

# Preventing and/or Decreasing Shoulder Impingement - by Ricky Frausto

## Introduction

We as coaches have begun to see more and more shoulder pain among CrossFit Omaha athletes. Because of this, I have decided to write an article in order to hopefully educate you a little on how the shoulder works and what may be causing pain to this area. There may be some words describing the shoulder that you may or may not be familiar with. This is okay. Just try and understand how the shoulder works and why you may be experiencing pain and/or loss of mobility that keeps you leery of that next CrossFit met-con.

## Anatomy and Function of the Shoulder

The shoulder was designed for mobility. It is the one joint that has the greatest range of motion in all directions compared to any other joint in the body. This is allowed due to how the humerus or upper arm is connected to the shoulder. As a visual, the head of the humerus is sometimes likened to that of the size of a golf ball whereas the glenoid, or area where the humerus sits on the scapula (think ball and socket), is about the size of a dime or the top of a golf tee. If we use this analogy, you can understand how much movement the arm is capable of in any direction. I will now begin to explain a little about shoulder anatomy and function. Do not worry about remembering what everything is called but rather how the shoulder functions. This will help you to understand how and why impingement occurs.

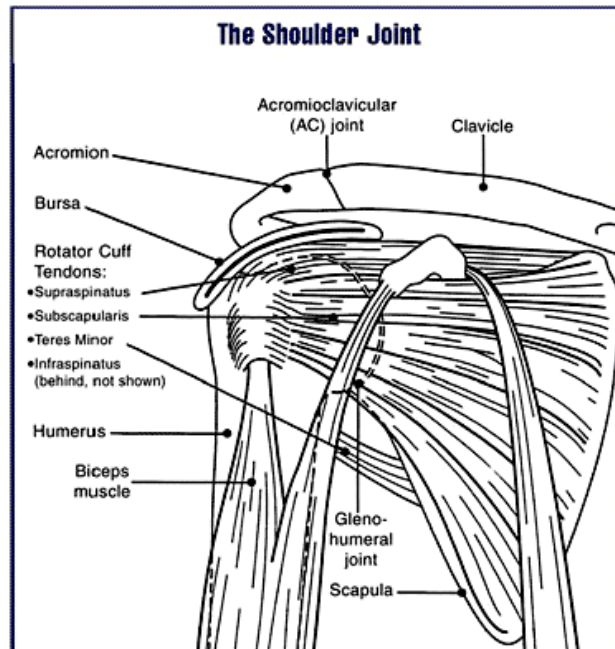
This ball and socket joint is held in place and moved by a few different muscles and tendons that are connected to the scapula (shoulder blade). There are six main muscles that allow you to move the arm in different directions, four of which are grouped together and called the rotator cuff. These six muscles allow for joint movement in basically four directions. These four directions include, flexion and extension (in front of you all the way to overhead and back to your side), abduction and adduction (out to the side all the way to overhead and back in to your side), scaption (away from you in a 45 degree angle all the way to overhead and also considered abduction or adduction), and internal and external rotation of the arm. The arm can also move in a combination of directions such as abduction and external rotation, i.e. the top of a baseball pitch.

These muscles are called the teres major, the deltoid, and the rotator cuff which includes the supraspinatus, the infraspinatus, teres minor, and the subscapularis.



Along with these muscles, the arm is held in place by only one bony attachment, the clavicle or collar bone. This is the only thing, other than muscles and tendons, which hard connects the arm to the rest of the body.

Knowing all of this anatomy will allow you to understand how the shoulder functions and of course how this function can become faulty. Normal function of the shoulder is for the muscles to allow for the head of the upper arm to roll, slide, and glide within the glenoid or socket. When you elevate your arm in any direction, flexion, abduction, or scaption, the head of the upper arm or ball rolls then slides and glides down into the socket for normal, pain-free movement.



Looking at the picture above, you will see that the outer most edge of the shoulder blade is called the acromion and this is what is connected to the clavicle or collar bone. Right below this area is a bursa sac which serves to lubricate the movement of the muscles through this area between the head of the upper arm and the acromion.

