Diagnosis-Driven Physical Examination of the Shoulder

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# Shoulder Physical Exam

## Observation

<table>
<thead>
<tr>
<th>Bony abnormality</th>
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<tr>
<td>Muscle abnormality</td>
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## Palpation ABC’s

<table>
<thead>
<tr>
<th>Acromioclavicular joint</th>
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</thead>
<tbody>
<tr>
<td>Biceps tendon</td>
</tr>
<tr>
<td>Coracoid</td>
</tr>
<tr>
<td>Subacromial space</td>
</tr>
</tbody>
</table>

## ROM/Strength: SITS

<table>
<thead>
<tr>
<th>Supraspinatus/Deltoid: Abduction scapular plane:</th>
</tr>
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<tbody>
<tr>
<td>ROM Active</td>
</tr>
<tr>
<td>ROM Passive</td>
</tr>
<tr>
<td>Full tear: Drop Arm Test</td>
</tr>
<tr>
<td>Motor: Empty Can</td>
</tr>
<tr>
<td>Infraspinatus/Teres Minor External Rotation (ER)</td>
</tr>
<tr>
<td>ROM Active</td>
</tr>
<tr>
<td>ROM Passive</td>
</tr>
<tr>
<td>Full tear: ER Lag</td>
</tr>
<tr>
<td>Motor: Resisted ER</td>
</tr>
<tr>
<td>Subscapularis Internal Rotation (IR)</td>
</tr>
<tr>
<td>ROM Active (spinous level)</td>
</tr>
<tr>
<td>ROM Passive</td>
</tr>
<tr>
<td>Full tear: IR Lag</td>
</tr>
<tr>
<td>Motor: Gerber lift off/Belly press</td>
</tr>
</tbody>
</table>

## Provocative Tests: BIAS

### Biceps:

- Yergason's (resisted supination)
- Speed's (resisted flexion)

### Impingement:

- Neer's
- Hawkins

### Acromioclavicular

- Scarf
- Cross arm

### Stability

- Apprehension/Relocation
- Load and Shift
- O'Brien
Descriptions of tests:

**SITS ROM/Strength**

**Supraspinatus/deltoid:**
- **ROM:** Abduction: 0-180 degrees is normal. + painful arc in abduction may indicate subacromial or GH pathology
- **Full tear test:** Drop arm: From arms overhead, have patient lower arms slowly in adduction, thumbs down. If patient is unable to maintain strength against gravity below 90 degrees (arm "drops"), this may indicate acute full supraspinatus tear.
- **Strength:** Empty Can Test: Position the arm in 90 degrees forward flexion, 30 degrees abduction, thumbs down. Press firmly down on the forearms and ask the patient to resist.

**Infraspinatus/TM:**
- **ROM:** External Rotation (ER): Starting with elbows at sides, flexed to 90 degrees, then externally rotate outward. Normal ER ROM is at > 30 degrees, but depends on muscle bulk—symmetry may indicate pathology.
- **Full tear ER Lag Test:** if ER is asymmetric, extend ER in passive ROM as far as possible—if pt unable to hold position and ‘lags’ back to limited ER position, + ER lag test may indicate IR/TM tear.
- **ER Strength:** Have the patient start in neutral ER position (elbows at sides, flexed 90) and attempt external rotation against resistance.

**Subscapularis:**
- **ROM:** Internal Rotation (IR): Have the patient place one hand behind his back and reach as far superiorly as possible. Note the spinal level and compare both sides.
- **Full tear IR Lag Test:** if IR is asymmetric, extend IR in passive ROM as far as possible up spine—if pt unable to hold position and ‘lags’ back to limited IR position, + IR lag test may indicate Subscapularis tear.
- **IR Strength:** Gerber liftoff test: Have the patient place one arm behind their lower back and try to push away from the body. Inability to perform the "lift off" represents subscapularis weakness from a tear or other injury.

**Provocative Tests**

**Biceps:**
- **Yergason’s test:** With the patient’s elbow flexed at 90 degrees, have pt supinate and flex forearm against resistance. + Pain AT BICEPS may indicate biceps tendonitis or subluxation of the long head tendon.
- **Speed’s test:** Have patient hold shoulder at 60 degrees of forward flexion with arm supinated and elbow flexed at 20 degrees. Ask the patient to attempt forward flexion of the arm against your resistance + Pain AT BICEPS may indicate biceps tendonitis.

