Shoulder Exam Workshop for the Primary Care Provider

Irvin Sulapas, MD, CAQSM, FAAFP
Assistant Professor – Sports Medicine
Department of Family & Community Medicine
8/13/19
I have no actual or potential conflict of interest in relation to this presentation.
Objectives

- At the conclusion of the session, participants should be able to:
  - Describe various diagnostic and prognostic criteria for various shoulder conditions.
  - Understand the appropriate imaging modalities to order for shoulder pain.
  - Understanding evidence based interventions for patients with shoulder pain.
  - Understand when to appropriately refer for treatment.

Source: www.wakesportsmedicine.com
Shoulder pain

- 3rd most common MSK complaint in general population
- Accounts for 5% of general medicine MSK consults
- Incidence of shoulder pain: 6.6-25 cases per 1000 patients
- Peak incidence – 4th – 6th decade of life
- Shoulder pain 2nd to only knee pain for referrals to orthopedics or primary care sports medicine clinics
- 8-13% of athletic injuries involve the shoulder and up to 3.9% of new ED visits

Shoulder Injuries

A careful history will help establish the diagnosis and formulate a treatment plan

Important factors
- Chief complaint
- MOI (mechanism of injury)
- Hand dominance
- Sport
- Prior treatments

Common complaints
- “pain with overhead activities”
- “pain at night when I lie on that side”
- “feels like my shoulder is about to come out”
Muscles of the shoulder

Source: Netter’s Sports Medicine
<table>
<thead>
<tr>
<th>History</th>
<th>Associated Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>&lt; 40 yo: instability, rotator cuff tendinopathy&lt;br&gt; &gt; 40 yo: rotator cuff tear, adhesive capsulitis, glenohumeral OA</td>
</tr>
<tr>
<td>DM or Thyroid</td>
<td>Adhesive capsulitis</td>
</tr>
<tr>
<td>Hx of trauma</td>
<td>&lt; 40 yo: shoulder dislocation/subluxation&lt;br&gt; &gt; 40 yo: rotator cuff tears</td>
</tr>
<tr>
<td>↓ ROM</td>
<td>Adhesive capsulitis, glenohumeral OA</td>
</tr>
<tr>
<td>Night pain</td>
<td>Rotator cuff, adhesive capsulitis</td>
</tr>
<tr>
<td>Numbness, tingling, pain radiating past elbow</td>
<td>Cervical etiology</td>
</tr>
<tr>
<td>Pain location</td>
<td>Anterior – superior – AC joint pathology&lt;br&gt; Diffuse pain in deltoid – rotator cuff, adhesive capsulitis, glenohumeral OA</td>
</tr>
<tr>
<td>Pain with overhead activity</td>
<td>Rotator cuff</td>
</tr>
<tr>
<td>Sports</td>
<td>Shoulder instability with overhead and collision sports&lt;br&gt; AC joint pathology w/ weight lifting</td>
</tr>
<tr>
<td>Weakness</td>
<td>Rotator cuff, glenohumeral OA</td>
</tr>
</tbody>
</table>
Range of Motion

- Should be evaluated in flexion, abduction, IR, ER
- Loss of AROM/PROM – adhesive capsulitis or OA
- Loss of AROM with preserved PROM – rotator cuff
- "Painful arc" – pain with AROM between 60-100 degrees of abduction → rotator cuff disease/impingement
E. External rotation strength.
Resistance to external rotation with the arm at the patient’s side and elbow flexed 90° preferentially tests the infraspinatus.

F. Internal rotation strength.
Internal rotation strength is tested by the patient adducting the arm to the side with the elbow flexed 90° and forcefully internally rotating against the examiner's hands.

Source: Netter’s Sports Medicine
Empty can/Jobe’s test

- Tests for supraspinatus pathology
- Arms abducted to 90 degrees and forward flexed 30 degrees.
- With thumbs turned downward, patient actively resists and downward force applied by the examiner
- Positive test – weakness/pain compared to other side.

Source: https://s3.amazonaws.com/
External Rotation Lag Test

- Most accurate strength test to identify full thickness supraspinatus and infraspinatus tears
- Passive Arm 20º abduction, Elbow 90º flexion, and arm almost maximal ER, ask patient to hold position
- Positive sign – patient unable to maintain position (arm internally rotates)
External Rotation Lag Test

Positioned in near maximal external rotation
Lift off test

- Tests for subscapularis pathology
- Arm internally rotated behind patient’s lower back
- Patient internally rotates against examiner’s hand
- Positive test – inability to lift the hand off of the back

Source: http://www.e-semio.org/Lift-off-test
Internal Rotation Lag Test

- Best for detecting full thickness tears of subscapularis
- Elbow flexed to 90º and shoulder internally rotated with hand behind the back
- Positive test – Patient unable to maintain position when hand is lifted away from back
Hawkin’s test

- Tests for impingement
- “Like a hawk”

Figures 1a and 1b. Hawkins’ Impingement Test. Forward flex the arm to 90 degrees with the elbow bent to 90 degrees. The arm is then internally rotated. A positive test, noted by pain on internal rotation, may signify subacromial impingement including rotator cuff tendinopathy or tear.

