Objectives

• 1. Describe 6 key components of the history and physical examination of patients presenting with shoulder pain

• 2. Relate anatomical structures and landmarks to pain and dysfunction of the shoulder

• 3. Perform specialized provocative testing on the shoulder and appropriately interpret findings to support a probable diagnosis.
Common Sites of Shoulder Pain

- Acromioclavicular separation
- Osteolysis of distal clavicle
- Rotator cuff tear
- Impingement syndrome
- Frozen shoulder
- Cervical radiculopathy (spine)
- Humeral shaft fracture
- Ruptures biceps tendon (proximal)
- Biceps tendinitis
- Labrum injury
- Cervical radiculopathy (spine)
- Rotator cuff tear
- Frozen shoulder
- Glenohumeral arthritis
- Clavicle fracture
- Osteoarthritis
- Scapular fracture
Superficial Musculature of the Shoulder
Bony Anatomy of the Shoulder

Image of a healthy shoulder joint with labeled parts:
- Acromion
- Ligaments
- Clavicle (collarbone)
- Humerus (arm bone)
- Capsule
- Scapula
- Biceps tendon
Glenohumeral Joint

Diagram showing the Glenohumeral joint with labels for Acromion, AC joint, Clavicle, Humerus, and Scapula.
Right Shoulder – A/P View
Left Shoulder Axillary View

- Spine of Scapula
- Glenoid Fossa
- Acromioclavicular Joint
- Acromion of Scapula
- Clavicle
- Coracoid Process
- Head of Humerus
- Greater Tubercle
- Lesser Tubercle
- Shaft of Humerus
Y-View

- Acromion
- Coracoid process
- Body of scapula
- Inferior angle
- Humerus
Acromion Types

Type I  Type II  Type III
Acromion Types

- Type I - Flat
- Type II - Curved
- Type III - Hooked
ACROMION
BURSAE

Bursae in the Shoulder

- Subacromial bursa
- Coracoid process
- Clavicle
- Acromion
- Subdeltoid bursa
- Humerus
- Subcoracoid bursa

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Vascular Supply

Anterior humeral circumflex artery
Posterior humeral circumflex artery
Thoracoacromial artery
Origin of suprascapular artery
Circumflex scapular artery
Subscapular artery
The axillary artery
Lateral thoracic artery
Rotator Cuff Muscles

- Supraspinatus
- Infraspinatus
- Teres minor
- Scapula
- Capsular ligament (cut)
- Humerus
- Coracoid process
- Acromion
- Clavicle
- Subscapularis
Rotator Cuff

Rotator Cuff Muscles

Supraspinatus

Infraspinatus

Subscapularis

Teres minor

Anterior view

Posterior view
Coracoid process

Biceps brachii, long head

Biceps brachii, short head

Biceps brachii tendon

Radial tuberosity

Coracohbrachialis

Brachialis

Coronoid process of ulna

(b) Anterior muscles
Adhesive Capsulitis
Tendinitis

Inflamed shoulder tendons

Supraspinatus muscle tendon

Biceps muscle tendon

Subscapularis muscle tendon
A large skin incision is made over the shoulder to reach the area of injury. The anterior portion of the acromion is removed.
<table>
<thead>
<tr>
<th>MUSCLE</th>
<th>ORIGIN</th>
<th>INSERTION</th>
<th>ACTION</th>
<th>INNERVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subscapularis</td>
<td>Scapula fossa</td>
<td>Lesser tubercle of humerus</td>
<td>Medial rotation</td>
<td>Upper and lower subscapular nerves (C5, C6)</td>
</tr>
<tr>
<td>Infraspinatus</td>
<td>Infraspinatous fossa</td>
<td>Greater tubercle of humerus</td>
<td>Lateral rotation</td>
<td>Suprascapular nerve (C5, C6)</td>
</tr>
<tr>
<td>Teres Minor</td>
<td>Posterior lateral surface of scapula</td>
<td>Greater tubercle of humerus</td>
<td>Lateral rotation</td>
<td>Axillary nerve (C5, C6)</td>
</tr>
<tr>
<td>Supraspinatus</td>
<td>Supraspinatous fossa</td>
<td>Greater tubercle of humerus</td>
<td>Initiates abduction (to 15°)</td>
<td>Suprascapular nerve (C5, C6)</td>
</tr>
</tbody>
</table>
HISTORY

- Onset
- Location
- Duration
- Character
- Aggravators
- Relievers
- Timing
- Severity
- Overhead
- Look down
- Dislocation
- Clunking
- Anterior/posterior
- Rotator Cuff
- Throwing
- Sleep
HISTORY: **Overhead?**

**IMPINGEMENT SYNDROME**

- Most often associated with overhead activities
- Washing hair; reaching up to cabinets/shelves
- Repetitive use
- Wake at night when rolling onto an extended arm
HISTORY: Look down!

