Common Shoulder Problems in Family Medicine

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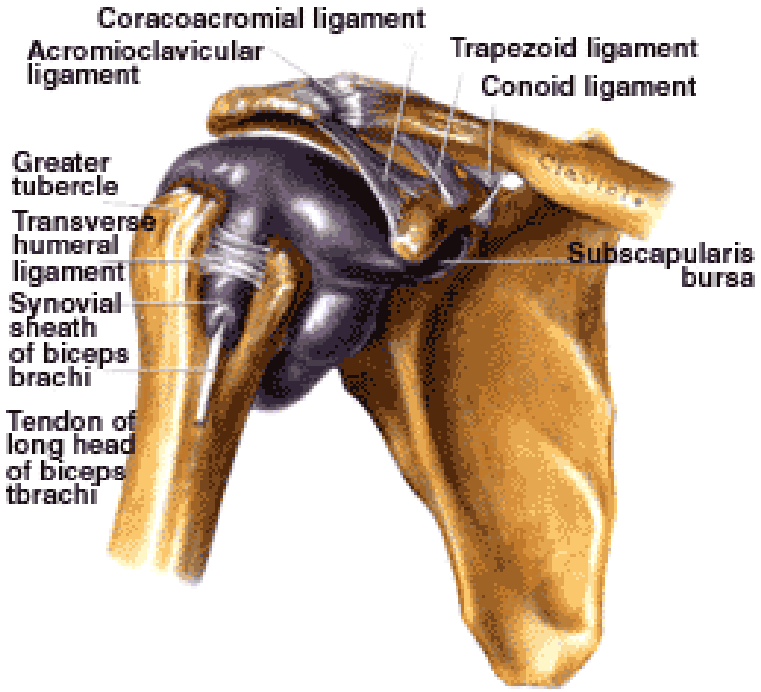
Disclosures

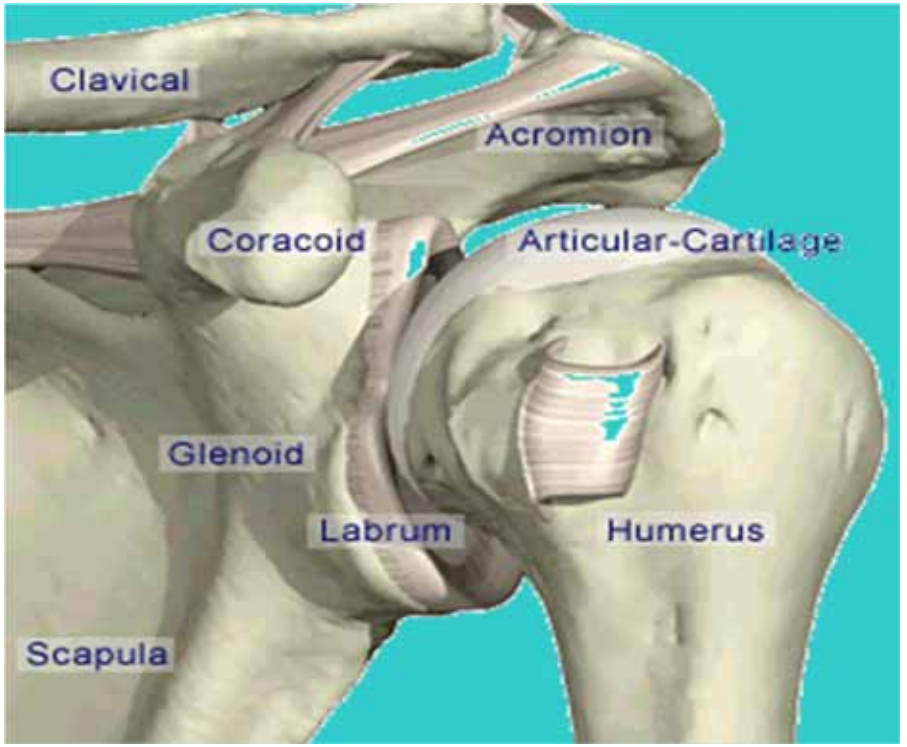
- **Neither I, Kevin E. Burroughs, nor any family member(s), have any relevant financial relationships to be discussed, directly or indirectly, referred to or illustrated with or without recognition within the presentation.**

Goals/Objectives

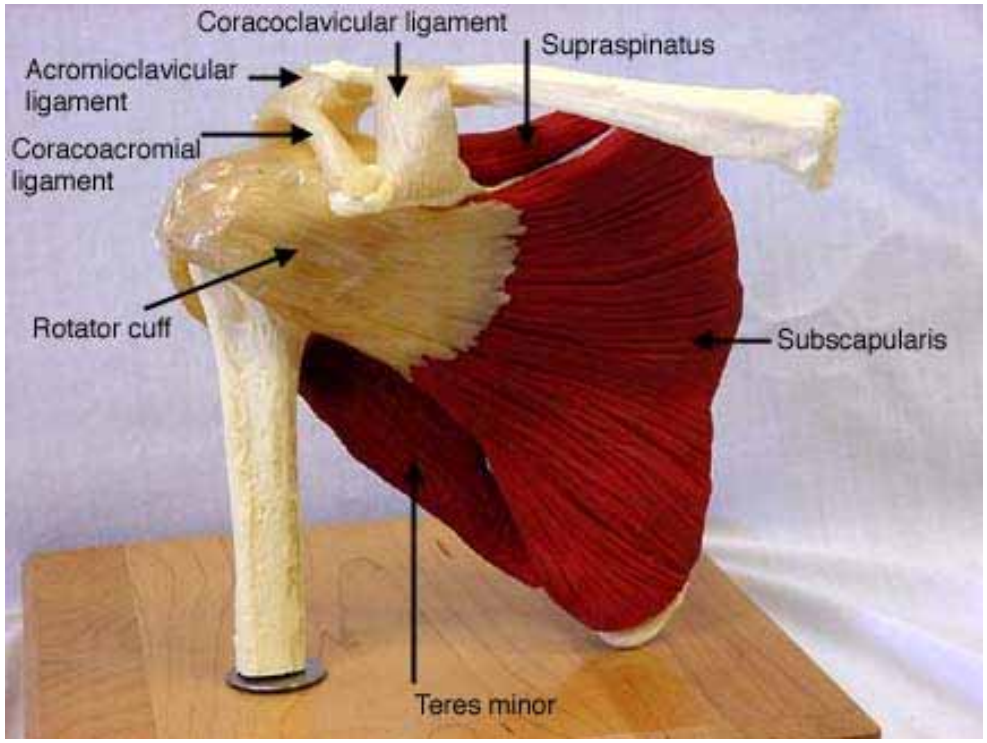
- Review basic shoulder anatomy
- Review shoulder examination techniques
- Discuss evaluation and treatment of common shoulder problems encountered in a primary care clinic

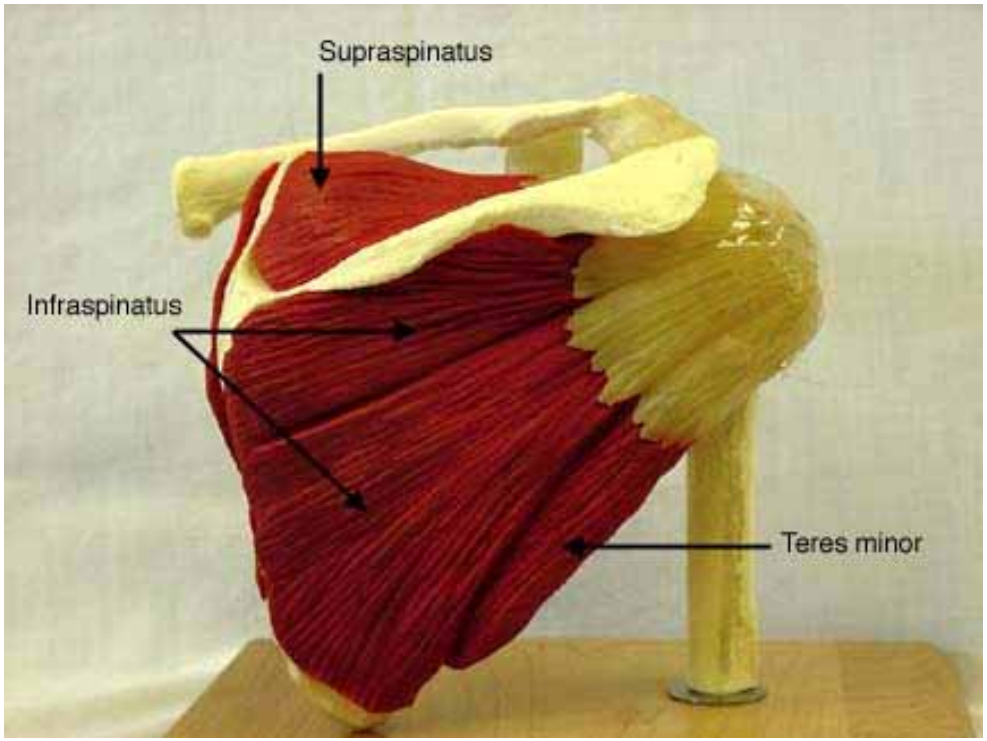
Tendons and Ligaments of the Shoulder (Anterior View)

