



USACK Guide to Shoulder Exercises

By Dave Jenkinson DO
USACK Head Team Physician
Cell: (423) 902-3424
jenk@amssm.org

INTRODUCTION

Coaches and athletic trainers can help develop and carry out sound programs for preventing shoulder injuries. Pre-season conditioning should address the flexibility, strength, and endurance of the shoulder muscles, particularly the scapular stabilizers and the rotator cuff muscles. The conditioning program must be tailored to the skill and fitness level of the paddler. Learning the correct mechanics of the strength training, choosing proper equipment, and proper supervision are all very important in a successful program. In-season training must be adjusted to avoid overuse injuries, and a proper warm-up and cool-down period should be routine with practice or competition. Such measures will not only help prevent injury, but will also make athletes more successful

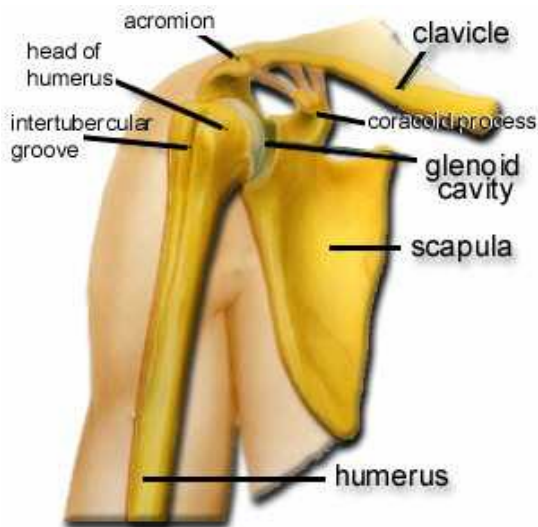
It has been found that over 70 percent of junior paddlers had marked weakness in the rhomboid muscles of the shoulder which puts them at high risk of shoulder injury. This weakness combined with ligamentous laxity ("loose shoulders") often found in young paddler has led to a crisis of injuries in the paddling community. This together with the inherent risk of paddle sports (especially whitewater) it is no wonder there are high incidents of injury and disability.

So, how do you avoid such an injury,? One of the most important things for every athlete to know is the difference between normal muscular soreness and fatigue vs. early symptoms of pathology (such as decreased range of motion, weakness, pain.) If the

symptoms seem abnormal, try to determine any contributing factors such as changes in intensity, distances, or stroke mechanics. The sooner a potential problem is identified and addressed, the better the chance for a quicker and healthier recovery. Remember, you need to pay attention to your body. If a paddler continues to work through and ignore the pain, the inflammatory response will increase and make the pain more global. This makes it harder to pinpoint a diagnosis and focus the treatment on the source of the problem.

Another important aspect of injury prevention and rehabilitation is strength and conditioning. Due to the mobile nature of the shoulder, a strong and stable scapula (shoulder blade) is a necessity. Scapular weakness can contribute to an abnormal shoulder rhythm (faulty stroke) and put increased stress on the rotator cuff and biceps. See the exercises section for some strengthening suggestions.

ANATOMY



The shoulder joint is composed of three bones: the clavicle (collarbone), the scapula (shoulder blade), and the humerus (upper arm bone).

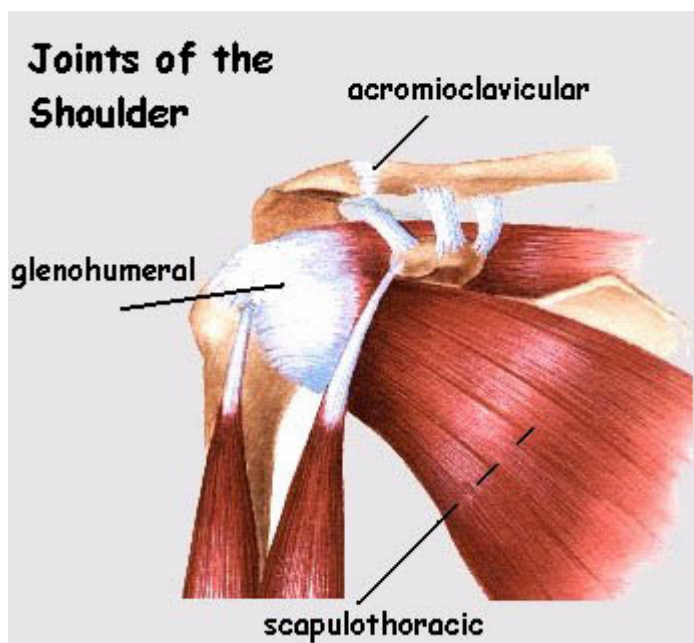
The “shoulder joint” is actually made up of 3 joints, the glenohumeral joint, the scapulothoracic joint and the acromioclavicular joint:

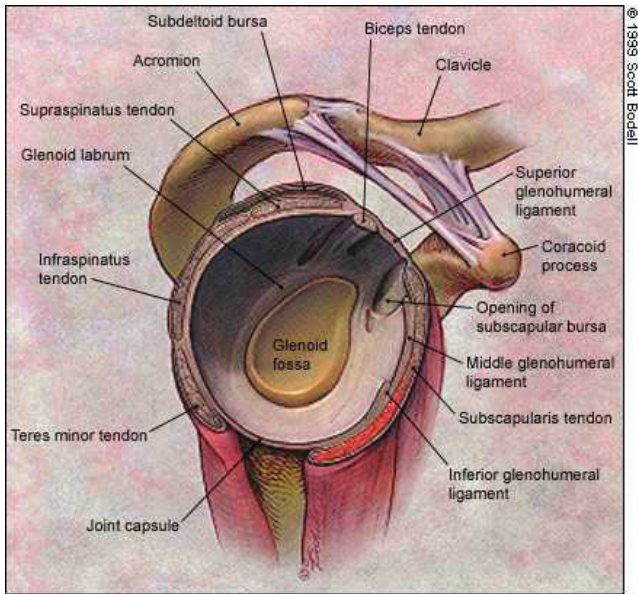
The shoulder joint is a ball-and-socket joint between the glenoid cavity (glenoid fossa) of the scapula (shallow bowl of the outer end of scapula) and the round, ball like, head of the humerus. This “glenohumeral” joint, commonly thought of as “the shoulder joint”, helps move the shoulder forward and backward and allows the arm to rotate in a circular fashion or hinge out and up away from the body.

The next joint that makes up the shoulder complex is the scapulothoracic joint, the joint between the scapula and the back. This is a very important joint, it both stabilizes and increases the mobility of the glenohumeral joint. This joint and the muscle associated with it play a huge role in paddling and yet are commonly ignored by most paddlers and strengthening programs. Strengthening the back muscle (rhomboids and trapezius can prevent injury to the glenohumeral joint

The acromion (highest point of the shoulder) is formed by the outer end of the scapula extending over the shoulder joint. This is also called the acromial process. The acromioclavicular joint (AC joint) is the joint between the acromion of the scapula and the clavicle.

The glenohumeral joint itself is made up of 3 set of rings. The inner most is the glenoid capsule, the middle ring are the small stabilizing muscles the rotator cuff muscles (supraspinatus, infraspinatus, subscapularis, teres minor), and the outer most ring are the “great movers” of the shoulder (deltoid, pectoralis major, latissimus dorsi, trapezius)





TYPES OF INJURY...

Instability:

Shoulder instability isn't really an injury, rather it is a description of excessive looseness of the shoulder joint. It often first seen in cadet/junior or female paddlers. Instability may be a normal part of the development process or because of injury. Generally shoulders will stiffen or tighten with age. In paddlers, shoulder instability can be made worse by activities such as over extended dufek strokes or dynamic bracing in holes that place extreme force upon the shoulder. The only way to "prevent" instability from leading to further injuries is to work on strengthening the whole shoulder / capsular complex.

