EXAMINATION OF THE SHOULDER

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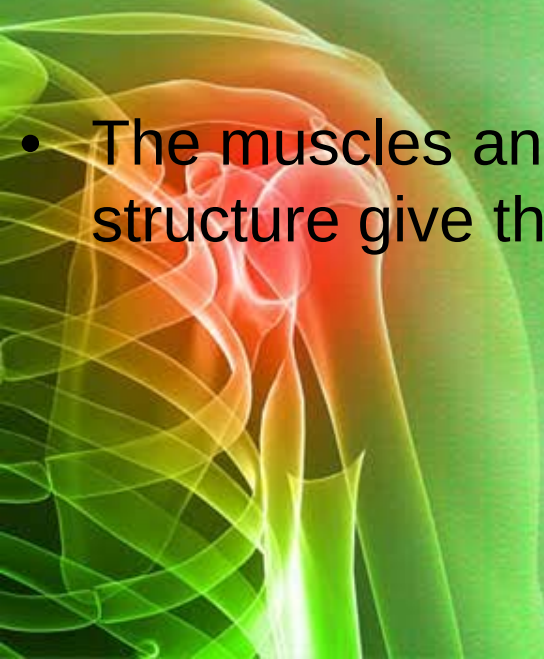
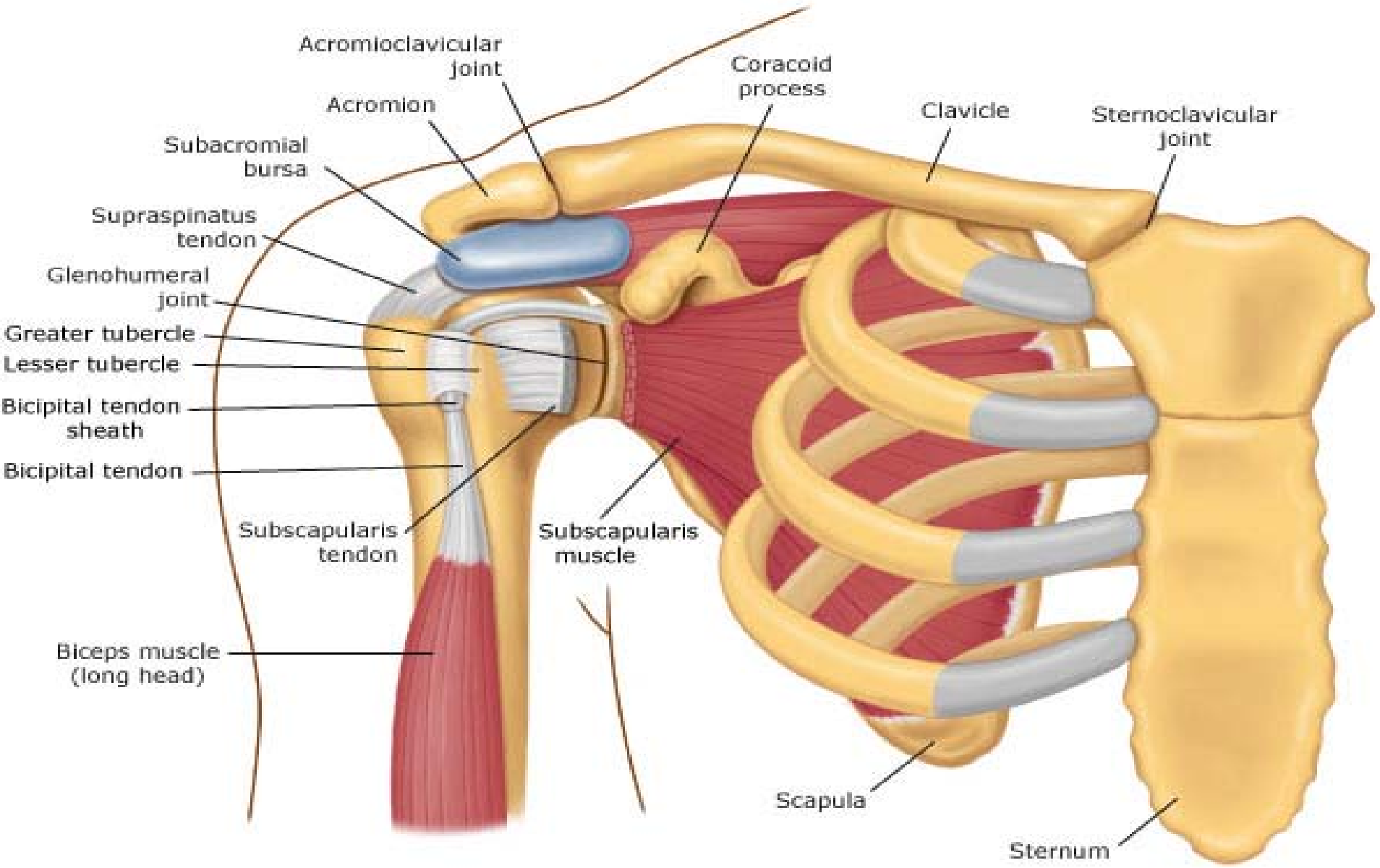
Opening Statements

- The shoulder is very unstable from a bony standpoint
- Stability is almost totally dependent upon the synergism of the musculotendinous units
- The muscles and a lack of restrictive bony or ligamentous structure give the shoulder tremendous range of motion.



