

Evaluation of the Painful Shoulder

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Objectives

- Review important shoulder anatomy
- Review MSK shoulder pain differential and history taking
- Demonstrate musculoskeletal shoulder exam, including special testing
- Determine what, if any imaging, is needed
- Discuss common MSK causes of shoulder pain, including diagnosis and management

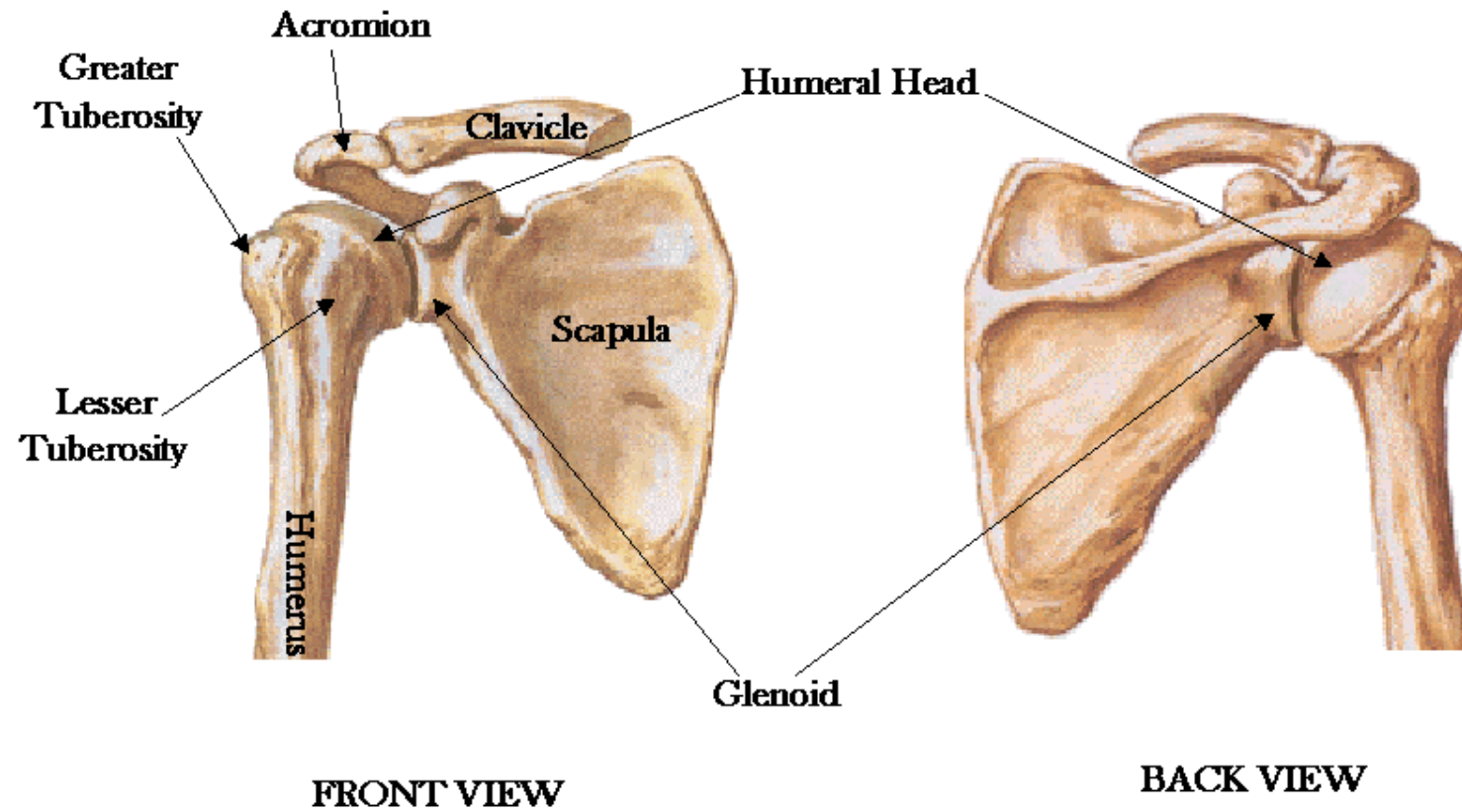


The Shoulder

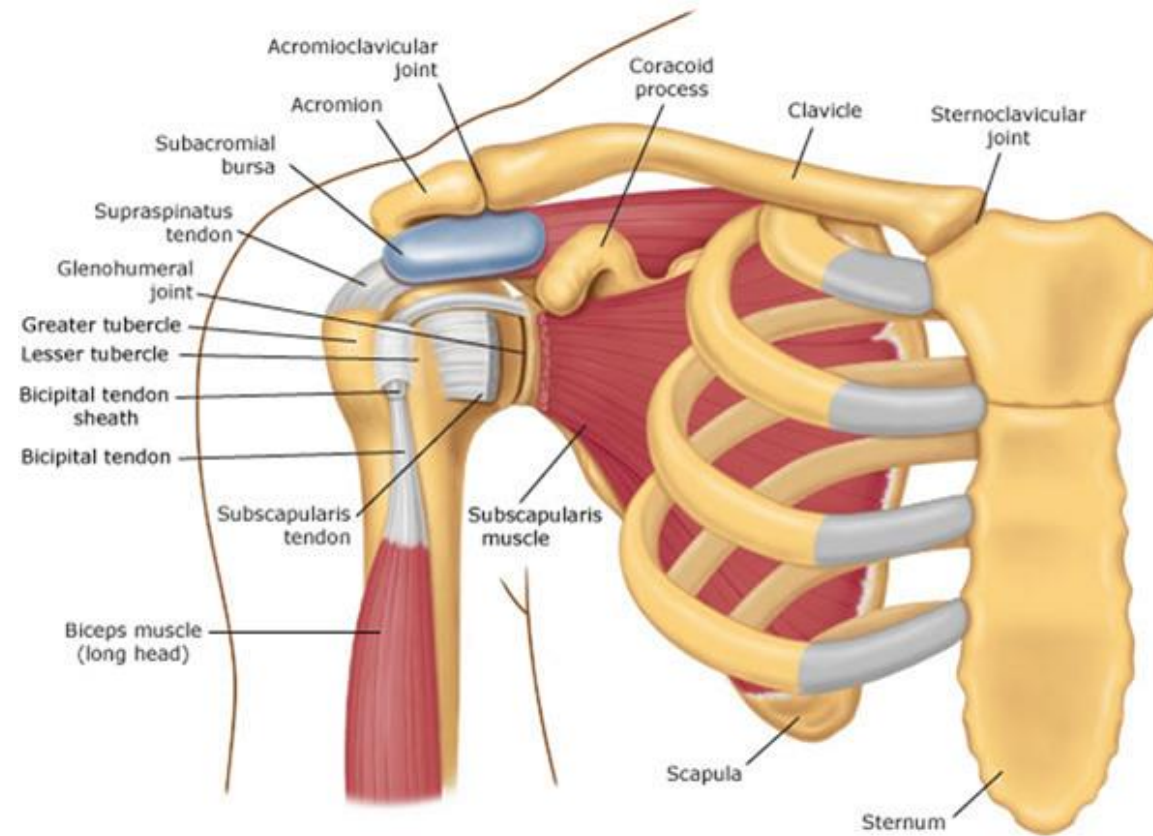
- Shoulder pain is common in the primary care setting, responsible for 16% of all musculoskeletal complaints.
- Taking a good history, paying special attention to the age of the patient and location of the pain, can help tailor the physical exam and narrow the diagnosis.
- Knowledge of common shoulder disorders is important as they can often be treated with conservative measures and without referral to a surgical subspecialist.