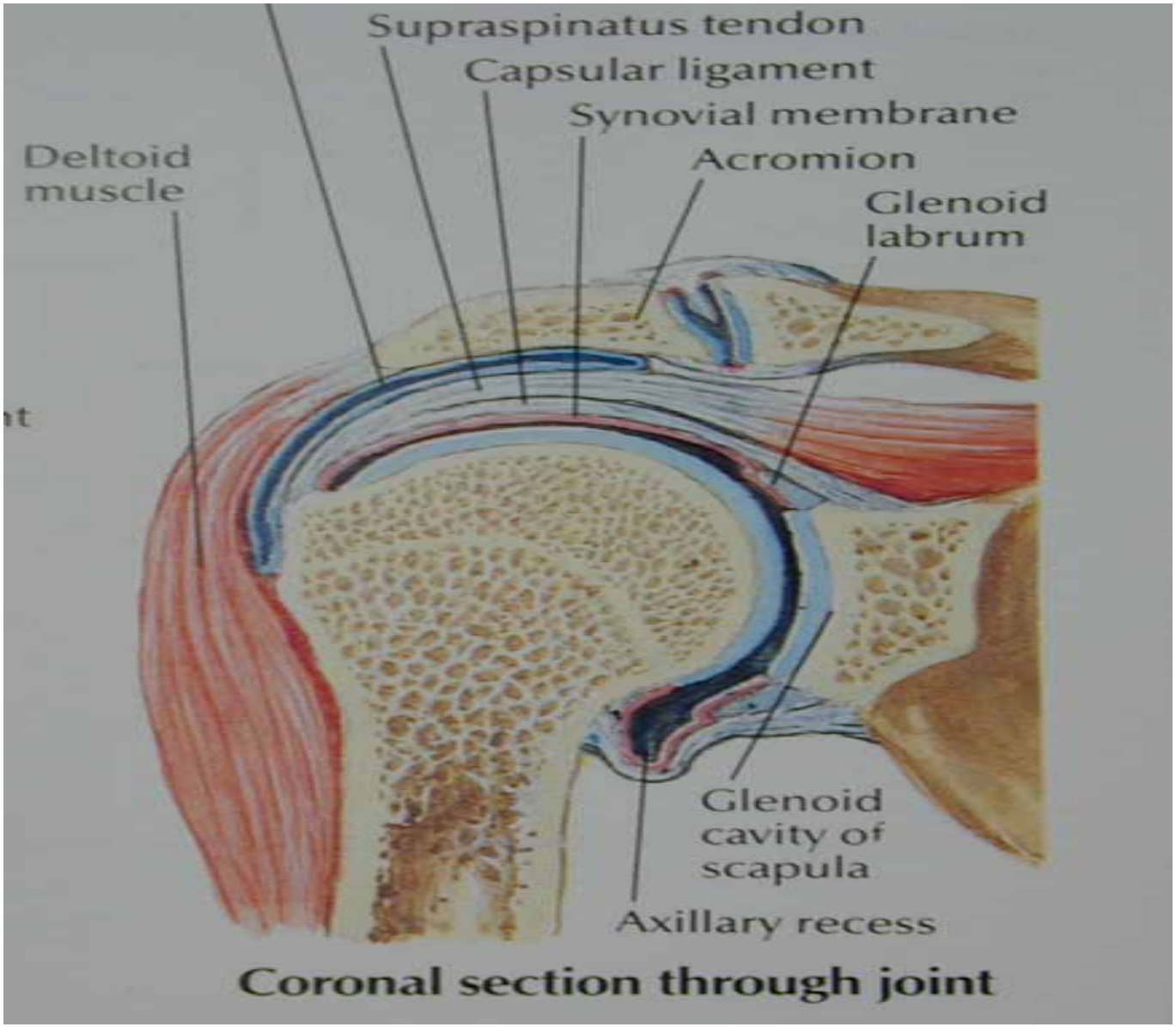




View of Rotator Cuff







Coronal section through joint

Functional Anatomy

- 3 bones: clavicle, scapula, humerus
- 4 "joints" comprise the shoulder
  - Sternoclavicular
  - Acromioclavicular
  - Glenohumeral
  - Scapulothoracic (actually an articulation not joint)
- Ranges of motion
  - Abd- 180*, Add- 45*, Flex- 90*, Ext- 45*
  - Int Rotation- 55*, Ext Rotation- 40-45*

Pain in the shoulder

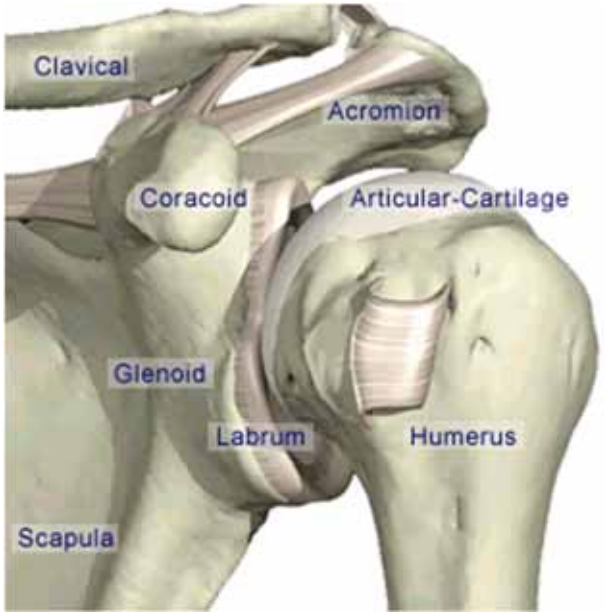
- Aside from the shoulder itself, referred pain comes from:
  - Hand (i.e. carpal tunnel)
  - Neck (i.e. cervical radiculopathy)
  - Chest (i.e. cardiac pain, esp left shoulder)
  - Abdomen [i.e. diaphragmatic irritation (gall bladder to right scapula)]
- Onset of pain may be clue also
  - At night, esp lying on side - RC
  - With overhead motions - impingement

Shoulder-Physical Examination

- Check the neck first (Spurling's)
- Palpation
  - Bony aspects
  - Biceps tendon (long and short heads)
  - Note crepitation
  - In extension anterolateral subacromial space for bursa

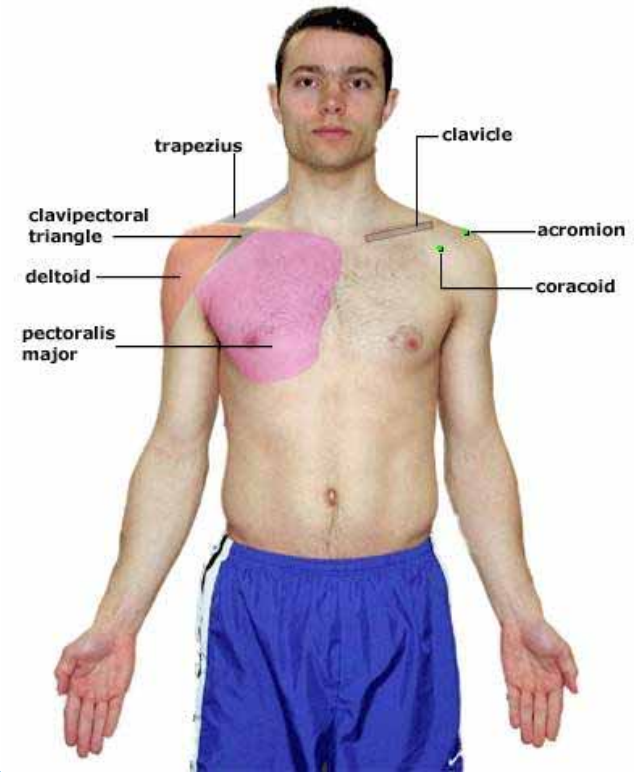
Bony Palpation

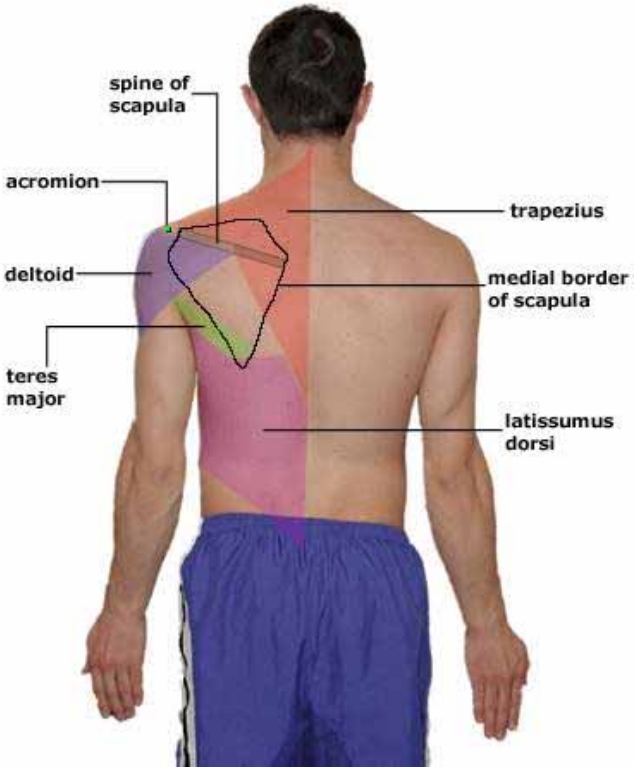
- Easiest to start at the sternoclavicular joint
- Work distally along the clavicle to AC
- Just inferior and medial is coracoid process
- From acromion, inferior is lesser tuberosity
  - Biceps groove is just lateral (int rotate arm)
  - Inferior, shoulder extended subacromial bursa
- Spine of scapula points to T-3, inferior T-7