**Impingement:**
- **Hawkins’ test:** In 90 degrees of forward flexion and 90 degrees of elbow flexion, passively internally rotate the arm. + Pain may indicate subacromial impingement syndrome.
- **Neer’s test:** Raise patient’s extended arm in passive forward flexion to an overhead position. + Pain may indicate subacromial impingement syndrome.

**Acromioclavicular tests:**
- **Scarf test:** Patient actively moves arm in horizontal adduction—ie ask pt to put their hand on their other shoulder. + Pain at the AC joint may indicate acromioclavicular joint pathology.
- **Cross arm test:** With pt’s arm at 90 degrees of forward flexion, have pt actively cross arm in horizontal adduction against your resistance. + Pain at the AC joint may indicate acromioclavicular joint pathology.

**Stability tests:**
- **Apprehension test:** Perform with the patient supine or seated. Have the patient abduct to 90 degrees with the elbow flexed, hand pointing upward. Try to externally rotate the arm while gently pushing anteriorly on the humerus and watch for a reaction from the patient. Apprehension indicates a positive test for anterior instability.
- **Relocation test:** Perform following the apprehension test. Use the same positioning, but press posteriorly on the humerus instead. If the patient has anterior instability, this should cause a decrease in pain.
- **Load and Shift:** As the patient lies in a supine position with the shoulder relaxed, the examiner places both hands around the patient’s upper arm and first the humeral head is "loaded," or pushed against the glenoid fossa, and then the humeral head is moved (shifted) anteriorly and posteriorly.
- **Obrien’s test:** Patient flexes their arm to 90° with the elbow fully extended and then adducts the arm 10-15° medial to sagittal plane. The arm is then maximally internally rotated (thumb down) and the patient resists the examiner’s downward force. The procedure is repeated in supination (thumb up). Pain with thumb down that is relieved when thumb up is a positive test for labral pathology.
DIAGNOSIS-DRIVEN PHYSICAL EXAMINATION OF THE SHOULDER

ACP Musculoskeletal Medicine Teaching Group
ACP National Conference 2024

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OBJECTIVES

1. **Inspect/Observe** pertinent shoulder anatomy
2. **Palpate** key anatomical shoulder landmarks (ABC’s)
3. Organize Rotator Cuff **Range of Motion/Strength** (SITS)
4. Organize Shoulder **Provocative Tests** (BIAS)
5. **Practice** shoulder exam and cases in small groups

PRIMARY CARE SHOULDER EXAM

- Inspection
- Palpation: **ABC’S**
- Range of motion/Strength: **SITS**
- Provocative tests: **BIAS**
**SHOULDER: BONES & JOINTS**

- **Clavicle**
- **Humerus**
- **Scapula**
- **Glenoid Fossa**
- **Acromion**
- **Coracoid Process**

**PRIMARY CARE SHOULDER EXAM**

- **Inspection**
- **Palpation:** ABC’S
- **Range of motion/Strength:** SITS
- **Provocative tests:** BIAS
OBSERVATION: BONY DEFORMITIES
PRIOR FRACTURE

OBSERVATION: BONY DEFORMITIES
AC JOINT SEPARATION
OBSERVATION: MUSCLES
BICEPS RUPTURE

POSTERIOR ROTATOR CUFF MUSCLES

Supraspinatus
Infraspinatus
OBSERVATION: MUSCLES
ROTATOR CUFF ATROPHY

SHOULDER EXAM

• Inspection
• Palpation: ABC’S
• Range of motion/Strength: SITS
  Provocative tests: BIAS
PALPATION: ABCS

- AC joint
- Biceps Tendon
- Coracoid
- Subacromial Space

SHOULDER BONES: POSTERIOR BONES

- Clavicle
- Acromion
- Posterior Scapular Spine
- Subacromial Bursa
SUBACROMIAL SPACE:
CONTENTS

Subacromial Bursa
Supraspinatus Tendon
Long head of the Biceps

PALPATION: ABCS

- AC joint
- Biceps Tendon
- Coracoid
- Subacromial Space

- AC joint oa/separation
- LH Biceps Tendonitis
- Frozen Shoulder
- SA Impingement
SHOULDER EXAM

• Inspection
• Palpation: ABC’s
• Range of motion/Strength: SITS
  Provocative tests: BIAS