### **Shoulder Impingement**

When there is pain in the shoulder when we take a barbell overhead it is usually derived from impingement. What is impingement? Impingement of the shoulder joint occurs when the head of the upper arm moves in a way where no sliding occurs (it stays in place as it rolls as opposed to rolling within the socket) or it may even be caused by bony structures such as spurs. This narrows the space between the head of the upper arm and the outer most part of the scapula (acromion) thus causing a few things to occur. For one, when this space narrows, the bursa sac may get pinched and become inflamed, but most often the actual rotator cuff becomes irritated and inflamed and possibly even torn. This impingement causes a great deal of pain in many CrossFit athletes when bringing the arms overhead, especially when a load is involved.

## **Impingement and CrossFit**

There seems to be a certain few people that suffer from shoulder impingement while others who perform the same workouts see no impingement. Why is this? Well, one of the main reasons is how we are setup structurally. If you stand in front of a mirror, what do you see, in terms of your structure? How do your thumbs face? I ask this because where your thumbs face can be the first sign of why you may be suffering from impingement. If they face in, you may be more susceptible to impingement. Why? Because this shows an imbalance in the musculature that internally rotates the arm and the musculature that externally rotates the arm.

In CrossFit, we go overhead abundantly. We also internally rotate the arm in while overhead abundantly. This sets us up for possible impingement because the musculature involved in internally rotating the arm outnumbers the musculature that externally rotates the arm. Of the six muscles that I named previously, only two of them are involved in externally rotating the arm, the infraspinatus and teres minor. This is in stark contrast to the remaining four that work to internally rotate the arm. In addition to those four there are a number of other muscles that contribute to internal rotation on a secondary basis (not their primary goal). They include the pecs, lats, and biceps. When these internal rotators become well developed, they out-muscle the two external rotators. This causes us to walk around with the 'shoulders slumping forward' type of posture, thus the thumbs facing in.

When we begin our session of lifting for the day, whether that is strength development or met-con and our posture is in this less than ideal state, we expose ourselves to the susceptibleness of being injured. This less than ideal state doesn't allow for normal movement of the ball and socket joint. It may not affect us immediately but the irritation to the rotator cuff can get to a point where surgery is needed. What can we do to avoid this problem?

## **Preventing and Eliminating Impingement**

There are some ways in which we can possibly avoid impingement. One of the first ways we can eliminate shoulder pain and/or avoid it is to reduce swelling. Whether it is visible or not does not mean that swelling is not present. CrossFitters use the shoulders a lot and for the most part we cannot always say we use them correctly. Incorrect use will cause swelling. You can eliminate this swelling by icing. Optimally, you want to take Dixie cups, fill them with water, and freeze them. Once frozen, rip off the top part of the cup and begin to ice the shoulder in a circular motion for about 5 to 10 minutes and no more. You should do this at least twice a day if not more. Reducing swelling is the first step to increasing mobility thus reducing pain.

A second way to eliminate and/or prevent impingement is to focus our attention on posture, putting ourselves into more of an ideal state. If your thumbs face in or you have forward slumping shoulders, try and focus on rotating your arms outwards so that your thumbs face forward and using your upper back muscles to pinch the shoulder blades back. This will take your shoulders and place them in a more structurally correct position. You can test this by having someone placing pressure on your trap muscles. There should be no tension on the traps when the shoulders are in a correct position. You may even have that person place their hands on your shoulders and jump and try and support themselves momentarily. If posture is correct, this person should be able to successfully support themselves (momentarily) whereas when posture is incorrect, you may feel pain in the lower back and even buckle underneath the person jumping on you. This posture can also be reinforced on the anterior (front) by bracing and anchoring in the ribs. This is to keep you from taking a good thing,

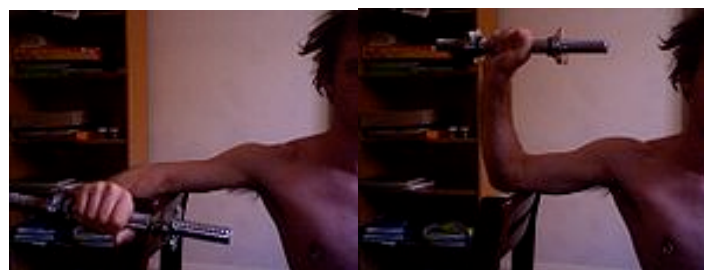
improving posture, and keep you from making it a bad thing, hyper-extending your lower back. Hyper-extending your lower back will keep you from being able to properly pull the shoulder blades back. This is the first way to preventing possible impingement and/or pain.