Shoulder-Physical Examination

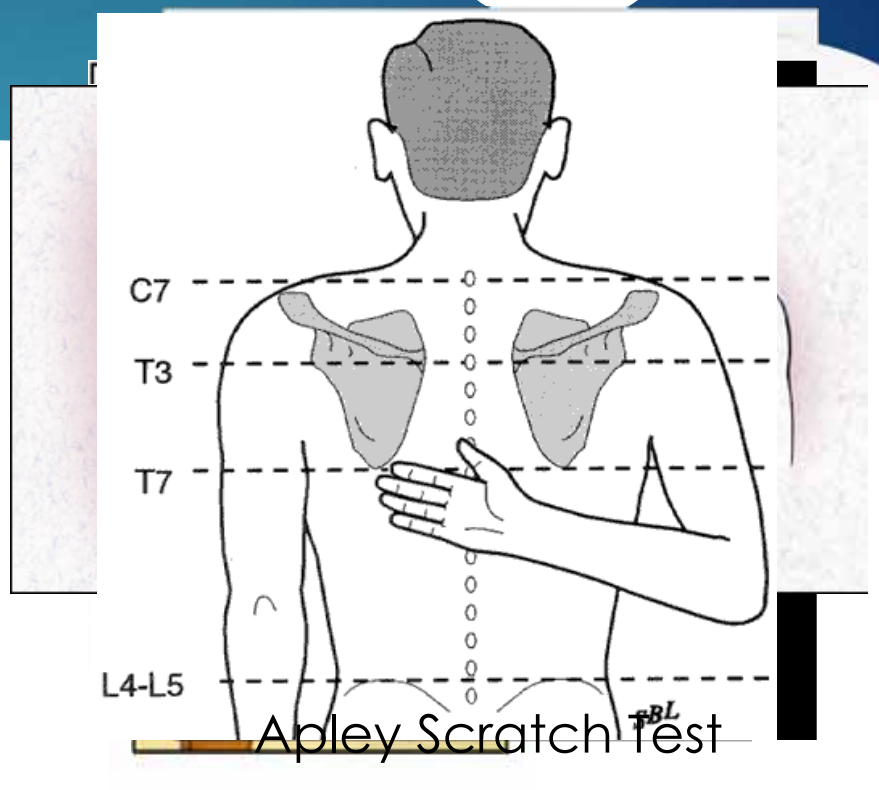
- Inspection
  - Note obvious deformity, asymmetry
  - Muscle atrophy (deltoid, supra and infraspinatus)
  - Skin
    - swelling, ecchymosis, venous distension





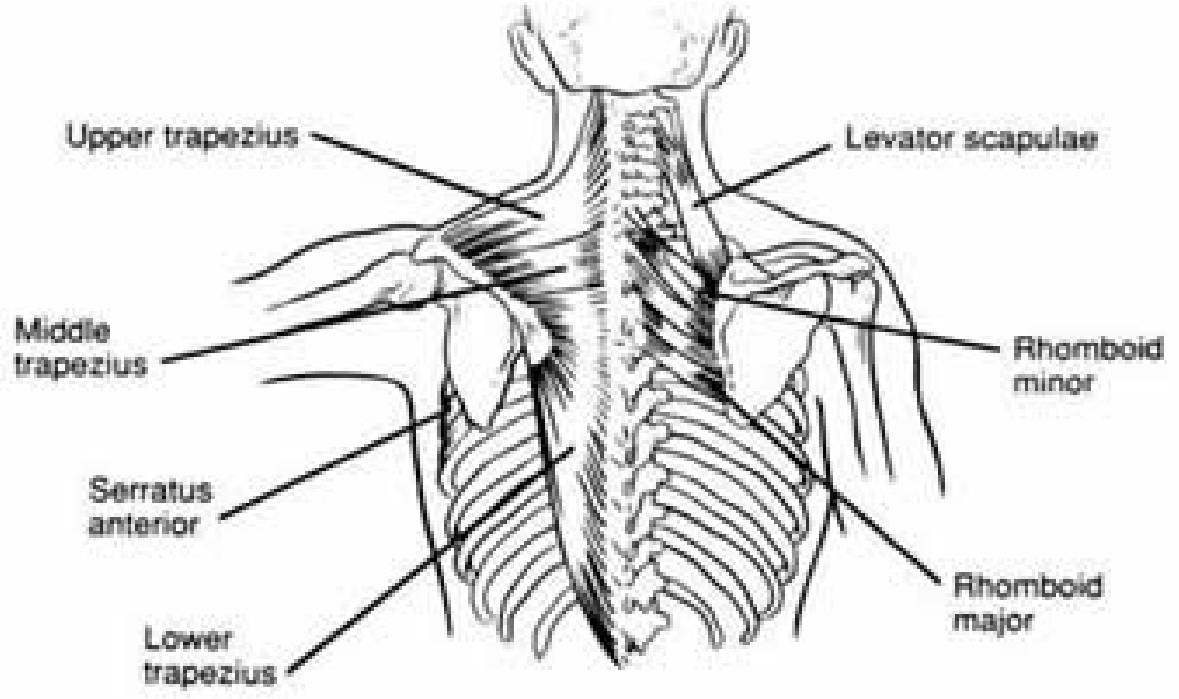
Range of Motion

- Forward flexion:
  - 160 – 180°
- Extension:
  - 40 - 60°
- Abduction:
  - 180◦
- Adduction:
  - 45 °
- Internal rotation:



Apley Scratch Test

Scapular Actors



www.aaos.org and Arthroscopy: The Journal of Arthroscopic and Related Surgery, Vol 19, No 6 (July-August), 2003: pp 641-661 641

