

# COURT SIDE

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A Back2Sports Sports Injury Management Newsletter

## Overdiagnosis of Subacromial Impingement Syndrome

**Subacromial Impingement Syndrome is a common diagnosis. Unfortunately it is often overdiagnosed as the primary etiology for patients who complain of pain in the anterosuperior aspect of a shoulder. Subacromial impingement syndrome is a specific diagnosis and it is not the only cause of pain in the anterosuperior aspect of the shoulder.**

A subacromial impingement syndrome is a condition that results in pain and loss of movement when soft tissues are impinged or compressed under the acromion (see picture). The soft tissue that is often impinged is one of the rotator cuff tendons—the supraspinatus tendon. Other structures that can mimic the pain of a subacromial impingement of the supraspinatus tendon are the long head of the biceps tendon, acromio-coracoid ligament and the subacromial bursa due to the proximity of the structures.

Abnormal biomechanics that disrupts the normal movement pattern in the shoulder can result in the Supraspinatus tendon being impinged and the surrounding structures sensitized, hence leading to pain. One quick test is to look for the presence of a painful arc when the affected arm is abducted. Typically there will be pain at around 90 degrees, which subsequently reduces as the arm is moved higher into abduction. This test however, does not differentiate between pain from an intrinsic tendon disorder or as a result of an impingement. Perhaps a more diagnostic test is to contract the muscle isometrically, in this case, into abduction with an expectation of a reproduction of pain. This is repeated again with the humeral head distracted away from the acromion. If the

pain is less and the contraction is stronger with the distraction, we can conclude the pain on contraction is a result of impingement.

### Common Primary Leading Cause

There are many factors that can cause a subacromial impingement syndrome. One common cause is an anatomical anomaly such as a bony spur present under the acromion which results in a reduction of the subacromial space; however the spur itself may not be a primary cause of the impingement. Often it is a combination of a presence of a spur and a poor movement pattern that results in the superior translation of the humeral head causing the impingement. Surrounding tissue inflammation can aggravate the condition. An interesting study done by Jerosch et al. found that muscle-strengthening exercises achieved better outcomes when compared to an acromioplasty in the treatment of subacromial impingement.

As mentioned, impingement occurs as a result of the approximation of the humeral head to the acromion. This approximation occurs due to a muscle imbalance between the muscles that draw the humeral head up and the muscles that hold it stable in the centre of the Glenoid fossa. The muscles in question are the deltoids which pull the humeral head superiorly and the inferior cuffs, which are the Subscapularis and Infraspinatus which creates a downward force. Relative to the other two rotator cuff muscles, as these two muscles are positioned lower and their function is to provide a downward force. Together with the other cuff muscles, their function is to stabilize the humeral head in the centre

of the socket. Therefore, weakness in the inferior cuff muscles allows the humeral head to ride upwards, impinging structures that are under the acromion.

Another common cause is overuse of the shoulder especially in competitive athletes who perform repetitive overhead motion may also develop subacromial impingement as a result of inflammation in the supraspinatus tendon. This is especially significant for athletes who perform overhead activities that involve flexion and internal rotation of the humerus. When the arm is in an overhead position, the supraspinatus muscle has to contract eccentrically to decelerate internal rotation and adduction of the arm as the arm moves into the release position. This can lead to a tension overload and inflammation if done repetitively. The soft tissue inflammation reduces the subacromial space and thus leads to an impingement, and a potential tear in the tendon.

### Physiotherapy Management

There are many different methods in the treatment of a subacromial impingement syndrome and the most common interventions to date are modification of activity, the use of non-steroidal anti-inflammation medications, subacromial injections of steroids and physiotherapy treatments.

In an impingement that is caused primarily by muscle dysfunction, physiotherapy has an important role to play in the treatment and rehabilitation of the shoulder. Often, the impingement is largely due to

dysfunctional shoulder biomechanics, as in this case weakness in the inferior cuffs. However, the pain in the shoulder due to the impingement can also alter effectiveness of the scapular stabilizers. These stabilizers include the middle and lower trapezius and the Serratus anterior. With a deficiency in the scapular stabilizers, the resting position of the scapular and its movement relative to humeral movement will be altered into a downward rotation. This can further aggravate the condition. Other factors that can influence the position of the humeral head relative to the glenoid is the presence of joint and capsule restrictions.

Apart from the anti-inflammatory modalities, joint mobilisation and the deep tissue release of the over active muscles, especially the Rhomboids and the Levator scapulae in a downward rotated scapular, the main goal of physiotherapy is to change the mechanics the glenohumeral joint and the scapular humeral rhythm. This is achieved through isolating, strengthening and progressively training the muscles in the functional or the painful position. The following are some exercises that are commonly taught to patients with sub-acromial impingement.

### 1. Active relocation exercise

The above exercise assesses the ability to activate and isolate the Subscapularis and the Infraspinatus muscles via palpation. It is common to find poor activation in one or both muscles. Once the deficiency is determined, the client will be taught to isolate and activate the muscle/s in a non painful position. As the clients' ability improves, the arm will be raised to the position where the impingement occurs. The final progression is to achieve dynamic control, at is to contract the affected cuff and add movement to the arm, example- internal and external rotation.



Figure 1: Active Relocation Exercise

### 2. Ribcage slides

This exercise works on the Serratus



Figure 2: Ribcage Slides.

Anterior muscle, which is one of the primary stabilizers of the scapular. Together with the Upper Trapezius, the Serratus Anterior upwardly rotates the scapular. The progression to this exercise is to increase load by doing the exercise with single arm or to increase the instability, by making the surface more unstable- using a wobble board or a gym ball.

### 3. Scapular control of middle, lower trapezius and Serratus Anterior

This exercise is done in a more functional position and works the muscles both concentrically and eccentrically. As the arm is taken forward, the scapular has to upwardly rotate, the theraband acts as a resistance to that movement. When the arm is lowered against resistance, the muscles are still contracting albeit lengthening at the same time. This eccentric control is important as the loss of control in the scapular is usually in the eccentric phase.



Figure 3: Scapular Control of Middle, Lower Trapezius and Serratus Anterior

Physiotherapy management of the sub-acromial impingement involves various aspects. For a successful rehabilitation, the following factors must be assessed and addressed. The inflammation; the

scapular thoracic, scapular humera I and glenohumeral mechanics; the surrounding soft tissue dysfunctions; stability and motor control of the shoulder complex. On last point to note, although the cervical spine does not contribute to the impingement, it still needs to be assessed as a C4/5 dysfunction can increase the irritability of the shoulder.

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