- Full neck flexion – r/o radiculopathy
  - C5, C6, Suprascapular & Axillary nerves
    - Supraspinatus, Infraspinatus, Subscapularis
  - C7 – below elbow

- Referred pain from
  - Chest (lungs, diaphragm)
  - Abdomen (liver, gall bladder, colon)
History: Dislocation

- Previous history raises risk
- "Something slipping out of place."
- May be chronic
History: Clunking

• NORMAL:
  – Clicking, popping, snapping

• TENDINOSIS:
  – Deeper, heavier clunk

LABRALTEAR:
  – Severe pain with
  – Movement blocked
History: Anterior/Posterior

Anterior:
- Biceps tendon groove
- AC Joint

Posterior
- Supraspinatus
- Teres Minor
History: **Rotator Cuff**

- **Tendinitis:**
  - Subacromial pain
  - Worse w activity; better w rest

- **Rotator Cuff Tear**
  - Dull, relentless, “toothache” pain
  - Severe at night; prevents sleep
  - Can’t sleep on affected side
History: Throwing

• Pain with **COCKING**
  – Anterior cuff tendinitis
  – Instability or anterior dislocation

• Pain with **ACCELERATION**
  – Rotator cuff tear
  – Impingement

• Pain with **RELEASE/DECELERATION**
  – Posterior cuff tendinitis
  – Posterior dislocation (rare)
History: Sleep

- **Impingement**
  - Wake in pain w arm overhead

- **Tendinitis**
  - Sleep may be interrupted when rolling to affected side

- **Rotator Cuff Tear**
  - Relentless pain makes sleep difficult; cannot lie on affected side
HISTORY

- Onset
- Location
- Duration
- Character
- Aggravators
- Relievers
- Timing
- Severity

- Overhead
- Look down
- Dislocation
- Clunking
- Anterior/posterior
- Rotator Cuff
- Throwing
- Sleep
Musculoskeletal Exam

- Inspection
- Palpation
- Range of Motion
- Resisted Strength
- Provocative Testing

* One joint above; one below
**Inspection**

- Movement
- Alignment
- Swelling
- Asymmetry
- Scars
- Bruising
- Venuos Distention

- Squaring of the shoulder:
  - dislocation

- Scapular winging:
  - Instability/dislocation
  - Serratus anterior or trapezius dysfunction

- Atrophy
  - RCT
  - Nerve entrapment
  - Radiculopathy
What do you see?

A good place for a chart
What do you see?
What do you see?

![Image of a man with a yellow arrow pointing to his arm]
What do you see?

• What do you see?

• What do you see?
What do you see?
PALPATION

Looking for:

- Deformity
- Spasm
- Tenderness

- Sternoclavicular joint
- Clavicle
- AC joint
- Coracoid
- Anterior Glenohumeral Joint
- Biceps tendon
- Acromion
- Posterior GH joint
- Scapula
- Trapezius
- Paracervicals
<table>
<thead>
<tr>
<th>Positive TTP</th>
<th>Consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Sterno-clavicular joint</td>
<td>Dislocation</td>
</tr>
<tr>
<td>• Clavicle</td>
<td>Fracture, dislocation</td>
</tr>
<tr>
<td>• AC joint</td>
<td>Dislocation, arthritis</td>
</tr>
<tr>
<td>• Coracoid</td>
<td>Biceps tendinitis</td>
</tr>
<tr>
<td>• Anterior Glenohumeral Joint</td>
<td>Tendinitis, labral tear, dislocation</td>
</tr>
<tr>
<td>• Biceps tendon</td>
<td>Tendinitis, rupture</td>
</tr>
<tr>
<td>• Acromion</td>
<td>Arthritis, bursitis,</td>
</tr>
<tr>
<td>• Posterior GH joint</td>
<td>Dislocation, tendinitis</td>
</tr>
<tr>
<td>• Scapula</td>
<td>Neuropathy, atrophy</td>
</tr>
<tr>
<td>• Trapezius</td>
<td>Spasm, trigger points</td>
</tr>
<tr>
<td>• Paracervicals</td>
<td>Spasm, degenerative disease</td>
</tr>
</tbody>
</table>
Percussion/Neuro/Circulatory

Biceps

Triceps

Distal Sensation

Distal Circulation
### Range of Motion

<table>
<thead>
<tr>
<th>Flexion</th>
<th>180</th>
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</thead>
<tbody>
<tr>
<td>Extension</td>
<td>45-60</td>
</tr>
<tr>
<td>Internal Rotation</td>
<td>90</td>
</tr>
<tr>
<td>External Rotation</td>
<td>90</td>
</tr>
<tr>
<td>Abduction</td>
<td>150</td>
</tr>
</tbody>
</table>

