

Chapter 22

Shoulder Pain

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Introduction

Shoulder pain is a common complaint in the outpatient setting [1]. It can originate from intrinsic shoulder pathology or be referred from other anatomical sites.

The shoulder girdle is composed of three bones (clavicle, scapula, and humerus) and four articular structures (sternoclavicular, acromioclavicular, glenohumeral, and scapulothoracic joints) (Fig. 22.1). The humeral head contacts with the shallow depth of the glenoid in the glenohumeral (shoulder) joint, providing great shoulder mobility but making the glenohumeral joint susceptible to instability and injury. Rotator cuff muscles dynamically stabilize the shoulder joint. The rotator cuff is composed of four muscles (supraspinatus, infraspinatus, subscapularis, and teres minor) and forms a cuff around the head of the humerus. The supraspinatus tendon and subacromial bursa are susceptible to impingement between the greater tubercle of the humerus and the acromion.

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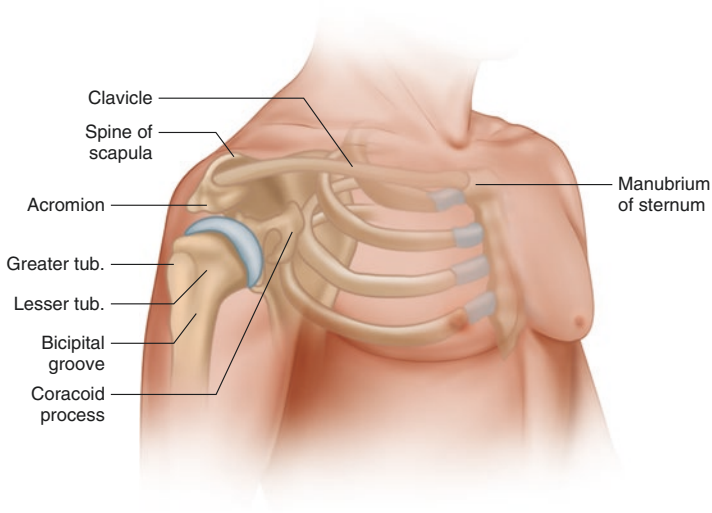


FIG. 22.1 Anterior shoulder. Modified from Kinjo M, Kinjo K, et al.: *Manual of Clinical Procedures in Outpatient Internal Medicine*, 2nd. ed. Tokyo, Igaku-Shoin Ltd. 2017

Key History and Physical Exam

First, ask patients if the shoulder pain began following an episode of trauma. Next, extrinsic and intrinsic causes of shoulder pain should be sought. Extrinsic causes include referred pain from cardiac, thoracic, and diaphragmatic pathology or radiating pain from the neck. Most of the shoulder problems seen in primary care settings are due to intrinsic shoulder disorders.

History

Once traumatic injury has been ruled out, the clinician should differentiate extrinsic and intrinsic causes. Extrinsic causes include cardiovascular, thoracic, abdominal, or neurologic conditions. Pain history and exacerbating factors, such as specific activities, need to be elicited. Shoulder pain provoked by movement, stiffness, instability, weakness, or range of motion is usually attributable to an intrinsic shoulder condition. If an

intrinsic shoulder condition is suspected, the clinician should decide if the pain is due to extra-glenohumeral conditions or not. The patient is asked to point to the specific site of the pain, such as the acromioclavicular joint, biceps tendon, or scapula. In acromioclavicular osteoarthritis, the pain is typically localized to the superior portion of the shoulder and is worse when reaching across the body (adduction) or in full abduction (raising arm laterally in an arc). In biceps tendinopathy, shoulder pain is often felt in the anterior aspect of the shoulder with tenderness in the bicipital groove. When the sternoclavicular joint is involved, degenerative, inflammatory, or septic arthritis is considered. If extra-glenohumeral conditions are not likely, detailed physical examination can help distinguish different pathologies in the glenohumeral joint area.