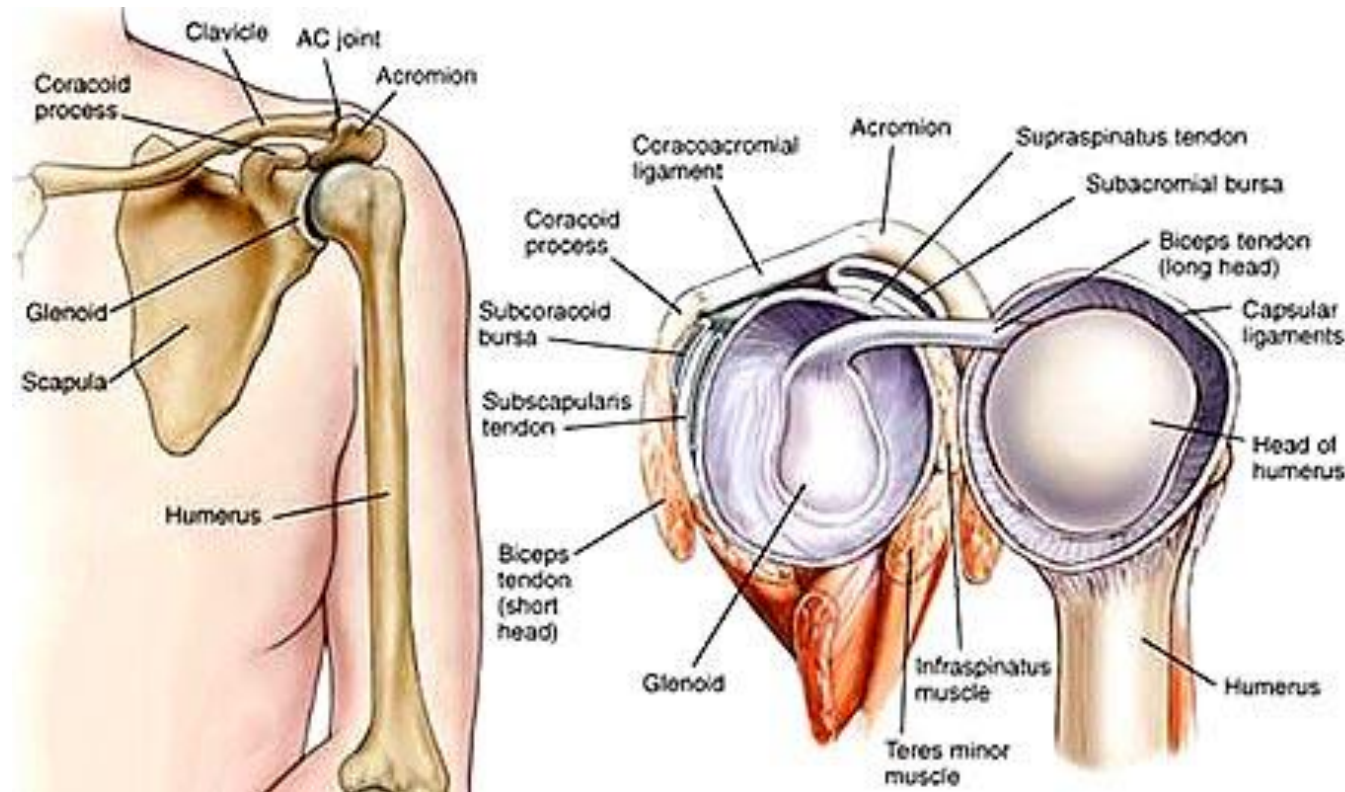
Shoulder Anatomy



Shoulder Anatomy

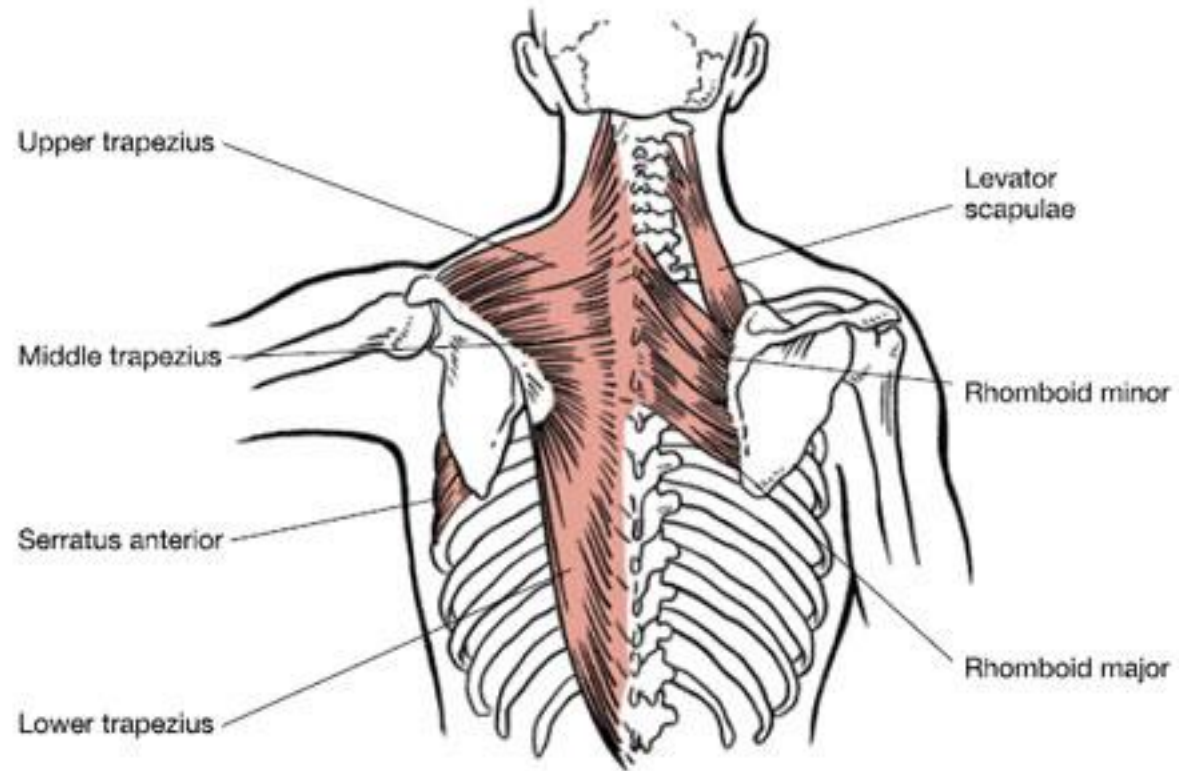


Shoulder Anatomy



Shoulder Anatomy

Figure 1-20
Superficial and deep muscles
that act at the
scapulothoracic
articulation



(MSK) Shoulder Pain Differential

- Rotator Cuff & Biceps
 - Tear
 - Strain
 - Tendinopathy
- Other Muscle Tear
- Arthritis
 - Glenohumeral (GH)
 - Acromioclavicular (AC)
 - Referred pain from spine
- Adhesive Capsulitis
- Impingement
- Scapular Dyskinesia
- Glenohumeral Instability
- Labral Tears
- Fracture
 - Humerus
 - Clavicle
 - Scapula
- Nerve Entrapment/Thoracic Outlet/Neuropraxia



Taking Your History

- Age
- Hand dominance
- Occupation
- Sports/physical activities
- Trauma/injury
- Onset
- Location
- Character
- Duration
- Radiation
- Aggravating/relieving factors including position
- Night pain
- Effect on shoulder function
- Stiffness/restriction of movement
- Grinding or clicking
- Weakness
- Numbness/tingling
- Pain
- Position of shoulder at injury



The Physical Exam

- Inspection – from the front and back
 - Asymmetry
 - Bony deformity or abnormal contour
 - Muscle atrophy or bulge
 - Scapular winging
 - Posture



The Physical Exam

- Range of Motion
 - Active
 - Passive
 - Apley's "scratch" test
 - Scapular movement
- Strength Testing/Resisted Movements