SHOULDER QUIZ 2:
ROTATOR CUFF

Name 4 Rotator cuff muscles and their actions:
• S upraspinatus
• I nfraspinatus
• T eres Minor
• S ubscapularis
ROTATOR CUFF MUSCLES: SITS

Posterior:
- Supraspinatus
- Infraaspinitus
- Teres Minor

Anterior:
- Subscapularis

Abduction
Rom: 0-180

ROTATOR CUFF SITS: SUPRASPINATUS

Abduction
Rom: 0-180
ROTATOR CUFF SITS: INFRASPINATUS/TERES MINOR

External Rotation
ROM: 0-90

ROTATOR CUFF SITS: SUBSCAPULARIS

Internal Rotation
ROM: spinous level
### SHOULDER EXAM TIP: ROM/STRENGTH BY SITS

<table>
<thead>
<tr>
<th>SITS ROM</th>
<th>Full Tear Test</th>
<th>Strength Test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SITS: Abd</td>
<td>Drop Arm</td>
<td>Empty Can</td>
</tr>
<tr>
<td>SITS: ER</td>
<td>ER Lag</td>
<td>Resisted ER</td>
</tr>
<tr>
<td>SITS IR</td>
<td>IR Lag</td>
<td>Lift Off/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Belly Press</td>
</tr>
</tbody>
</table>

**SITS**

**Muscle:**
- Supraspinatus

**Motion:**
- Abduction

**Full tear test:**
- Drop Arm

**Strength test:**
- Empty Can
SITS

Muscle:
- Infraspinatus/TM

Motion:
- Ext Rotation

Full tear test:
- ER Lag

Strength test:
- Resisted ER

IS/TM FULL TEAR TEST: EXT ROTATION LAG

Provider pulls pt to extent of passive ER ROM...
**SITS**

**Muscle:**
- Subscapularis

**Motion:**
- Int Rotation

**Full tear test:**
- IR Lag

**Strength test:**
- Gerber Lift off
- Belly Press

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**SHOULDER EXAM: ROM/STRENGTH**

**SITS**

- **Supraspinatus**
  - ROM: Abduction Active/Passive (if limited)
  - Strength: Empty Can
  - Full tear test: Drop Arm

- **Infraspinatus/Teres Minor**
  - ROM: External Rotation Active/Passive (if limited)
  - Strength: ER Strength
  - Full tear test: ER Lag test

- **Subscapularis**
  - ROM: Internal Rotation Spinous process level Active/Passive (if limited)
  - Strength: Gerber lift off
  - Full tear test: IR Lag
SHOULDER EXAM

• Inspection
• Palpation: ABC’s
• Range of motion/Strength: SITS

Provocative tests: BIAS

SHOULDER PROVOCATIVE SIGNS: BIAS

• Biceps Tests
• Impingement Tests
• Acromioclavicular Tests
• Stability Tests
### Shoulder Exam: Provocative Signs: BIAS

- **Biceps tests**
  - Yergason’s
  - Speed’s

- **Impingement Tests:**
  - Neer’s
  - Hawkin’s

- **Acromioclavicular tests**
  - Scarf test
  - Cross arm

- **Stability Tests:**
  - Apprehension
  - Relocation
  - Load & Shift
  - Sulcus
  - O’Briens

### BIAS: Biceps Tests

- **Yergason’s Test**
  - Resisted Supination

- **Speed’s Test**
  - Resisted Bicep Flexion
BIAS: IMPINGEMENT

Neer’s Test
- Elbow extended
- Internally rotated
- Forward flexion,

Hawkin’s Test
90° forward flexion, elbow flexed,
➢ internal rotation

BIAS: AC JOINT TESTS

Scarf test
➢ Active adduction

Cross arm test
➢ Resisted adduction
BIAS: STABILITY

- Anterior
  - Apprehension/relocation
  - Load & Shift
- Posterior
  - Load & Shift
- Inferior
  - Sulcus sign
  - Labrum
  - O’Brien’s Test

SHOULDER GLENOHUMERAL STABILIZERS:
LABRUM

Glenoid Fossa
Labrum
SHOULDER GLENOHUMERAL STABILIZERS:
CAPSULE

- Prevents anterior, inferior and posterior displacement

SHOULDER GLENOHUMERAL STABILIZERS:
ROTATOR CUFF: DYNAMIC STABILIZERS

- Supraspinatus
- Infraspinatus
- Teres Minor
- Subscapularis
# Shoulder Exam

- **Inspection**
- **Palpation:** \(\text{ABCS}\)
- **Range of motion/Strength:** \(\text{SITS}\)
- **Provocative tests:** \(\text{BIAS}\)

