



Shoulder Tips & Tricks: The Essentials of Physical Examination

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Introduction

Shoulder pain is a common complaint in the outpatient orthopedic setting. A thorough physical examination is key in delineating the underlying diagnosis in patients with shoulder complaints. Although the shoulder physical examination is crucial for diagnosis and management, it often remains elusive to residents. The examination can be simplified by dividing it into the following: inspection, palpation, range of motion (ROM), neurovascular and cervical spine exam, and special testing.

Inspection

The physical examination of the shoulder should begin with thorough inspection. This includes full visualization of both the front and back of the patient. It is best to begin the exam from behind, as this is the area that is most forgotten. The patient should be wearing a gown open in the back. The goal with inspection is to identify any abnormalities in muscle bulk, signs of muscular atrophy, or any bony or soft tissue asymmetries. It is important to visualize the scapula bilaterally and observe for any asymmetry. Atrophy of a muscle or group of

muscles can be a key indicator for underlying nerve damage or chronic rotator cuff tear. Protraction of the scapula in the resting position is a sign of scapular dyskinesis.

Palpation

Palpation of relevant anatomic structures should be systematic and consistent. Palpation is important to identify tender and nontender areas as well as areas of crepitation. Position yourself behind the patient. Palpation should include the coracoid process, acromioclavicular joint, anterior process of the acromion, greater tuberosity of the humerus, bicipital groove, and lesser tuberosity of the humerus (Figure 1).

Range of Motion

Range of motion can be an important indicator of underlying shoulder pathology. Shoulder range of motion consists of forward flexion, abduction, adduction, extension, internal and external rotation. Normal values for ROM are listed in Table 1. While active range of motion can be limited by pain or weakness, not many conditions cause diffuse reduction in passive range of motion, making it an important aspect

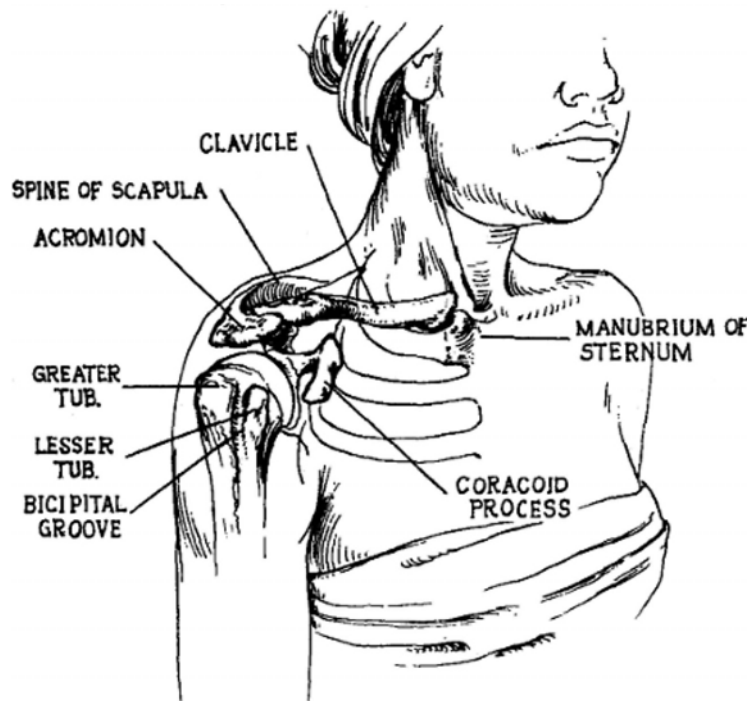


Figure 1. Bony landmarks of the shoulder as published in Hoppenfeld.¹

Table 1. Normal Values for Shoulder Range of Motion

	Degrees
Forward flexion	0-180
Abduction	0-90
Adduction	0-50
External rotation at 0/90	0-70 / 0-100
Internal rotation at 0/90	T7 / 0-70
Extension	0-45°

of the physical exam. There are two main causes of significantly decreased passive range of motion; severe arthritis and frozen shoulder. Isolated decrease in passive internal rotation of the dominant arm in an overhead throwing athlete likely represents glenohumeral internal rotation deficit (GIRD), placing the athlete at greater risk of impingement and labral injury.

The exam begins with the patient sitting upright. Forward flexion and abduction are tested, followed by internal and external rotation at neutral. Then the patient is instructed to lie supine at the edge of the table for testing of internal rotation and external rotation at 90 degrees, also known as the ABER position. The examination table provides stabilization of the scapula to isolate glenohumeral motion.

Lastly, scapular motion must be tested. This may be done during the inspection aspect of the exam or range of motion portion of the exam. In addition to the resting position of the scapula, the examiner must evaluate the position of the scapula during movement. Medial winging of the scapula is an indicator of serratus or long thoracic nerve dysfunction. Lateral winging is less common and typically results from nerve injury to the spinal accessory nerve.

Neurovascular Exam and Cervical Spine Exam

In the majority of patients distal sensory, motor, and vascular examination will be normal. However, these tests must not be overlooked as they may steer the clinician towards the proper diagnosis outside of the shoulder. Weakness in major muscle groups may be caused by injury to the muscle itself or from a nerve palsy. Knowing the anatomy will help direct further diagnosis and workup. Similarly, the neck may be the cause of the patient's symptoms rather than the shoulder.

Always check the cervical spine. The Spurling maneuver is usually performed with the patient in the seated position and is used to assess for radicular pain. The examiner turns the patient's head so that the patient is facing the affected side. The patient's head is then extended, and a downward pressure is applied to the top of the patient's head.