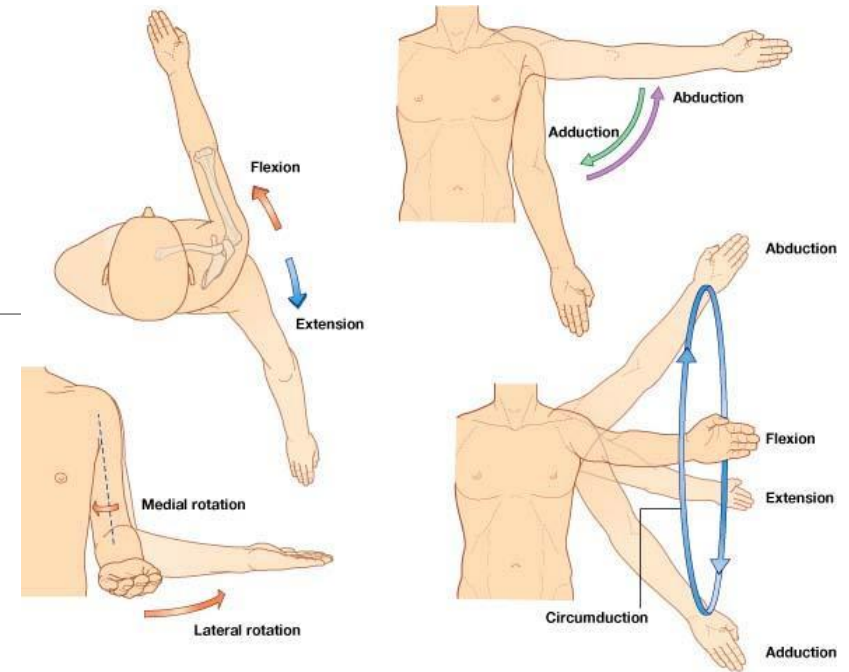
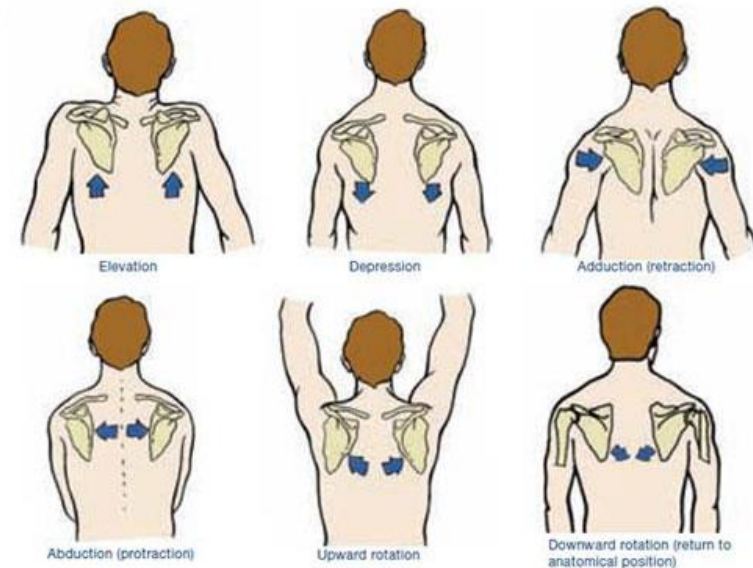
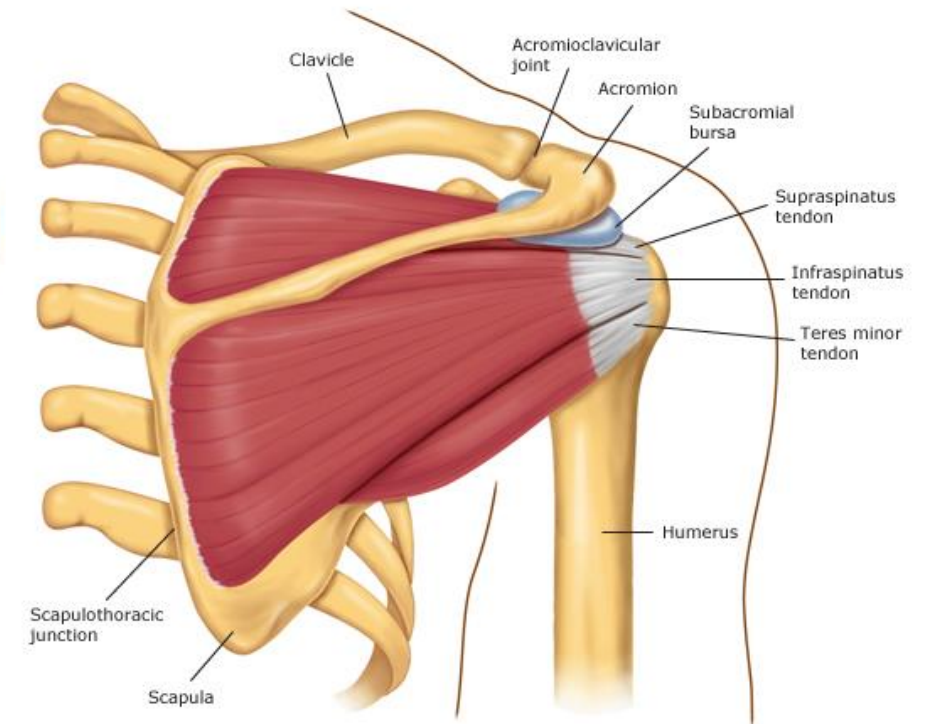
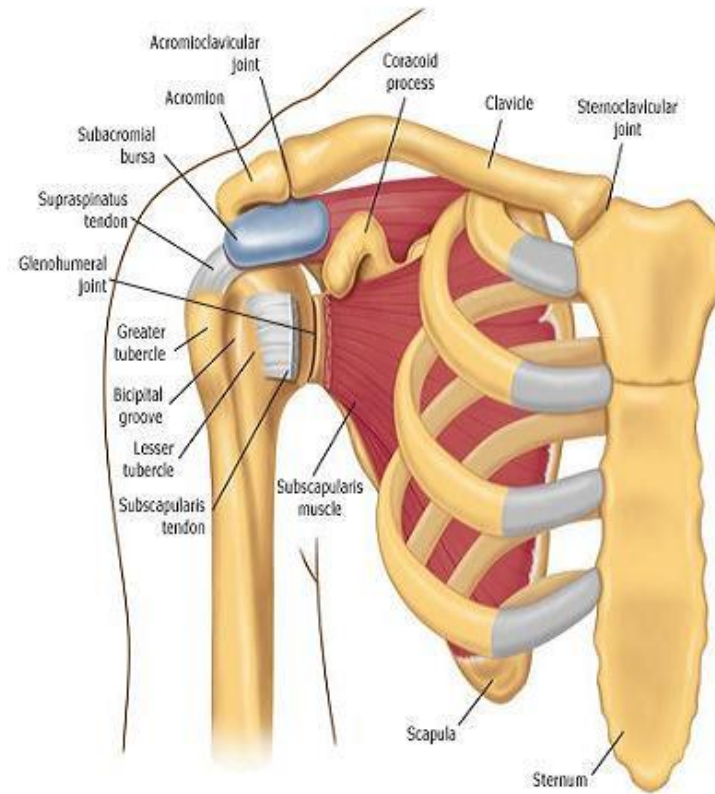


