



**Level 5 Diploma in Massage Therapy for Sports
The Shoulder- Complex Assessment**

RQF

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The Shoulder Joint

Formed by the articulation of the scapula and humerus (shallow ball and socket joint), the shoulder joint allows a wide range of movement including flexion, extension, abduction, adduction, internal and external rotation and circumduction. The majority of movement at this joint is provided by the pectoralis major, latissimus dorsi and deltoids. The shoulder joint may often be referred to as the glenohumeral joint as the head of the humerus articulates with the glenoid cavity (fossa)



Pectoralis Major



Deltoid



Latissimus dorsi

Deep Musculature of the Shoulder

Underneath the joint is a more subtle arrangement of musculature. Each originates on the scapula and inserts on the upper humerus and plays a key role in stabilising the shoulder joint and controlling movement. They are often referred to as the rotator cuff. Having stability, integrity and coordinated function reduces the potential risk of injury to these muscles and at this joint. The subscapularis is the largest and strongest rotator cuff muscle, essential in overhead sports.

Teres Minor	Runs laterally from the scapula to the humerus to aid with adduction and external rotation
Supraspinatus	Runs superiorly from the scapula to the top of the humerus to aid shoulder abduction
Infraspinatus	Runs laterally from the scapula (higher than the teres minor) to the humerus to aid horizontal extension, external rotation and adduction
Subscapularis	Runs from the underneath of the scapular to the front of the humerus to aid internal rotation and adduction



Teres Minor –
Abduction and lateral
rotation



Infraspinatus –
Horizontal extension,
lateral rotation and
abduction



Subscapularis –
Internal rotation and
adduction



Supraspinatus –
Shoulder abduction

The Shoulder Girdle

The shoulder girdle is comprised of the scapula and the clavicle. They move in coordination with the shoulder joint to allow complex movements in the upper limbs.

Posterior Muscles of the Shoulder Girdle



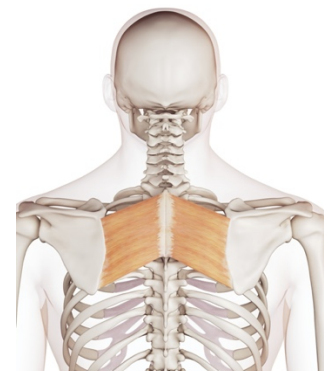
Rhomboid Minor



Levator Scapula



Trapezius



Rhomboid Major

These muscles allow for various combinations of elevation (shrugging the shoulders), retraction (shoulders back, chest out) and depression (shoulders dropped) to occur

Anterior Muscles of the Shoulder Girdle

The pectoralis minor and serratus anterior originate at the costal bones and insert on the anterior surfaces of the scapula. The anterior-inferior alignment allows them to both to protract and depress the shoulder girdle. When used with the appropriate shoulder joint action they can assist in pushing movements such as press ups.



Serratus Anterior



Pectoralis Minor

Injuries and conditions of the shoulder

Unlike the hip, the shoulder's primary strength does not come from the skeletal framework, but from soft tissue components. Highly prone to overuse and misuse. A very common site of injury for gym users! Some of the most common injuries and conditions of the shoulder are presented below.

General shoulder pain – Many shoulder injuries are related to muscular injury, however do not discount bone or cartilage injuries. The most common muscles affected are:

- deltoid
- trapezius
- biceps brachii
- infraspinatus
- Subscapularis
- supraspinatus
- pectoralis major
- pectoralis minor

Since the treatment for all soft tissue injuries is the same i.e.:

- acute stage: PRICE
- sub-acute stage: regain mobility, optimise scar tissue formation, develop flexibility
- chronic: continue post-treatment care to include strength, proprioception, regaining function

The first task of the sports massage practitioner is to identify which muscle(s) is involved.

Presentation subjective: If the pain is general then some questions need to be asked:

- Where does it hurt?
- What movements or activity were you performing when it happened?
- What movements give you pain?