Radiology of the Shoulder - AP

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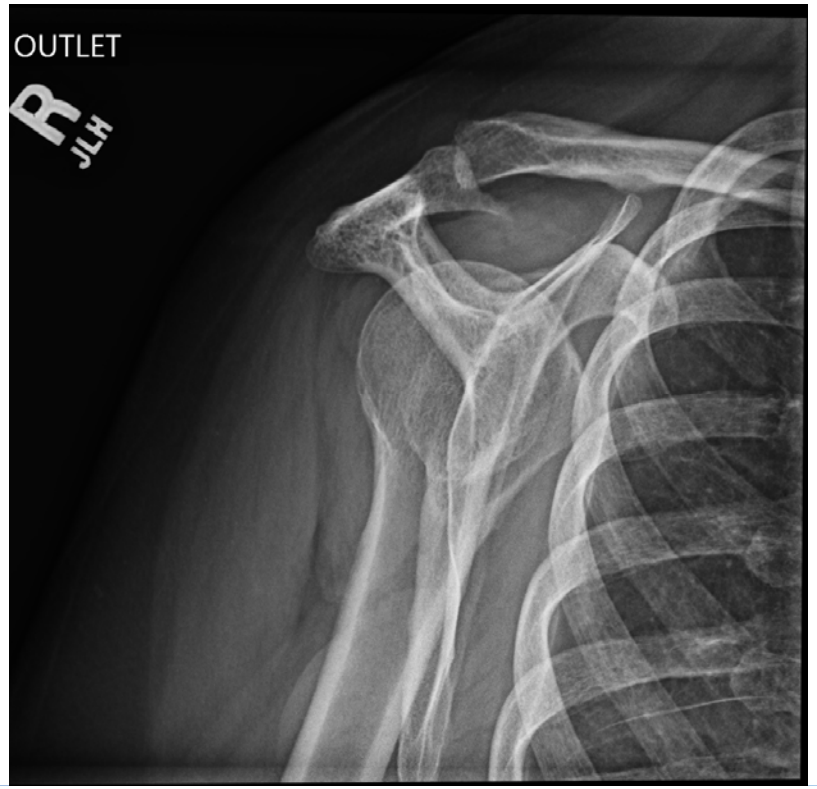
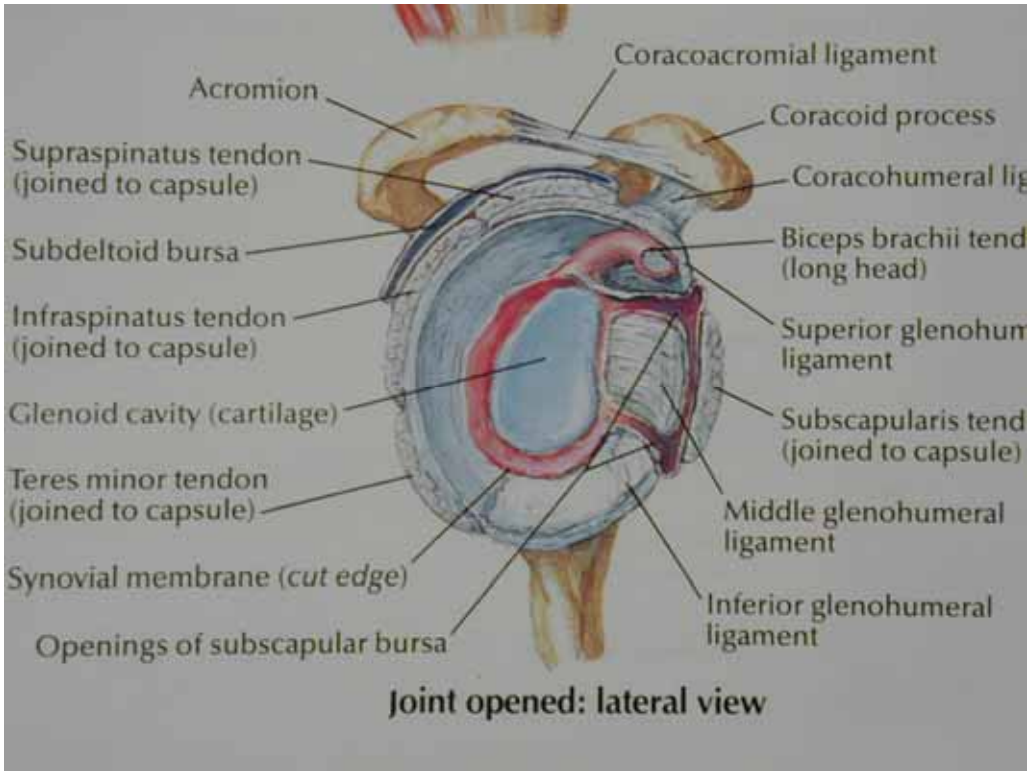
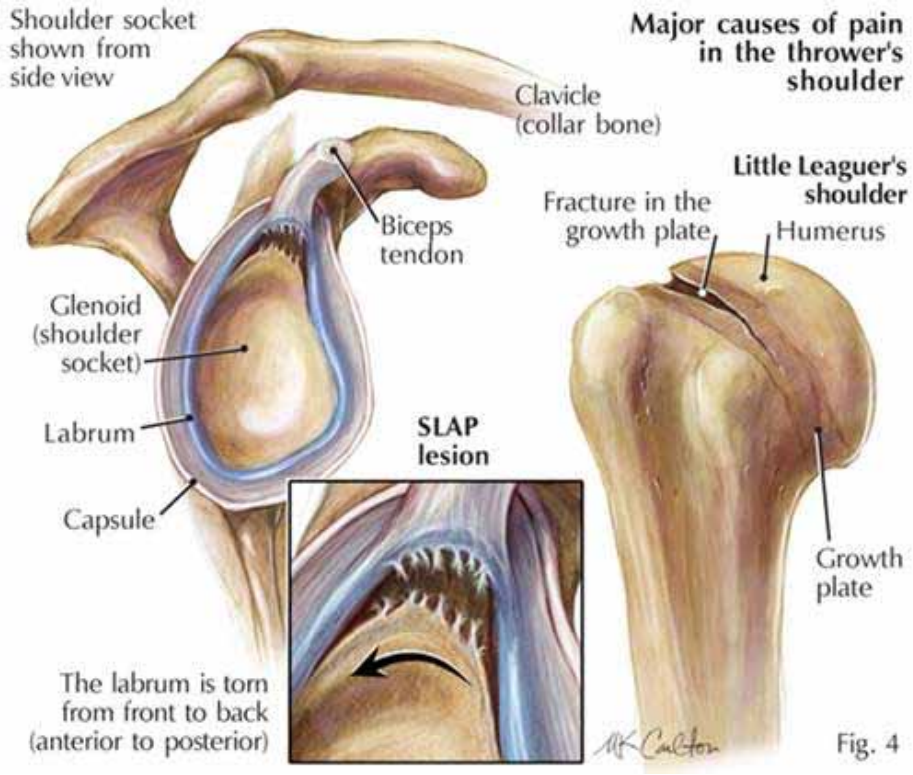




Shoulder Injuries

- Rotator cuff
- Instability
- Labral pathology
- Little Leaguer's shoulder

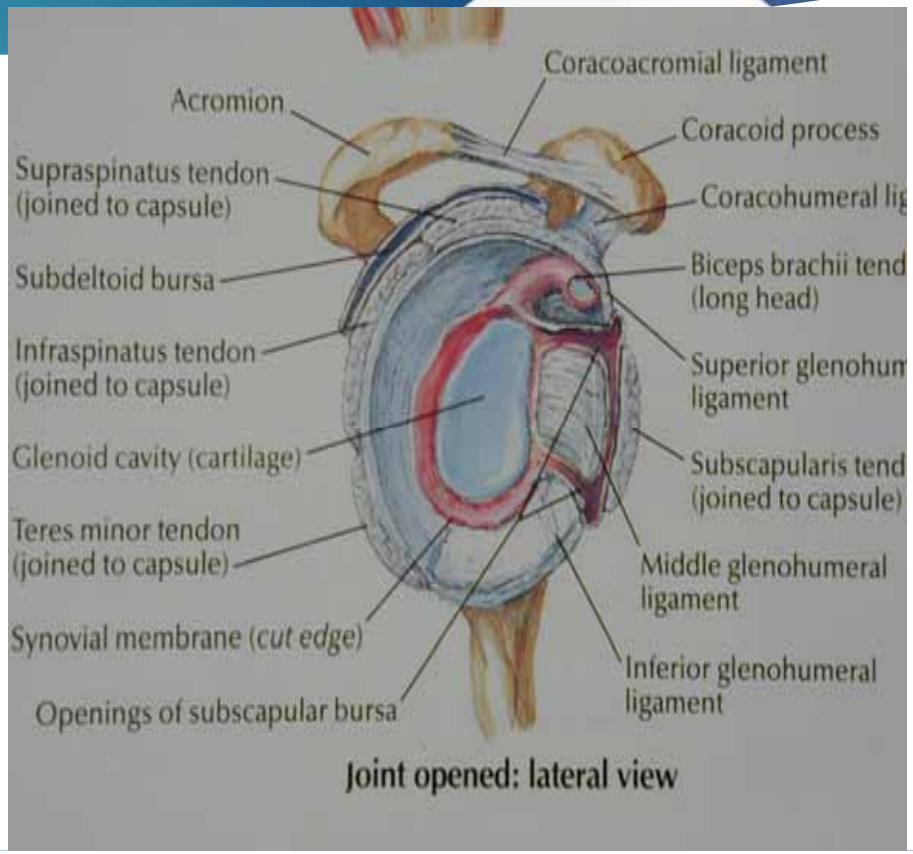


Rotator Cuff Injuries - Evaluation

- History
  - Specific injury or insidious onset?
  - Pain during cocking usually impingement
  - Pain during deceleration commonly tensile failure
- Physical exam
  - AROM/PROM
  - Glenohumeral translation
  - Apprehension/relocation tests
  - ↓ strength due to pain, inhibition, fatigue – rarely full-thickness tear

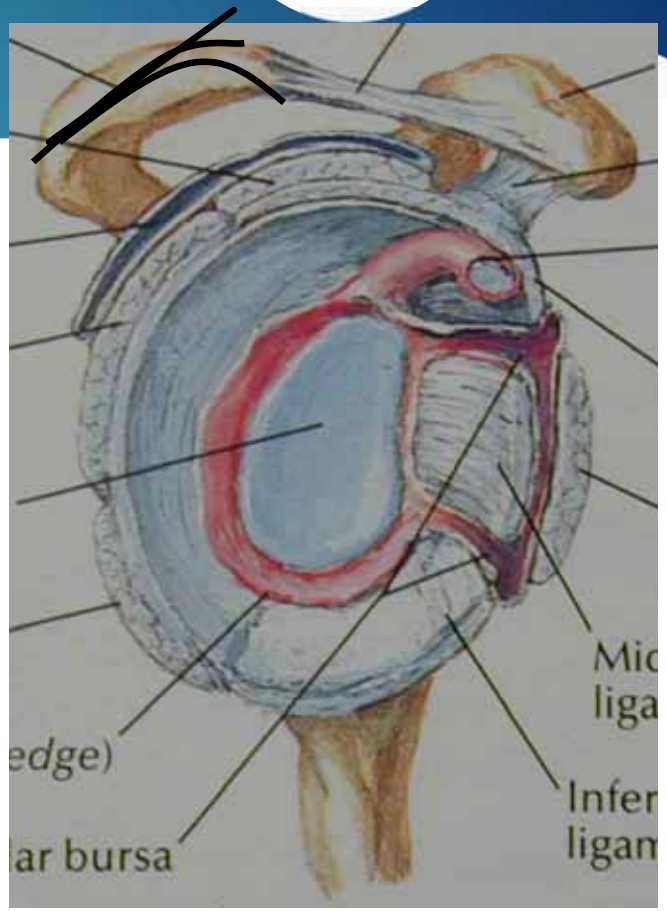
Rotator Cuff

- Mnemonic (anterior to posterior) Sub Sit
  - **Sub** scapularis
  - **S** upraspinatus
  - **I** nfraspinatus
  - **T** eres minor