Self myofascial release techniques such as rolling out the thoracic spine (upper back) with foam rollers or even a tennis ball of some sort can also prevent or eliminate impingement. When the thoracic spine is always in a position of hyper-kyphosis (hunchback, the T-spine is naturally kyphotic) because of strong internal rotators causing us to have less than ideal posture, it and the connective tissue surrounding it becomes stiff and immobile. When this happens, every time you take something overhead, the head of the upper arm runs into the top of the shoulder blade causing irritation and inflammation of the rotator cuff musculature. By using a foam roller or tennis ball to roll out the upper back, you make that area supple and pliable, like it should be, which will then allow you to pull the shoulder blades back and out of the way so that the arms have room to go overhead properly. It allows you to assume correct posture during extremity movement (i.e. shoulder press) which will keep impingement from occurring or at least allowing an already inflamed rotator cuff to begin the healing process.

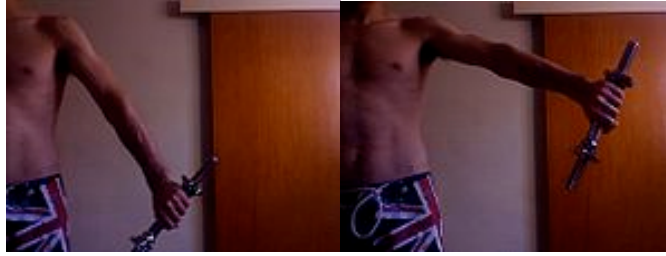
The last source of preventing and/or eliminating impingement and pain, other than surgery, from the shoulder is to strengthen the appropriate muscles that help to stabilize the shoulder. We now know that our inflamed rotator cuff may come from our incorrect posture which when we start going overhead causes the upper arm to clash with the outermost, upper part of our shoulder blade. When this happens, impingement follows, as the bursa and/or rotator cuff become pinched between these two areas which cause us to feel pain. As we work on correcting posture and foam rolling, we can begin to strengthen the external rotator cuff muscles in order to balance out the stronger internal rotators which are causing poor posture in the first place. This is done by performing exercises with light dumbbells and/or therapy bands. Some of these exercises include side-lying external rotation, abducted external rotation, and scaption with the arm internally rotated.



A. Side-lying External Rotation



B. External Rotation while the Arm is Abducted



### C. Internally rotated Scaption

You can perform these exercises for higher volume like 2 to 3 sets of 10 to 20 reps. This will help to strengthen the external rotators of the shoulder and prevent possible future shoulder impingement.

#### **Overview**

So in closing, we have discovered that shoulder problems can arise from a number of reasons, some of which we have no control over such as bony structures (spurs) on the acromion of the shoulder blade but most other problems can be prevented or eliminated if they already exist. We know that if pain exists that we should be icing our shoulders on a regular basis using Dixie cups as an effective and cheap method to reduce swelling. This icing should occur for no more than 5 to 10 minutes at a time, allowing the tissue to warm back up so that no ice burns occur. We also know that posture plays a big role and connective tissue around the thoracic spine can become stiff and immobile due to this posture, which puts the shoulder blade in the way of normal overhead movements, causing impingement. We can alleviate this problem by putting effort into correcting this posture and spending time on the foam roller and/or getting deep-tissue massaged. And finally, we can also start to implement light dumbbell exercises to strengthen the appropriate musculature once swelling has gone down and posture is improved.

I hope that this article helped you realize the importance of corrective movement and its role in preventing and eliminating shoulder pain both around the house and in the gym. So the next time you are about to thruster the 7<sup>th</sup> rep in round three of Fran, you might want to think about how important it is to keep those elbows up, for posture sake anyways, when coming out of that squat and into that overhead position...