Drop arm test

- Tests for rotator cuff pathology
- Arm passively raised to 160 degrees
- Ask patient to slowly lower arm
- Positive test – inability to control the lowering phase and "dropping" arm
Crossover test

- Tests for AC joint pathology
- Patient forward flexes affect arm to 90 degrees
- Actively adducts arm across body
- Forces acromion into distal end of clavicle
Neer’s test

- Tests for impingement of rotator cuff under coracoacromial arch
- Place hand on scapula to prevent protraction
- Arm is full pronated and placed in forced flexion
- “Neer to the ear”
Sulcus sign

- Tests for inferior glenohumeral instability
- Examiner pulls downward on the elbow or wrist while observing the shoulder area for a sulcus or depression near the acromion
- Positive test – presence of depression

Apprehension and Relocation

- Tests for shoulder instability
- Patient is supine
- Arm is abducted to 90 degrees and the elbow is flexed at 90 degrees
- Positive apprehension - Pain and a sense of instability with further ER
- Positive relocation - Relief of these symptoms with a posteriorly directed force on proximal humerus
Apprehension and Relocation

FIGURE 2. To perform the apprehension test (A), the examiner abducts the patient’s arm 90° and externally rotates it 90°. The test is positive if the patient senses the shoulder slipping out of the joint, not just pain. To perform the relocation test (B), the examiner posteriorly directs force on the anteriorly subluxated humeral head. The test is positive if the humeral head relocates in the joint.
Speed’s Test

- Speed’s test – Biceps tendinitis at long head
- Arm forward flexed 50 degrees at shoulder
- Hand supinated
- Elbow flexed at 15 degrees
- Examiner palpates bicipital tendon at bicipital groove
- Patient forward flexes shoulder against resistance
- Positive test – pain in area of bicipital groove

Source: http://www.mhhe.com/hper/physed/athletictraining/ch22.mhtml
Yergason’s Test

- Tests for biceps tendinitis/stability
- Patient’s elbow is flexed to 90 degrees
- Hand pronated
- Examiner palpates biceps tendon at bicipital groove
- Examiner resists patient’s active attempts to supinate and externally rotate

O’Brien’s test

- Tests for labral tear
- Part 1
  - Arm flexed to 90 degrees with thumb DOWN
  - Arm adducted across chest
  - Patient flexes arm at shoulder, resisting examiner’s downward pressure
- Part 2
  - Arm flexed to 90 degrees with thumb UP
  - Repeat
- Positive Test - Pain with thumbs down but relief with thumbs up

Source: http://www.anatomy-physiotherapy.com/
Shoulder Imaging

- X-rays
- AP – oblique view of GH joint
- True AP (Grashey) – Taken in plane of scapula
Shoulder Imaging

- Axillary – important to evaluate dislocations. Useful in evaluating coracoid fx, and glenoid rim fractures (Bankart)
Shoulder Imaging

- Bankart lesion
- Injury to inferior glenoid labrum due to shoulder dislocation
- Treatment: Ortho referral
- “Break ‘off the bank’ of the glenoid”

Source: http://www.shoulderdoconline.co.uk/; http://radiopaedia.org/articles/bankart-lesion
Shoulder Imaging

- Scapular Y view
  - Evaluates acromion type
  - Evaluates relationship of humerus to glenoid fossa for dislocations
- Also helpful for proximal humerus and scapula fractures

Source: http://eorif.com/shoulder-xray
Shoulder Dislocation

AP View

Scapular Y

Source: 2018 ABFM ITE
Shoulder imaging

- MRI w/o contrast gold standard to evaluate soft tissue and cartilage
- If suspecting labral pathology, get an MRI with arthrogram
- Use of MSK US – the future!
  - Diagnostic accuracy of US, MRI, and MRI for full thickness rotator cuff tears were similar (Sn > .90, Sp > .90)
  - When considering accuracy, cost, and safety, US is a good option

Rehabilitation Principles

- Three types of contractions
- Concentric – contraction when load is lifted and muscles shorten (weightlifting)
- Eccentric – controlled weight lowering and muscle lengthens (“negatives”)
- Isometric – Joint angle and muscle length do not change during contraction (i.e. planks, yoga)

Source: http://smpp.northwestern.edu/bmec66/biodex/biodexback.htm
Rehabilitation Principles

