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# Shoulder Dysfunction

## Structure and function

The shoulder complex consists of the scapula, clavicle and humerus. For the purposes of this info sheet we will concentrate on the glenohumeral (ball and socket) joint of the humerus (arm bone) with the scapula (shoulder blade) and the coracoacromial arch above.

The shoulder joint allows the arm to be lifted forwards and backwards (flexion, extension), away from and against the side of the body (abduction, adduction) and rotated inwards and outwards (internal, external rotation). When the arm is abducted away from the side of the body, it can only raise so far before the arm bone impacts on the bony coracoacromial arch. Therefore, in order to raise your arm above about 90°, the arm must be externally rotated.

The shoulder joint has a huge range of movement. Unlike other joints, instead of using ligaments to limit and control excess movement, it uses 4 small muscles called the rotator cuff. If one of these muscles is injured and weak, the joint will sit slightly out of place, will move awkwardly and may be painful.

There are also several large muscles which add strength to the shoulder, including deltoid, biceps, triceps, pectorals, latissimus dorsi and rhomboids. If one of these muscles is injured, weak or overly strong it will cause dysfunction of the shoulder and may also cause pain in the neck or back.

## Conditions

### **Rotator cuff tendonitis**

The rotator cuff muscles attach to the top of the arm bone. The supraspinatus, infraspinatus and teres minor attach to the back of the scapula. The subscapularis attaches to the front of the scapula and therefore cannot be touched directly. Overuse of any of these muscles may cause inflammation or a tendonitis. Weakness or strain of one or more of these muscles causes an imbalance in the movement of the shoulder joint and may lead to impingement of the tendons or bursa against the coracoacromial arch, aggravating the inflammation.

It causes pain and aching over the shoulder and top of the arm. It is usually worse at night and can be very sharp on certain movements such as putting on a coat. If the arm is abducted away from the side, there is a *painful arc* between 60° and 120°. If the arm is fully externally rotated the abduction may be full range and painless.

It is important to avoid putting more strain and pain on the shoulder. As soon as possible start isometric exercises which should *not* be painful. Once all movements are pain free concentric strengthening exercises can commence.

If allowed to become chronic, a bursitis may develop, there is muscle wasting, loss of power and movements become more restricted. It may develop into a frozen shoulder.



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## Shoulder Dysfunction cont...

### **Bursitis**

A bursa is a sac of fluid which protects tendons from injury where they run over bone. There are many bursae in the shoulder but the commonest affected is the *subacromial bursa*. It protects and enables smooth movement of the supraspinatus tendon and head of humerus under the coracoacromial arch. Chronic injury to the supraspinatus tendon, rotator cuff imbalance or even carrying heavy shoulder bags may all cause the bursa to become inflamed.

Painful movements, usually abduction and external rotation should be avoided until the inflammation dies down. Avoid direct contact including massage and lying on the affected side.

Treat as for rotator cuff tendonitis. If the inflammation persists, a local steroid injection may be advised however it is important to rehabilitate effectively else it may return. More than 2 injections are not recommended as the tissue may be weakened by the steroid.

### **Frozen shoulder (adhesive capsulitis)**

Basically a sticky, inflamed shoulder joint. The pain starts insiduously and gradually the shoulder stiffens until all movements are very limited, particularly abduction and internal rotation; the pain may radiate down the arm. After about 6 months the pain gradually subsides and the movements eventually start to improve. It may take 6 months to 2 years to resolve although good management can reduce this time significantly. It often starts with a chronic tendonitis and bursitis and should be treated in a similar way whilst accepting that once the entire joint is involved, resolution will take some time.

It is important to avoid increasing the pain. Rest and protect the arm. Avoid lying on the affected side to sleep. Gentle massage will help keep muscles comfortable and as the pain lessens, isometric exercises can be started.

### **Biceps tendonitis**

This may occur on its own with a specific strain, usually lifting or weight training. More often it occurs alongside a general rotator cuff tendonitis. It causes tenderness at the front of the shoulder and weakness of flexion. It should be treated as for rotator cuff tendonitis. If allowed to become chronic, the biceps tendon may suddenly snap. Maybe surprisingly, once the initial bruising has subsided, it causes little trouble or dysfunction.

### **Shoulder dislocation/chronic instability**

Usually an acute sports injury or road accident, the shoulder usually dislocates through the front of the joint. Once it has been reduced, it is important to strengthen the joint effectively as the rotator cuff will have been disrupted and this could lead to chronic instability.

### **Acromioclavicular dislocation/recurrent subluxation**

Usually a sports injury, the clavicle dislocates and protrudes above the shoulder. It is relatively easy to reduce but commonly remains unstable and subject to recurrent subluxation. It often remains a bony prominence but may give very little trouble although may result in arthritic changes later in life.

### **Osteoarthritis**

Usually of the acromioclavicular joint due to recurrent injuries, subluxations and chronic rotator cuff tendonitis. Causes pain on reaching high overhead, which is therefore best avoided! Best managed by improving rotator cuff stability.

Of the glenohumeral joint itself, is more rare and is usually secondary to fractures or chronic stiffness due to rotator cuff tendonitis or frozen shoulder.