Shoulder Anatomy Review



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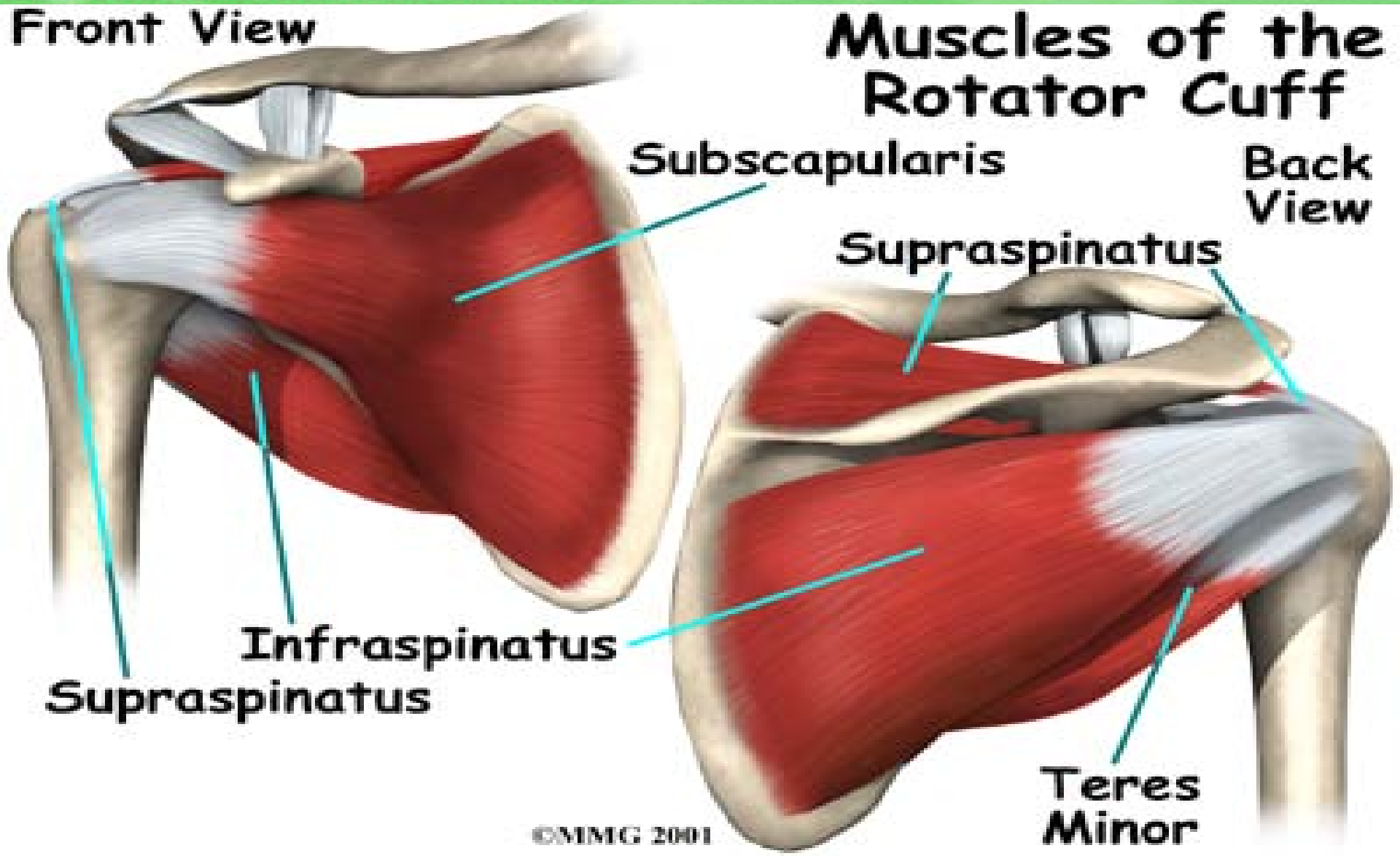
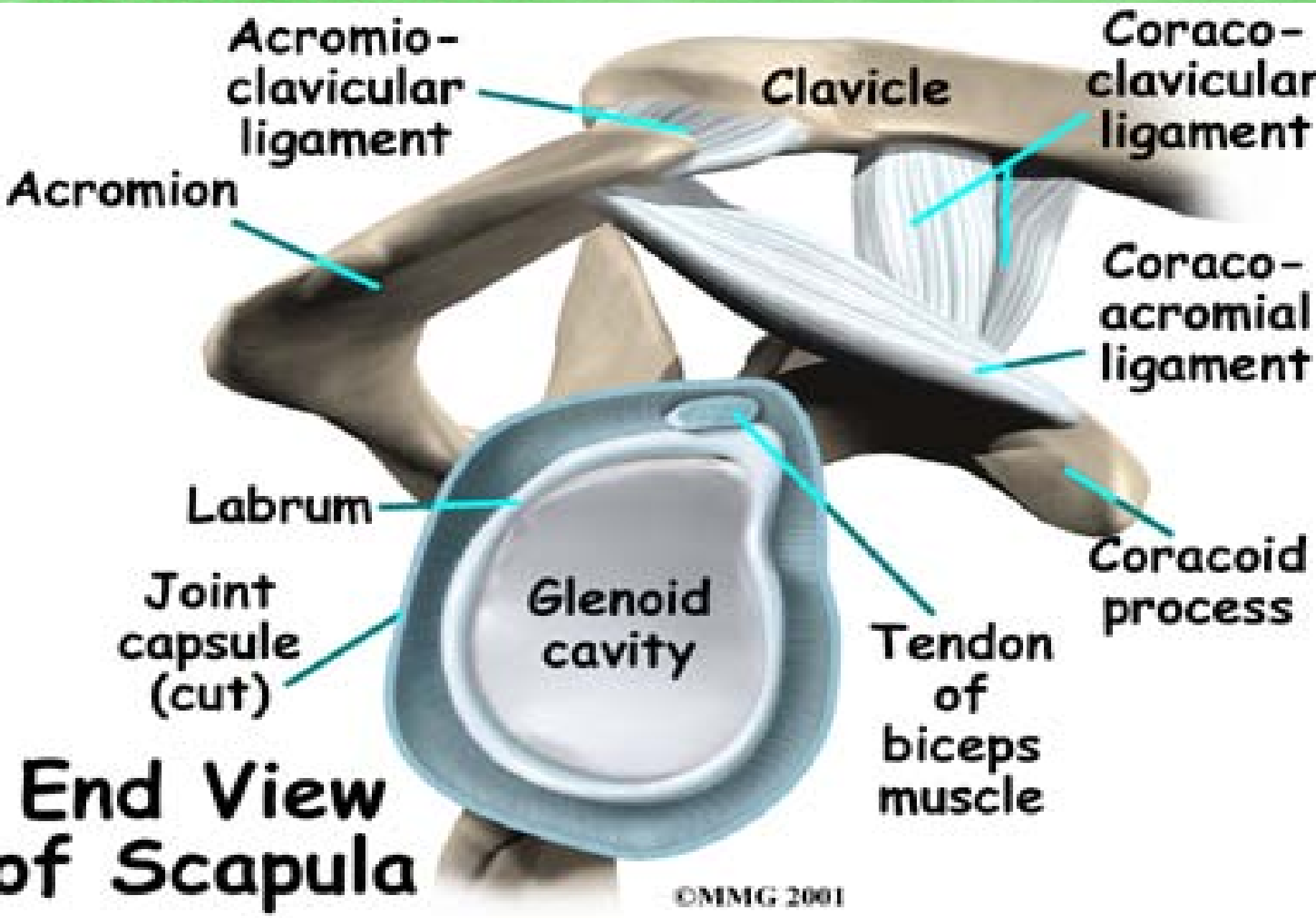


Functions of the Components of the Shoulder

- **Glenohumeral Joint**
  - * **Capsular ligaments**: joins the glenohumeral joint capsule anteriorly, inferiorly, and posteriorly
  - * **Coracohumeral ligament**: provides stability superiorly, preventing superior translation

- **Muscles of the Rotator Cuff**
  - ***Supraspinatus**: abducts the humeral head and acts as a humeral head depressor
  - ***Infraspinatus**: externally rotates and horizontally extends the humerus
  - ****Teres minor***: externally rotates and extends the humerus
  - ***Subscapularis**: internally rotates the humerus

Shoulder Anatomy Review



Functions of the Components of the Shoulder

- **Acromioclavicular joint**
  - **Coracoacromial ligament**: controls anterior and posterior translation of the lateral clavicle
  - **Coracoclavicular ligament**: controls vertical stability; restrains superior and anterior displacement
  - **Acromioclavicular ligament**: provides stability across the joint; restrains posterior translation and displacement of the clavicle

The Shoulder Labrum

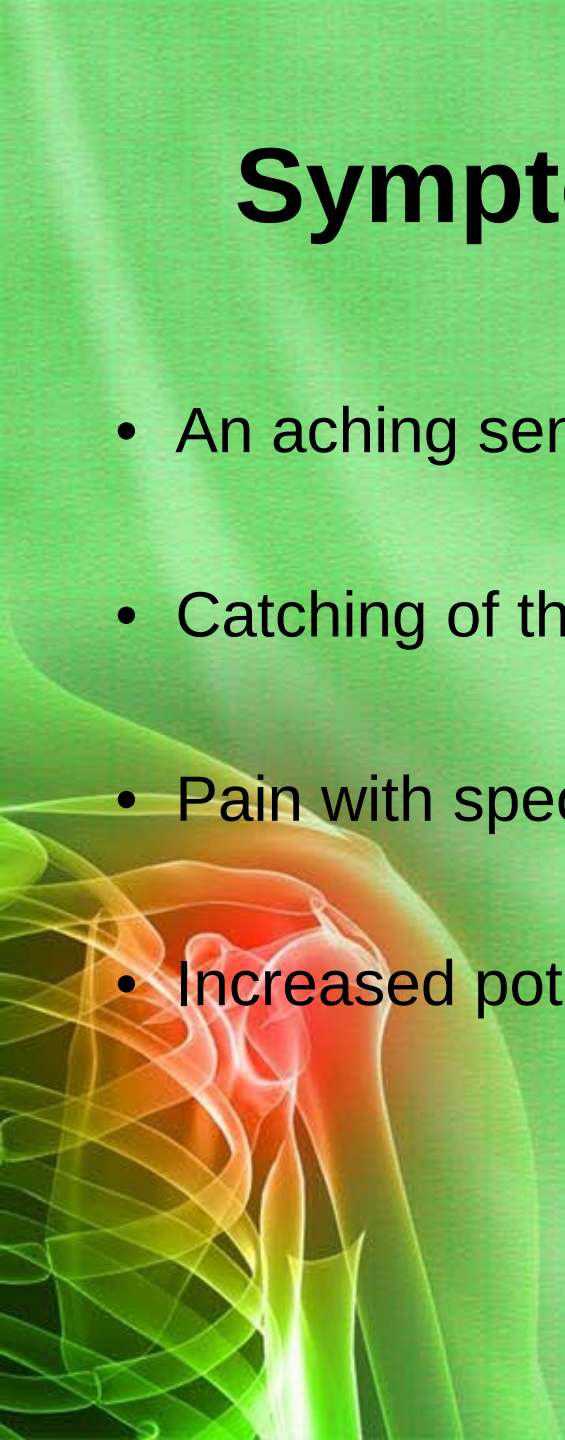
Labrum Definition and Function

- Its a cuff of cartilage that forms a cup for the end of the humerus to move within.

- This cuff of cartilage makes the shoulder joint much more stable, and allows for a very wide range of movements

Symptoms of a Torn Labrum

- An aching sensation in the shoulder joint
- Catching of the shoulder with movement
- Pain with specific activities
- Increased potential for shoulder dislocations



Labral Tear Patterns

- **Slap Tears:** Commonly seen in overhead throwing athletes. The torn labrum is at the top of the shoulder socket where the biceps tendon attaches to the shoulder.

- **Bankart Lesions:** Occurs when a shoulder dislocates. This makes the shoulder more susceptible to future dislocations.