Common causes of shoulder pain differ by patient age. In older individuals, frozen shoulder (adhesive capsulitis) or osteoarthritis causes unilateral shoulder pain. Adhesive capsulitis is suspected when patients complain of pain and stiffness, progressive inability to reach overhead, and globally restricted ROM (range of motion) in any direction [2]. The patient may have a history of diabetes or prolonged immobility secondary to shoulder injury or stroke. Glenohumeral osteoarthritis may be suspected if patients complain of pain on movement in all planes, accompanied by crepitus. Acute or subacute onset of bilateral shoulder pain at rest and stiffness worse in the early morning suggests polymyalgia rheumatica. Milwaukee shoulder is characterized by a large shoulder effusion associated with hydroxyapatite crystals, typically seen in elderly women.

Middle aged and older patients often develop rotator cuff tendinopathy. Subacromial impingement is suspected when patients complain of subacute lateral shoulder pain worse with movement overhead. Rotator cuff tear is often of sudden onset associated with weakness and pain at night [3]. Inflammatory polyarthritis involving hands and wrists suggests rheumatoid arthritis. If inflammatory spinal pain is associated with extra-articular features such as uveitis, psoriasis, or inflammatory bowel disease, spondyloarthritis is suspected. In younger adults, sports injury including subluxation of the shoulder joint and sprain of the acromioclavicular joint are common. Superior labrum tear is suspected in patients

with throwing or overhead activities, and the pain is greatest with the shoulder abducted and externally rotated.

Past Medical and Surgical History

Ask about previous injuries, treatments, and comorbidities such as diabetes. History elements for Shoulder pain

- Did the shoulder pain develop following traumatic injury or overuse?
- Is there is a history of cardiac disease? Does the shoulder pain develop with chest pain on exertion?
- Does the shoulder pain and/or numbness develop when you move the neck to the side?
- Is there any history of prior shoulder pain?
- Where is the site of the shoulder pain? Is it localized or diffuse? Is it in the anterior, lateral, or posterior aspect of the shoulder?
- Was the onset of shoulder pain sudden or gradual?
- Was the duration of shoulder pain acute (<6 weeks), sub-acute (6–12 weeks), or chronic (>6 weeks)?
- Does the pain in the anterior shoulder get worse when reaching overhead? (rotator cuff tendinopathy)
- Is there stiffness and difficulty moving the shoulder when reaching overhead?
- Is the shoulder pain aggravated when moving in multiple directions?
- Does the head of biceps hurt when lifting or carrying heavy objects?
- Is the shoulder pain at rest and is it worse in the morning?
- Is there presence of fever, weight loss, dyspnea, or chest pain?

Physical Examination

First, compare affected and unaffected joints. Inspection, palpation, range of motion, strength, assessment of joint stability, and special tests to detect focal conditions should be included.

Inspect symmetry, bulk, deformities, and atrophy above and below the scapular spine. Muscle atrophy below the scapular spine in an older patient suggests chronic rotator cuff tear or suprascapular nerve injury [3]. Ask the patient to raise arms in a push-up position with both hands against a wall and view scapular position from behind. An elevated protracted scapula described as winging, suggests dysfunction of the long thoracic nerve or muscular dysfunction.

When palpating the shoulder and surrounding pathology, the cervical spine is first to be examined, then moving from proximal to distal structures: sternoclavicular joint, clavicle, scapular spine and adjacent musculature, acromion, subacromial space, acromioclavicular joint, bicipital groove, and greater and lesser tuberosity of the humerus.

Full range of motion suggests a normal glenohumeral joint, rotator cuff tendon, and muscles. Have the patient perform six different shoulder motions including abduction, adduction, flexion, extension, and internal and external rotation. Internal and external rotation should be tested with the shoulder abducted to 90°. For abduction, ask the patient to raise the arm from his/her side to overhead (0–180°). If the patient has limited active ROM, evaluate passive ROM with assistance to raise the arm until limited by pain. Active ROM is easily tested with the “Apley scratch test,” which can be used to provide useful information on shoulder range of motion. First, ask the patient to touch the superior medial tip of the opposite scapula to assess external rotation and abduction. Then ask the patient to reach behind the back and touch the tip of the inferior scapula on the opposite side to assess internal rotation and adduction (Fig. 22.2). Finally, ask the patient to reach across the chest and touch the opposite shoulder to assess adduction.