- The key to rehab is eccentric exercises
- Knowing which muscle is injured can guide the exact rehab exercise.
Rotator Cuff Injuries

- **Mechanisms of Action**
  - > 40 yo – Chronic degenerative tear, or shoulder dislocation
  - < 40 yo – Acute avulsion injury

- **Sx:** Pain with overhead activities, night pain

- **Physical Exam**

<table>
<thead>
<tr>
<th>Muscle</th>
<th>Strength Testing</th>
<th>Special Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supraspinatus</td>
<td>Weakness to resisted elevation in Jobe position</td>
<td>Drop arm test + Jobe test (empty can)</td>
</tr>
<tr>
<td>Infraspinatus</td>
<td>ER weakness at 0º abduction</td>
<td></td>
</tr>
<tr>
<td>Teres minor</td>
<td>ER weakness at 90º abduction and 90º ER</td>
<td>Hornblower’s sign</td>
</tr>
<tr>
<td>Subscapularis</td>
<td>IR weakness at 0º abduction</td>
<td>Lift off test</td>
</tr>
</tbody>
</table>
Rotator Cuff Injuries

- **Treatment**
- Physical Therapy
- NSAIDs
- Subacromial corticosteroid injection
- [http://www.orthoinfo.org/](http://www.orthoinfo.org/)
Adhesive capsulitis

- 2-5% of general population
- Peaks between 40-60 yo
- Women > men
- Seen in diabetics
- 3 stages
  - Painful stage
  - Stiffness stage
  - Recovery stage
- Self limiting, but can last for 1-2 years
- Some patients’ symptoms can last up to 4 years

Adhesive capsulitis

- **Treatment**
  - Acetaminophen
  - NSAIDs
  - Oral steroids, tapered over 2-3 weeks
    - Prednisone 60 mg, decrease by 10 mg every 4-7 days
    - Improves pain and ROM, but has not shown to shorten the duration
  - IA corticosteroid injection
  - Physical therapy
  - PT + corticosteroid injection has been shown to have greater improvement than PT alone
- **When to refer:** No improvement in 6-12 weeks of conservative management

Adhesive Capsulitis

- Surgical management: MUA (Manipulation Under Anesthesia)
Biceps tendinitis

- Commonly accompanied by rotator cuff injury or SLAP lesions (labral tear)
- Often found in patients 18 – 35 yo involved in throwing or contact sports, swimming, and gymnastics
- Athletes over 35 yo, or nonathletes > 65 yo develop biceps tendinitis due to sudden overuse

Source: Am Fam Physician. 2009 Sep 1;80(5):470-6.
Biceps tendinitis

- **Sx:** throbbing ache in anterior shoulder
- **Physical exam:**
  - Most common finding – TTP to bicipital groove
  - + Speed’s test
  - + Yergason’s test
- **Treatment**
  - Acetaminophen
  - NSAIDs
  - Ice
  - PT
  - Injection
- **When to refer** – conservative treatment failure after 3 months

Cryotherapy

- Hemodynamic effects include reflexive vasoconstriction followed by delayed vasodilation
- Neuromuscular effects
  - Decrease nerve conduction velocity
- Joint effects – decreasing synovial collagenase activity

Cryotherapy

- **Types**
  - Superficial: cold packs, ice massage
  - Other: vacocoolant sprays

- **How to apply:**
  - Keep leg elevated
  - Apply ice directly and move it frequently
  - Ice for 20 minutes
  - Repeat in 45 min – 1 hour

Superficial heat

- Conductive methods
  - Heat packs
  - Warms body tissue > dry heat, but no difference in therapeutic relief

- Convective methods
  - Hydrotherapy: Whirlpool baths

- Conversion methods
  - Radiant heat (i.e. infrared radiation, heat lamp)
  - Used for patients who cannot tolerate weight of hot packs
Ice vs heat

- After injury? ICE
  - Ice limits swelling s/p injury (vasoconstriction)
  - Heat vasodilates capillaries
- Recovery from injury? HEAT
  - Use heat 2-3 days s/p injury
- Rehab: HEAT before exercise, ICE afterwards
- Arthritis flare up? Generally, ICE
  - Whatever feels better!
- Kinesiology taping (KT) becoming more popular
- Compared to standard taping, does not limit joint/muscle movement
- Enhances blood and lymph circulation by enlarging subcutaneous interstitial area
- Relieves pain, improves functional capacity and resolves muscle imbalance
- Studies have shown that KT treatment may provide some benefit, but PT is still superior
Knowledge of the anatomy and provocative maneuvers can help diagnose multiple shoulder pathologies

Key to rehab is eccentric exercises

Refer to orthopedics if conservative measures fail after 3 months