

EXAMINATION OF THE SHOULDER

Joints

- Glenohumeral** – The head of the humerus articulates with the glenoid fossa which is deepened by a ring of fibrocartilage known as the glenoid labrum.

The Glenohumeral joint is located just lateral to the coracoid process

- Acromioclavicular** – Clavicle articulates with the acromion of the scapula
- Sternoclavicular** – Clavicle articulates with the sternum
- Scapulothoracic** – Scapular articulation with the chest wall

Bony Landmarks

1. Sternum
2. Sternoclavicular joint
3. Clavicle
4. Coracoid process
5. Acromioclavicular Joint
6. Acromion
7. Greater tuberosity of the humerus
8. Spine of the scapula
9. Medial border of the scapula

INSPECTION

Ask the patient to completely disrobe and expose both shoulders and neck (women may keep bra on)
Walking into the office – Look at position the shoulder is being held in and look for movement at the shoulder

ANTERIOR INSPECTION

Easiest way to find abnormalities is by comparison with the other shoulder.

- Position** – Is one shoulder depressed much more than the other
- Skin** – Scars, bruising
- Boney Structure** – Start at clavicles and work laterally looking for asymmetry in bones
- Musculature** – Deltoid mass, pectoral muscles. Loss of deltoid mass is seen as squaring off of the shoulder joint.

LATERAL INSPECTION

- Position** – Often the shoulder is held anteriorly which increases the likelihood of impingement.

POSTERIOR INSPECTION

- Position** – Look at the scapula to make sure they are both in the same position – look for winging of the scapula which may be static (neuromuscular problem) or dynamic (often seen with shoulder pain)
- Skin** – Look at the skin for abnormal creases (thoracic kyphosis)
- Boney Structure** – Slight kyphosis of the thoracic spine, scapular position, winging of the scapula
- Musculature** – Atrophy of trapezius, supraspinatus

PALPATION

BONES

- Sternoclavicular joints
 - Feel for tenderness or prominence of the joints
 - Shrugging the shoulders may reveal crepitus
- Clavicle
- Coracoid process
- Acromioclavicular joint
- Greater tuberosity of the Humerus
- Bicipital Groove
- Lesser tuberosity of the Humerus

- Spine of the scapula
- Vertebral and inferior borders of the scapula

SOFT TISSUE

- Rotator Cuff** – The SIT muscles (supraspinatus, infraspinatus, and teres minor) all insert into the greater tuberosity of the humerus in that order. Palpate the insertion of these muscles at the greater tuberosity moving posteriorly.
- Subacromial bursa** – Extend the humerus and palpate the subacromial bursa
- Axilla** – Lymphadenopathy
- Bicipital tendon** – Often difficult to feel and often tender. Asymmetric tenderness may suggest a problem.

MUSCLES

- Sternocleidomastoid, trapezius, deltoids, biceps, triceps, pectorals

ACTIVE & PASSIVE RANGE OF MOTION

ABDUCTION (180) – Glenohumeral & Scapulothoracic

- Ideally watch from behind so you can see the rhythm of movement and the scapular movement. Ask the patient to raise arms from the side to full abduction (180 degrees) above their head. Then slowly lower the arms back down to the sides. While you are doing this you are watching and asking the following:
 - Movement:** The initial 60-90 degrees are entirely glenohumeral – Glenohumeral movement is actually only about 90-110 degrees. The scapula then begins to rotate on the thorax. The final phase is almost entirely scapulothoracic. NOTE: PATIENTS MAY CHEAT and bring their arms forward to get them above their head.
 - Pain with Abduction:** From 60 – 100 degrees is known as the painful arc and likely represents rotator cuff pathology, Pain at 180 degrees is likely from the AC joint.
 - Weakness:** Giving way when lowering the arm is suggestive of a problem within the subacromial space – especially a rotator cuff tear.

ADDUCTION (45)

- Ask the patient to bring the arm across in front of the body. They should be able to bring the arm across by about 45 degrees.

FLEXION (180)

- Ask the patient to raise their arms forward above their head. Inability to do this usually represents a problem with the glenohumeral joint.

EXTENSION (50)

- Ask the patient to swing their arm back behind them

INTERNAL ROTATION (55)

- With the arms at the sides and the elbows flexed to 90 degrees ask the patient to rotate their arms inward.

EXTERNAL ROTATION (45+)

- With the arms at the sides and the elbows flexed to 90 degrees ask the patient to rotate their arms outward.

Capsular Pattern of Restriction: External Rotation > Abduction > Internal Rotation

Functional Movement: The above range of motion are useful to formally assess shoulder movement, however, they provide little insight into functional movements. I usually ask the patient to do the following:

- Raise their arms above the head** – See if they can do it using full abduction and using forward flexion. With shoulder problems you'll find most patients get their hands above their head using forward flexion. Significant functional limitations come from being unable to get the hands above the head spanning from personal hygiene (washing the hair), getting things out of high cupboards, and even driving as holding the arms on the steering wheel may be difficult.
- Put the hands behind the head** – This requires an element of flexion and abduction: Again this will highlight functional difficulties.

3. **Reach behind the back and scratch as high up on the back as possible:** This requires internal rotation and extension of the shoulder. Patients unable to do this will have problems with hygiene and dressing.