## The Essential Shoulder Exam for Internists

- **Inspection** – Bony abnormalities, muscle atrophy
- **Palpation** \(\text{ABC's}\): AC joint, Biceps tendon, Coracoid, Subacromial space
- **ROM/Strength:** \(\text{SITS}\)
  - **Supraspinatus**
    - Abduction
    - Drop Arm/Empty Can
  - **Infraspinatus/Teres Minor**
    - External Rotation
    - ER Lag test/ Resisted ER
  - **Subscapularis**
    - Internal Rotation Spinous process level
    - IR Lag/Gerber lift off
- **Provocative Tests:** \(\text{BIAS}\)
  - **Biceps**
    - Yergason’s
    - Speeds
  - **Impingement**
    - Neer’s
    - Hawkins
  - **AC Joint**
    - Scarf
    - Cross Arm
  - **Stability**—Next layer

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### Key Features of Top Shoulder Problems

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<tr>
<th>Diagnosis</th>
<th>History</th>
<th>Exam</th>
<th>Workup</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glenohumeral (GH) OA</td>
<td>Older patient</td>
<td>Decreased AROM + PROM</td>
<td>X-ray: loss of GH joint space, flat</td>
<td>Non-op including GH CSI</td>
</tr>
<tr>
<td></td>
<td>Insidious onset, diffuse pain, limited ROM</td>
<td>Cuff testing: strength intact, minimal</td>
<td>humeral head, osteophytes, sclerosis</td>
<td>Surgery referral when fails</td>
</tr>
<tr>
<td>Adhesive Capsulitis</td>
<td>Similar to GH OA, age 40-60, ♀ &gt; ♂</td>
<td>Same as GH OA</td>
<td>Normal x-ray</td>
<td>Good results w/ non-op including GH CSI but may take 1-2 years</td>
</tr>
<tr>
<td>RTC: suspected partial thickness tear/tendinopathy/subacromial bursitis</td>
<td>Pain w/ overhead reach, night pain, radiation to elbow (but not beyond)</td>
<td>Full ROM (active may be limited by pain), ± Neers and Hawkins, pain with cuff testing but strength intact</td>
<td>• Clinical dx&lt;br&gt;• X-ray if trauma/concern for fx&lt;br&gt;• MRI (x-ray prior) only if fails non-op measures</td>
<td>Non-operative rx:&lt;br&gt;• Activity mod&lt;br&gt;• Analgesics&lt;br&gt;• PT&lt;br&gt;• 1-2 subacromial corticosteroid injections (CSI)</td>
</tr>
<tr>
<td>RTC: suspected full thickness tear</td>
<td>As above + weakness</td>
<td>AROM may be limited by pain/weakness. Full PROM. Cuff testing w/ pain + weakness</td>
<td>• X-ray + MRI for acute suspected FTT, or acute on chronic in young patient</td>
<td>Urgent surgery for acute traumatic FTT; expedited for acute on chronic</td>
</tr>
<tr>
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<td>Treatment</td>
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</table>
| **Biceps Tendonitis** | Ant/medial shoulder pain, worse w/ elbow flexion/supination (e.g. turning door knob) | TTP, Speeds, Yergasons                                               | Clinical dx                                 | •Non-op, biceps tendon CSI  
•Surgery referral if fails |
| **Labral Tear**      | Young, active patients clicking/catching                                  | + O’Briens                                                           | •Xray for trauma or r/o other causes  
•MRI vs MR arthrogram                         | •Non-op trial for most  
•< 35, acute injury: surgery referral for SLAP repair    |
| **AC Joint OA/Sprain** | Hx shoulder injury; weight lifting (sprain), Anterior shoulder pain         | TTP AC joint  
+ Cross arm test | Xray shows AC OA or joint separation                             | •Non-op  
•AC joint CSI  
•Surgery referral if fails                    |
| **GH Instability**   | Young, active patients, dislocation, subluxation, “dead/numb” feeling deltoid | + Apprehension, relocation  
Xray: Hill Sachs lesion                      | •Non-op  
•Surgery referral if fails                       |