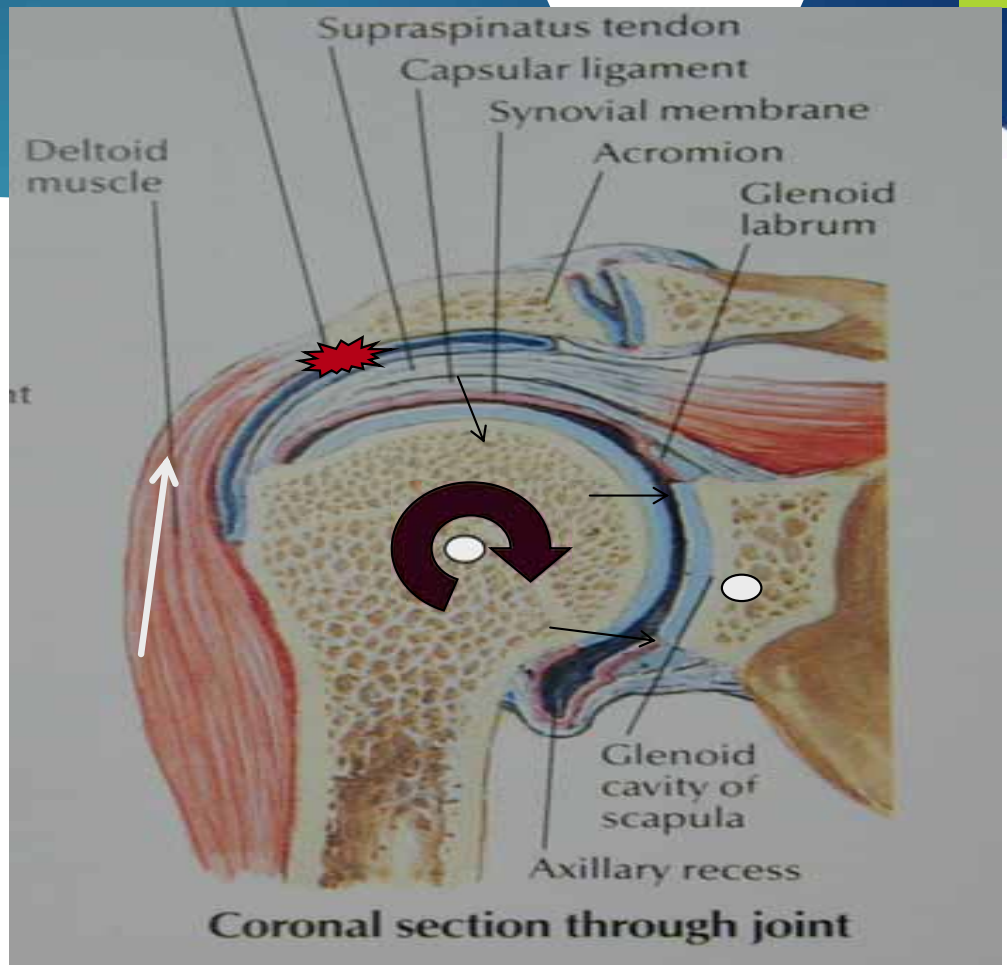
"Impingement"

- Structural or Mechanical
- Shape of the acromion
  - Anatomic variant
  - Degenerative change
  - AC arthropathy



"Impingement"

- Dynamic
  - Affects on rotator cuff allow superior migration
    - RC tear
    - RC tendinitis
    - RC weakness
    - Instability
  - Esp. in <30-35 yo



Shoulder

- Hawkin's sign
  - Arm passive abduction to 90*, forward flex 30* with thumbs pointing down, internal rotation
- Neer's Impingement sign
  - Arm to full forward elevation, pain 160-180*
  - Positive Neer test if pain relieved by injection
- Speed's test
  - 90* arm forward flexion, palm up, bicep pain
- Yergason's test
  - 0* adduction, elbow flexed. Pt. tries to flex elbow and supinate vs. resistance. Pain biceps

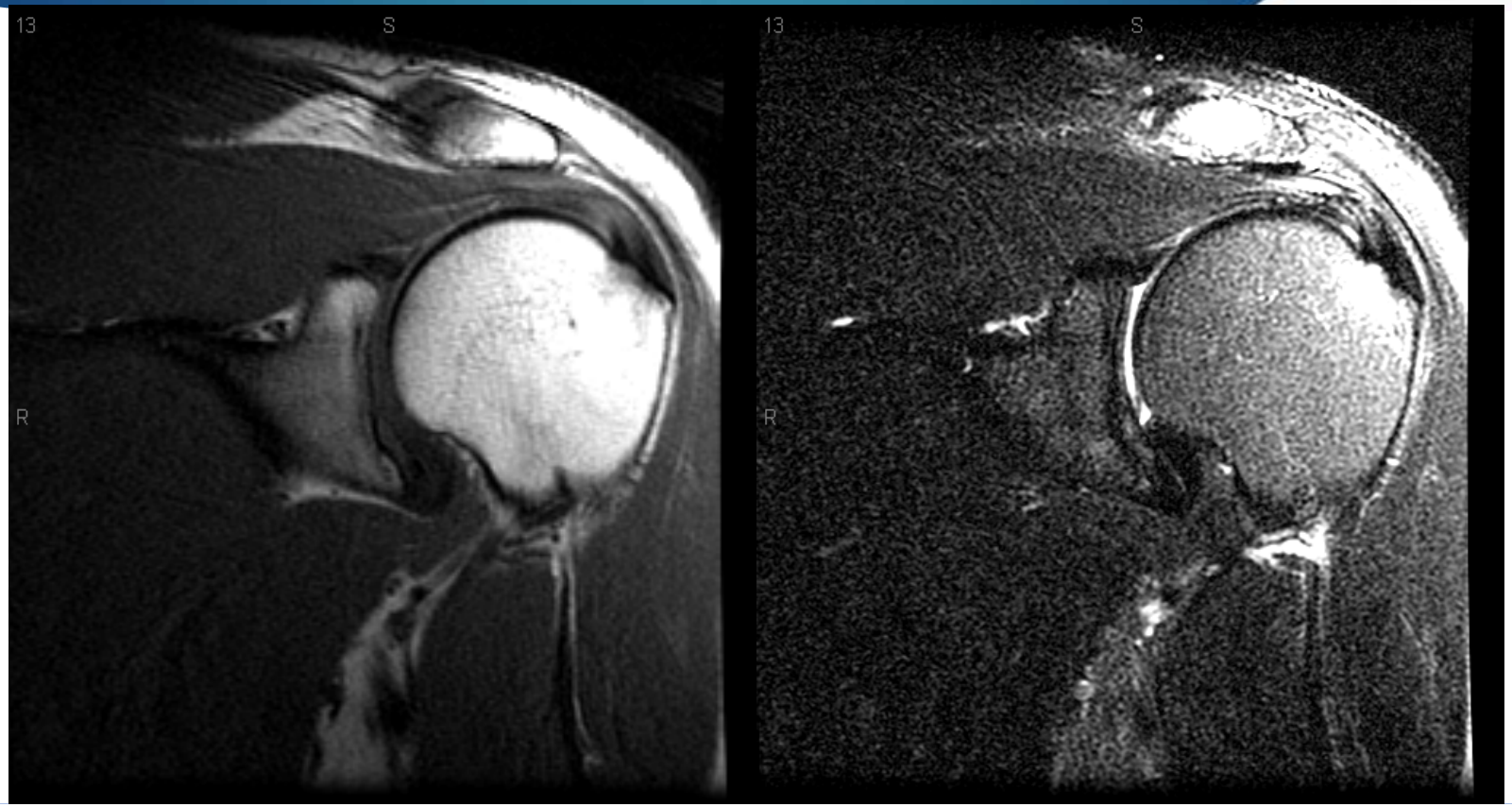
Rotator Cuff Testing

- EMG study by Kelly et al showed the best positioning to test each of the rotator cuff muscles
- Supraspinatus-
  - "full can", pain with "empty can"
- Infrapinatus-
  - External rotation from -45 degrees
- Subscapularis
  - "Push Off" start with hand in small of back