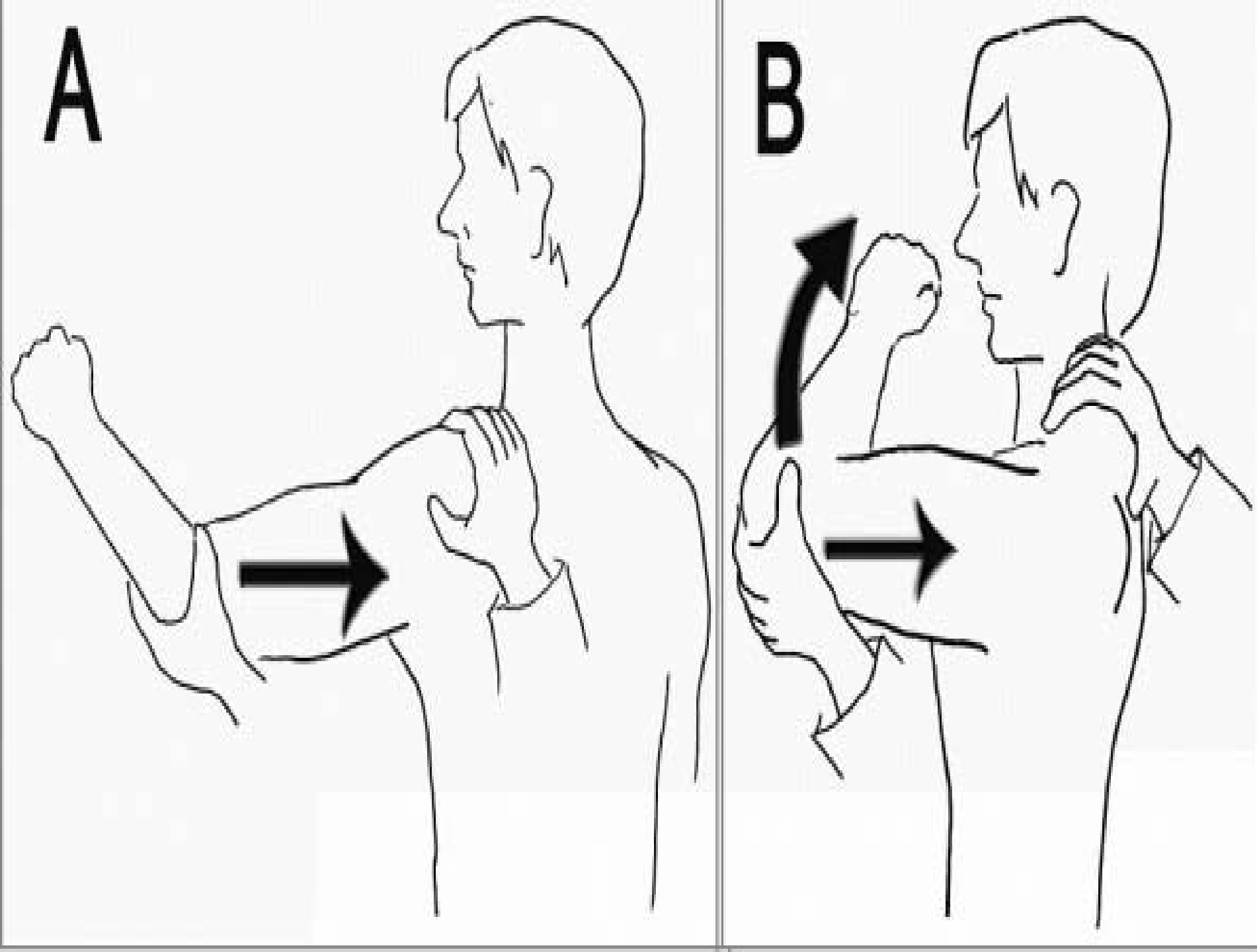
- **Posterior Labral Tears:** Sometimes seen in athletes in a condition called internal impingement. In this syndrome, the rotator cuff and labrum are pinched together in the back of the shoulder.

Labrial Test

- **Crank Test**: Performed with the patient lying and elevating the shoulder with the elbow flexed at 90 degrees. An axial load is applied while the arm is rotated internally and externally and circumducted

- **Jerk Test (Jahnke):** The patient sits with the arm internally rotated and flexed forward to 90 degrees. The examiner grasps the elbow and axially loads the humerus in a proximal direction. While axial loading of the humerus is maintained, the arm is moved horizontally across the body.

- **Push-Pull Test:** The patient is supine and the arm held at the wrist with the shoulder at 90 degrees abduction and neutral rotation. The examiner places the other hand on the proximal humerus and while pulling with the arm holding the patient's wrist, the examiner pushes with the arm on the proximal humerus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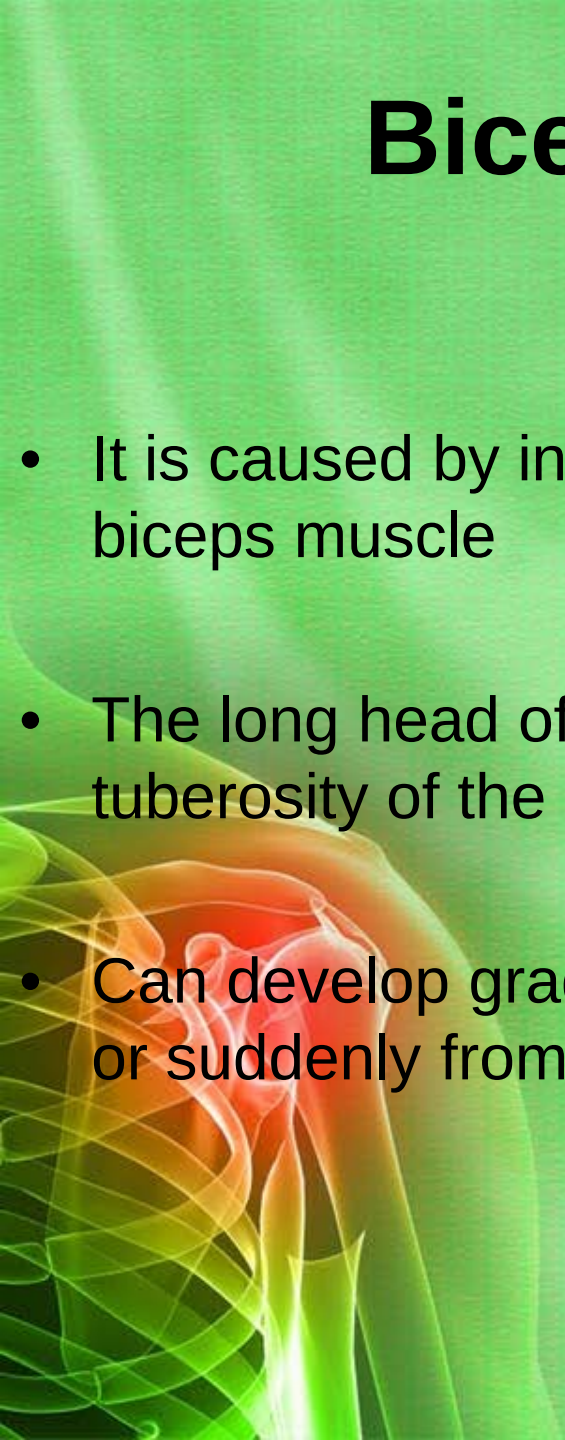
Treatment of Labral Tear's

- Treatment of a torn labrum depends on the type of tear that has occurred.
- Most labral tears do not require surgery
- Surgical intervention usually depends on shoulder instability and or pain

Bicep Tendonitis

Bicep Tendonitis Facts

- It is caused by inflammation of the long head tendon of the biceps muscle
- The long head of the biceps originates from the supraglenoid tuberosity of the scapula
- Can develop gradually as a result of overuse, aging, or stress, or suddenly from injury