Presentation objective:

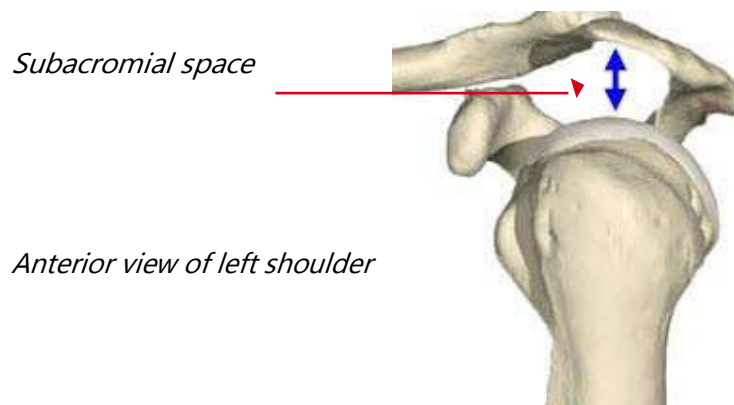
- ROM tests should give a clear indication as to which muscles are involved
- palpation could be used for confirmation
- a full ARTS examination may still be desirable if the cause was a minor event or if it is the re- occurrence of a previous injury

Practitioner's aims/actions:

- treat any inflammation using PRICE
- support soft tissue repair using the principles of post-treatment care
- try to determine the cause and give preventative advice or treatment
- identify any secondary conditions which may be apparent
- lengthen short muscles
- strengthen inhibited muscles
- Ensure the client has sufficient ROM, strength and proprioceptive abilities to carry out ADLs without the need to develop compensatory movement patterns
- educate the client and give corrective exercise

Impingement syndrome ('swimmer's shoulder') – Could possibly be diagnosed as a 'dysfunction' rather than an 'injury', impingement of soft tissue structures located within the shoulder is a very common condition.

If the subacromial space (humerus to acromion) becomes compromised for any reason, muscles of the rotator cuff (e.g. supraspinatus, infraspinatus, subcapularis), long head of bicep brachii and localised bursae can all become trapped.



The available space can lessen for possible two reasons:

- the structures which need to pass through it become larger
- the acromion and the humerus move closer together

The structures which need to pass through it become larger

Repetitive overhead activities such as swimming can irritate sub-acromial structures when they come in contact with bony surfaces. The friction created will cause inflammation (tendinitis) and the resulting swelling will increase the size of the affected structure. Since the structure is now too large to fit the structure, the problem will exacerbate itself. The aim of the therapist therefore, is to break this cycle of events ie. establish and remove the cause.

The acromion and the humerus move closer together

Abduction of the arm requires a complex series of events to occur if the subacromial space is to be maintained, especially as the movement increases beyond 60°-80°.

Understanding of the 'scapulohumeral rhythm' series of events which (should) occur during shoulder abduction is key if the practitioner is to identify any dysfunctional movement patterns.

1. First the shoulder girdle needs to be stabilised. This is achieved by the shoulder girdle muscles acting as fixators. Since acting as fixators is the primary purpose of the majority of shoulder girdle muscles they mainly comprise endurance (Type 1) muscle fibres. Therefore, non-functional isolating exercises such as 'shrugs' predispose to injury since these muscles have little phasic ability.

2. With the arm by the side, the deltoid is now at a biomechanical disadvantage as it can only impart an upward pull on the humerus. Consequently, any abduction needs to be initiated by the supraspinatus muscle. Supraspinatus then remains highly active until about 30° after which the deltoid can begin to assist it.

Note: A weak supraspinatus will compensate by flexing the spin laterally away from the from the movement. This gives momentum to the arm, thereby 'flicking' it into a position after which the deltoid can take over.

3. Since the angle of pull of the deltoid draws the humerus into the glenoid cavity, if the subacromial space is to be maintained, this action needs to be counterbalanced by a downward pull from the rotator cuff muscles.

Note: should rotator cuff strength be insufficient and be 'overpowered' by deltoid strength (a common occurrence in body builders who train by 'isolating the deltoids' from functional movement patterns) the space decreases and impingement occurs.

4. Beyond that of 70°-80° there is no further abduction available at the gleno-humeral joint, therefore all muscle contractions involved in abduction beyond this point are isometric and simply maintain the humerus in a fixed position.

For abduction of the 'shoulder complex' to continue beyond 70°-80° elevation of the shoulder girdle needs to occur.

5. The contraction of the inferior shoulder girdle muscles therefore, becomes increasingly eccentric whilst the superior shoulder girdle muscles become concentric, thus maintaining an active stability during movement as the arm passes the horizontal (on the upward movement).