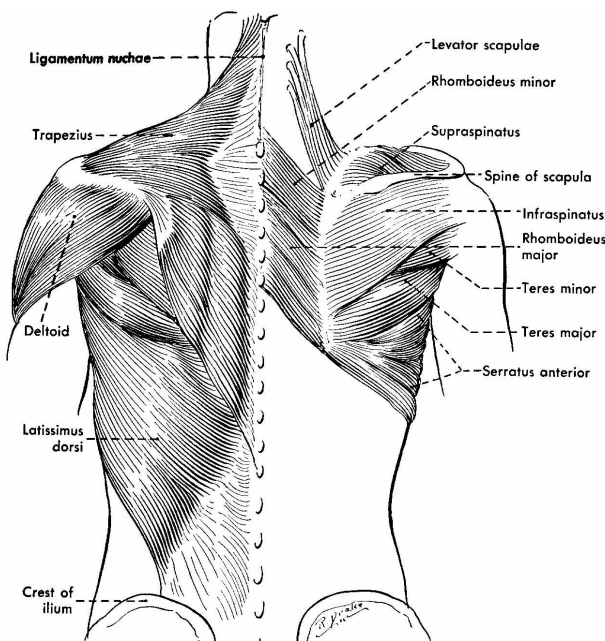
Dislocations:

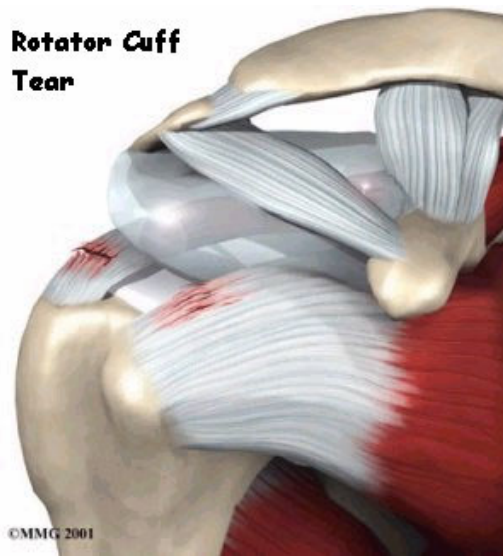
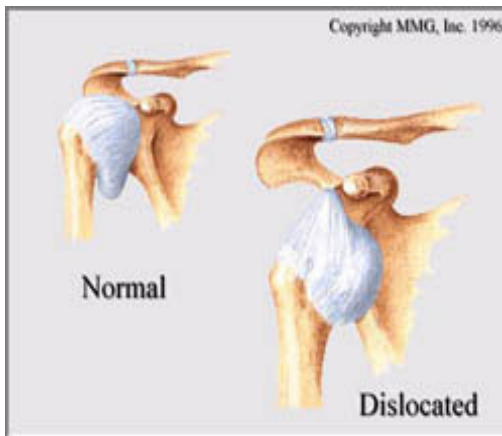
Sudden trauma can result in shoulder dislocation or popping of the humerus out of the shoulder socket (joint). It is best if dislocations are treated immediately by trained sports medicine providers rather than waiting. When the shoulder pops out of the socket repeatedly the condition is called recurrent instability. Dislocations are a very serious problem for the paddling community, and surgery should be considered to repair the torn ligaments. Alternatively, exercises that strengthen the rotator cuff can sometimes help increase shoulder stability.

The inner most ring consist of an articular cartilage that cushions this joint by covering the head of the humerus and face of the glenoid. Stabilizing the joint is the labrum, a ring of fibrous cartilage surrounding the glenoid called the glenoid capsule or just joint capsule.

The middle ring is the rotator cuff, a structure composed of muscle tendons that, with associated muscles, holds the ball at the top of the humerus in the glenoid socket and provides mobility and strength to the shoulder joint.

Two filmy sac-like structures called bursae permit smooth gliding between bone, muscle, and tendon. They cushion and protect the rotator cuff from the bony arch of the acromion.





Overuse/strains:

Sudden increases in paddling can place extensive stress on the shoulders and lead to fatigue and decrease in flexibility. This is a common problem in the early season when paddlers who haven't been working out in the off season engage in intense "catch-up" work or who fail to get sufficient rest. Paddlers at the end of the season who haven't give themselves sufficient rest and recovery time, can also develop overuse syndrome.

Though painful and inconvenient, these overuse or "impingement" problems can usually be treated with activity modification, ice, use of anti-inflammatory medication and stretching exercises.

If you are suffering from a sore shoulder it is important to listen to what your body is saying. Smart athletes understand their limits and take steps to strengthen and stretch their shoulders. If the trouble persists for greater than 72 hours you should contact a sports medicine provider.