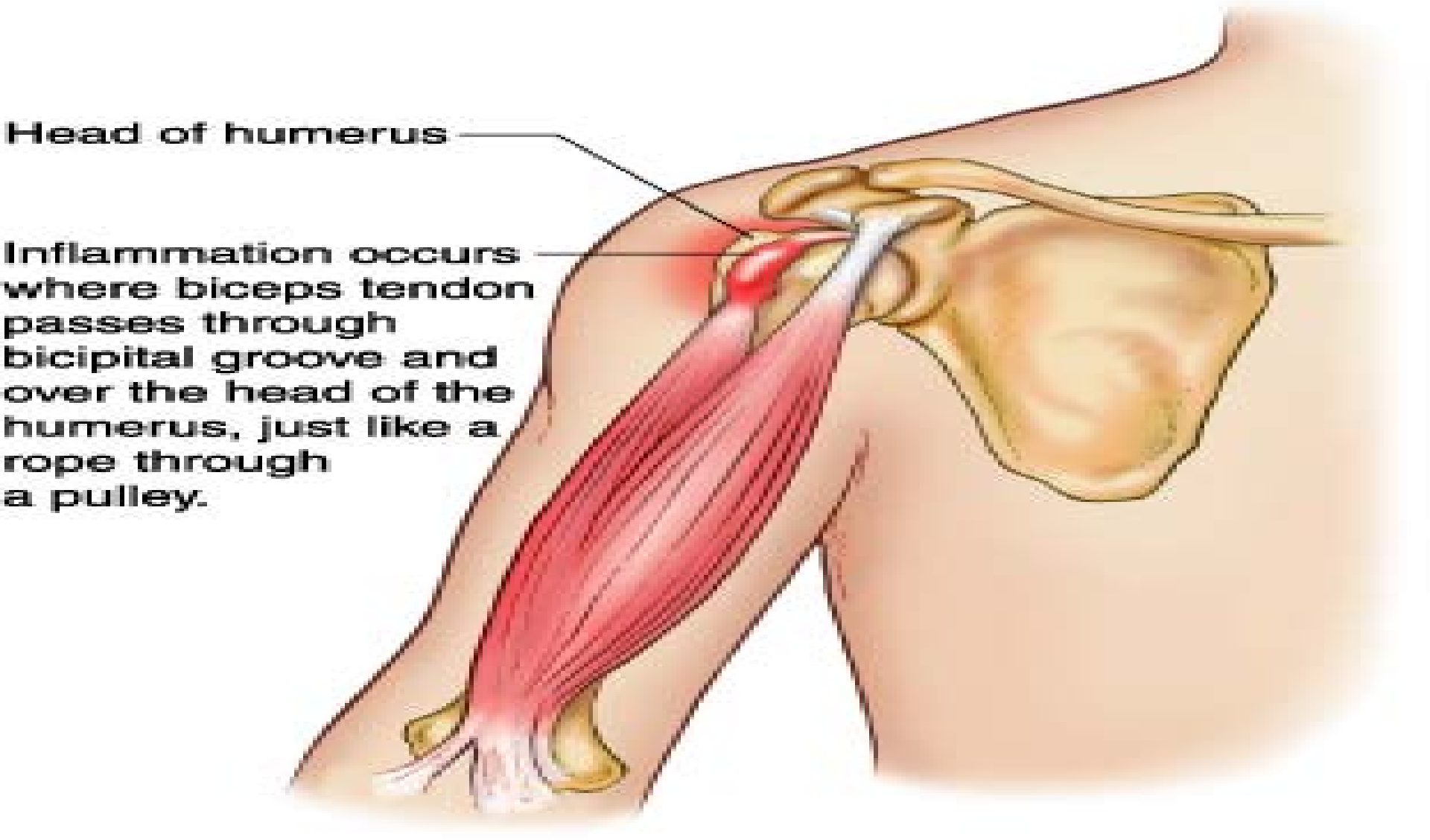


Function of the Bicep Tendon

- It helps to stabilize the head of the humerus during shoulder motion

- Assists in shoulder flexion when raising the arm.

Bicep Tendonitis

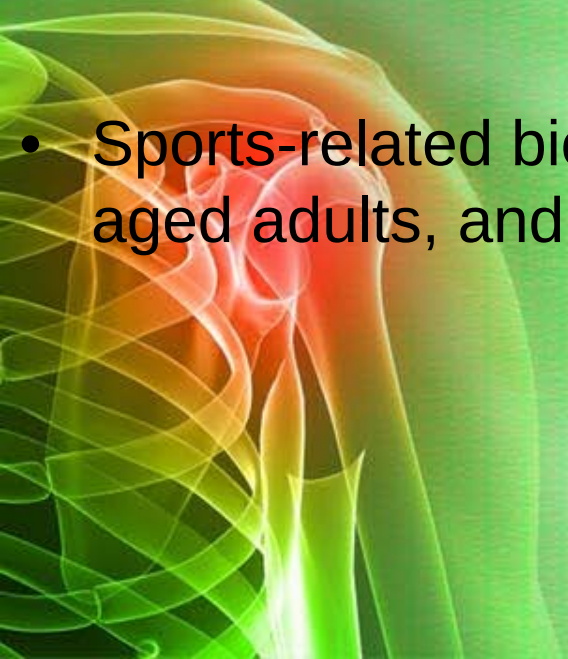


Bicep Tendonitis Risk Factors

- Those who perform frequent repetitive overhead motions such as carpenters, painters, and delivery or warehouse workers
- Those who perform overhead throwing motions such as baseball pitchers
- Those who participate in sports such as swimming, gymnastics, and racquet sports.

Biceps Tendonitis Incidence and Prevalence

- Biceps tendonitis is seen often in conjunction with rotator cuff disease and impingement syndrome
- Primarily diagnosed in men and women between the ages of 25 and 40
- Sports-related biceps tendonitis is reported in teens to middle-aged adults, and occurs equally in male and female athletes.



Examination Tests for Biceps Tendonitis

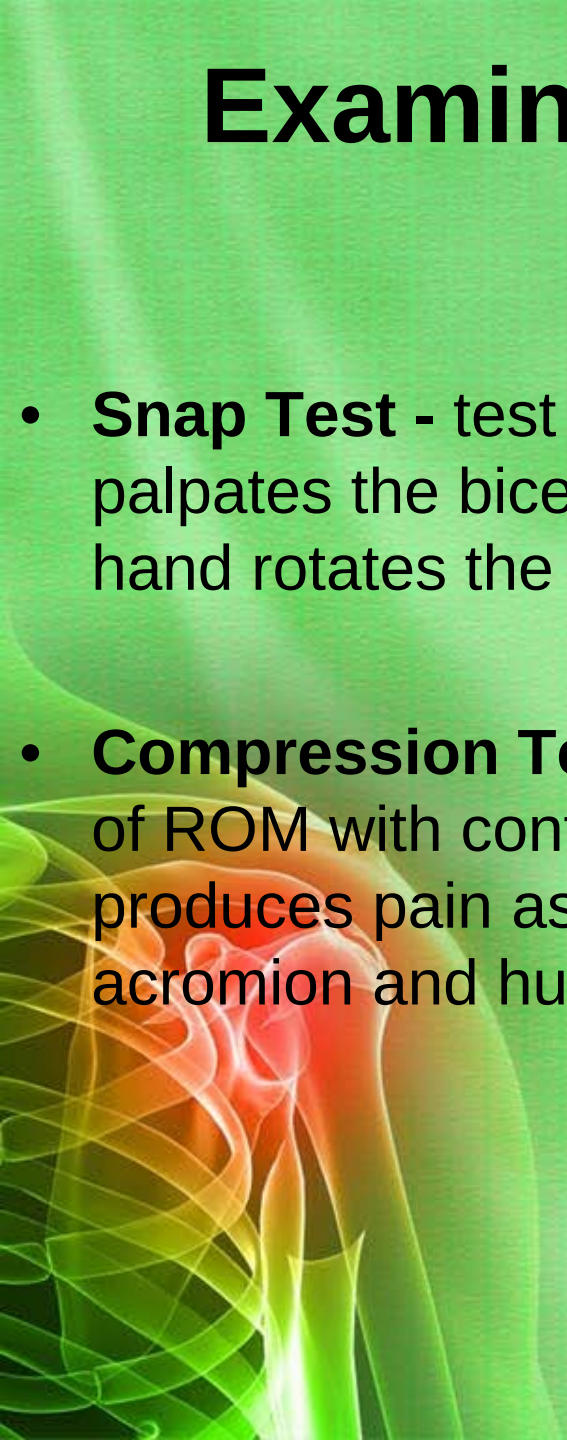
- **Speed test**: The patient complains of anterior shoulder pain with flexion of the shoulder against resistance, while the elbow is extended and the forearm is supinated. Sensitivity 90% Specificity 13.8%

- **Yergason test**: The patient complains of pain and tenderness over the bicipital groove with forearm supination against resistance, with the elbow flexed and the shoulder in adduction. Popping of subluxation of the biceps tendon may be demonstrated with this maneuver. *Sensitivity* 79% Specificity 43%

Examination Tests for Biceps Tendonitis

- **Snap Test -** test for subluxation of LHB. The examiner palpates the biceps groove with one hand whilst the other hand rotates the shoulder

- **Compression Test** - Passive elevation of the arm to the end of ROM with continued application of posterior pressure produces pain as a result of compression of LHB between the acromion and humeral head.



Treatment for Biceps Tendonitis

- Physical Therapy
- NSAIDS
- Transcutaneous Electrical Nerve Stimulation (TENS)
- Phonophoresis (Ultrasound) and Iontophoresis (Electrical) delivery of steroids into tissues
- Local steroid injection into bicipital groove

Impingement Syndrome

Impingement Syndrome Definition

- It’s a pathologic condition in which there is irritation of the Supraspinatus tendon secondary to abrasion against the under surface of the anterior one third of the Acromion.

- Pain usually lateral in shoulder

Impingement Syndrome Causes

- Anatomic abnormalities of the acromion
- Unfused acromial process
- Acromial malunion or nonunion
- Thickened Coracoacromial ligament
- Acromial slope
- Acromioclavicular joint enlargement
- Prominence of the greater tuberosity of the humerus
- Displaced greater tuberosity fracture
- Shoulder instability

Impingement Test

- **Hawkin's Test** With the arm in the throwing position and flexed forward about 30 degrees, forcibly internally rotate the humerus. Pain suggests impingement of the supraspinatus tendon against the coraco-acromial ligament

- **Jobe's Test.** The arm is held in the scapular plane as if pouring out a can of pop. If painful it is because the greater tuberosity is being driven up against the acromion

- **Neer's Test**: The arm is held at the side with elbow fully extended then internally rotated with thumb touching side of leg Then examiner passively forward flexes shoulder overhead to 180 degrees

Impingement Syndrome Treatment

- Physical Therapy 60%-90% improvement in most cases
- Subacromial Steroid Injection
- High-intensity laser therapy
- NSAIDs
- Subacromial decompression