In summary:

- abduction of the arm to 70 degrees / 80 degrees - the humerus (should) move independently from a fixed scapula
- abduction of arm beyond 70°-80° - the humerus and scapula move as a complete unit

Presentation subjective:

- pain on overhead function or specific isolated movements
- history of overuse or sudden increase in overload

Presentation objective:

- elevated / protracted shoulders
- observable muscle imbalances
- restricted movements
- often there is a reduction in pain during passive movements since this will isolate any influences / symptoms of the deltoid muscle
- compensatory movement patterns
- special tests

Practitioner actions:

- treat any inflammation using PRICE
- lengthen short muscles
- strengthen inhibited muscles

- Ensure the client has sufficient ROM, strength and proprioceptive abilities to carry out ADLs without the need to develop compensatory movement patterns
- try to determine the cause and give preventative advice or treatment
- identify any secondary conditions which may be apparent
- educate the client and give corrective exercise

Adhesive capsulitis - This is commonly known as 'frozen shoulder' and describes an inability to move the glenohumeral joint.

The condition itself develops over a period of time (chronic), with movement being increasingly difficult and restricted. Due to the adhesions that thicken the joint capsule (known as the sleeve) and loss of muscular strength and size, lessens the effectiveness of which they fix the glenohumeral joint in place. The cause of the condition is unknown, however injury can be an initial instigator of the condition.

Once in the chronic stage this condition can take months to years to improve and in some cases, the client will never regain full ROM due to the degenerative joint changes.

Presentation subjective:

- pain during all shoulder movements
- diagnosis from GP or physio practitioner

Presentation objective:

- pain at the deltoid insertion, greater tuberosity and bicipital groove
- reduced or lack of ROM, even on passive movements
- hypotrophy of local musculature

Practitioner aims/actions:

Since causative factors are largely unknown and may be linked to hormonal imbalances only symptoms can be treated by the practitioner:

- treat any inflammation using PRICE
- lengthen short muscles
- strengthen inhibited muscles
- Ensure the client has sufficient ROM, strength and proprioceptive abilities to carry out ADLs without the need to develop compensatory movement patterns
- identify any secondary conditions which may be apparent
- educate the client and give corrective exercise

Dislocation of the shoulder joint - Most dislocations occur anteriorly. They are usually caused by traumatic injury such as receiving an impact to the arm held out in reaction to a fall, impact to the shoulder itself or damage to the joint capsule, labrum or rotator cuff muscles. However, excessive instability will leave an individual more prone to dislocations, and if stability is highly compromised the humeral head can move out of position even during a simple movement.

Presentation:

- extreme pain
- complete lack of use of the arm
- humeral head palpated in the armpit
- empty shoulder joint socket

Practitioner actions:

- refer for immediate x-ray diagnosis and manipulation to relocate as soon as possible (A&E)

Acromioclavicular (AC) joint injuries - Damage at this joint can range from instability to full dislocation where the articulating surfaces of the clavicle and acromion separate, leaving the clavicle clearly raised above the acromion. In the majority of cases, injuries to the AC joint happen by falling onto the point of the shoulder or on an outstretched hand causing a sprain to the AC ligament.

Any damage or change in articulation at this joint will directly affect the trapezius and deltoid as their origins support this joint. This would also mean that the condition of the musculature will affect the joint action or damage the joint.

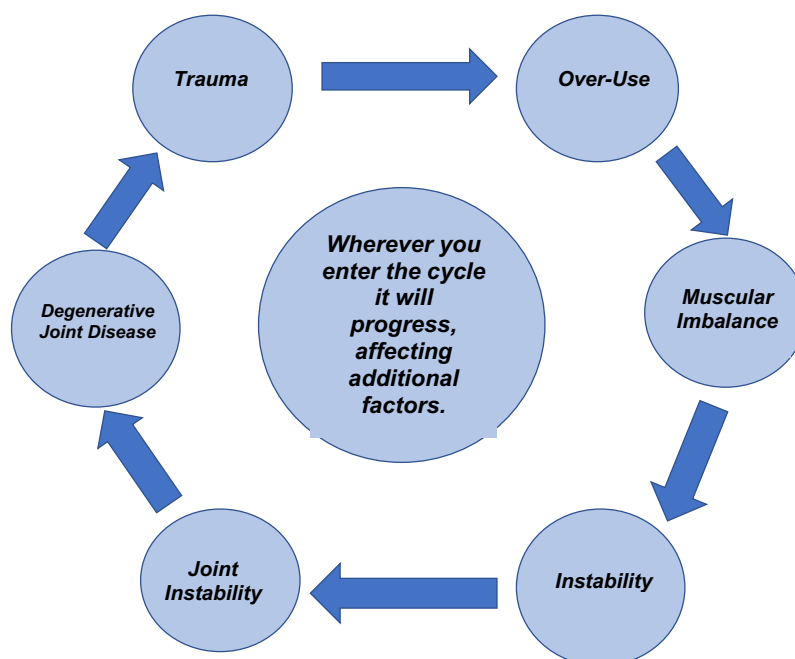
Presentation:

- pain in the affected area
- pain on activating any musculature connected to the clavicle or scapula in more severe cases
- reduced function and/or ROM in the shoulder complex
- visible joint dislocation

Practitioner actions:

- if in the acute phase and/or the joint is maligned refer for x-ray (A&E)
- if in the later stages maintain mobility of the glenohumeral joint
- utilise massage and stretches to reduce adhesion formation
- maintain activation of rotator cuff muscles

The cycle of shoulder joint and girdle dysfunction



Assessment of the Shoulder

After completing range of movement testing on the shoulder, we can look to set out further tests to help identify any problems with mobility and joint condition. Often the shoulder is prone to overuse injuries and swelling when there is injury or an issue with the biomechanical function. Its, also important to consider referred pain that might be felt at the shoulder but the issue could be in the neck or thoracic spine for example.

Initial Assessment:

The cervical spine can refer pain to the shoulder/scapular region. It is imperative that the cervical spine be screened appropriately as it may be contributing to the patient's clinical presentation. Within initial assessment the key area to look for is symmetry. The function, height and shape should be very similar for both shoulders. Check the position of the scapula and compare levels for an easy to use starting point.

Look to palpate the area also, as this will give you a key insight into muscular tone, any soreness and any abnormalities. Areas such as the AC Joint, ST Joint and acrominio process. The palpation will also help alert you to any swelling, temperature differences and tenderness.

The Bear Hug Test

This special test is to help to test for subscapularis muscle tear or dysfunction. As a major muscle within the rotator cuff, which provides a huge proportion of the strength generated by the rotator cuff. An example of this test is within our resource's library. *(Can be seen on online platform.)*

1. Client places the injured shoulder side, palm of hand onto the opposite shoulder. With fingers outstretched.
2. Ensuring elbow is at 90 degrees
3. Therapist with a small amount of resistance tries to lift and external rotate the shoulder from the forearm.
4. The client resists this by naturally internally rotating.



The Internal Lag Test

Or otherwise known as the spring back test. Will look and identify weakness in the Infraspinatus or Tere's Minor muscles of the rotator cuff. A positive test would see the arm spring back forwards. An example of this test is within our resource's library.

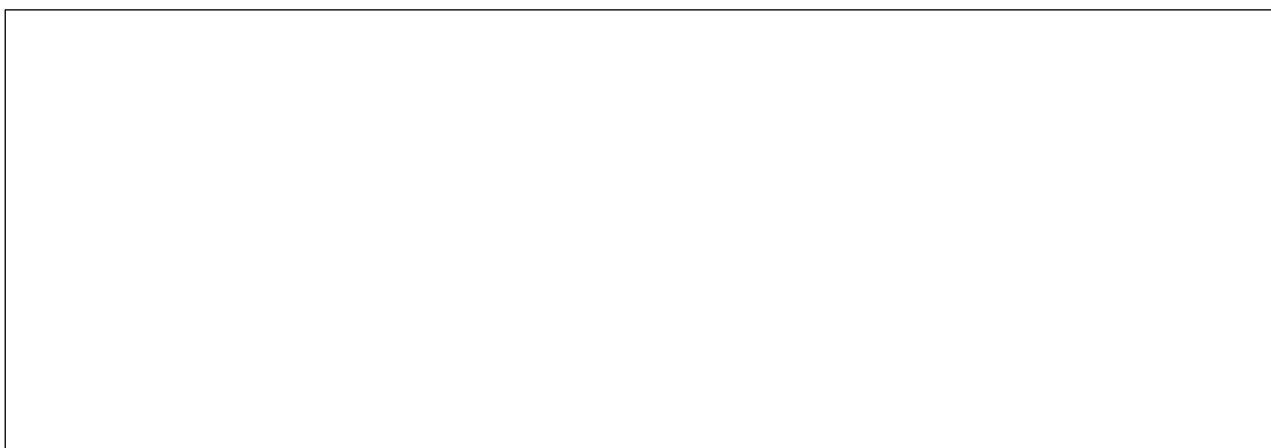
1. Client holds arm up and puts in 90 degrees of abduction. As well as maximal external rotation. Guided by the therapist.
2. Upon removal of therapist removing support, ask them to hold this position. If they can this indicates a negative test.



