

## Upper Extremities: Shoulder and Arm

The upper extremity is a complex system consisting of a series of unique joints that facilitate a full range of motion. This includes the sternoclavicular, acromioclavicular, and Glenohumeral joints. In addition, the motion of the scapula on the thorax increases range of motion, and is referred to as the scapulothoracic joint. Clavicular motion is also present in the motion of upper extremities, with the distal portion always moving opposite to the proximal portion. The scapula moves in a gliding motion, and assists in increasing the range of motion with scapular glide. Motion can be tested with Apley's maneuver. Common problems associated with the shoulder include rotator cuff tendinopathy, subacromial impingement, and frozen shoulder.



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### Joints

#### Sternoclavicular

##### Sternum-clavicle

The sternoclavicular (SC) joint is the meeting of the manubrium and the proximal clavicle. The SC joint contains an articular disc and is enclosed by a joint capsule. It is a saddle-type joint that functions as a ball-and-socket joint. The SC joint is the only true joint between the upper extremity and the thorax. The SC joint is a very strong joint, and clavicular dislocations are very uncommon.

#### Acromioclavicular

##### Acorn-man-clavicle

The acromioclavicular (AC) joint is the junction between the distal clavicle and the acromion process of the scapula. The joint is a plane-type synovial joint. It is strengthened by the coracoclavicular ligament. There are no muscles that cross the AC joint to cause motion. Rather, AC joint motion occurs secondary to motion of the sternoclavicular and scapulothoracic joints.

#### Glenohumeral

##### Gecko-humorous

The glenohumeral (GH) joint is the articulation of the proximal humeral head and the glenoid cavity of the scapula. This joint is a synovial ball and socket joint. The joint capsule of the glenohumeral joint attaches to the scapula at the margin of the glenoid cavity on the anatomical neck of the humerus, and is lined by a synovial membrane. The tendon of the long head of the biceps is enclosed in this capsule. The Glenohumeral joint has the greatest freedom of movement of any joint, and allows for flexion, extension, rotation, abduction, adduction, and circumduction.

#### Scapulothoracic

##### Scapula-Thor

The Scapulothoracic joint is not a true joint, but rather the movement of the scapula on the thorax enabling an increased range of motion and increased control of upper extremity movement. The term associated with the combined movement of the glenohumeral joint and scapulothoracic movement is commonly termed the scapulohumeral rhythm and occurs at a 1:2 ratio.

### Motion

## Apley Scratch

### Apple Scratch

The Apley Scratch test is used to test for gross shoulder range of motion. This test is conducted by first having the patient reach up and behind the head, touching the opposite shoulder. This evaluates abduction and external rotation. To evaluate internal rotation and adduction, the patient will be asked to place their hand across the front of the body, touching the opposite shoulder. Finally, to further evaluate the full range of internal rotation and adduction, the patient can be asked to place their hand behind their back, touching the inferior angle of the opposite scapula.

## Clavicle Teeter-Totter

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The clavicle teeter-totter is a term used to describe the motion of the clavicle. The clavicle can move anterior, posterior, superior, and inferior. The distal end of the clavicle will move opposite to the proximal end. For example, if the distal end of the clavicle moves inferiorly, the proximal end will move superiorly. The motion of the clavicle is always named for the distal movement. The movement of the shoulder can also cause the clavicle to rotate around a transverse axis, posterior with flexion/internal rotation or anterior with extension/external rotation.

## Scapular Glide

### Scapular Glider

Scapular glide refers to the motion of the scapulothoracic joint. This is the movement of the inferior angle of the scapula along the thorax, and can be lateral/inferior or proximal/superior. This motion is used to increase the range of motion and improve strength of the upper extremity during active movement.

## Common Pathologies

### Rotator Cuff Tendinopathy

#### Rotating Shoulders Tendon-part-hat

Rotator cuff tendinopathy is a common injury due to trauma, overuse, or instability of the glenohumeral joint. It involves inflammation of the tendons that make up the rotator cuff, including the supraspinatus, infraspinatus, teres minor, and subscapularis. The Supraspinatus tendon is the most common cause of rotator cuff tendinopathy, and pain is exacerbated by abduction from 60-120 degrees. Treatment for this includes NSAIDs, Ice, rest, OMT, and physical therapy.

### Subacromial Impingement

#### Sub-acorn-man Impinged

Subacromial Impingement refers to inflammation of the tendons creating the rotator cuff secondary to pressure of the acromion on the tendons. Rather than strain or injury, the tendinopathy presents due to excessive pressure or decreased space within the acromion. This can be caused by muscle tension, or somatic dysfunction of the scapula, thorax, or clavicle. Treatment includes NSAIDs, corticosteroid injections, and OMT treatment.

### Frozen Shoulder

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Frozen shoulder is characterized by decreased range of motion during active and passive movement. Extension is frequently the only motion that is not significantly limited, with pain noticeable at the end of motion. Tenderness is found on the anterior shoulder upon physical examination. It is most common in those over forty years of age. Spencer's technique is an OMT technique designed for frozen shoulders, and can be performed in addition to physical therapy and NSAIDs.