STABILITY & SPECIAL TESTS

ACROMIOCLAVICULAR JOINT

1. **Pain at end range of abduction:** Ask the patient to bring the arms above the head and note whether pain is seen at end range of abduction.
2. **Forced Adduction:** Flex the arm to 90 degrees and bring it across the body. With the opposite arm grasp the elbow and gently force the arm towards the body. If this does not provoke pain, the examiner grasps the upper arm and forces it into further maximal adduction.

GLENOHUMERAL STABILITY

1. **Sulcus Sign:** With the arm hanging at the side the humerus is grasped and an attempt to move the humeral head anteriorly and posteriorly is made looking for excessive movement. Then the arm is retracted downward and the examiner looks for a concavity (sulcus) which develops in the subacromial deltoid contour.

ROTATOR CUFF IMPINGEMENT

The subacromial space contains the tendons of the rotator cuff and the subacromial bursa. The space is bound inferiorly by the humeral head and superiorly by the acromion and coracoacromial ligament. The space is tight and any tissue enlargement or swelling may result in an impingement syndrome. The impingement syndrome occurs when the rotator cuff is compressed against the undersurface of the acromion.

1. **Neer Sign:** Bring the arm passively into full flexion while the scapula is held in place. Then internally rotate the arm to bring the greater tubercle of the humerus into a position which would impinge upon the subacromial space. The test is positive with anterior shoulder pain.
2. **Hawkins Test:** The shoulder is passively flexed forward to 90 degrees with the elbow flexed at 90 degrees. The shoulder is then internally rotated. This test is positive with anterior shoulder pain.

ROTATOR CUFF TEARS AND TENDINOSIS

MAJOR ROTATOR CUFF TEARS

1. **Drop arm test** – The arm is passively abducted fully and the flexed 30 degrees into the scapular plane. Support is then removed. If the patient cannot hold the arm up then a major rotator cuff tear should be suspected.

SUPRASPINATUS

1. **Empty Can Test:** Abduct both arms to 90 degrees, Move the arms forward 30 degrees, Internally rotate the shoulder to point the thumbs down to the floor, Ask the patient to resist downward displacement of the arms from this position. Weakness may be due to a torn cuff or nerve injury C5. Giveway weakness may be secondary to pain (tendinosis).
2. **Resisted Abduction:** Abduct the arms slightly, As the patient to resist you as you try to push the arms back to the sides. Again weakness may be due to a torn cuff or nerve injury C5. Giveway weakness may be secondary to pain (tendinosis).

INFRASPINATUS AND TERES MINOR

1. **Isometric resisted external rotation:** Flex the elbows to 90 degrees, bring both elbows into the sides. Ask the patient to rotate the shoulder outwards (keeping the elbows at their sides) while you resist this motion. Weakness may indicate a cuff tear or C5 radiculopathy, Giveway weakness may be secondary to pain (tendinosis).
2. **Hornblower Test:** The arm is brought into 90 degrees abduction with the elbow at 90 degrees. The patient is asked to resist the arm being rotated internally. Weakness usually means a cuff tear.

SUBSCAPULARIS

1. **Isometric resisted internal rotation:** Flex the elbows to 90 degrees, bring both elbows into the sides. Ask the patient to rotate the shoulder inwards (keeping the elbows at their sides) while you resist this motion. Weakness may indicate a cuff tear or C5 radiculopathy, Giveway weakness may be secondary to pain (tendinosis)

2. **Scapular Lift Off:** The arm is placed behind the back in the mid lumbar region with the palm outward. The patient is asked to lift the hand off the back. The patient should be able to do this against some resistance. Compare both sides.

BICIPITAL TENDONITIS

1. **Speed's test:** The arm is fully supinated, flexed at the shoulder 60 degrees and extended fully at the elbow. The patient must restrict downward pressure while the bicipital groove is palpated. Pain in the bicipital groove with downward pressure suggests bicipital tendonitis.
2. **Yergasen's test:** The arm is held at the side with the elbow flexed 90 degrees and the palm facing upwards. Try to pronate the arm against resistance while palpating the bicipital groove. Pain in the bicipital groove suggests bicipital tendonitis.

SHOULDER DISLOCATION

Apprehension Test

NEUROLOGIC EXAMINATION

Shoulder Movement Motor Examination

- Flexion – Anterior deltoid & coracobrachialis (C5, C5,6)
- Extension – Lats (C6,7,8), Teres major (C5,6), and Posterior Deltoids (C5,6)
- Abduction – Deltoid (C5,6) and Supraspinatus (C5,6)
- Adduction – Pectoralis Major (C5-T1)
- External Rotation – Infraspinatus (C5,6) & Teres Minor (C5)
- Internal Rotation – Subscapularis (C5,6), Pectoralis Major (C5-T1)
- Scapular Elevation – Trapezius (Spinal Accessory nerve)
- Scapular Retraction – Rhomboids (C5)
- Scapular Protraction – Serratus Anterior (C5,6,7)

Nerve	Motor	Sensory	Reflex
C5	Shoulder Abduction	Deltoid	Biceps
C6	Elbow Flexion and Wrist Extension	Thumb	Brachioradialis
C7	Elbow Extension and Wrist Flexion	Long Finger	Triceps
C8	Finger Flexors	Little Finger	
T1	Finger Abduction and Adduction	Inner arm about elbow	

JOINT ABOVE AND BELOW

Cervical spine, elbow, wrist and hand