**AROM loss with normal PROM:**
- ? Rotator Cuff Tear
- ? Impingement

**PROM loss with abnormal AROM**:
- ? Adhesive Capsulitis
- ? GH Osteoarthritis
Subacromial Impingement

- Neer Test: With the arm fully pronated, raise the patient’s arm fully overhead in full flexion. Stabilize the scapula to prevent scapulo-thoracic motion.
Subacromial Impingement

• Neer Test: With the arm fully pronated, raise the patient’s arm fully overhead in full flexion. Stabilize the scapula to prevent scapulo-thoracic motion.
Supraspinatus Testing

**Supraspinatus muscle injury:**

- **Jobe’s Test (“Empty Can” Test)**
  Position arm in scapular plane and point thumb down as if emptying out can. Examiner pushes down on arm.

- **Hawkin’s Test**
  Position arm in throwing position and flexed forward 30 degrees. Examiner internally rotates humerus.

- **Drop Arm Test**
  Position patient’s arm fully abducted so hand is over the head. Ask patient to slowly adduct arm to their side. If supraspinatus M is torn, at <90 deg, the arm will suddenly drop.
Infraspinatus Testing

Patient has pain when externally rotating the shoulder against resistance with elbow flexed to 90 degrees.
Subscapularis Injury

- **Lift-Off Test**: Position patient’s hand behind the back at waist level with palm facing out. Ask patient to move arm away from body against examiner resistance.
Rotator Cuff Muscles

- Supraspinatus
- Infraspinatus
- Teres minor
- Scapula
- Capsular ligament (cut)
- Acromion
- Coracoid process
- Subscapularis
- Humerus
- Clavicle
**Yergason Test:** Position patient’s elbow at 90 degrees with thumb up. Have the patient **supinate and flex elbow** against examiner’s resistance (holding at wrist.)
Labrum

- Labrum
- Glenoid cavity
- Long head of biceps
• Position patient’s arm in 90 degree flexion and external rotation. Push humerus into glenohumeral joint while internally and externally rotating.
Bony Anatomy of the Shoulder

Healthy shoulder joint

- Acromion
- Ligaments
- Clavicle (collarbone)
- Humerus (arm bone)
- Scapula
- Capsule
- Biceps tendon
**O’ Brien’s Test:** Position shoulder in 90 deg flexion, elbow extended, and 15 deg. Adducted. Point thumb down. Apply downward force. Repeat with thumb up.

**With thumb up only:**
- **DEEP** pain = Labral tear
- **TOP OF SHOULDER** pain = AC Joint
AC Joint Dysfunction

• The patient actively flexes the shoulder to 90 degrees then actively adducts it.

• AC joint dysfunction (arthritis, spurring, etc.) indicated by pain
• **SPEED’S Maneuver**
  Flex patient’s elbow 20-30 degrees with forearm supinated and elbow flexed 20-30 degrees, arm in 60 degrees flexion. Resist forward flexion of the arm while palpating biceps tendon at anterior shoulder.
Dislocation Tests

**A. Apprehension Test**
- Examiner applies pressure to the posterior aspect of the humerus.
- Positive indication of instability: patient expresses apprehension and/or pain.

**B. Relocation Test**
- Examiner applies downward pressure.
- Positive indication of instability: patient expresses relief.

**C. Anterior Release Test**
- Examiner performs relocation test, then releases downward pressure.
- Positive indication of instability: patient expresses apprehension and/or pain.
With patient’s arm in neutral, pull downward on elbow or wrist while observing shoulder area for a depression lateral or inferior to the acromion. Many asymptomatic patients, especially adolescents normally have some degree of instability.
OA  Impingement
Posterior Dislocation
Anterior Dislocation
Common Sites of Shoulder Pain

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- Scapular fracture
- Biceps tendinitis
- Impingement syndrome
- Rotator cuff tear
- Frozen shoulder
- Glenohumeral arthritis
- Labrum injury
- Humeral shaft fracture
- Ruptures biceps tendon (proximal)

Anterior

Posterior
REFERENCES


About JOF

• Our Mission: To improve the lives of people with musculoskeletal conditions through education, research & service.

• Our Goal: To raise the profile and priority of non-surgical musculoskeletal health with local hospitals, schools and the general public, while encouraging a collaborative, multi-disciplinary care model in ortho community.

• We call this approach Orthopedic Primary Care.
We strive to remove barriers to innovation and improvement of care by embarking on efforts that build community among schools, hospitals, providers, & the industry.

JOF’s vision is to be the Bay Area’s pre-eminent resource for information, collaboration and innovation affecting musculoskeletal health and common orthopedic conditions.
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Thank You