Rotator cuff tear:

As people age their tendons begin to lose strength. This weakening combined with continuing stress can gradually lead to a rotator cuff tear. The rotator cuff tendons are located beneath the deltoid muscle and bone at the tip of the shoulder. Tears can also occur due to hard use or a sudden jerk. In the majority of cases, rotator cuff tears can be treated by exercising and strengthening compensating muscles in the shoulders. In some cases surgery to repair the damaged tendon may be necessary.

EXERCISES

General Stretching

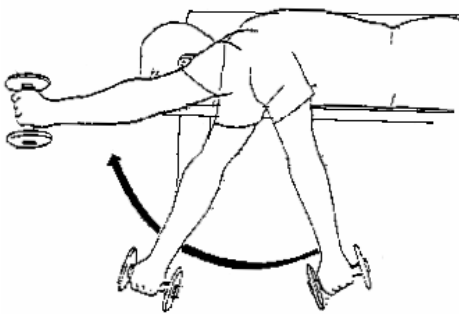
One thought to keep in mind to minimize risk of injury is to be cautious with stretching. Most paddlers (especially females) are not lacking flexibility and actually have a tendency to be too flexible. Try to avoid partner stretching, which can be too aggressive. A gentle 5-10 minute upper extremity warm-up should be enough to increase blood flow and prepare the muscles for a workout. Occasionally a paddler may develop some tightness in the posterior shoulder capsule that can be a source of pain. A clinician, athletic trainer, or physical therapist should assess this area if pain persists

Strengthening Exercises

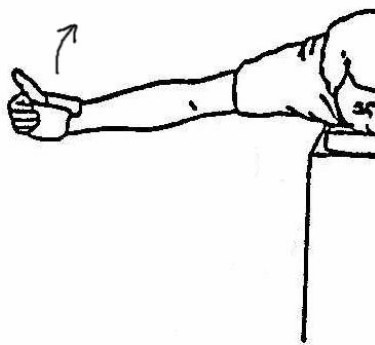
For the first exercises in the series, you will need a high flat bench (your hands should clear floor when lying face down on it), or an inclined bench set at 30-45 degrees. Lie face down on the bench (supine position). Avoid an excessive curve in your lower back (lumbar spine) this may be helped by placing a pad under your navel. Choose a weight that allows you to do 12-15 repetitions. It is important to do all exercise slowly and under control, the first phase, (lift phase) should be done in 2 seconds breathing out, the second phase, (release phase) should take 4 seconds and be breathing in.

Shoulder Flexion:

Starting position is lying face down with dumbbells in each hand, arms hanging straight. Raise your arms up and to the front as far as you can. Palms should face the floor at the top of the movement. At the top, squeeze your shoulder blades together and slightly down. This should increase the feeling of contraction in the mid-scapular region. Lower slowly and repeat 12-15 times.



degrees to your body (make a T with your arms straight out). With your thumbs pointing towards the ceiling, keeping your shoulders down and relaxed (no shrugging), move your thumbs towards the ceiling, hold for 10 – 20 seconds...and let down slowly. You should feel your shoulder blades touch and then slide outward as you lower your hands. Do 1 set of 10

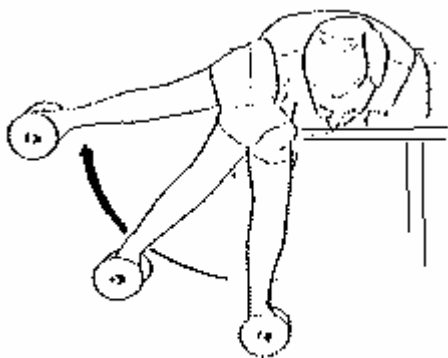


Shoulder Abduction:

From the starting position, raise both arms out to the side. Keep your arms straight but not locked at the elbow joint. Palms should be facing towards the floor at the top of the motion. Again, at the top squeeze the shoulder blades together to increase mid-scapular muscle contraction. Lower slowly and repeat 12-15 times.

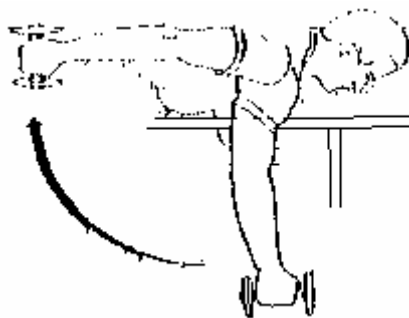
Scapular Stabilizers – Lower Trapezius:

Lying face down on a table, position your arms at a high three quarters position ("Y" position). With your thumbs pointing at the ceiling, raise your arms...hold...and lower slowly. You should feel your shoulder blades slide down your back and then back (hard to feel, but if you do it right you will feel the burn on the bottom of your shoulder blades).