Figure 3-34
Scapular
movements



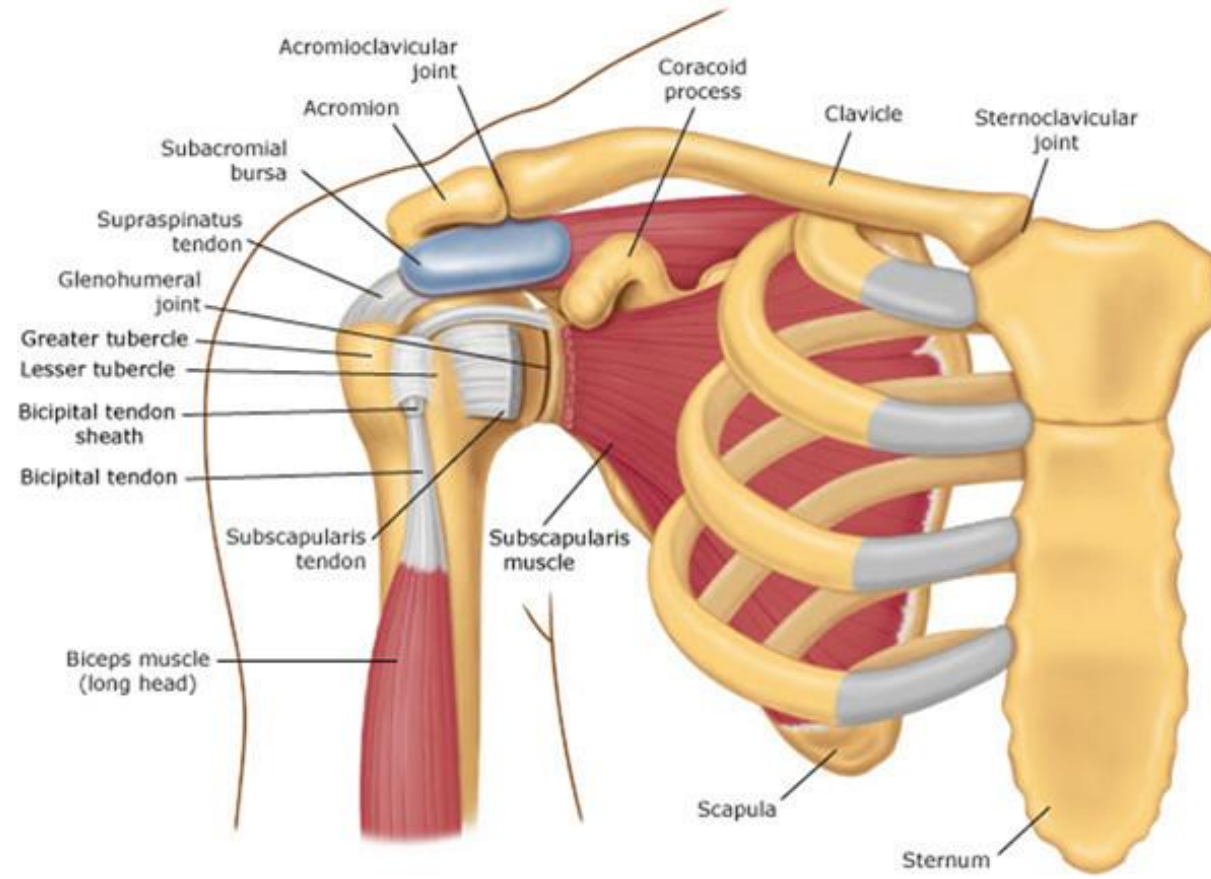
The Rotator Cuff Muscles

- **SITS**
- **Supraspinatus**
 - Abduction
- **Infraspinatus**
 - External rotation
- **Teres minor**
 - External rotation
- **Subscapularis**
 - Internal rotation



The Physical Exam

- Palpation
 - AC, SC, and GH joints
 - Biceps tendon
 - Coracoid process
 - Acromion
 - Scapula
 - Musculature



Special Tests

- Rotator Cuff
 - “Drop-arm”
 - “Empty can,” lift-off, and resistance testing
- Impingement
 - Neer’s
 - Hawkins/Kennedy



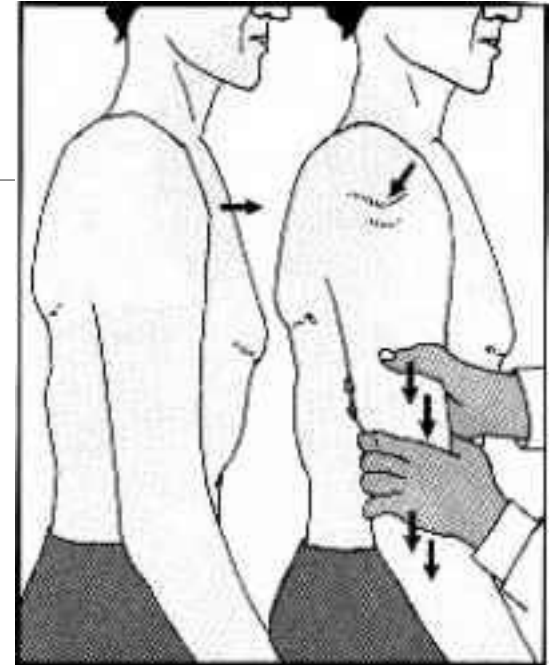
Special Tests

- Biceps
 - Speed's
 - Yergason's
- AC Joint
 - Cross-arm



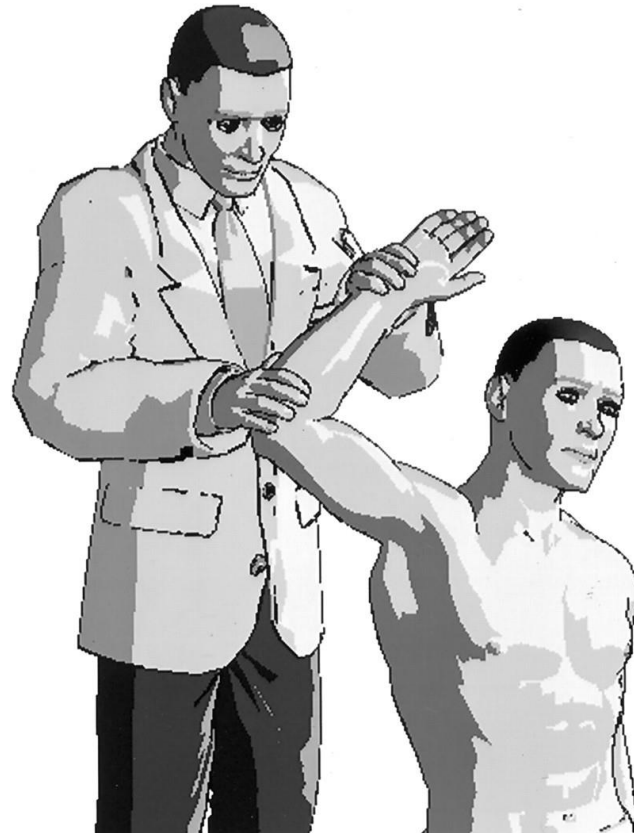
Special Tests

- Shoulder Instability
 - Sulcus sign
 - **Apprehension, relocation, release**
 - Load and shift