The Empty Can Test

The Empty Can Test is used to assess the supraspinatus muscle and supraspinatus tendon. However recently there has been research to suggest the integrity of the test is affected as it requires significant amounts of deltoid strength.

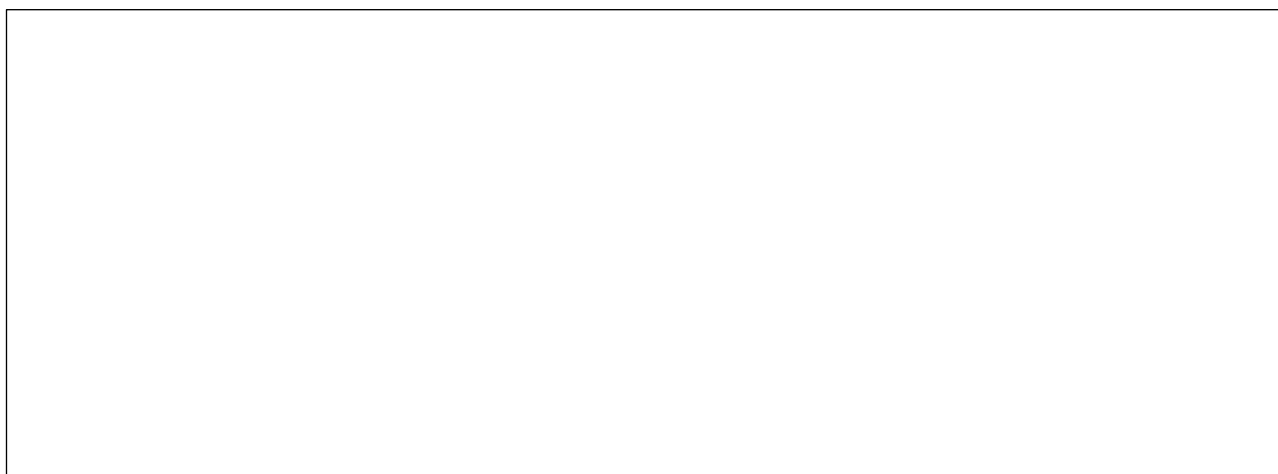
1. The client should have their arms raised to 90 degree's of the scapular plane, with their elbows extended.
2. Get the client to put their thumbs down to ensure full internal rotation and pronation of the forearm.
3. As therapist place downward pressure upon the client's hands and ask them to resist. A positive test will see pain reported.



The Lag lift off Test

The test is to help identify a full thickness subscapularis tear.

1. Your client can be either seated or standing. With the hand of the reported injured shoulder, place it upon the base of the back. The lumbar region.
2. The therapist lifts the hand of the clients back. Supporting the elbow and the wrist with the other hand. Almost achieving full external rotation.
3. The ask the client to hold this position actively, removing your support at the wrist but maintaining it at the elbow. A positive test will see the clients hand return to the base of the back as they will not be able to hold it.

