Shoulder Exam: Rapid Exam and Diagnosis

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Objectives

- Be able to perform three minute shoulder exam
- Discuss common MSK diagnoses, and how to rapidly stratify based on history
Shoulder Overview

- Shoulder girdle facilitates placement of hand in space.
- Shoulder is an inherently unstable joint → mobility > stability
  - Compare to the hip: stability > mobility
- It is a non weight bearing joint – most problems related to overuse, inflammatory, trauma
Anatomy

- Musculature (major)
  - Rotator cuff:
    - supraspinatus, infraspinatus, subscapularis, teres minor
    - Biceps, triceps, deltoid, rhomboid, trapezium, pec, lats

- Bones
  - Scapula, clavicle, humerus
Anatomy

- 4 shoulder joints:
  - sternoclavicular (SC), acromioclavicular (AC), glenohumeral (GH), scapulothoracic (ST)
  - Only synovial attachment to torso through SC articulation

Capsule, labrum and ligaments
- inferior glenohumeral ligament
Shoulder

Instability
Impingement

Rotator cuff disease
AC joint separation
Adhesive capsulitis

Axillary nerve
Suprascapular nerve

C5, C6 radiculopathy
brachial neuritis

Biomechanics

Tissue injury

Neurologic sequelae
Instability: Static and Dynamic forces

**Static Stabilizers**
- Bone, cartilage, ligament
- Work primarily at end ROM
- Glenoid fossa is shallow - labrum deepens slightly
- IGHL acts as a hammock/sling
- Deficiency of IGHL either stretching or tearing
- Negative intraarticular pressure, viscosity of synovial fluid: loss with RC tear, compounding symptoms. Suction cup

**Dynamic Stabilizers**
- Rotator cuff muscles
- Compressive force to Resist upwards pull of deltoid
- LH of the biceps (may conceptualize as 5th RC given role in GH stability)
- Scapular stabilizers (rhomboids, serratus anterior, trapezius, levator scapulae)
- Work primarily at mid-ROM
Common Diagnoses

- Dislocations
- Rotator cuff tendinopathy and tears
- Impingements
- Bursitis
- AC arthropathy
- Adhesive capsulitis
- Neurologic (eg C5 radiculopathy)
- Referred pain (eg C5-6 facet arthropathy)
Uncommon Diagnoses

- Brachial Neuritis (aka Parsonage-Turner Syndrome)
- Facioscapulohumeral dystrophy (FSHD)
History and Physical

- Age and activity major predictors of pathology
  - Dislocations
    - Age predicts likelihood of repeat dislocation (>>younger age)
  - Rotator cuff tears
    - Rare in younger patients and athletes
    - More common in >40yo
  - Impingement:
Shoulder Instability

- Laxity does not equal instability

Definitions

- Instability: symptomatic laxity of the shoulder
- Apprehension: feeling of impending instability
- Subluxation: partial loss of articulation (i.e. popping in and out of joint)
- Dislocation: total loss of articulation
Traumatic Dislocations

- Shoulder is most commonly dislocated joint
- Majority are anterior dislocations (95%)
  - Typically from FOOSH
  - Typically pt presents with arm in a abducted, ER position
  - Axillary nerve commonly injured
- Risk factors:
  - overhead activities (eg throwing)
  - younger
- X-ray (common views: A/P, scapular Y view)
  - Bankart lesion (anterior labral avulsion from glenoid)
    - Westpoint view
  - Hill-Sacks lesion (posterior humeral head defect)
    - Striker notch view
- If posterior dislocation – consider electrocution or seizure
Rotator cuff

- What are the four muscles?
  - Fifth muscle?
- What is tendinopathy?
  - Tendinosis, tendinitis?
- Rotator cuff disease is a spectrum of pathological changes:
  - Normal → tendinosis → partial tear → full thickness tear
Rotator cuff

- Rotator cuff tendinopathy and tears are more common than osteoarthritis in the shoulder.
- X-ray may show superior migration of the humerus due to unopposed deltoid pull.
Impingement (external)

- **Primary – anatomic**
  - Narrowing of coracoacromial arch space, resulting in RTC impinging
  - Associated with type 3 “hooked” acromion