Diminished both active and passive ROM in all direction indicates either adhesive capsulitis or glenohumeral arthritis. If active ROM is diminished but passive ROM is normal, differential diagnosis includes rotator cuff disease, labral tear, biceps tendinitis, or AC joint osteoarthritis. Provocative maneuvers for examination of rotator cuff injury are impor-

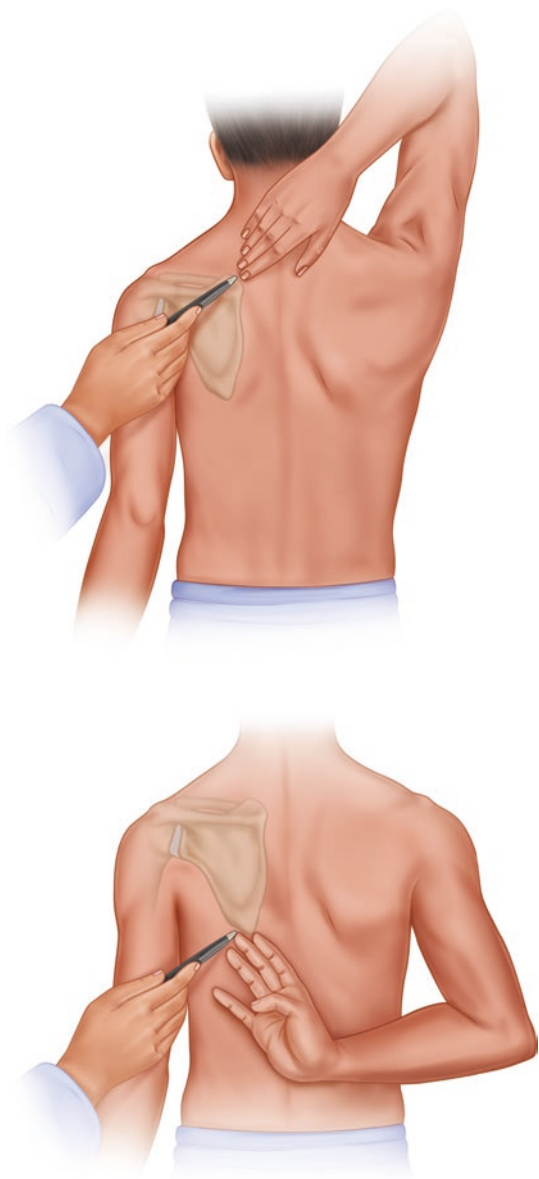


FIG. 22.2 Apley scratch test. Modified from Kinjo M, Kinjo K, et al.: Manual of Clinical Procedures in Outpatient Internal Medicine, 2nd. ed. Tokyo, Igaku-Shoin Ltd. 2017

tant. Rotator cuff disease includes impingement, tendinitis, partial thickness tear and full thickness tear. The supraspinatus tendon is susceptible to subacromial impingement. Several maneuvers can assess rotator cuff injury. Supraspinatus isometric strength is examined by having the patient abduct the arm to 30° (deltoid muscle initiates abduction) and having him/her resist continuous pressure while the examiner attempts to adduct the arm. A painful arc test is to simply have the patient actively abduct the arm in the scapular plane (Fig. 22.3). The test is positive when the pain is provoked with active abduction between 60 and 120° [4]. This is one of the most helpful physical examination tests for subacromial impingement (supraspinatus tendinopathy or subacromial bursitis) [3]. Pain between 120 and 180° suggests problems in the acromioclavicular joint. Provocative maneuvers for full thickness rotator cuff tear are external rotation lag test and internal rotation lag test, which are important because this condition requires surgical intervention. In external rotation lag test when patient abduct shoulder 20 degrees and flex elbow 90 degrees, examiner passively rotate patient arm into full external rotation. If the patient is unable to maintain the position of full external rotation, the test is considered positive. In internal rotation lag test, if patient is unable to maintain the position when the hand of patient is lifted off from the back by examiner, the strength of subscapularis muscle is diminished by the tear [3].