Special Tests

- Labrum
 - O'Brien's
 - Crank test
 - SLAPprehension



Imaging

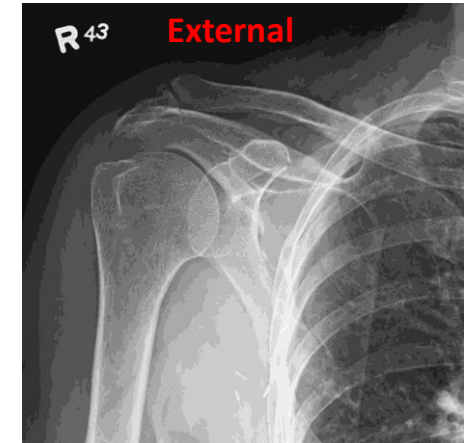
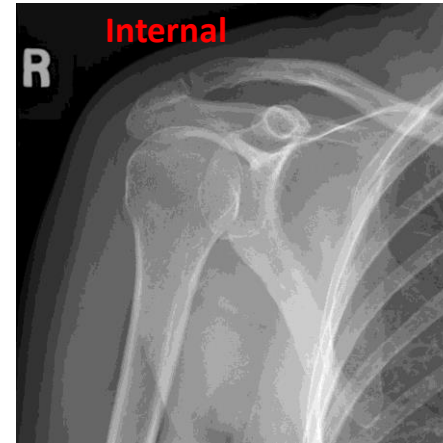
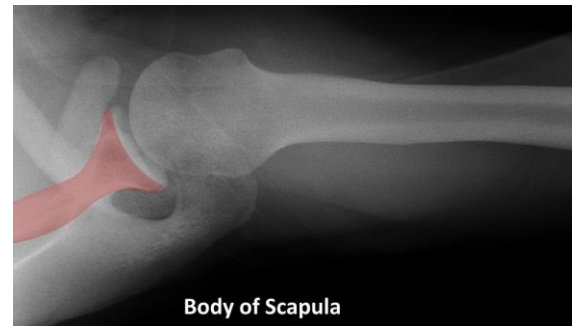
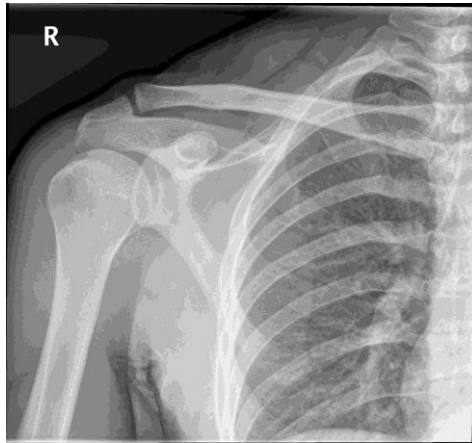
- Questions to ask myself:
 - Will this provide additional beneficial information?
 - Is the diagnosis unclear?
 - Was there a traumatic injury?
 - Were there concerning findings on exam?
 - Will the result affect my management?
- When ordering the imaging study:
 - Start small
 - Provide all necessary details (ie “left shoulder pain” versus “acute left lateral shoulder pain after fall, eval for fracture)
 - Decide if special views or instructions are needed



Imaging

- **Xrays**

- When?
- UM Routine Views include **AP & Axillary Lateral**
 - Consider adding **internal and external rotation** for good views of lesser and greater tubercles



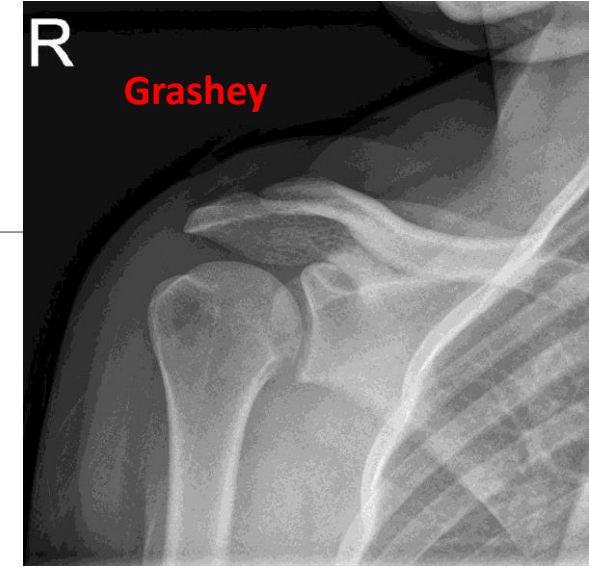
Case courtesy of Dr Craig Hacking, Radiopaedia.org, rID: 37498; Case courtesy of Dr Matt Skalski, Radiopaedia.org, rID: 23096; Case courtesy of Dr Matt A. Morgan, Radiopaedia.org, rID: 37170



Imaging

- Xrays

- Traumatic Injury?
 - **Scapular Y** (true lateral)
- Arthritis?



- **Grashey** (glenoid or “true AP”)

Case courtesy of Dr Craig Hacking, Radiopaedia.org, rID: 37498; Case courtesy of Dr Matt A. Morgan, Radiopaedia.org, rID: 35616

- AC joint? UM includes AP and obliques (Case courtesy of Dr Craig Hacking, Radiopaedia.org, rID: 37930)
- Clavicle? UM includes AP, 30 degree cephalad & caudal (Case courtesy of Dr Craig Hacking, Radiopaedia.org, rID: 36886)

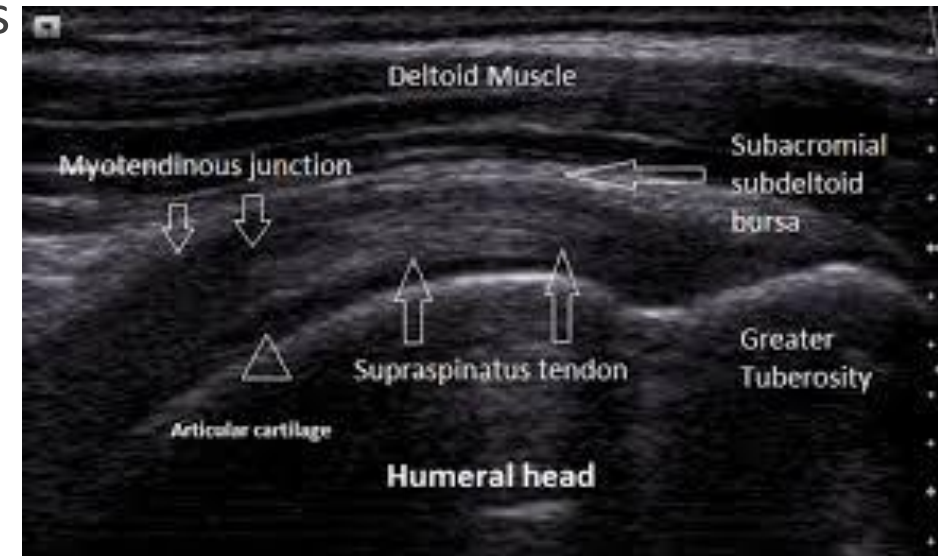


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Imaging

- **Ultrasound**

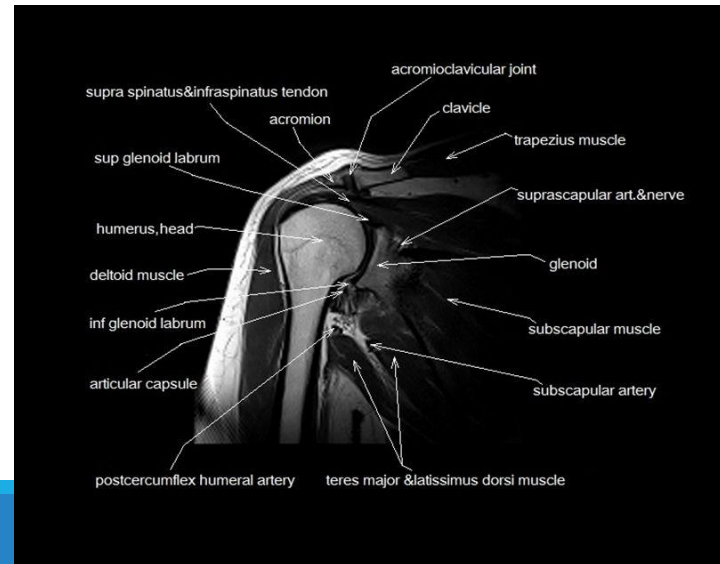
- Evaluate rotator cuff and adjacent muscles, bursa, long head of biceps, fluid collections
- Diagnose tendinopathy, tears, bursal thickening, impingement
- However, not great at quantifying large tears
- Less expensive, non-invasive
- Static and dynamic evaluation
- “Upper Extremity US”



Imaging

- **MRI**

- Multiplanar, non-invasive
- Can better characterize large RC tears, can diagnose occult fractures, more information on ligaments and nerves
- More expensive, static
- Do not need immediately if full ROM and only complains of pain and weakness
- Add arthrogram (contrast) for labral pathology