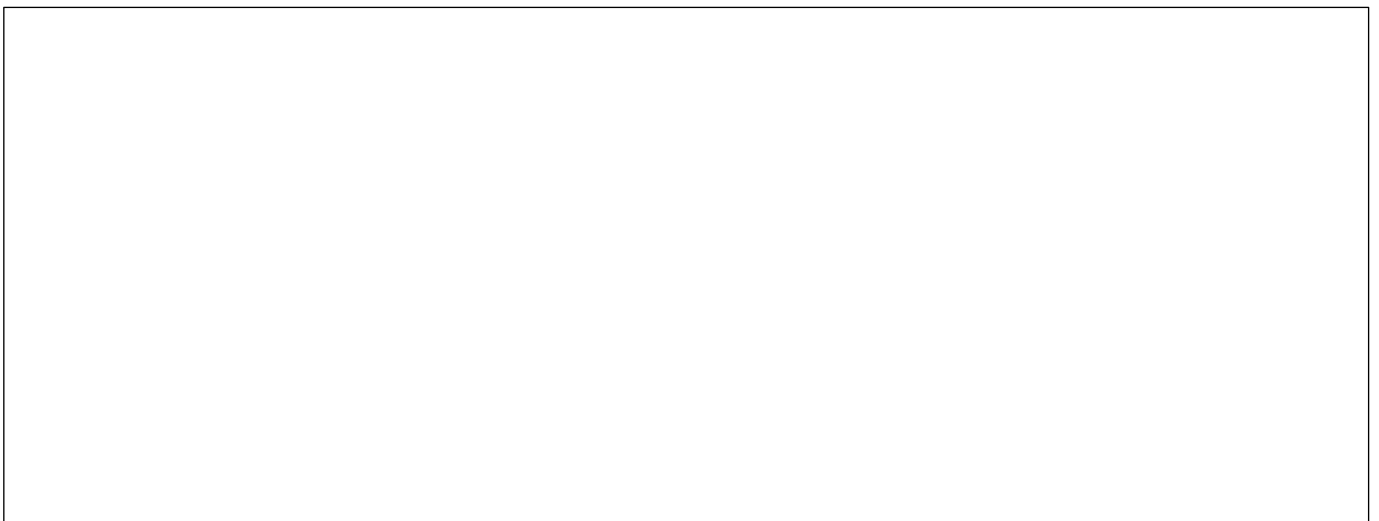


Subacromion Impingement (Swimmers Shoulder)

Neers Test

The test is to help identify sub-acromial pain syndrome. A positive test would be pain would be brought up again.

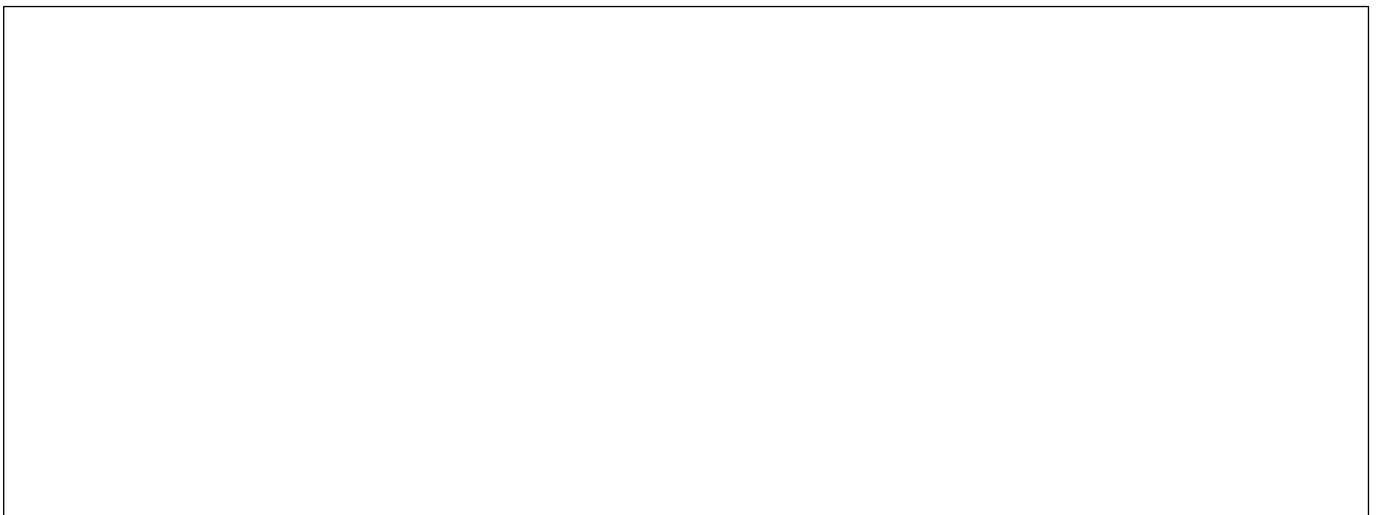
1. With your client in the seated position.
2. With one hand, depress the scapula
3. Apply pressure on the clients hand downwards, bringing the arm into internal rotation.



Hawkins Kennedy Test

The test is to help identify sub-acromial pain syndrome. A positive test would be pain would be brought up again.

1. Ask your client to take a seated position.
2. You take your hand and place on the opposite shoulder, with the injured (reported pain) arm, resting on your forearm.
3. Apply pressure on the clients hand downwards, bringing the arm into internal rotation.



Painful Arc

The test is to help identify sub-acromial pain syndrome. A positive test would be pain would be brought up again during abduction.

1. Client is standing
2. Request the client to maximally abduct the arms.





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