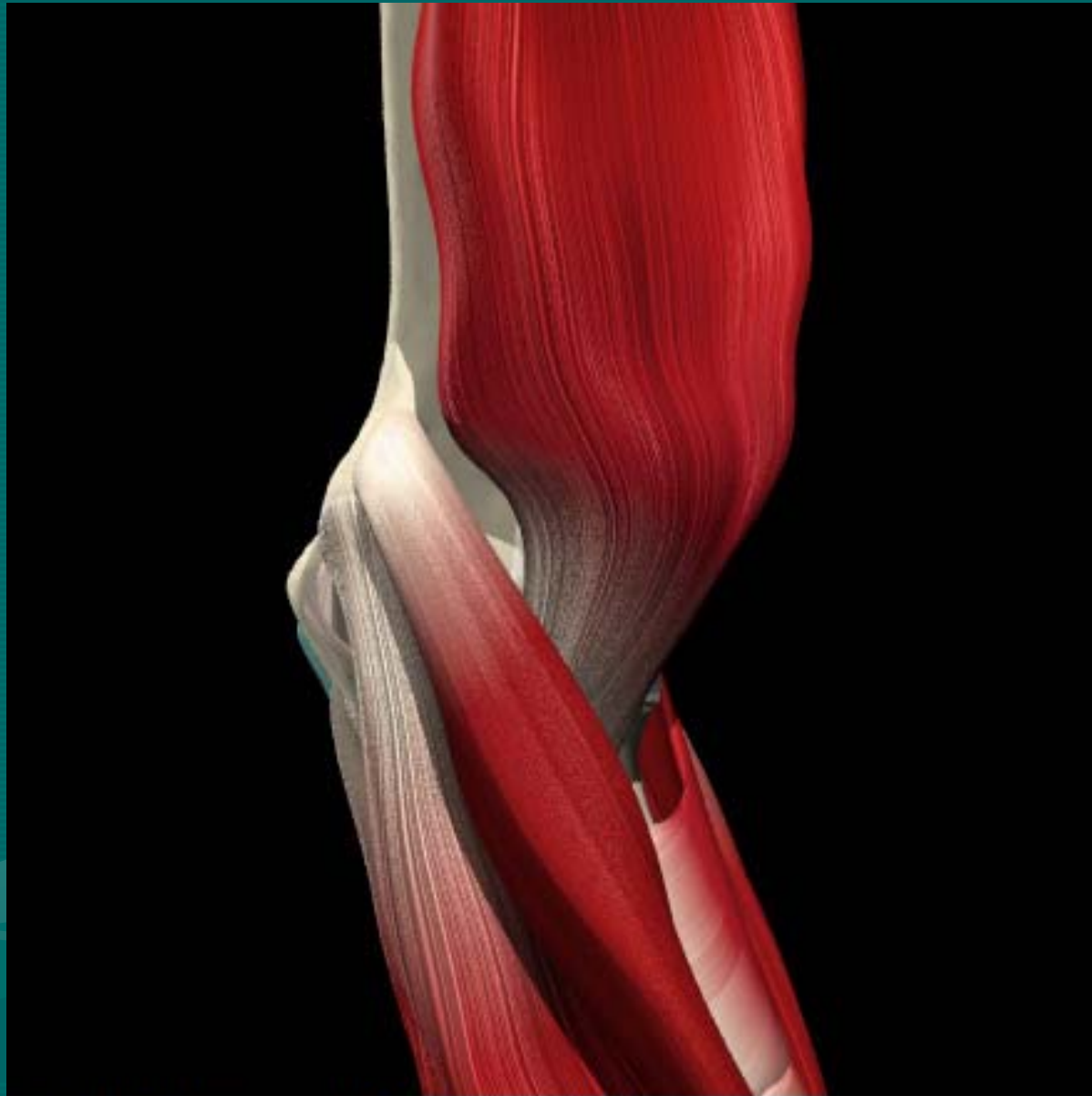
- Pain when gripping tightly or when flexing wrist and elbow.
- Pain does not radiate into the wrist.
- May have repetitive stress to area with activity

- EXAM

- Shortness in the flexor-pronator group
- Tightness in the Pectoralis minor, serratus anterior and subscapularis
- Resisted flexion of the wrist with an extended elbow increases symptoms
- Resisted pronation may also increase symptoms due to pronator teres.