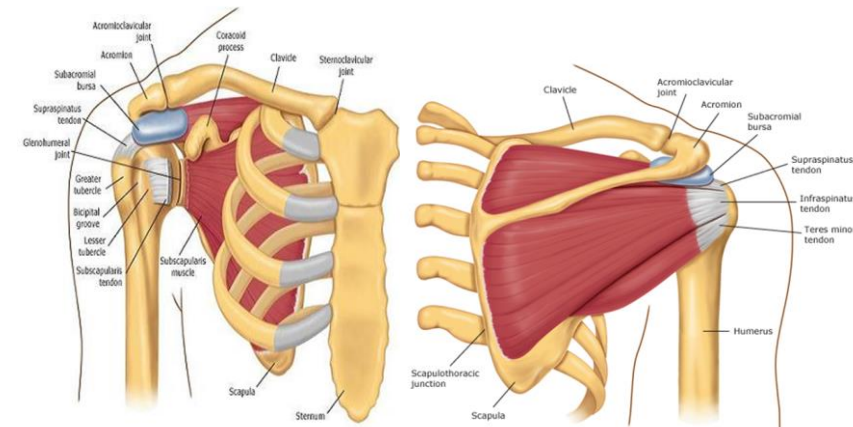
Case 1

- History:
 - 54 yo M engineer
 - 4 months of lateral shoulder pain without injury
 - Starting doing cross-fit for weight loss
 - Pain aggravated by overhead and behind back movements
- Exam:
 - Full ROM but painful arc between 70-120 degrees of abduction
 - No significant weakness, but pain with resisted ROM
 - + empty can, Hawkins for pain
- Xrays – mild OA, mild cortical irregularity of greater tubercle



Rotator Cuff Pathology

- Strains/“bursitis”
 - Common in athletes or with increase in physical activity
 - Sudden onset of pain, some functional limitations
 - Exam: ROM limited by pain, some weakness due to pain, musculature ttp
 - +/- Xrays
 - Respond quickly to rest, activity modification, stretching, NSAIDs

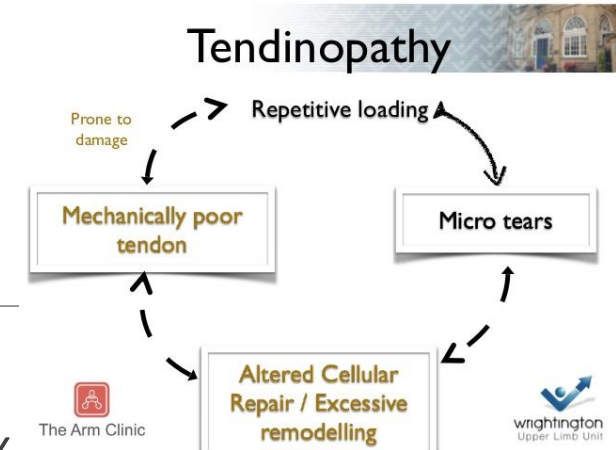


Rotator Cuff Pathology

- Tendinopathy

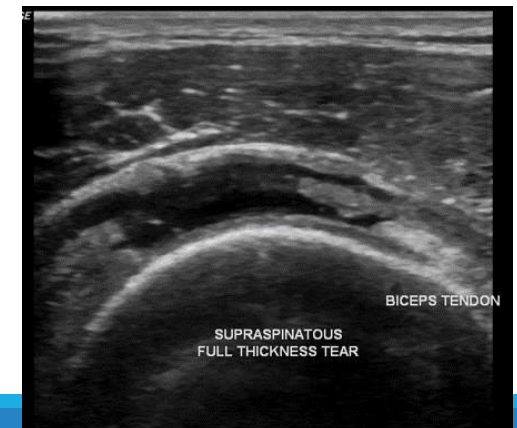
- Increased load/overuse → apoptosis → disorganization of collagen matrix
- Chronic progression of **pain** +/- weakness, more common in older population
- Worse with abduction, reaching behind, overhead
- Exam:
 - Pain with AROM and resistance testing, + empty can and lift off for pain, +/- Hawkins's
 - TTP over proximal humerus
- Imaging:
 - Xrays often negative
 - US

- Treatment: Activity modification, PT (up to 12 weeks!), consider subacromial steroid injection if no improvement or plateau in PT due to pain

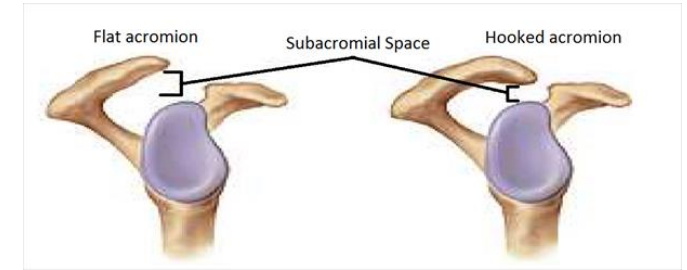


Rotator Cuff Pathology

- Partial and Full Thickness Tears
 - Typically older population
 - Degenerative tears versus acute traumatic tears
 - Pain +/- weakness, difficulty sleeping
 - Exam:
 - Similar to tendinopathy
 - If acute tear, expect + drop arm test, decreased AROM or helping from other arm, more severe weakness with resistance testing
 - Xray – may show OA, cortical irregularity, or humeral head migration
 - US/MRI for confirmation of diagnosis
 - Treatment: acute versus chronic? → conservative versus Ortho referral

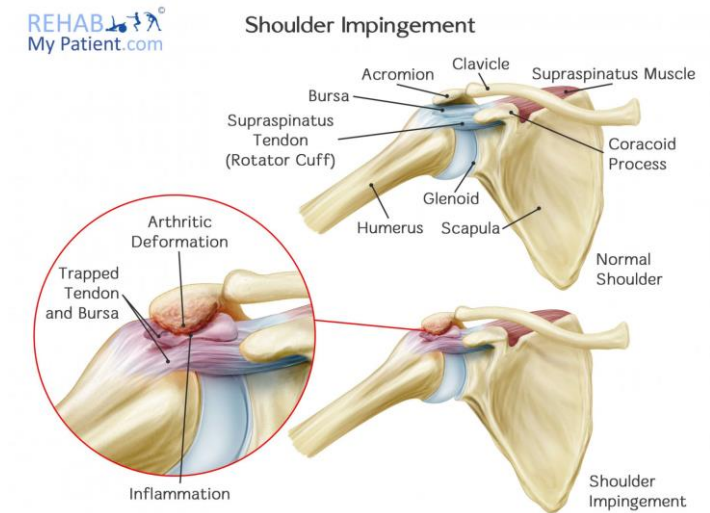


Rotator Cuff Pathology



Ethos Health

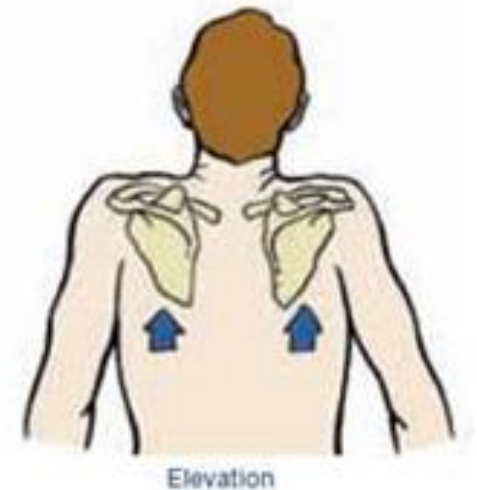
- Impingement
 - Mechanical irritation of RC tendons as result of narrowing of subacromial space
 - Anatomical causes (beaked acromion, osteophytes)
 - Muscular weakness or imbalance (scapula, RC, deltoid)
- Exam:
 - Inspection – posture, scapular movement
 - Pain with active abduction
 - + Hawkin's, Neers
- Xrays – may show anatomical cause
- US – +/- bursal thickening, dynamic testing
- Treatment: Activity modification/rest, PT, steroid injection, rarely surgical decompression



