

What is Winging of the Scapula and what causes it?

The scapula (shoulder blade) is the largest bone of the shoulder complex and has the greatest number of muscles attached to it. These muscles both stabilise the arm to the body and move the arm around in space. All these muscles act at the same time at times and oppose each other at other times, but work together like a well trained team to allow the arm to move in space. If any of these muscles are not working in the right way at the right time this leads to a break in the rhythmic motion of the scapula. This is known as a scapula 'dysrhythmia'. This leads to 'winging' of the scapula.

Winging of the scapula is a surprisingly common physical sign, but because it is often asymptomatic it receives little attention. However, symptoms of pain, weakness, or cosmetic deformity may demand attention.

Winging may be caused by injury or dysfunction of the muscles themselves or the nerves that supply the muscles.

Winging can also affect swimmers.

How is winging treated in swimmers?

Winging is treated through a supervised physiotherapy programme.

These exercises address the three important areas:

- 1) the **rotator cuff**,
- 2) the **muscles that stabilize the shoulder blade**, and
- 3) the muscles of the low back, abdominal, and pelvis that make up the “**core**” of the body – the abdominal and lower back muscles.

It is important to note that these exercises should only be performed by the uninjured athlete. Injured athletes may need to modify the exercises in duration and range of motion depending on the level of pain or impairment the athlete is experiencing.

In doing these exercises, keep in mind that the shoulder does not act by itself when you swim. You use your back, trunk and even your legs to help stabilize the body and help in the pulling movement. You will use many of these same muscle groups as you perform these exercises. Also, these exercises should be performed AFTER practice or several hours before you practice. *DO NOT do these exercises right before your workout* since you do not want to fatigue these muscles before you swim.

Practical Tips

1. While it is beneficial to complete each of the exercises presented in this review each week, it is unlikely that the athlete will complete all of them every day, due to the amount of time it would take. If time is an issue, try the “Light Version” by alternating days with the different groups of exercises. For example, complete the three Rotator Cuff exercises on Monday, the Shoulder Blade Stabilizing exercises on Tuesday, the Core Strength exercises on Wednesday and the Stretching exercises on Thursday. Then start the cycle from the beginning.
2. While it is best not to perform these exercises before practice, we realize that for some programs this may be the only time your group is together. If this is the case, it will not hurt to complete the exercises before the water workout, but realize that in

doing so the athlete may experience some degree of fatigue in the targeted muscles during practice.

Primary Rotator Cuff Exercises

The first group of exercises we want to describe is designed to strengthen the rotator cuff muscles in the shoulder. The rotator cuff is made up of four small muscles deep in your shoulder. When these muscles contract they cause the shoulder to:

Rotate the arm away from the body. This movement is called external rotation.



Rotate the arm towards the body. This movement is called internal rotation.



Lift the arm away from the body. This movement is called shoulder abduction.



Exercise #1 - External Rotation

Equipment: To perform this exercise you will need a light to moderate resistance Theraband or surgical tubing. How do you determine what strength Theraband is right for you? Pull on it and if it feels like the resistance is too light – you probably have the right level of resistance. You will be performing many repetitions so a resistance that feels too easy will probably be just right as you start to fatigue.



The Movement: The External Rotation exercise focuses on strengthening the muscles that externally rotate the shoulders. The muscles that perform this motion usually are weak in swimmers. You are going to strengthen both sides of your body in this exercise.

Start by cutting the Theraband and tying it into a loop. The loop should be big enough so that your hands are 6-8 inches apart when your elbows are at your sides and your forearms are parallel to the floor.

Stand up straight with good posture. Do not hunch your shoulders forward. Lift your sternum and your chest towards the ceiling to help set your shoulder blades in the proper position.



Your elbows should be at your sides and should be bent 90 degrees so your forearms are parallel to the floor and your thumbs are pointing towards the sky. Perform the exercise by trying to rotate your hands away from your body like you are pulling taffy apart. The figures to the left show the correct start and finish positions.