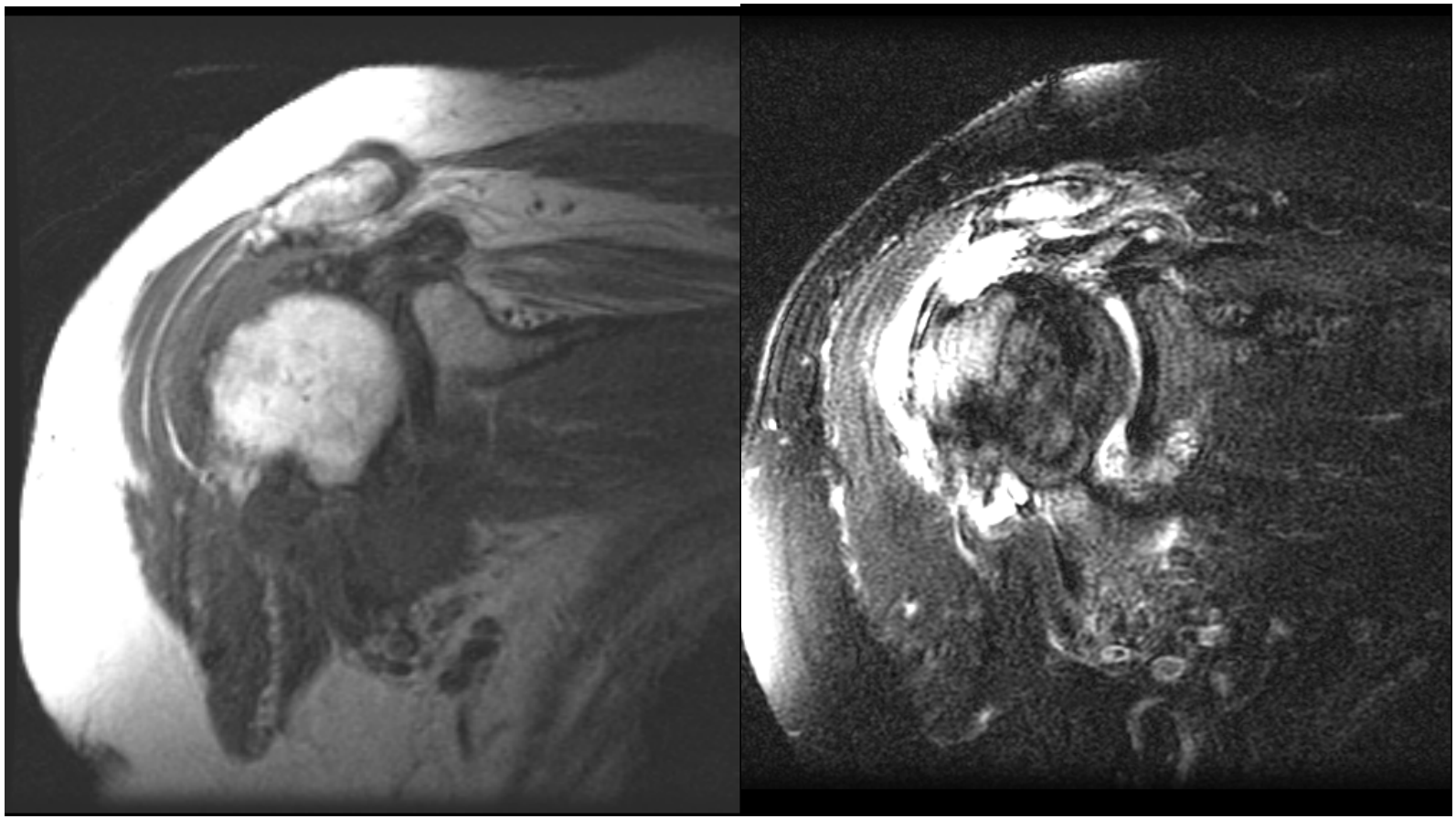
Rotator Cuff Injuries - Evaluation

- Radiology
  - Plain films:
    - AP
    - Grashey if concern for OA
    - Outlet
  - MR
  - Ultrasound

Rotator Cuff Tendinitis



Rotator Cuff Tear with Retraction



Rotator Cuff Injuries - Treatment

- Rest
- Rehab
  - Restore ROM
  - Strengthen cuff and scapular stabilizers
  - Maintain conditioning
  - Throwing program
- Anti-inflammatories
- Surgery

Posterior Capsule Stretch

- Contractures of the posterior structures, pectoralis minor, and short head of the biceps can contribute to glenohumeral internal rotation deficit and increased anterior

Labral Pathology

- Repetitive microtrauma results in fraying or tearing
- Disruption of biceps anchor causes pain and anterior-inferior translation of humeral head when completely detached
- Can occur alone, or with instability or cuff pathology

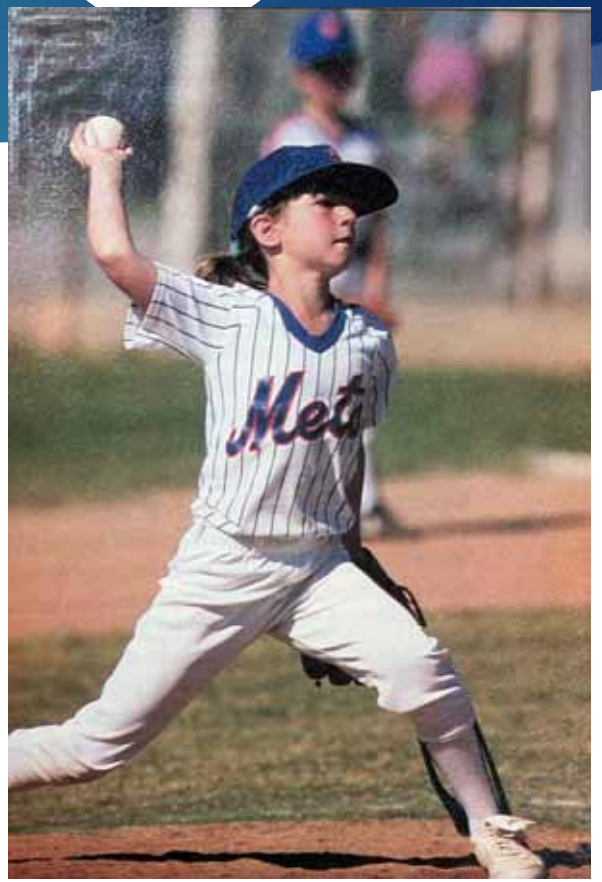
O'Brien's Active Compression Test

- Labral, AC, or biceps pathology
- Arm flexed to 90°
- Arm cross-arm adducted 10-15°
- Elbow extended
- Max pronation
- Resist downward force
- Positive test if painful
- Beware location of pain
  - AC
  - Biceps

Shoulder – Labrum Tests

- Other Tests Described
- Biceps Load
  - Abducted arm in 90/90 position, resisted biceps curl
- Crank
  - Axial load with circumduction

Little Leaguer's Shoulder



- Prox. humerus physeal fxs in Little League players were 1st described by Dotter
- Joint capsule/ligaments ≅ 2-5x stronger than physis
- Present with dull ache and can't throw
- 12-15 greatest risk may not completely fuse 'til 20-22
- Pain due to stress fx at the

Little Leaguer's Shoulder

- Mechanism
  - Appears to be caused by rotational stress applied to proximal humeral physis during act of throwing
  - Overuse inflammation of proximal humeral physis vs. stress fracture of physis
  - During throwing, shoulder is forcibly internally rotated and adducted from an externally rotated abducted position

Little Leaguer's Shoulder

- Radiology
  - Widening of the proximal humeral physis
  - Easily seen on bilateral AP internal and external rotation x-rays
  - Associated findings
    - Demineralization
    - Sclerosis
    - Fragmentation of lateral aspect of proximal humeral metaphysis

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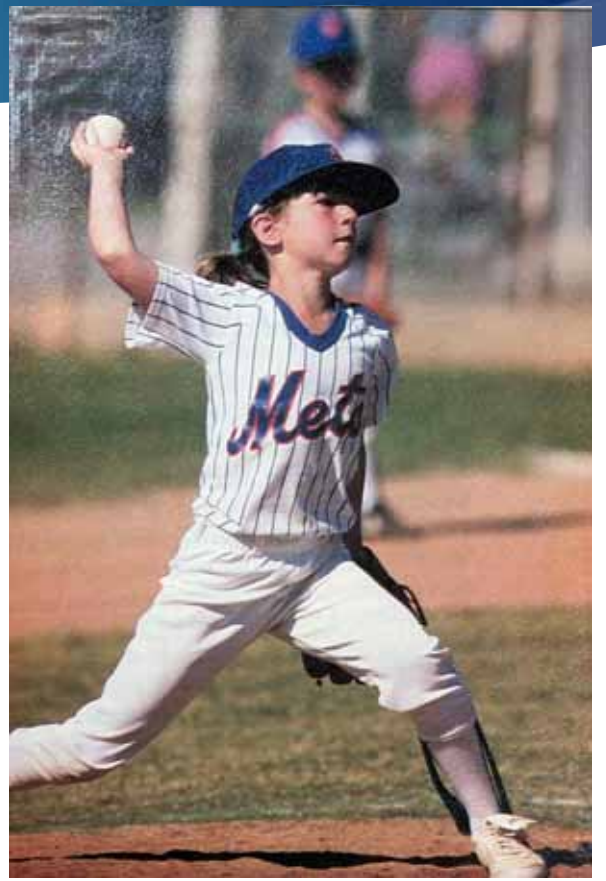

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Risk Factors for Injury of Throwing Athletes

Pitching while fatigued	Throwing too many endings over the course of the year
Not taking enough time off from baseball every year	Throwing too many pitches and not getting enough rest
Pitching on consecutive days	Excessive throwing when not pitching
Playing on multiple teams at the same time	Pitching with injuries to other body regions
Not following proper strength and conditioning routines	Not following safe practices while it showed cases
Throwing curveballs and sliders at a young age	Radar going use