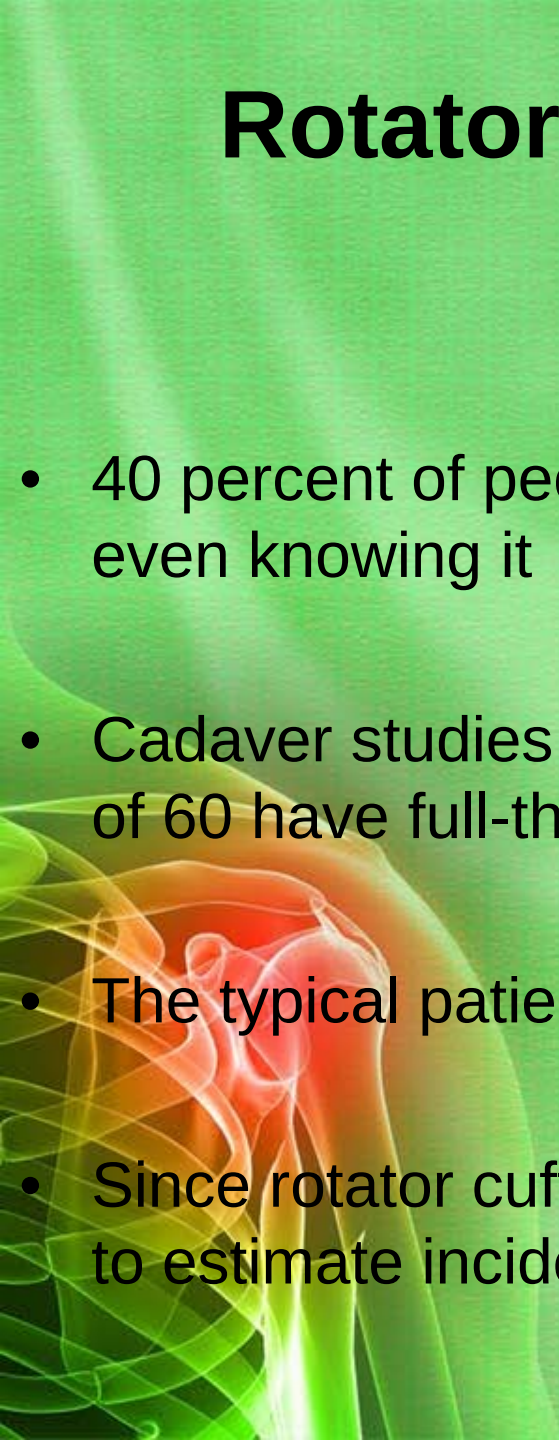
ROTATOR CUFF TEARS

What causes the rotator cuff to tear?

- The rotator cuff tendons have areas of very low blood supply.
- Degeneration from aging
- Repetitive shoulder motions
- Excessive force can tear weak rotator cuff tendons

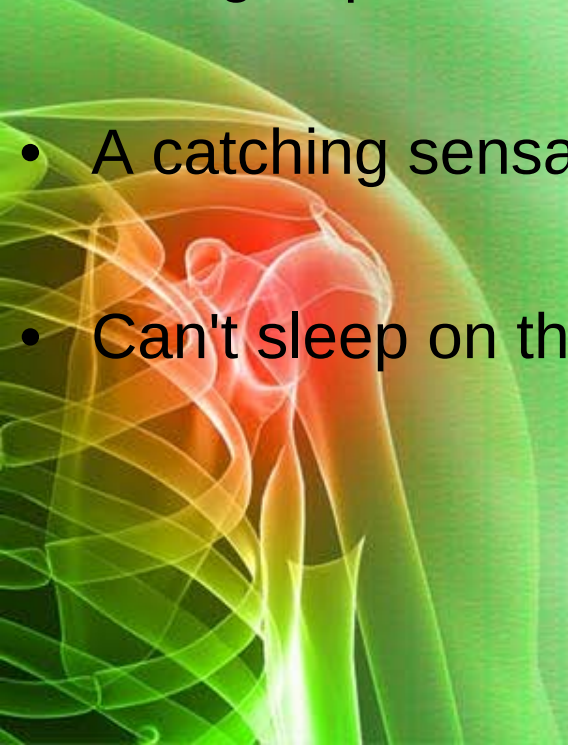
Rotator Cuff Tear Incidence and Prevalence

- 40 percent of people may have a mild rotator cuff tear without even knowing it
- Cadaver studies showed that 39% of individuals over the age of 60 have full-thickness tears
- The typical patient with a rotator cuff tear is in late middle age
- Since rotator cuff tears may produce no symptoms, it is difficult to estimate incidence and frequency.



Rotator Cuff Tear Signs

- Pain and weakness in the affected shoulder
- A vague pain in the shoulder area
- A catching sensation when you move your arm
- Can't sleep on the affected side due to the pain

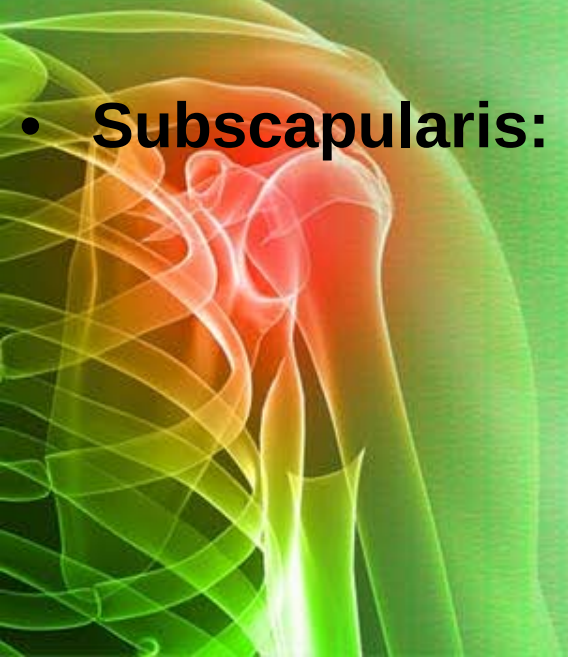


Rotator Cuff Muscle Function

- **Supraspinatus**: Contraction allows the shoulder to abduct
  Most commonly damaged of the rotator cuff muscle

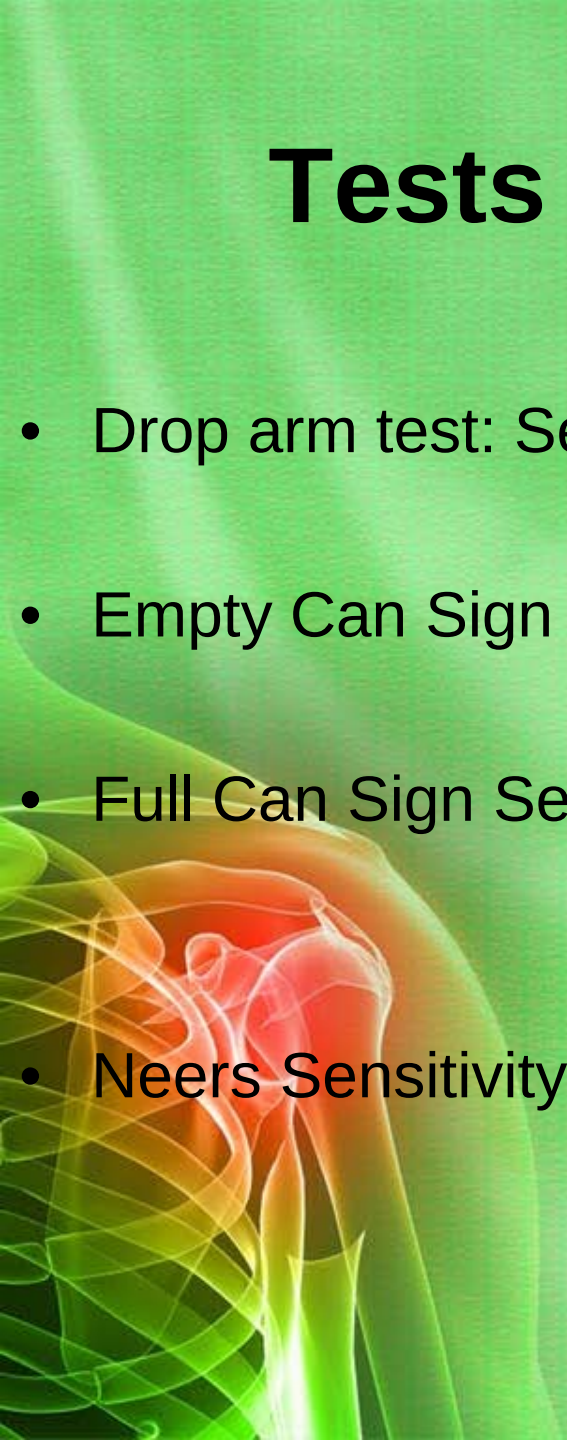
- **Infraspinatus/Teres Minor**: Contraction allows the arm to rotate externally

- **Subscapularis:** Contraction causes internal rotation.



Tests for Rotator Cuff Tear

- Drop arm test: Sensitivity: 27%; Specificity: 88%
- Empty Can Sign Sensitivity: 70%; Specificity: 65%
- Full Can Sign Sensitivity: 75%; Specificity: 65%
- Neers Sensitivity: 70%; Specificity: 35%



Acute Rotator Cuff Tear

- This tends to happen as a result of a sudden, powerful movement.