Shoulder Extension:

From the starting position, rotate hands so palms face backwards or towards your feet. Raise your arms as if you were reaching behind yourself. Hold the contraction for a moment at the top, lower slowly, and repeat 12-15 times.

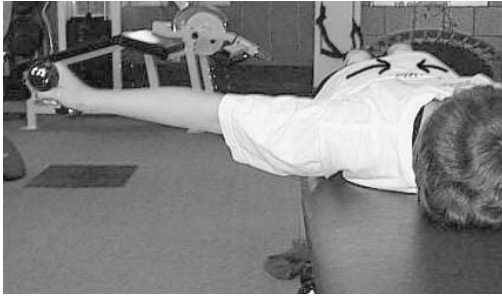


Additional Scapular Stabilizers – Middle Trapezius:

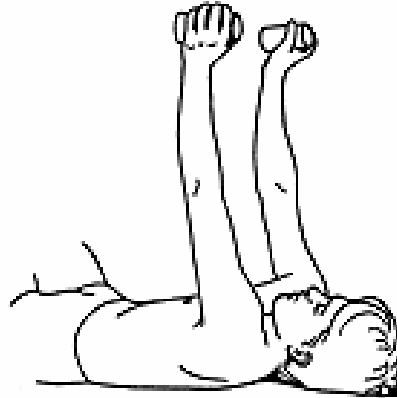
(Note the upper traps are not much of a concern, the middle and lower trap are far weaker.) Lying face down, position your arms parallel to the floor and 90

Scapular Retraction:

Holding the weight in each hand, squeeze your shoulder blades together while keeping your arms straight. Relax fully, and repeat 12-15 times. This exercise can usually be done with much heavier weight than the previous exercises. You can modify the exercise to involve other mid-scapular muscles by alternating contractions with an emphasis on scapular retraction and elevation, and scapular retraction with depression.

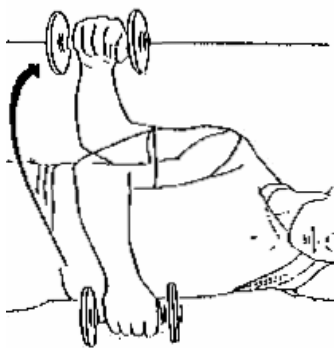


towards the ceiling. Relax and pull the shoulder blades together again, and repeat 12-15 times. This exercise can be difficult to do smoothly, and to get a feeling of contraction around the rib cage. With good concentration, you will be able to isolate the serratus anterior muscles, helping to further stabilize the scapulae.



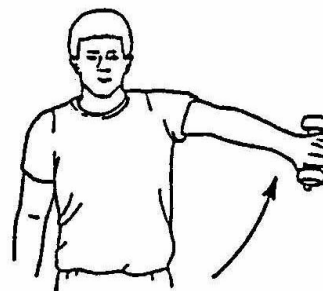
External Shoulder Rotation:

For this exercise, lie on your side in a straight line. Bend the elbow of your top arm to 90 degrees, allowing the palm of that hand to rest on your body. Using a dumbbell, slowly raise your arm, keeping the elbow bent at 90 degrees, pivoting your elbow against your rib cage. Raise up and back as far as you can, lower slowly and repeat 12-15 times.



Supraspinatus Raises:

Stand with good posture, dumbbell in each hand. Roll your hands in towards your body until your thumbs point towards the floor. Slowly raise your arms out to the side and slightly in front of your body about 30-45 degrees. Stop when your arms are parallel with the floor. Lower slowly and repeat 12-15 times. Remember to keep your arms straight, slightly in front of the body, with thumbs pointing down.