- TREATMENT/PREVENTION

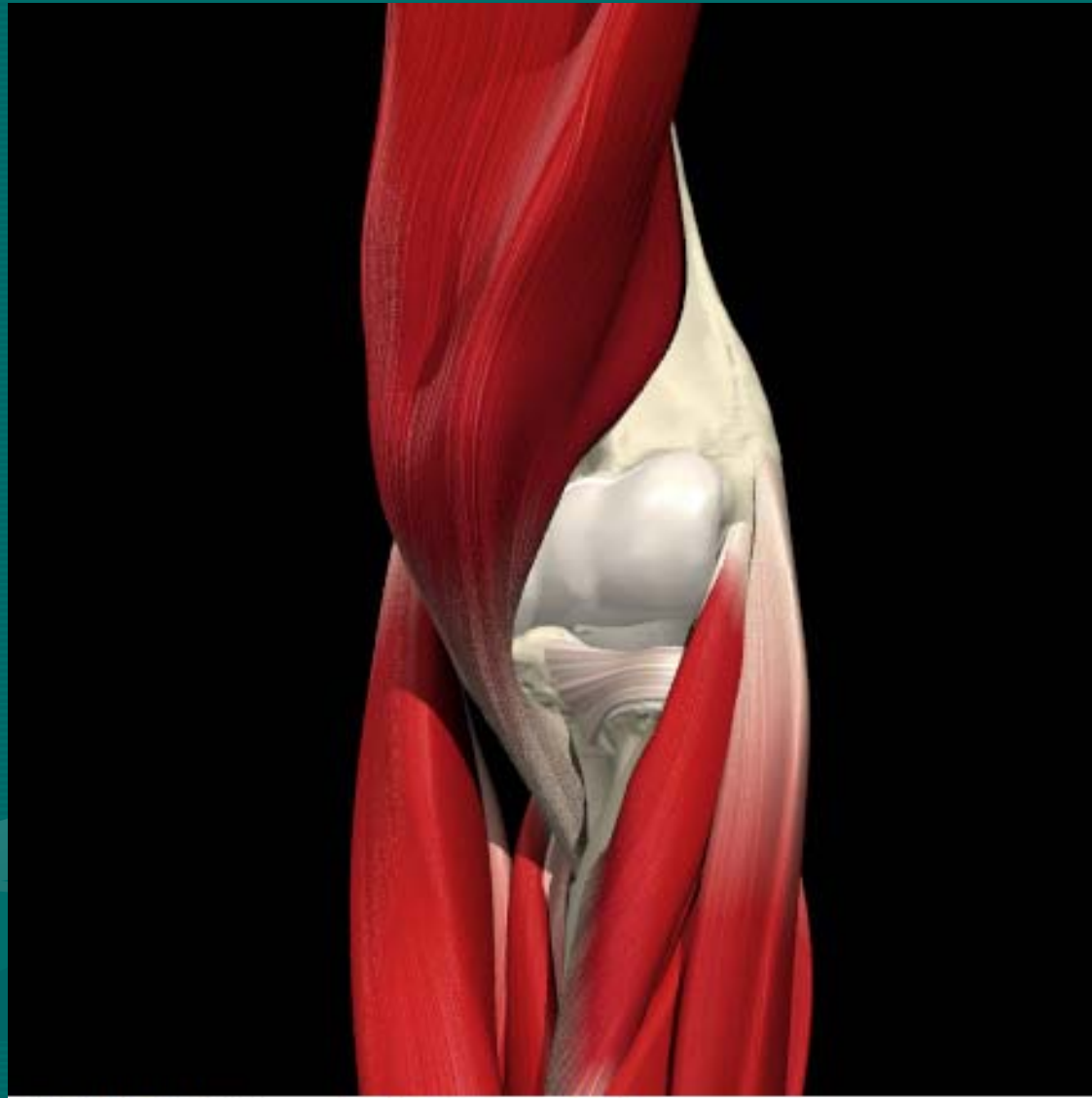
- Rest and ice
- Stretching 2-3 times a day
- Stop repetitive activity or take breaks during the day.
- Posture of upper extremity in pec minor, subscapularis, and serratus anterior
- Friction massage by a practitioner



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LATERAL EPICONDYLITIS (Tennis Elbow)

- ANATOMY
 - Primary involves the extensor carpi radialis brevis muscle.
 - Stressed when in wrist extension and supination
- SYMPTOMS
 - Slow onset of symptoms
 - Pain with gripping, and repeated flexion and extension of the elbow.
 - Pain at rest when severe
 - May have radiation of symptoms toward the wrist
- EXAM
 - Pain with gripping activities and wrist extension exercises
 - Pain also with passive/active wrist flexion and pronation while elbow extended.
 - Swelling and discoloration
 - Pain at rest, decreased ROM, and weakened grip strength
- TREATMENT/PREVENTION
 - Rest and ice
 - Bracing elbow
 - Night splint at night in 20 degrees of extension
 - Stretching exercises
 - Strengthening exercises (not until symptoms have subsided)
 - Massage techniques by practitioner
 - Correct mechanics of activity
 - Proper equipment if playing tennis



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