Acromioclavicular (AC) joint disease is suspected if localized pain over the AC joint, pain on abduction, or pain on cross arm adduction is present. Biceps tendinitis related to degenerative changes is common in older patients. In order to accurately palpate the biceps tendon, the clinician first identifies the greater tubercle of the humerus and moves his/her fingers medially into the bicipital groove and then rolls the biceps tendon under his or her fingers as the shoulder is rotated internally and externally. Special maneuvers for biceps injury include Yergason's test (Fig. 22.4). In this test, the patient flexes the elbow to 90° , and the clinician provides resistance to forearm supination. If pain in the area of the bicipital groove is reproduced, the test is positive.

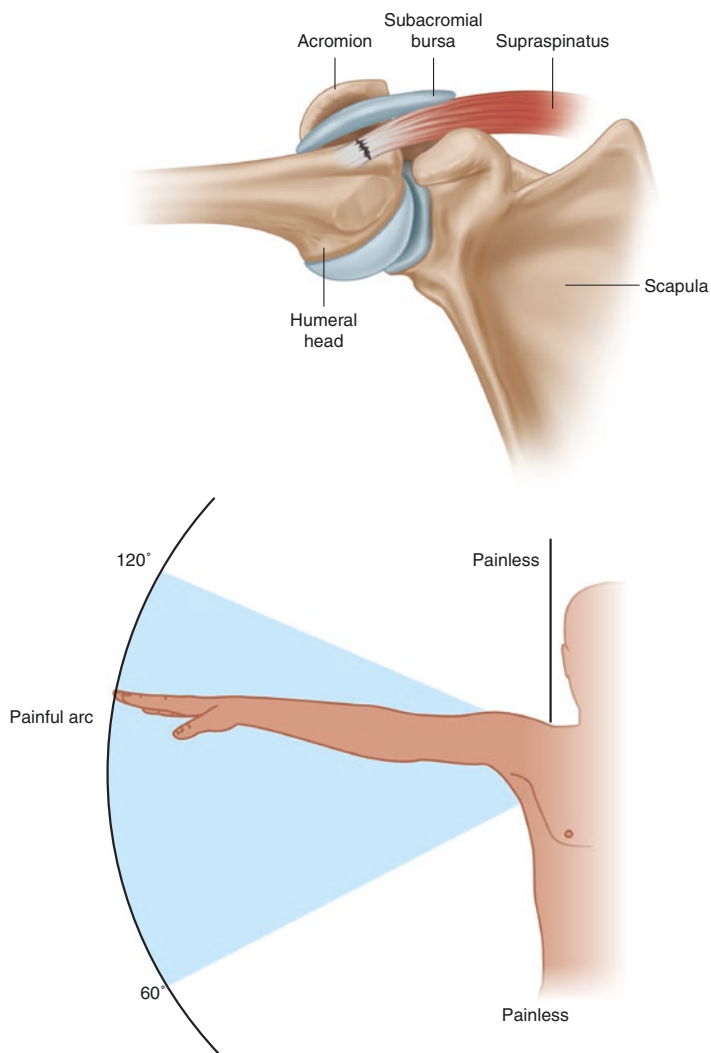


FIG. 22.3 Impingement sign. Modified from Kinjo M, Kinjo K, et al.: Manual of Clinical Procedures in Outpatient Internal Medicine, 2nd. ed. Tokyo, Igaku-Shoin Ltd. 2017