Focus on squeezing your shoulder blades together before you start this exercise. Feel this squeeze through the ENTIRE exercise. If you do not focus on squeezing the shoulder blades you will be exercising the wrong muscles.



You should take about two seconds to complete each repetition – 1 second as the muscles contract and you externally rotate the shoulders. Then take 1 second as you return to the starting position. Count 1-and-2-and, 1-and-2-and as you perform the exercise to get the correct timing.

You should perform 3 sets of this exercise, resting 30 seconds between each set. Each set should end after 2 minutes or when you are no longer able to maintain correct form. It is time to end the set if:

- the shoulders start to roll forward,
- you use your upper body or wrists to help the motion or,
- you are unable to keep your shoulder blades squeezed together.

It is okay if you are only able to complete a few repetitions at first, but strive for completing 3 sets of 2 minutes. When you can do this, move up to a higher resistance Theraband.

Exercise #2 – Full Can Scaption/ Full Can Straight Arm Lifts

Equipment: You do not need equipment to perform this exercise, but as you get stronger, you can use some very light weights. You can make your own weights by filling two small water bottles with sand.

The Movement: The Full Can Scaption Exercise gets its name because performing it is like lifting a can without spilling its contents. The exercise strengthens the part of your rotator cuff that lifts the arm. Start this exercise using no weight. As you progress and get stronger you can use very light weights with this exercise, but even the strongest athletes should not lift more than 5 extra pounds.



Stand upright with your feet shoulder width apart and do not allow the shoulders to slump forward. Lift your chest towards the ceiling to help set the shoulder blades in the proper position. Focus on pinching your shoulder blades together and you should feel tension in these muscles for the entire exercise. The figures to the left show the proper posture and starting position.

Raise your arms so that they extend straight out to your sides. Move your hands forward about 1-2 feet so they are now slightly ahead of your shoulders to get in the proper exercise position. This will actually allow you to perform the movement in the same plane of the shoulder blade. Keep your thumbs turned up so they are facing the sky. (See figures to the right).



Lower your hands to your side and then lift them up again so your hands end up level with the top of your head (See the figures showing the start and finish positions for the exercise to the left).

Maintain a steady cadence – Take 1 second to lift your hands to head level and one second to lower the hands back to your sides. As you raise and lower your hands, count slowly 1-up-2-up, 1-down-2-down... Remember to keep your hands and arms ahead of your shoulders and keep your shoulder blades together.

Continue this exercise for 2 minutes or until you are unable to lift your arms while keeping your shoulder blades pinched together. Perform 3 sets in this way taking 30 seconds rest between each set.

Exercise #3 - Ball on the Wall

Equipment: One tennis ball or light medicine ball.

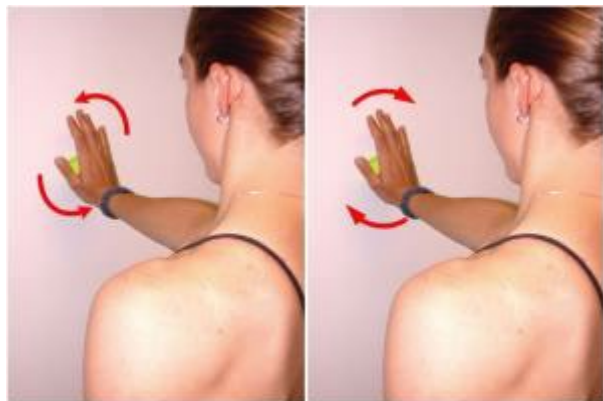
The Movement: The Ball on the Wall exercise is designed to strengthen the muscles that stabilize the shoulder blade (scapula) as well as those that internally and externally rotate the shoulder. You will need a tennis ball or a light medicine ball to perform this exercise.