- The symptoms will usually include:
  - Sudden, tearing feeling in the shoulder, followed by severe pain through the arm
  - Limited movement of the shoulder due to pain
  - Severe pain for a few days
  - Specific tenderness (“x marks the spot”) over the point of rupture/tear
  - Inability to abduct your arm with severe tear

Acute Rotator Cuff Tear Treatment

- Apply ice to reduce swelling
- Control the pain with appropriate medications
- Rest the arm – a sling can sometimes be quite useful if you still need to go to work/school, which can be removed at night
- You may require imaging studies (x-ray, MRI, CT Scan) to identify what the problem is and rule out any fractures
- Consider consulting a physiotherapist who can assist you with rehabilitating the injury
- Surgical Intervention

Chronic Rotator Cuff Tear

- Develops over a period of time
- Occur at or near the tendon, as a result of the tendon rubbing against the overlying bone
- Usually found on the dominant side
- More often an affliction of the 40+ age group
- Pain is worse at night, and can affect sleeping
- Gradual worsening of pain, eventually some weakness
- Eventually unable to abduct arm (lift out to the side) without assistance or do any activities with the arm above the head
- Some limitations of other movements depending on the tendon affected

Chronic Rotator Cuff Tear Treatment

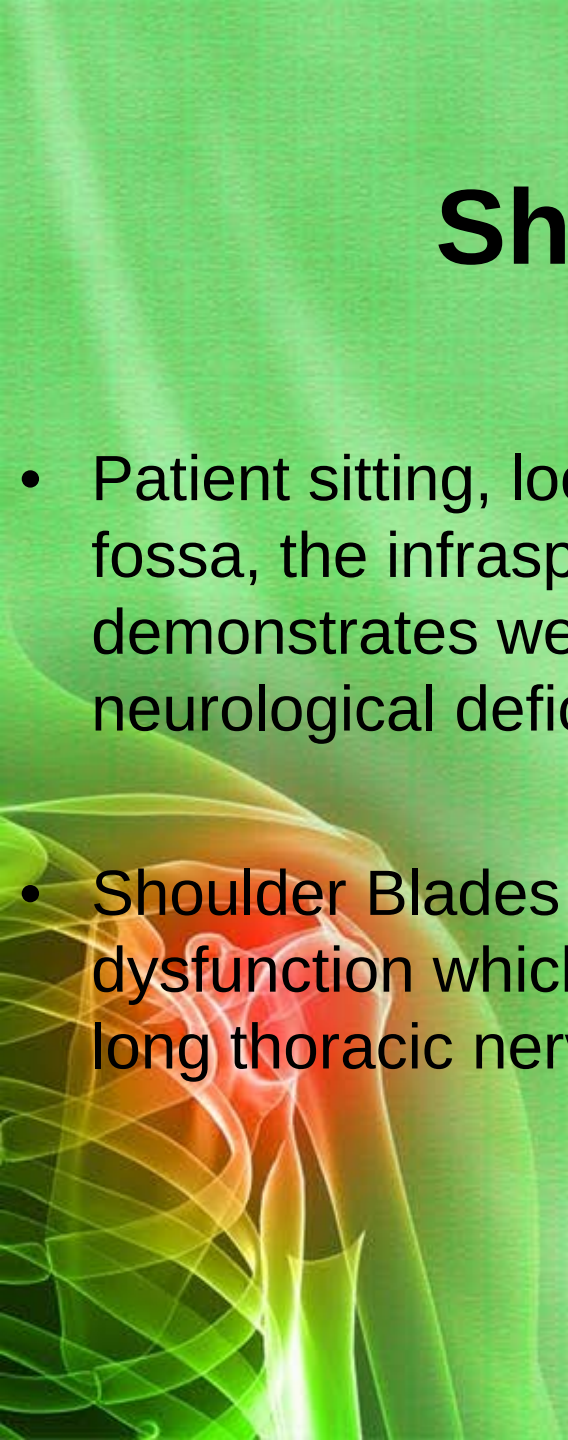
- Control pain
- Apply ice to reduce swelling and pain
- Alternating heat and ice may also be beneficial.
- Sometimes you might be referred for an injection of steroid medication directly into the site of the problem to help reduce any inflammation and allow you to proceed with rehabilitation
- Shoulder exercises which can be provided by a physiotherapist
- Surgical Intervention

Physical Evaluation of the Shoulder

Shoulder Inspection

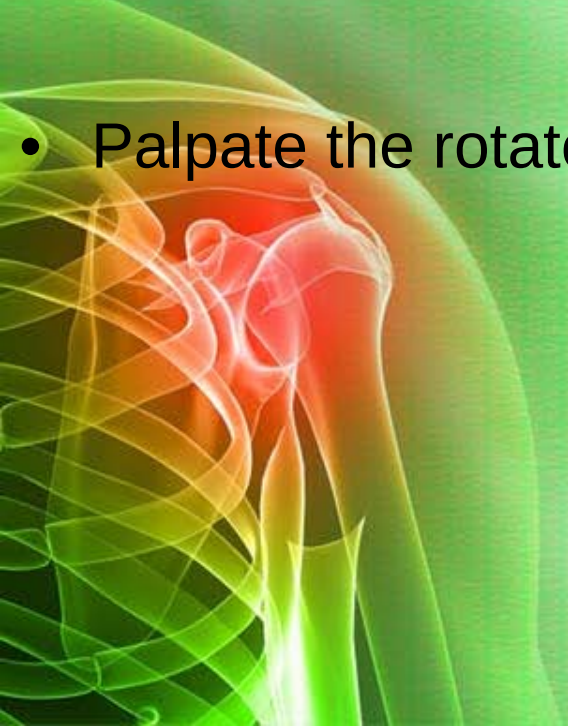
- Patient sitting, look for atrophy in three sites; the supraspinatus fossa, the infraspinatus fossa and the deltoid. This demonstrates weakness due either to a rotator cuff tear, or a neurological deficit

- Shoulder Blades look for winging or thoraco-scapular dysfunction which are a signs of instability and or injury to the long thoracic nerve. Wall push ups are ideal to identify this.



Shoulder Palpation

- Assess the clavicle and the posterior joint line.
- Palpate the Acromio-Clavicular joint, find the "soft spot" at the back of the clavicle, anterior to that is the A-C joint.
- Palpate the rotator cuff bursa



Range of Motion (ROM) Tests

- **External Rotation (Yergason's):**

  The patient is positioned sitting and the elbow is flexed 90 degrees. While the elbow is held against the patient's side, the examiner externally rotates the arm as permitted.

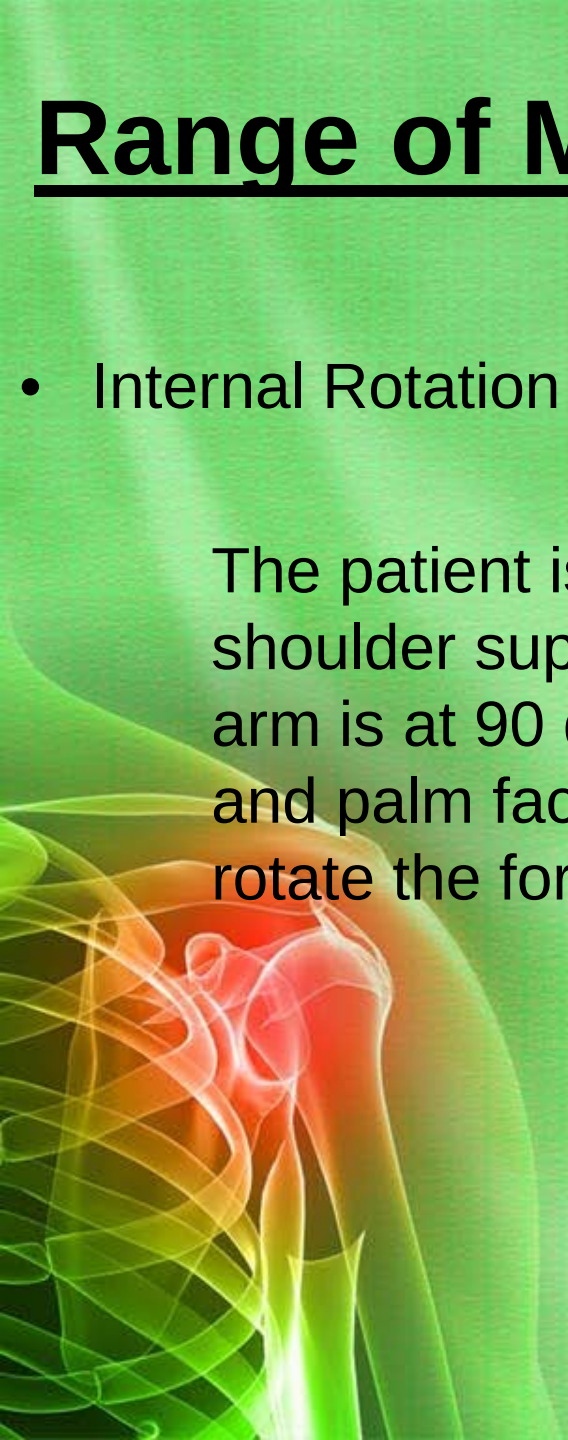
- **Internal Rotation (Lift Test)**

  The patient should be positioned sitting. Again with the elbows at the patient's side, the examiner should raise the thumb up the spine, and record the position in relation to the spine (reaching T7 is normal, unless bilateral symmetry is observed).