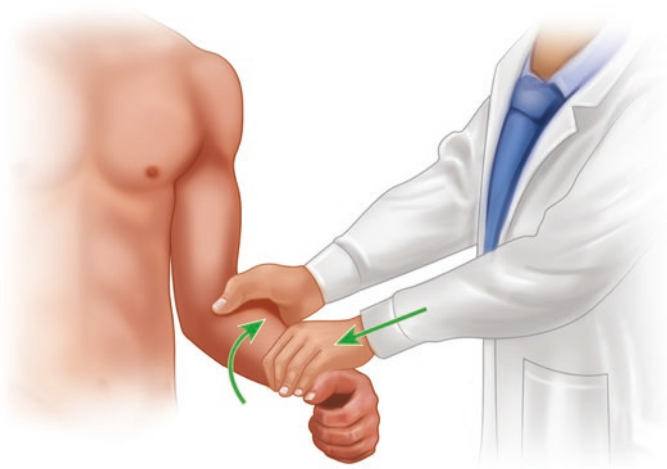


FIG. 22.4 Yergason's test (bicipital tendinitis). Modified from Kinjo M, Kinjo K, et al.: *Manual of Clinical Procedures in Outpatient Internal Medicine*, 2nd. ed. Tokyo, Igaku-Shoin Ltd. 2017

Differential Diagnosis

Please see algorithm (Fig. 22.5) for a visual depiction of the differential diagnosis of shoulder pain.

Pain from Surrounding Structures

- Cervical spine disease or spinal cord lesion affecting nerve root compression (C5, 6)
- Suprascapular nerve compression
- Thoracic outlet syndrome
- Brachial plexus lesions (brachial plexopathy)
- Herpes zoster

Abdominal

- Hepatobiliary disease
- Diaphragmatic irritation (liver abscess, ruptured ectopic pregnancy, splenic injury)

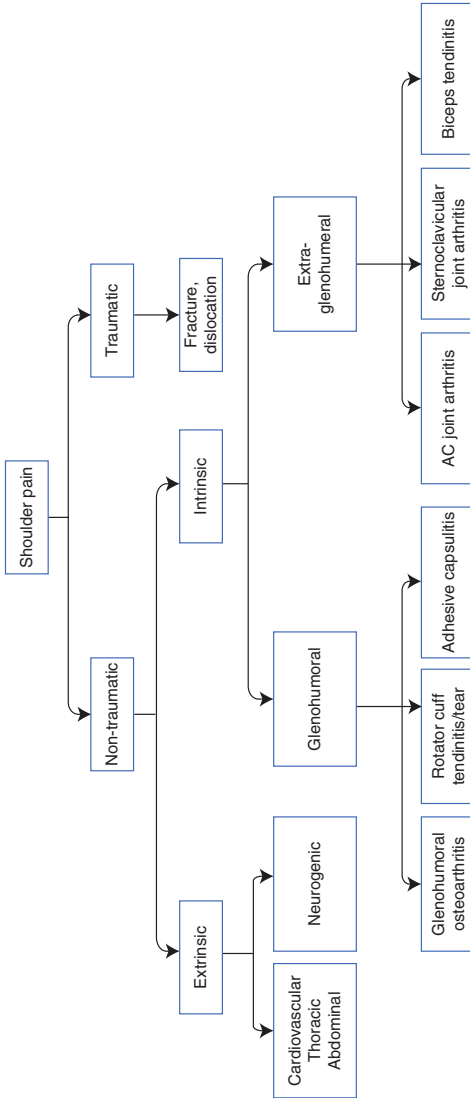


FIG. 22.5 Shoulder pain algorithm

Cardiovascular

- Myocardial ischemia

Thoracic

- Upper lobe pneumonia
- Apical lung tumor
- Pulmonary embolism

Intrinsic Shoulder Pain

Nonspecific shoulder pain

Polymyalgia rheumatica

Lateral shoulder pain:

- Rotator cuff injury (impingement syndrome, tendinopathy, partial thickness, or full thickness tendon tear)
- Adhesive capsulitis
- Cervical radiculopathy
- Labral tear
- Proximal humeral fracture

Anterior shoulder pain:

- Rotator cuff disease
- Glenohumeral osteoarthritis
- Acromioclavicular arthritis
- Acromioclavicular separation
- Biceps tendinitis/rupture
- Proximal humeral fracture
- Labral tear

Posterior shoulder pain:

- Scapular instability
- Scapulothoracic bursitis
- Cervical radiculopathy
- Subscapular nerve entrapment

Decision-Making

Poorly localized shoulder pain is often referred from internal pathology, including cardiac ischemia. Cervical nerve root pain is usually sharp in nature, radiating from the neck to the posterior shoulder and arm.