Facing the wall, stand up straight with one arm extended in front of you so that your palm almost touches the wall. Keeping the elbow straight, “pin” the ball between your hand and the wall. Pinch your shoulder blades together and feel that contraction through the entire exercise.

Roll the ball in small circles in a counter-clockwise motion for 15 seconds. Each circle should take about 1 second to complete. Without stopping, switch directions and make small circles in a clockwise direction.

Control the cadence so that you make one circle each second. Continue this exercise, switching between making clockwise and counter-clockwise circles, until you become fatigued, or 2 minutes, whichever comes first.



You know you are fatigued if you can not keep your shoulder blades squeezed together, if you hunch your shoulders, or if you can not hold the ball against the wall. Perform 3 sets, but do not go longer than 2 minutes for each set.

Repeat this procedure for the other arm.

Primary Shoulder Blade Stabilizing Exercises

The second group of exercises, the Shoulder Blade Stabilizers, is designed to strengthen the muscles that control how your shoulder blades move. These muscles are found in the middle of your upper back and along your sides. When these muscles contract, they cause your shoulder blades to rotate or slide across your back. They work in coordination with the rotator

cuff muscles to control the movement of the shoulder. If these muscles are weak, you can put too much stress on the rotator cuff when you swim.

Exercise #4 – Theraband Rowing

Equipment: One moderate resistance Theraband.

The Movement: Theraband rowing strengthens the muscles that hold your shoulder blades in place. These muscles are important in helping your shoulder joint to move when you swim.

First, make a loop with the Theraband and tie the ends together. The loop should be about 2 feet long. Attach the loop to a doorknob or some other stationary object that will not move when you pull on the Theraband. Sit on a bench or at the edge of a chair. Position the chair so that when your arms are extended in front of you the Theraband is just taut.



Sit with an upright posture, and lift the chest to help set the shoulder blades in the proper position. Do not hunch the upper back or shoulders.

Pull your hands toward your body. Keep your elbows in and pull your hands to a point between your belly button and your rib cage. Make sure you lead the pull with your elbows. Your palms should be facing upward when you pull towards your chest. See the figure below for proper start, middle and finish positions.





Remember to focus on squeezing the shoulder blades together with each row and maintaining this contraction for the entire exercise.

Maintain a comfortable cadence, completing 1 complete repetition every 2 seconds. Count to yourself 1-and-2-and, 1-and-2-and taking one second for the contraction and 1 second as you return to the starting position. Perform 3 sets of this exercise. Each set should end when you become fatigued or reach 2 minutes of exercise. Take 30 seconds rest between sets and strive for completing 3 sets of 2 minutes each. Like the other exercises, fatigue is indicated

when your posture slumps, or you cannot keep your shoulder blades pinched together.

Exercise #5 – Hitch Hiker

Equipment: No equipment is needed for this exercise, but as you get stronger, you can use some very light weights. You can make your own weights by filling two small water bottles with sand. These should weigh less than 2 pounds, even for the strongest swimmers.

The Movement: The Hitch Hiker exercise strengthens the muscles that control your shoulder blades as well as your rotator cuff muscles. You can exercise both sides of body at the same time, or choose to do one arm at a time.



Lay on your stomach on the floor. Relax your head and keep it in line with your spine. Put your arms straight out to your sides with your thumbs pointing to the ceiling (It looks like you are hitch-hiking).



While squeezing your shoulder blades together, lift your hands up off the floor and move them slightly towards your head. Use both arms at the same time. You should end up in a position that looks like a “Y” at the end of the exercise. Hold this position for 1-2 seconds and then relax to the starting position. Repeat.

Try to perform this exercise for 2 minutes. If you cannot continue the exercise for 2 minutes, that’s okay. When you become fatigued and can no longer maintain your form, rest for 30 seconds. Perform your second and third sets the same way.