Range of Motion (ROM) Tests Con't.

- Internal Rotation at 90 degrees of Forward flexion (Hawkins):

  The patient is positioned sitting with the elbow and shoulder supported to prevent muscle contraction. The arm is at 90 degrees with the fingers pointing downward and palm facing posteriorly. The examiner attempts to rotate the forearm posteriorly as far as possible.

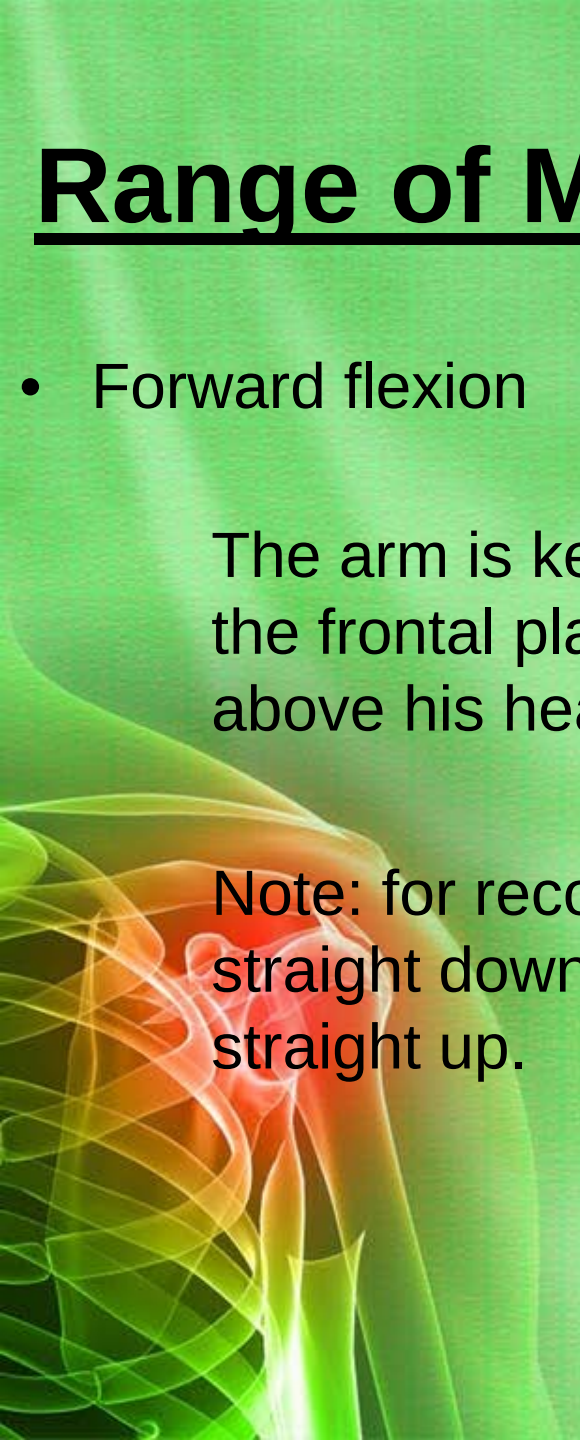


Range of Motion (ROM) Tests Con't.

- Forward flexion

  The arm is kept straightened and brought upward through the frontal plane, and moved as far as the patient can go above his head.

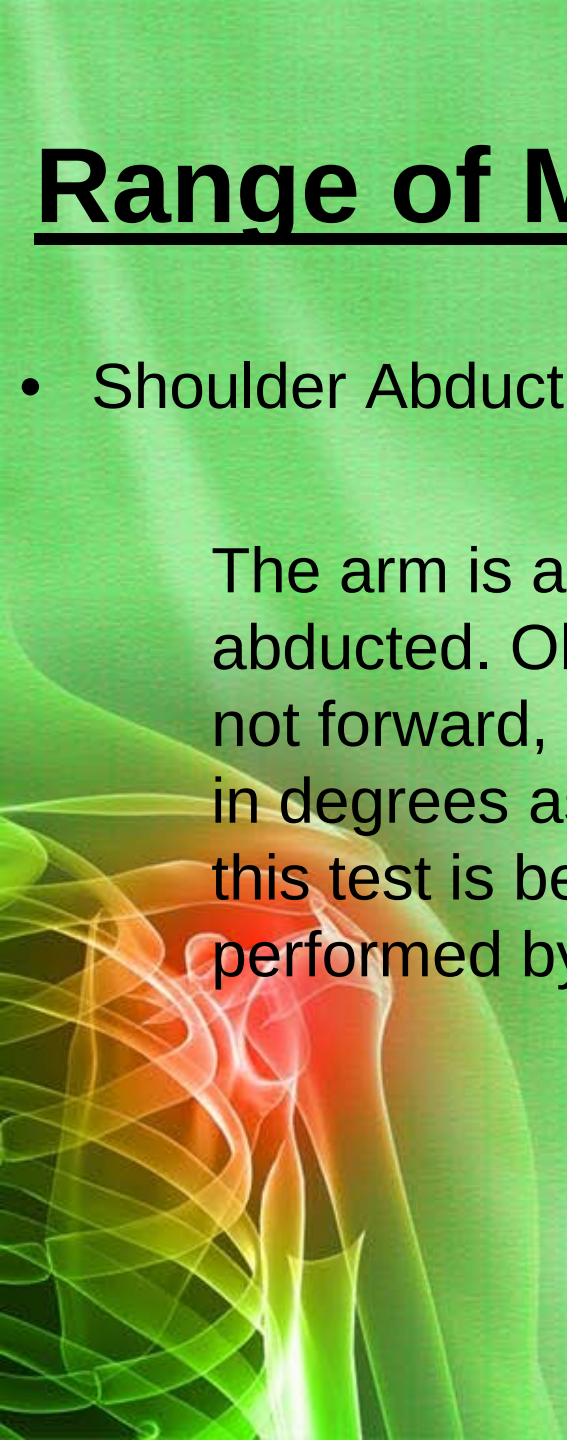
  Note: for recording purposes, 0 degrees is defined as straight down at the patient's side, and 180 degrees is straight up.



Range of Motion (ROM) Tests Con't.

- Shoulder Abduction: Active Test

  The arm is again kept straightened, while raised and abducted. Observe the twisting of hand facing outward, not forward, as in forward flexion. The ROM is measured in degrees as described for forward flexion. As pictured, this test is being done actively by the patient, but may be performed by the examiner as well.



Acromioclavicular (AC) Joint Testing

- **Palpation of AC Joint:**

  The patient's arm is kept at his side and the examiner palpates the AC joint for discomfort/pain and gapping.

- **Cross-Arm Horizontal Adduction Test**

  The patient places his hand on the opposite shoulder, while the examiner exerts force horizontally. Again, the presence of pain indicates possible pathology.

- **Obrien’s Test**

  The patient’s arm is flexed to 90° with the elbow fully extended and then adduct the arm 10-15°medial to sagittal plane. The arm is then maximally internally rotated and the patient resists the examiner's downward force.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Glenohumeral Laxity & Apprehension

- **Apprehension Test**

  Have the patient in the supine position, with the arm abducted 90 degrees. Rotate the shoulder externally by pushing the forearm posteriorly. If patient feels instability, they typically will balk when the test is performed.

- **Laxity Test (Gerber-Ganz Anterior Drawer Test)**

  Have the patient in the supine position. Stabilize the scapula, and slide the humeral head anteriorly and posteriorly within the glenoid fossa to evaluate the stability of the joint. Note the axial load being applied to the elbow.

- **Sulcus Sign**

  The patient's arm is held at his side in a position of rest. The arm is gently pulled downwards while the examiner looks and palpates for a depression below the shoulder

Impingement Tests

- **Impingement Test (Neers)**

  Position the patient sitting. Internally rotate the arm with the thumb facing downward, and abduct and forward flex the arm. If impingement is present, the patient will experience pain as the arm is abducted.