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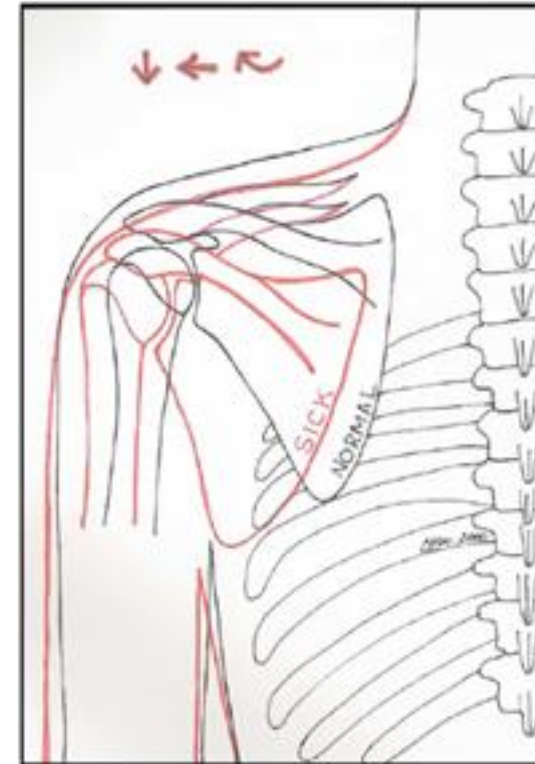
Case 2

- History:
 - 19yo F college volleyball player
 - Pain with hitting and overhead serving
 - Pain improves during off-season
- Exam:
 - Prominence of medial border of scapula on right with elevation
 - Full AROM with pain above 90 degrees of abduction
 - + Hawkin's
 - Pain with wind-up phase when demonstrating hitting/serving
- Xrays - normal



“SICK Scapula”

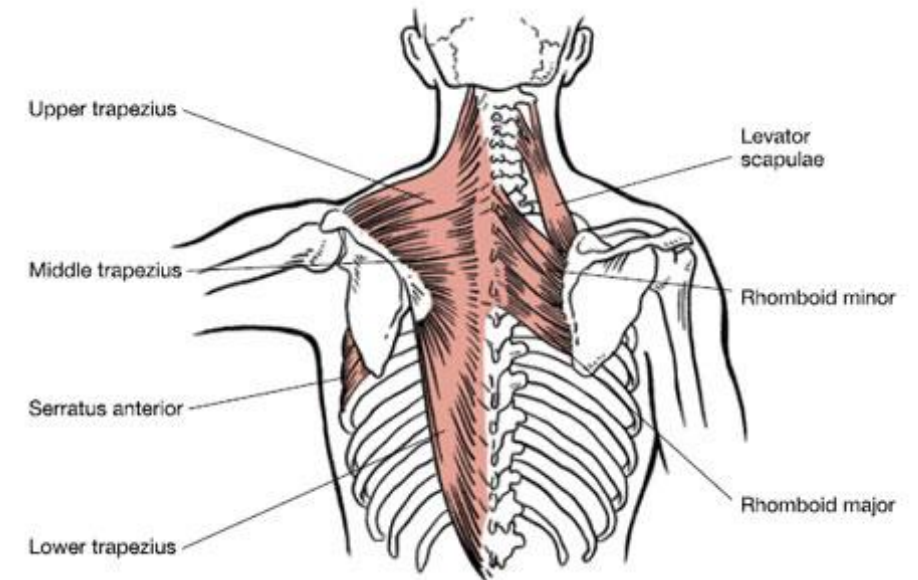
- Presentation & Symptoms:
 - Pain
 - Repetitive overhead activity
 - Drooping shoulder on dominant side
- Physical Exam:
 - **Scapular malposition**
 - Inferior medial border prominence
 - **Coracoid pain and malposition**
 - **Kinesis abnormalities of scapula**
 - Can result in impingement type symptoms



“SICK Scapula”

- Diagnosis:
 - Clinical
- Management:
 - Physical Therapy & kinetic-chain based rehabilitation
 - Pain free ROM → Strengthening
→ Proprioception exercises

Figure 1-20
Superficial and
deep muscles
that act at the
scapulothoracic
articulation



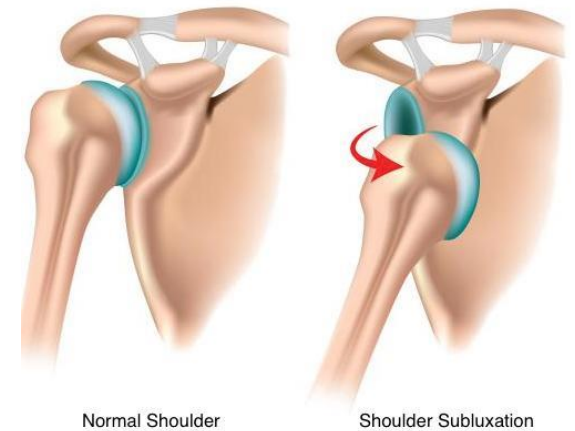
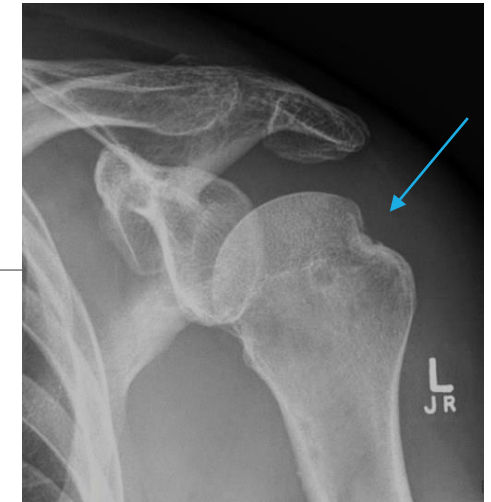
Shoulder (GH) Instability

- Presentation & symptoms:
 - Pain
 - Instability
 - Age < 40yo
 - Transient neurologic symptoms
 - History of dislocation or subluxation
- Physical exam findings:
 - + sulcus
 - + apprehension & relocation
 - load & shift testing



Shoulder (GH) Instability

- Diagnosis:
 - Clinical
 - Xrays often normal, could show Hill Sach's lesion
 - MR arthrogram if no improvement
- Management:
 - Activity modification
 - PT focused on aggressive strengthening
 - Refer to Ortho if no improvement with PT or if **recurrent dislocation**



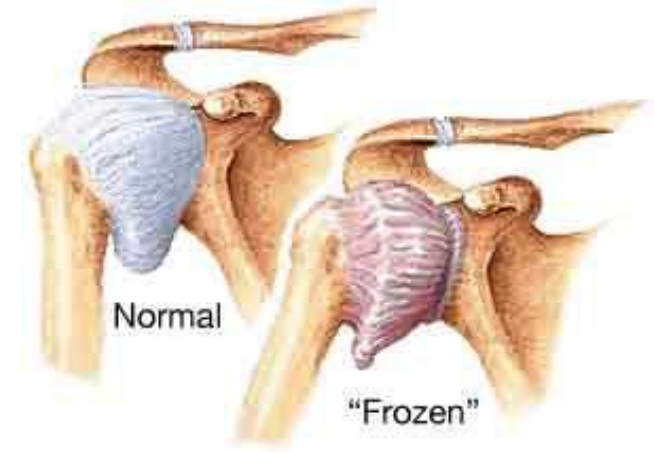
Case 3

- History:
 - 68 yo F, multiple medical problems including DM
 - 6 months of shoulder pain, decreased ROM, can't do ADLs
 - No injury, nothing makes it better
- Exam:
 - Active ROM quite limited, particularly with external rotation (15 degrees)
 - No improvement with passive ROM
 - Pan positive exam, difficult to get in position for special maneuvers
- Xrays – mild/moderate OA