- **Secondary**
  - Instability
  - Scapulothoracic dyskinesia (ie poor scapular coordination with arm)
  - Intrinsic RTC abnormality
    - Eg tendinosis, tear, neurologic
RTC History & Exam

- History:
  - Pain location – typically lateral arm
  - Pain when lying on that side
  - Worse with overhead activities or reaching behind

- Exam:
  - + Hawkins
  - + Painful arc (between 60 to 120 degrees)
  - + ER weakness
  - If all 3+, 95% probability RCT pathology
Adhesive Capsulitis

- Female > male; typically in their 50’s
- Asso. Thyroid dz, DM, immobilization
- Limited ROM (especially ER), painful
- Plain films normal
  - Arthrogram may show reduced capsule volume
- Typically described as 3 phases
  - Painful stage 1-3 months
  - Freezing stage 3-9 months (< pain, > loss ROM)
  - Thawing stage 9- 24 months (slow improved ROM)
Facet arthropathy referral patterns
Approach to MSK exam

- Inspection
- Palpation and ROM
- Neuromuscular exam
- Special & Functional Tests
Inspection

- View gowned pt from back
- Posture
  - Typical ‘modern’ posture – shoulders protracted, increase thoracic kyphosis, anterior head carriage
- Position of scapula
  - Is scapula equidistant from spine?
  - Subluxation?
  - **Scapular winging?**
    - Serratus anterior, trapezoid, or rhomboid weakness – each presents with specific pattern of winging
- Atrophy
  - Especially look for supraspinatus, infraspinatus, and deltoid atrophy
Range of Motion

- **Active ROM:**
  - Still viewing from behind
  - Bilateral shoulder abduction
    - Painful arc? – consider RTC pathology
    - Observe ‘smoothness’ of scapular motion
      - Symmetric? Delayed?
  - Flex elbows to 90 degrees (external rotation)
  - Rotate arms 180 degrees (internal rotation)
    - Standing exam of IR and ER is a gross test – ideal test is with pt supine on table, scapula is fixed and true GH rotation observed.
# Shoulder ROM

## Table 4-1. RANGE OF MOTION

<table>
<thead>
<tr>
<th>Position</th>
<th>Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward flexion/elevation&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0–180</td>
</tr>
<tr>
<td>Extension&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0–60</td>
</tr>
<tr>
<td>Abduction&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0–180</td>
</tr>
<tr>
<td>Adduction (humerus passes in front of trunk)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0–30</td>
</tr>
<tr>
<td>Glenohumeral internal rotation&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0–70</td>
</tr>
<tr>
<td>Glenohumeral external rotation&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0–90</td>
</tr>
</tbody>
</table>

<sup>a</sup>Zero begins at the anatomic position.

<sup>b</sup>Zero begins with the humerus abducted to 90 degrees.

Palpation

- From behind
  - supraspinatus, infraspinatus, deltoid – atrophy?
    - Compare to contralateral side - palpation more sensitive for atrophy than visual inspection
- From front
  - SC joint, move along clavicle to AC joint
  - drop off acromion to RTC
    - Lateral is supraspinatus
    - Posterior is infraspinatus
    - External rotate arm – palpate long head of biceps and subscapularis
Neuro exam

- **Strength**
  - Shoulder abduction, elbow flexion, elbow extension, **external rotation, internal rotation**, lift off test (subscapula)
  - Always compare sides

- **Reflexes**
  - DTRs – biceps, triceps, brachioradialis
  - Hoffman’s

- **Sensation** – dermatomal a/o peripheral nerves
Special tests

- Tons of them – we’ll go over just a few
Apprehension test (instability)

- Pt sitting or supine
- Gently abduct shoulder 90 deg, ER 90 deg
- Gentle anterior force at posterior shoulder
- + test: if signs or symptoms of apprehension
Relocation & Surprise tests (instability)

- Relocation test
  - Continue apprehension maneuver, however change examiners force by placing posterior pressure on anterior shoulder
  - + test: relief of anxiety/apprehension

- Surprise test
  - subsequently letting go of the posteriorly directed pressure
  - + test: with sudden fear/apprehension of dislocation
Sulcus Sign (Subluxation, inferior instability/labral tear)