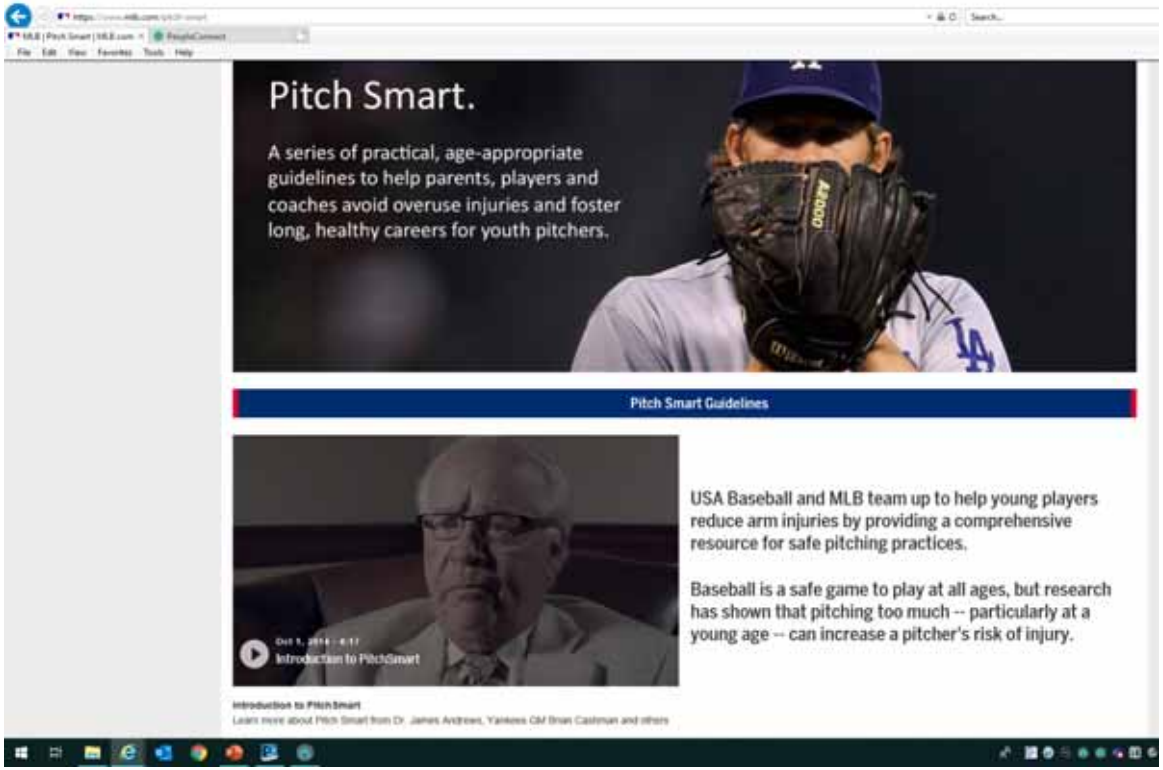
MLB Smart Pitch Count Limits/Rest

Age	Daily Max (Pitches in Game)	0 Days Rest	1 Days Rest	2 Days Rest	3 Days Rest	4 Days Rest	5 Days Rest
7-8	50	1-20	21-35	36-50	N/A	N/A	N/A
9-10	75	1-20	21-35	36-50	51-65	66+	N/A
11-12	85	1-20	21-35	36-50	51-65	66+	N/A
13-14	95	1-20	21-35	36-50	51-65	66+	N/A
15-16	95	1-30	31-45	46-60	61-75	76+	N/A
17-18	105	1-30	31-45	46-60	61-80	81+	N/A
19-22	120	1-30	31-45	46-60	61-80	81-105	106+

- Key to limit workload of pitchers to limit pitching with fatigue.
- Research has shown that pitch counts are the most accurate and effective means of doing so.
- These are the rest recommendations.

MLB Pitch Smart

- A series of practical, age-appropriate guidelines to help parents, players and coaches avoid overuse injuries and foster long, healthy careers for young pitchers
- **www.mlb.compitch-smart**



Instability

- Stability relies on ligaments and rotator cuff action
- Inferior glenohumeral ligament
  - Maximally stretched in external rotation
  - Chronic stretching can cause functional incompetence
  - Causes rotator cuff to work harder – can fatigue or tear

Shoulder Instability- Anterior

- Differentiate Laxity vs Instability
- Traumatic or atraumatic
  - History is key here
- Risk: repetitive overhead, "Gumby" types
- Symptoms: subluxation, "Dead Arm", ache
- Ask to put in position occurs most
  - Abduction, external rotation (Apprehension)
- AMBRI vs TUBS

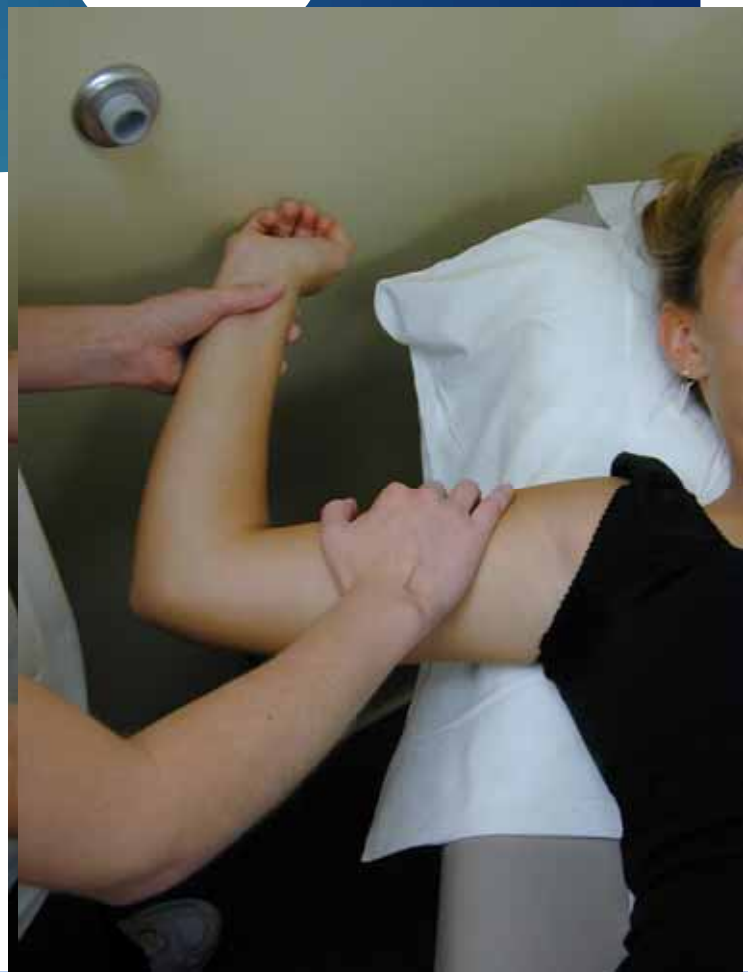
Shoulder Dislocations

- AMBRII
  - Atraumatic
  - Multi-directional
  - Bilateral
  - Rehabilitation
  - Inferior Capsular Shift
  - Interval lesion
- TUBS
  - Traumatic
  - Unidirectional
  - Bankart
  - Surgery

Thomas & Matsen JBJS 71A, 1989

Shoulder - Instability

- Apprehension test ("Bye-Bye" test)
  - 90 abduct, external rotation, watch for giveway
- Relocation test
  - Pt. supine, apprehension or pain with anterior force that improves with posterior directed force



Sulcus Sign/Test

- Seated, grab elbow, pull inferiorly.
- Observe below acromion for dimple looking for >1cm

Instability - Treatment

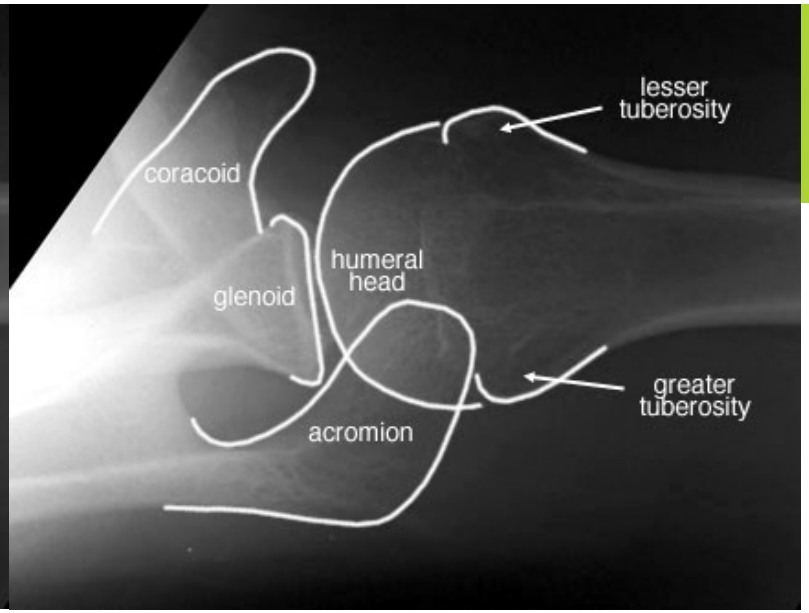
- Rest
- Rehab
  - As above, with stretching posterior capsule
- Surgical stabilization
  - EUA to determine direction & degree of laxity
  - Correct laxity without compromising motion
  - Subtle laxity → thermal capsulorrhaphy
  - Gross laxity → capsular shift

Acute Anterior Dislocation

- Present with pain, arm folded across chest
- Loss of deltoid contour, prominent anterior lump
- Must do neurovascular exam
- Best if can X-ray before reduction, but in most cases one attempt at reduction can be performed
- Several techniques