  Positive if pain is located in the sub-acromial space or anterior edge of acromion

  Sensitivity = 88.7%
  Specificity = 30.5%
  Reliability = 98%

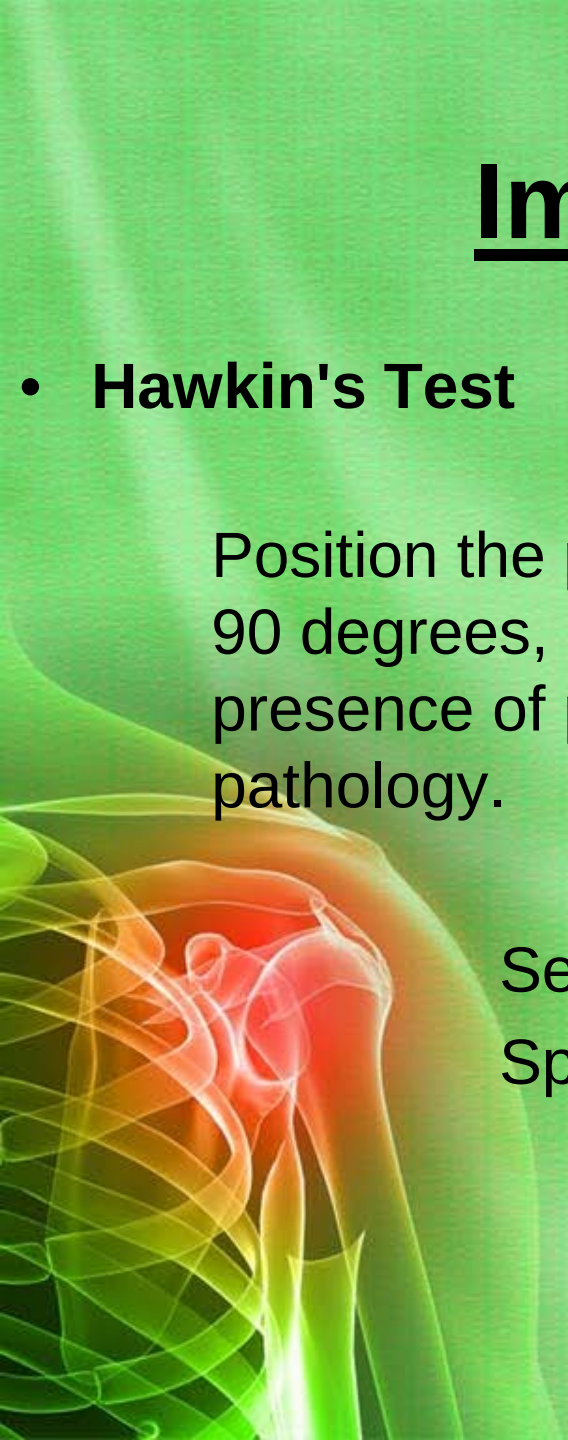
Impingement Tests

- **Hawkin's Test**

  Position the patient standing with the shoulder abducted 90 degrees, and internally rotate the forearm. The presence of pain with movement is indicative of possible pathology.

  Sensitivity of 92%

  Specificity of 25%



Strength Tests

- **External Rotator Cuff (RC) Strength (Yergason's)**

  Position the patient sitting, with his arms at his sides and elbows at 90 degrees. It is important to maintain the elbow positioning at the sides while the external rotation is attempted by the patient (the examiner applies internal resistance).

- **Internal RC Strength**

  Same as above, but the patient is attempting to rotate internally (and examiner resisting externally).

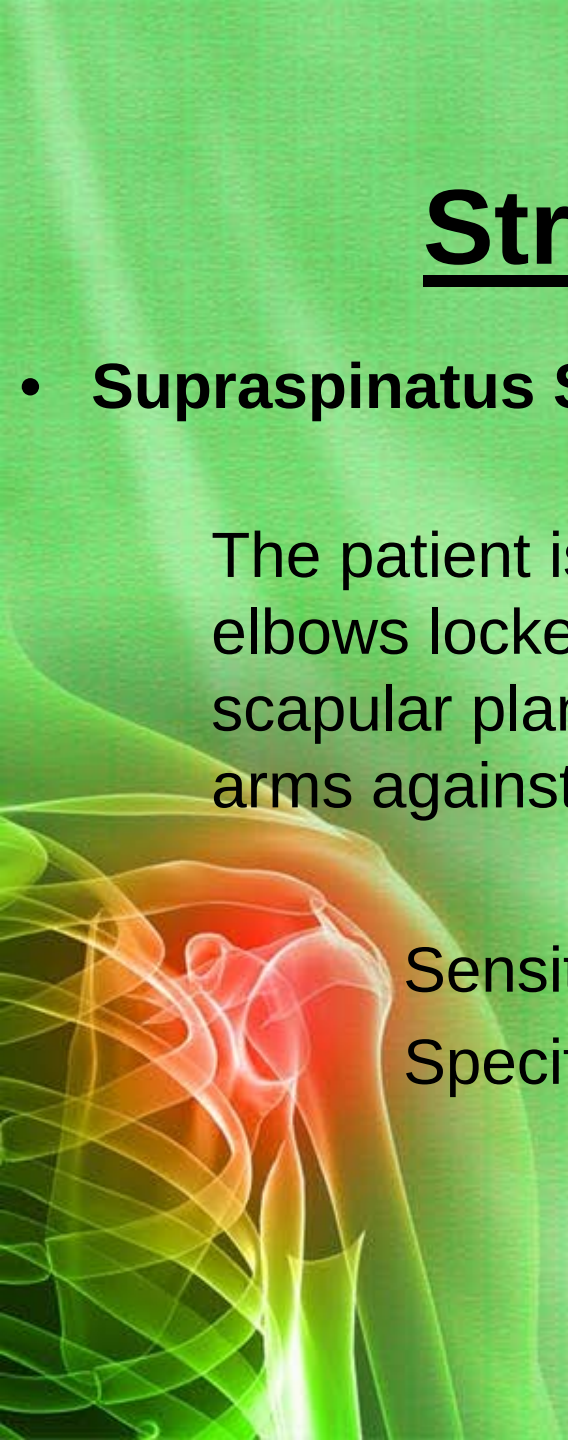
Strength Tests Cont.

- **Supraspinatus Strength (Drop Arm Test-Codman's Sign)**

  The patient is positioned sitting with arms straight out, elbows locked, thumbs down, and arm at 30 degrees (in scapular plane). The patient should attempt to abduct his arms against the examiner's resistance.

  Sensitivity 27% Supraspinatus tear

  Specificity: 88% Supraspinatus tear



Strength Tests Cont.

- **Palpation of Bicipital Groove (Yergason's)**

  Position the patient sitting, beginning with the arm straightened. The patient should then flex his arm to contract the biceps muscles. The examiner palpates the bicipital groove to attempt to illicit pain.

- **Speed Test for evaluation of Biceps Tendonitis**

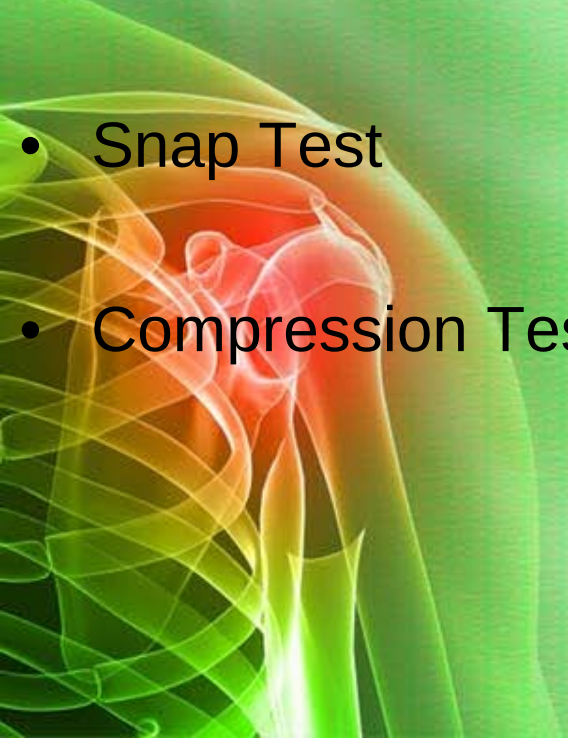
  The patient's elbow is extended, forearm supinated and the humerus elevated to 60°. The examiner resists humeral forward flexion

Summary Labrium Test

- Push-Pull Test
- Jahnke Jerk Test
- Crank Test

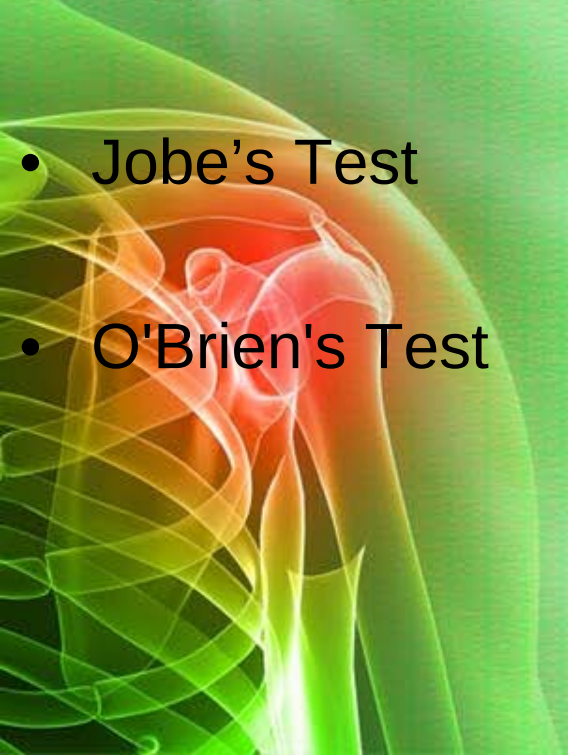
Summary Bicep Tendonitis Test

- Yergason’s Test
- Speed’s Test
- Snap Test
- Compression Test



Summary Impingement Test

- Hawkin's Test:
- Neer’s Test
- Jobe’s Test
- O'Brien's Test



Summary Rotator Cuff Test

- **Supraspinatus**: Best Test: Full or Empty can test
- **Infraspinatus/Teres Minor**: Best Test : Yergason's/Lag Test
- **Subscapularis:** Best Test: Lift off test