Shoulder Protraction:

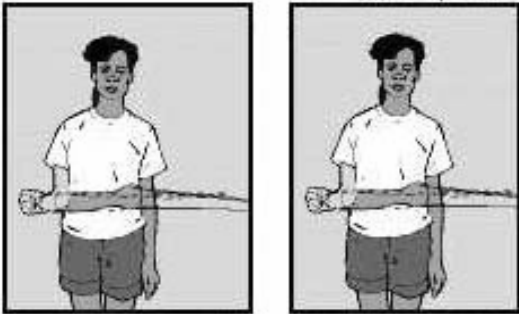
Use a narrow flat bench or the floor, lying on your back. Holding a barbell or two dumbbells, hold your arms straight above your body. Keeping your arms straight, reach up as far as you can, pushing the weight

Standing External/Internal Shoulder Rotation:

These two exercises are particularly useful for paddlers. You will need some kind of tension band or sport cord. Anchor the cord in a door or tie off at head height. For

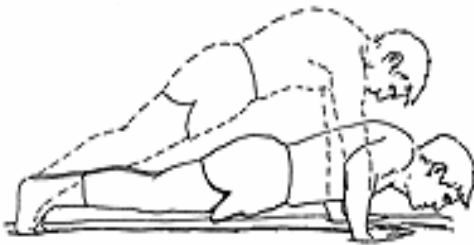
external rotation, stand facing the anchor. Raise one arm out to your side until it is parallel with the floor. Keep the upper trap quiet by not hunching your shoulders. Bend your elbow to 90 degrees. Hold the sport cord in your hand, and rotate up at the shoulder until your lower arm is perpendicular, or slightly beyond, to the floor. Rotate back to starting position and repeat.

For internal rotation, stand facing away from the anchor. Position your arm the same way. This time you will rotate down against resistance until your lower arm parallels the floor. When doing these exercises, it helps to imagine the upper arm is bolt being screwed in and out of bolt hole (your shoulder joint). Concentrate on pure rotation without involving the upper back, upper trap, or chest muscles.



Push-Up with Press-Up

With toes on ground, feet together, hands shoulder-width apart, and chest on floor, push up by straightening arms. Continue by pressing up shoulders and arching upper back. Return to start position with chest to floor.



This concludes basic stabilization exercises for the shoulder. You can also consciously involve scapular movement to rowing or pulling exercises to further

strengthen the shoulder joint complex. For example, when doing pull downs, allow yourself to reach forward on the upward phase so the scapula migrate forward on the rib cage. Conversely, on pulling phase of a pull down, squeeze the scapulae together at the end of the movement to more fully involve the mid-scapular stabilizers.

SUMMARY

The shoulder is perhaps the most complex joint in the body. With careful attention to maintaining flexibility, balanced strength, and good body mechanics, your shoulders should last a lifetime.

CONTACT INFORMATION

USACK / USOC Sport Medicine Staff

Dave Jenkinson DO
Head Team Physician
Cell: 423-902-3424
Email jenk@amssm.org

Ross Davis ATC
Trainer USACK/USOC - Sydney 2000
Work: 770-539-9001
Email: rossdavis@charter.net

Vinny Comiskey ATC
Head Trainer USOC - Chula Vista
Work: 619-682-6141
Email: vinny.comiskey@usoc.org

Mike Scandin PT ATC
Trainer @ Wausau
Work: 715-845-2942
Email: scandin4@msn.com

Ken Rundell PhD
Exercise Physiology - Marywood Univ.
Work: 570-340-6059
Email: rundell@es.marywood.edu

Other National Sports Medicine sources

❖ American Med. Society for Sports Medicine – a

national society of sports medicine physicians (non-surgeons)

<http://www.amssm.org/>

❖ American Orthopaedic Society for Sports Medicine – a national society of sports orthopaedic surgeons

<http://www.aossm.org/>

❖ American Osteopathic Association for Sports Medicine – a national society of sports medicine physicians (osteopathic physicians)

<http://www.aoasm.org/>

❖ National Athletic Trainers Association – a national society of sports medicine athletic trainers certified (ATC)

<http://www.nata.org/>

❖ American Shoulder and Elbow Surgeons Society – a national society of orthopaedic surgeons who specialize in just the shoulder /elbow joint.

<http://www.aaos.org/wordhtml/ases/homeases.htm>

❖ American College of Sports Medicine – an umbrella organization for all sports physician, trainer, physical therapist, exercise physiologist, nutritionist etc...

<http://www.acsm.org/>

Version - 2002-06-29