- Pt sits/stands with relaxed shoulder.
- Examiner distracts arm inferiorly,
- + test: increased space between humerus and acromion
Load & Shift (A/P instability, labral tears)

- Pt sitting or supine, the scapula is stabilized (secure coracoid and scapular spine) with one hand
- The humeral head is then grasped, translated anteriorly and posteriorly
- Palpate for movement of head along or over glenoid
  - 3 grades (0-25%, 25-50%, >50% respectively)
  - Neer and Foster’s study: PPV 93.8%, 90.9% sensitive, 93.3% specific for Bankart lesion (anteroinferior labral tear)
Empty Can (aka Jobe Test, aka Supraspinatus Test)

- first assess the deltoid by pt abducting arm to 90 degrees with neutral rotation
- Supraspinatus is then assessed by internally rotating arm (thumb towards floor) and moving the arm (horizontal adduction) 30 degrees
- Examiner then provides resistance
- + test: pain and or weakness

For detecting supraspinatus tendonitis:
Sensitivity: 77.2%
Specificity: 38.4%

For detecting supraspinatus tears:
Sensitivity: 18.7%
Specificity: 100%
O’Brien’s Test (labral tear vs AC arthropathy)

[With] the physician behind the patient, the patient is asked to forward flex the affected arm 90 degrees with the elbow in full extension. The patient then adducts the arm 10 to 15 degrees medial to the sagittal plane of the body. The arm is then internally rotated so the thumb is pointed downward. The examiner then applies uniform downward force to the arm. With the arm in the same position, the palm is then fully supinated and the maneuver is repeated. The test is considered positive if pain is elicited with the first maneuver and is reduced or eliminated with the second maneuver. Pain localized to the acromioclavicular joint or on top of the shoulder was diagnostic of acromioclavicular joint abnormality. Whereas pain or painful clicking described as inside the glenohumeral joint itself was indicative of labral abnormality.
Drop Arm

**Drop arm test** The examiner abducts the patient's shoulder to 90 degrees and then asks the patient to slowly lower the arm to the side in the same arc of movement. A positive test is indicated if the patient is unable to return the arm to the side slowly or has severe pain when attempting to do so.

Bryant et al. 7
For detecting RTC tear
PPV: 100%
Sensitivity: 10%
Neer’s test (impingement)

- Passively flex the shoulder to maximal forward flexion, pt’s thumb towards ear
- + test: pain in shoulder at maximal forward flexion

For assessing subacromial bursitis:
- Sensitivity: 75%
- Specificity: 47.5%

For detecting rotator cuff pathology:
- Sensitivity: 83.3%
- Specificity: 50.8%
Hawkin’s Test (impingement)

- Forward flex pt’s shoulder to 90 degrees with elbow flexed 90 degrees
- Internally rotate shoulder
  - Check at several locations by horizontally adducting arm and then internally rotating
- + test: pain in shoulder
Scapular assistance test (secondary impingement)

The scapular assistance test involves assisting the lower trapezius by manually stabilizing the upper medial border [of the scapula] and rotating the inferomedial border as the arm is abducted or adducted. The test is positive, indicating lower trapezius weakness as part of the injury, when it gives relief of symptoms of impingement, clicking, or rotator cuff weakness.
Lift Off Test (weak/torn subscapularis)

- Internally rotate arm behind pt’s back
- Pt presses hand posteriorly
- + test: Inability to lift/press arm backwards

For detecting subscapularis lesions:
- Sensitivity: 50%
- Specificity: 84.2%

For detecting subscapularis tears:
- Sensitivity: 50%
- Specificity: 95.4%
Yergason’s test (biceps tendinopathy)

- Pt’s elbow flexed 90 degrees, forearm pronated
- Pt resists supination
- + test: pain at bicipital groove (ie anterior shoulder)
Speed’s test (biceps tendinopathy)

- Shoulder forward flexed about 30 degrees, elbow full extended and supinated
- Doc puts downward force on arm, pt asked to resist
- + test: pain along biceps long head
Yocum’s test (AC arthropathy)

- Pt places hand on opposite shoulder and raises elbow against examiner’s resistance
- + test: pain at AC joint
Conclusion

- There are many should exams – try to quickly determine a differential diagnosis from the history and customize your exam to rule in/out for diagnosis.