Special Testing

In addition to the standard physical exam, a myriad of special tests can be performed to home in on a diagnosis. Scapular dyskinesia, previously described, may be the cause

of shoulder impingement. Other tests may identify rotator cuff pathology, labral pathology, or shoulder instability. It is important to stabilize the scapula to isolate glenohumeral joint motion. Often these tests will have some overlap, but when used in combination with history can be quite useful.

Impingement tests

Neer's test—The patient's arm should start in a resting position, relaxed at the side of the patient's body. The examiner internally rotates the arm and then passively moves the arm through the full range of forward flexion or until the patient reports pain. The test is considered positive if the patient feels pain in the antero-lateral aspect of the shoulder.

Hawkin's test—Passively forward flex the shoulder to 90 degrees and internally rotate the arm. Pain indicates subacromial impingement or rotator cuff pathology.

Adduction test—The patient's arm is flexed to 90 degrees with maximum adduction across the body. A positive test will cause pain at the AC joint.

Biceps tendinopathy tests

Speed's test—The arm is forward flexed to 90 degrees with the forearm in supination and the elbow fully extended. The patient then resists a downward force. This test is positive if the patient feels pain in the bicipital groove and is indicative of biceps tendonitis or instability.

Yergason's test—The patient's arm is adducted and examiner the elbow is flexed to 90 degrees with the forearm in neutral or pronation. The examiner places one hand on the bicipital groove and attempts to hold the arm in pronation while the patient attempts to supinate. The test is positive if there is pain in the area of the bicipital groove and often indicates bicipital tendonitis. If you feel a snapping of the bicipital tendon, there is likely transverse ligament pathology.

Labrum tests

O'Brian's test—With the arm in 90 degrees of forward flexion and 10 degrees of adduction, the patient should extend and internally rotate/pronate their arm, with their thumb pointed at the ground. The examiner provides a downward force distally on the wrist while the patient forcefully resists. This maneuver should be done both with the forearm in the neutral position and with the forearm pronated. The test is very similar to the Empty Can test, but the patient's arm is in an adducted position. The test is positive if the patient has pain and/or clicking when the forearm is pronated but has no pain with the forearm in a neutral position and indicates a SLAP lesion.

Crank test—The examiner should flex the patient's elbow to 90 degrees and forward flex the shoulder in the scapular plane to roughly 160 degrees. A gentle compressive force is then applied along the axis of the humerus while the shoulder is internally and externally rotated. If the patient's pain is reproduced with this test, or there is an audible or palpable click associated with the maneuver, there should be concern for a labral tear.

Kim test—The examiner should place the arm with the shoulder abducted to 90 degrees and forward flexed to 45 degrees. A posteriorly and inferiorly directed force is then applied to the humerus. The test is positive if the patient experiences pain and is highly indicative of a posteroinferior labral tear.

Rotator cuff tear tests

Jobe's/ Empty can test—Place the patient's arm with the shoulder at 90 degrees of forward flexion and roughly 30 degrees of abduction with the thumbs pointing downwards as if they are emptying a can. The patient should then attempt elevation of the arm against the examiner's resistance. Pain indicates a supraspinatus tear.

External rotation test—With the patient's elbow flexed to 90 degrees and the shoulder in neutral, the patient should attempt external rotation against resistance provided by the examiner. A test is positive if there is pain with resisted external rotation and is indicative of infraspinatus and/or teres minor pathology.

Internal rotation lag sign—The patient's arm is placed at the maximal internal rotation position, with the dorsum of their hand resting on their back. The examiner should grasp the forearm and lift the dorsum of the hand away from the spine. The patient is instructed to keep their hand off of their back. A positive test occurs when the patient is unable to maintain the position off of the back and is indicative of subscapularis tendon pathology.

Lift off test—Place the patient's arm internally rotated behind the back with the dorsum of the hand placed on the back. Ask the patient to lift the arm off of their back. A positive test is when the patient is unable to elevate their hand from their back and indicates subscapularis tendon pathology.

Belly press test—Place the patient's hand on their stomach and ask them to push their hand into their stomach as hard as they can. The patient should then attempt to bring the elbow forward in the scapular plane. The test is positive if the patient is unable to maintain the pressure on the stomach as they move their elbow forward or if the patient extends the shoulder and is indicative of a subscapularis lesion.

Shoulder instability tests

Apprehension / relocation test—For this test, the patient needs to be positioned supine on a table. The patient's shoulder is abducted to 90 degrees and passively externally rotated. If the patient has apprehension with external rotation of the humeral head, the apprehension test is positive which indicates anterior instability of the shoulder. The patient commonly reports that this sensation is similar to what they felt in prior subluxation or dislocation events. After the shoulder is externally rotated, the examiner places a hand over the humeral head and applies a posterior force. Relief of apprehension with this maneuver also indicates anterior instability of the shoulder.

Sulcus sign—With the patient's arm at their side, the examiner should place one hand on the patient's wrist and apply an inferior force as if to pull the patient's arm into the ground. An increased acromioclavicular interval reflects inferior laxity of the humeral head or instability.

Jerk test—With the patient seated, the examiner forward flexes the patient's arm to 90 degrees and internally rotates the arm while applying a compressive force along the humerus. While maintaining the axial compressive force, the arm is adducted across the patient's body. The test is positive if there is a sudden jerk, palpable clunk, or apprehension and this is indicative of posterior subluxation and instability. This test is highly sensitive and specific for a posterior labral tear.

Conclusion

The physical examination of the shoulder provides a wealth of information in patient diagnosis. Using the history and physical examination alone will often provide the diagnosis. At the very least it will direct the clinician towards proper imaging and can also assist in surgical planning.

References

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