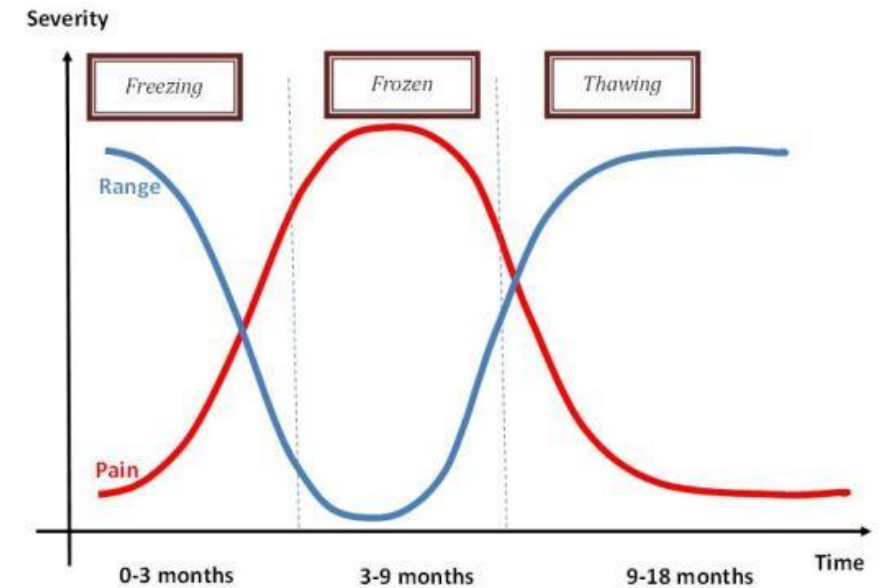
“Frozen Shoulder” (Adhesive Capsulitis)

- Presentation & symptoms:
 - Pain, often >3 months
 - Progressive loss of ROM
 - Age >40yo
 - Risk factors: immobility, DM, thyroid disorders
- Physical exam findings:
 - Limited active ROM, external rotation often 50% normal
 - **Endpoint with passive ROM**



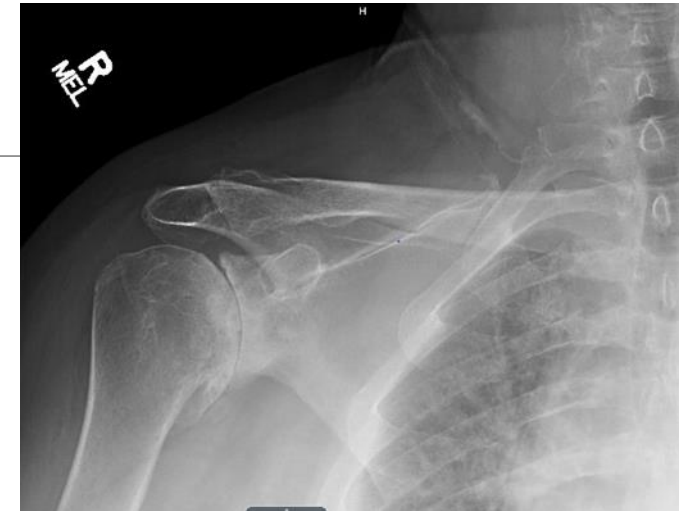
“Frozen Shoulder” (Adhesive Capsulitis)

- Diagnosis:
 - **CLINICAL!**
 - Xray if need to rule-out fracture or OA
 - US if concerned for RC pathology
- Management:
 - Set expectations – recovery can take 18+ months!
 - Pain control, gentle ROM exercises/PT
 - If severe, intra-articular CS injection with capsular distention followed by PT session within 24-36 hrs
 - If recalcitrant, consider surgical manipulation (Ortho)



Case 4

- History:
 - 72 yo M upset with his golfing game
 - Progressively worsening right shoulder pain and range of motion
 - Feels crepitus with movement
 - Multiple small injuries over the years
- Exam:
 - Active ROM limited in all directions, including external rotation
 - Decent strength with resistance testing, 4+/5
 - TTP around shoulder joint



• Xrays...

Shoulder Arthritis

- Presentation & symptoms:

- Age >50
- Progressive pain with activity
- Decreased ROM
- Impingement symptoms
- History of rotator cuff injury, previous trauma, or shoulder surgery

- Physical exam findings:

- AC joint: tenderness over AC joint, pain at extreme internal rotation, + cross-arm test
- GH joint: decreased ROM, pain and crepitus at extremes of motion, can have + labral testing



Shoulder Arthritis

- Diagnosis:
 - Clinical +
 - **Xray**
- Management:
 - AC joint:
 - Activity modification, NSAIDs, GC injection
 - GH joint:
 - Goal = maintain function with adequate pain control
 - PT, intra-articular GC injection
 - Referral to Ortho for arthroplasty if conservative treatment fails – for PAIN not ROM



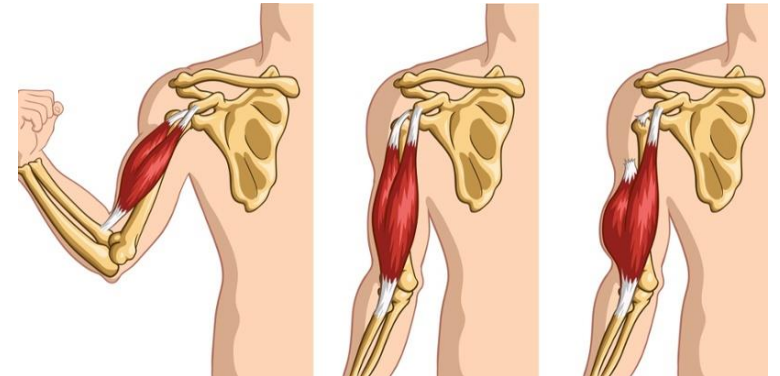
Case 5

- History:
 - 38 yo M assembly line worker
 - 1 week of anterior right shoulder pain after lifting injury at work
 - Noticed a bulge in his upper arm
- Exam:
 - Popeye deformity
 - Some pain with active ROM
 - TTP bicipital groove, distal biceps intact
 - + Speeds test
- Xrays - normal



Biceps Pathology

- Similar to RC, can have strains, tendinopathy and tears
- Chronic issues often associated with RC pathology/impingement
- Pain is usually anterior in location, worse with lifting
- Tears usually in >40yo, initial sharp pain/snap → pain soon subsides
- Exam:
 - Possible swelling or deformity, bruising on exam if tear
 - TTP at bicipital groove, + Speed's test, Yergason's
- Imaging
 - Xray – typically normal
 - US/MRI - diagnostic



Biceps Pathology

- Treatment
 - Strains/Tendinopathy/Partial Tears:
 - Activity modification, PT, consideration of steroid injection (not for strains)
 - Complete Tears (Proximal)
 - Still typically conservative, PT
 - Short head still attached so strength not severely affected
 - Tenodesis more likely to be done if young, more for cosmetic reasons
 - Distal Biceps Rupture
 - Urgent Ortho referral → surgery
 - Diagnose clinically (+ hook test), can use US



Physical Therapy



- A Good Prescription for Formal PT
 - Include your diagnosis AND any local biomechanical deficits
 - Examples could include poor posture, inflexibility
 - Duration and frequency (ex: 2x/week for 6 weeks), goals, restrictions, ?modalities
 - With rotator cuff injuries, request deltoid retraining
 - Don't forget about the scapula!!
- Set reasonable expectations with patients
- Stress importance of homework (HEP) during and after formal PT (3-5x/week)
- If unable to do formal PT, give patient a good HEP



Extra Sports Medicine Pearls

- Clavicle Fracture
 - Midshaft are most common
 - Usually from fall onto shoulder
 - Diagnose by xray
 - Sling (ortho if shortening, complete, open)
 - Typically heal in 4-6 weeks
- Proximal Humerus Fracture
 - Fall on outstretched hand
 - >60yo, osteoporotic women
 - Usually nondisplaced, at greater tubercle
 - Xray for diagnosis
 - Sling 2-4 weeks, early mobilization, PT



YouTube!

“Complete Musculoskeletal Exam of the Shoulder”
by University of Michigan Family Medicine



Questions?



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Thank You!



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