Anterior Dislocation

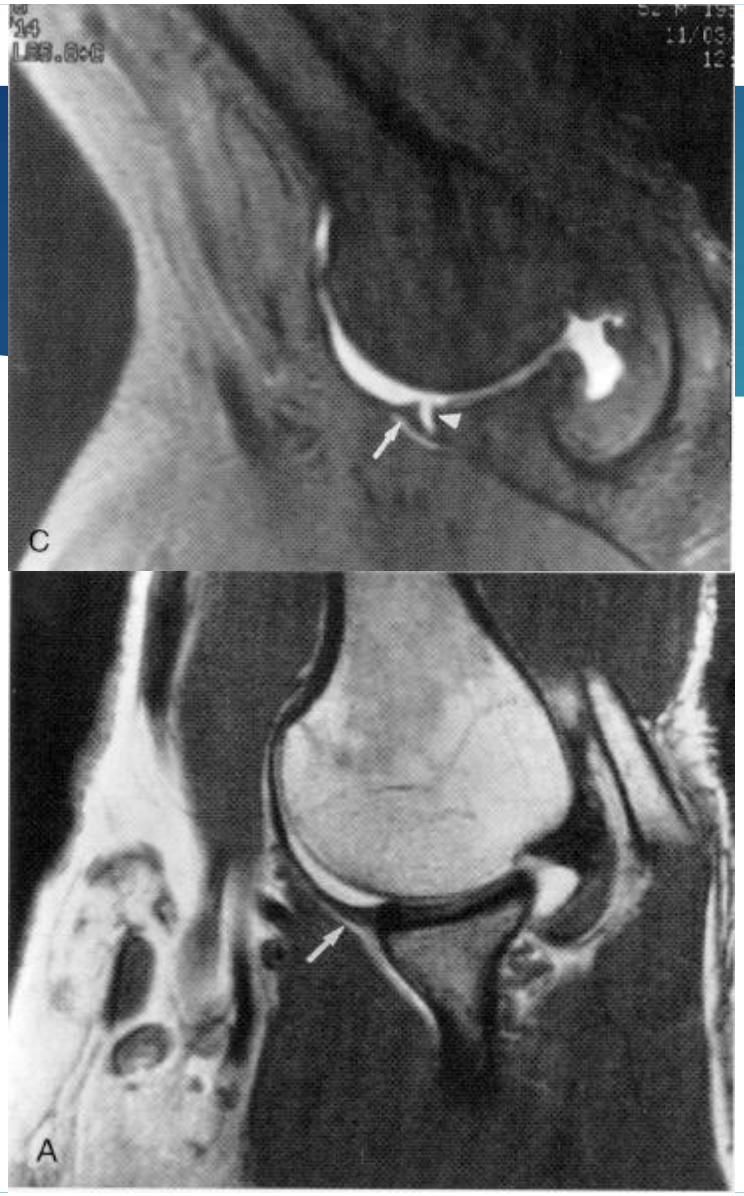
- After reduction, hold in internal rotation
- Studies vary on return to mobility
  - No external rotation for 6 weeks, to more aggressive motion in supervised PT
- Recurrence after first dislocation
  - 40-90% depending on study and age of patient
- What are Bankart and Hill-Sachs lesions?



For X-ray evaluation get orthagonal views (90° to each other): AP then either axillary or scapular Y

Hill-Sachs Lesion

Bankart Lesion in ABER



Posterior Dislocation

- Acute traumatic far less common than anterior.
  - FOOSH, electricution or convulsion
- Loss of normal rounded front
- Marked limitation of external rotation
- Reduce with forward traction
- Similar rehab

Adhesive Capsulitis

- A self-limiting condition
- Hx: Atraumatic, progressive painful restriction of movement of GH joint.
  - Ext rotation most restricted, then abduction
- Normal radiograph
- Female>male with peak age 56 yrs.
- Variable duration usually lasting 1-3 years
- Etiology greatly unknown

Adhesive Capsulitis

- Risk Factors

• **Previous trauma (immobilization)**	• **Increasing age**
• Female	• Dyslipidemia
• Hypertension	• Thyroid dysfunction
• Diabetes Mellitus	• Stroke/cardiac event

- Meta-analysis 18/5411 articles from Embase and Pubmed
- DM pts 5x more likely for AC than controls. Prevalence in DM 13.4%
- No significant difference insulin vs non-insulin
- Prevalence of DM in AC ~30%
  - ? Screen

Zreik NH, et al. Muscles Ligaments Tendons J. 6(1):26-34, 2016

Adhesive Capsulitis - Clinical

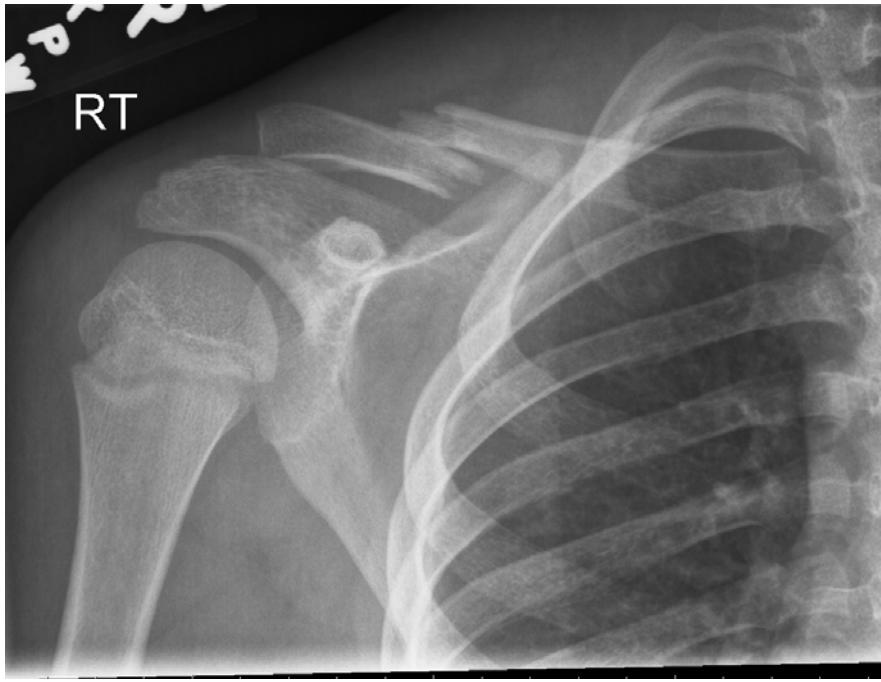
- Typically 3 phases
  - Initial painful phase "freezing" diffuse, sometimes severe pain worse at night, increasing stiffness (2 – 12 mos)
  - Phase 2 "frozen" ↓pain but significant loss of motion (4-12 mos)
  - Phase 3 "thaw" shows improving AROM (5-24 mos)
- EXAM:
  - Difficult secondary to pain
  - Can use anesthetic injection to help differentiate from other shoulder pathology
- XRAY:
  - Helpful to evaluate other pathology such as arthritis

Adhesive Capsulitis - Treatment

- **Manual therapy and exercise for adhesive capsulitis (frozen shoulder)**
  - The best available data show that a combination of manual therapy and exercise may not be as effective as glucocorticoid injection in the short-term. It is unclear whether a combination of manual therapy, exercise and electrotherapy is an effective adjunct to glucocorticoid injection or oral NSAID.
  - High-quality RCTs are needed to establish the benefits and harms of manual therapy and exercise interventions that reflect actual practice, compared with placebo, no intervention and active interventions with evidence of benefit (e.g. glucocorticoid injection).
  - Page MJ et al. Cochrane Database of Systematic Rev. (8)CD011275, 2014 Aug 26.
- **Adhesive Capsulitis of the Shoulder: A Systematic Review of the Effectiveness of Intra-Articular Corticosteroid Injections**
  - **Systematic review PubMed, EMBASE, CINAHL, SportDiscus, MEDLINE and the Cochrane Central Register of** Controlled trials, Database of Systematic Reviews. Level I, II evidence (RCTs) ≥ 6 mos f/u. Led to 8 studies w/406 subjects, 409 shoulders. Steroid injection vs no

Clavicle Fracture

- Most common in middle third
- History
  - Fall on outstretched arm or fall on point of shoulder
- Physical Exam
  - May be visible/palpable deformity
  - Auscultate lungs
- Treatment
  - Figure of 8 brace or regular sling
  - Distal 1/3 fx. are more difficult and



AC Joint Injury

- Fall on point of shoulder, or direct blow
- Ligamentous stability of joint provided by:
- AC ligament, CC ligament (2 parts), CA lig
- Grade 1
  - Local tenderness, Sling, return 7-14 days
- Grade 2
  - Local tender, slight deform. Tx same. 3-6 weeks
- Grade 3

Other Causes of Shoulder Pain

- Adhesive Capsulitis
  - Less common in athlete, unless already injured
- Biceps Tendonitis
  - Long head. Check Yergason Test for stability.
  - Localised therapy
- Rupture of the long head of the biceps
  - "Popeye" arm
  - Typically observational treatment

QUESTIONS ??????

THANK YOU