If a traumatic injury is present based on the patient's history, shoulder X-ray should be performed. Blunt trauma could cause fractures of the clavicle or proximal humerus, dislocation of the glenohumeral joint, and sprains/separation of the AC joint. If the patient has limited ROM with severe shoulder pain with or without trauma, plain shoulder X-ray is recommended to assess arthritis of the glenohumeral joint, acromioclavicular joint, or sternoclavicular joint. In osteoarthritis, characteristic X-ray changes include cartilage loss, subchondral sclerosis, and osteophytes. Plain X-ray is useful in identifying glenohumeral or AC osteoarthritis, calcific tendinitis, or other bone pathology. Calcium deposits in the supraspinatus tendon near its insertion may be seen.

Ultrasound or MRI should be checked if labral tear or rotator cuff tear is suspected. MRI is indicated when surgery is considered for suspected rotator cuff injury especially full thickness rotator cuff tear, impingement, avascular necrosis, biceps tendinopathy, inflammation, and tumors.

Treatment

Treatment goals are to reduce pain and improve ROM. NSAIDs are recommended for anti-inflammatory effects. As a general rule, patients should be advised to move the shoulder in all directions at least daily to preserve ROM.

Tendinitis, Bursitis, and Arthritis

NSAIDs are the first line therapy for these common disorders along with avoiding any repetitive motions that may have aggravated these structures in the first place. Medication

should be prescribed on a set basis for the first 7–14 days, not as “as needed.”

Patients unable to tolerate NSAIDs may respond to injection of steroids, as described under the adhesive capsulitis section below.

Rotator Cuff Injury

Suspected full thickness rotator cuff tear requires orthopedic referral. Other rotator cuff diseases often do well with conservative treatment. Ice can be used to reduce the acute inflammation. If the pain is initially relieved with use of ice, continue icing 20–30 min as often as every 2 h. Rest to avoid activities that aggravate symptoms (e.g., raising arm or overhead reaching). Nonsteroidal anti-inflammatory medication such as ibuprofen or naproxen is used to reduce pain and inflammation.

Stretching and range of motion exercises should be recommended either as part of a home self-management plan or a physical therapist plan.

The patient can be advised to do “pendulum stretching exercises” which can be started immediately after a shoulder injury [5]. While standing or sitting, the patient dangles his/her arm and allows the arm to slowly swing back and forth, then side to side, then in small circles in each direction to the degree only with minimal pain. If patients do not respond to conservative measures over 3 months and complain of progressively worsening pain or weakness, clinicians should consider specialist consultation.

Adhesive Capsulitis

Physical therapy with gentle shoulder mobility exercise is first recommended. Intra-articular glucocorticoid injections early in the course of frozen shoulder may be beneficial. Combined physical therapy following intra-articular glucocorticoid injection provides faster improvement [6]. Triamcinolone 20–40 mg or methylprednisolone 20–40 mg are suitable. Surgery does not seem to improve the outcome.

Clinical Pearls

- Shoulder pain is often referred from the neck. First, think of the non-shoulder pathology especially when the description of the pain is vague or diffuse, then evaluate the shoulder.
- Contrary to common sense, “If it hurts, don’t move it” usually does not apply to shoulder pain as the risk of adhesive capsulitis increases with each day of immobility.

Don’t Miss This!

- Extrinsic causes of shoulder pain could be referred from cardiac or intra-abdominal pathology; thus, time to diagnosis is crucial.
- Pain from biceps tendinitis is quite anterior rather than lateral. Don’t forget to examine this area.
- When rotator cuff disease is considered, full thickness tear should not be missed as it requires specialist referral.

References

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