If you reach the point where you can complete 3 sets of 2 minutes, perform the exercise while holding some small weights (less than 2 pounds) in your hands. Remember, you can make

your own weights by filling small water bottles with sand, and you can also perform this exercise with one arm at a time.

Exercise #6 – Push Ups with a Plus

Equipment: None.

The Movement: This push up exercise strengthens your chest muscles like a normal push up, but there is an added motion at the end that strengthens one of the muscles that stabilizes your shoulder blades. There is a progression to this exercise, which means you will first perform the exercise against a wall while standing. As you get more advanced you can do this exercise while on your knees and then finally in a traditional push-up position.



To start this exercise, stand at arms length away from a flat wall. When you stand up straight your palms should touch the wall. The hands should be shoulder-width, or slightly wider than shoulder-width, apart.

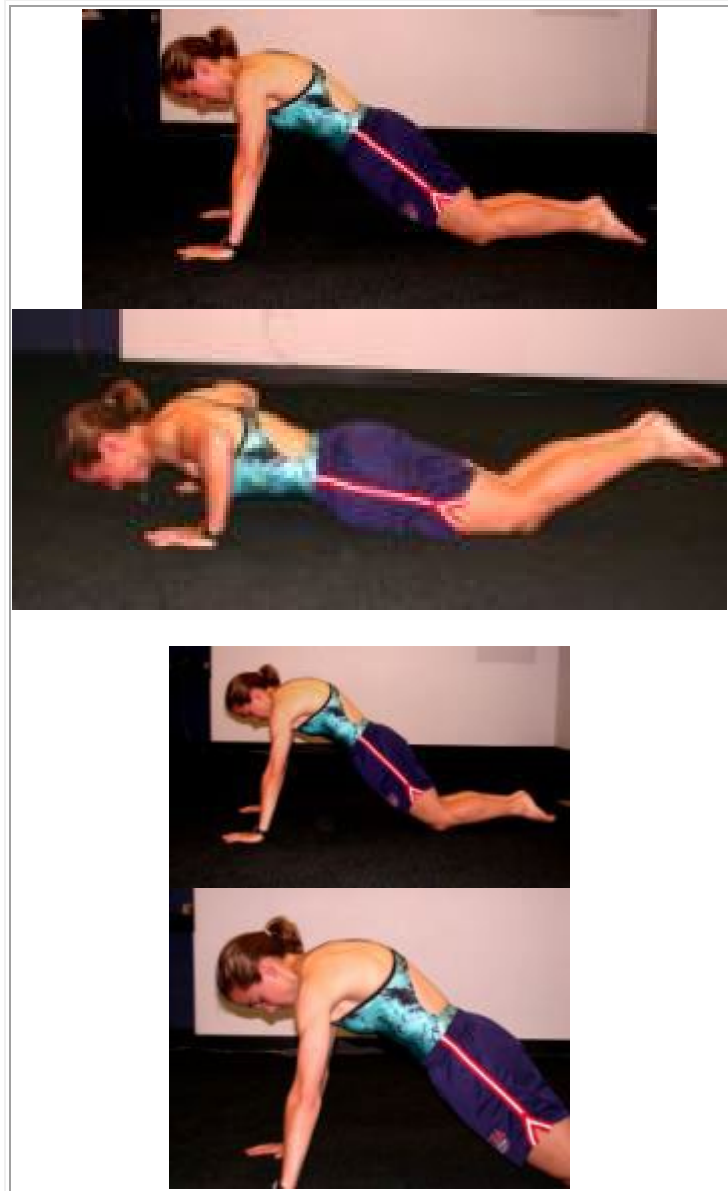
Allow your chest to move towards the wall, as you would into a normal push up position. Once you are in the “down position” push away from the wall. It is important to do this slowly so your hands never lose contact with the wall.



When you reach the normal ending position for a push up you want to keep going. This is where the extra action comes in. Continue pushing so that your shoulders rotate forward a bit. It should feel like the center of your back is farther away from the wall than your shoulders, as if you are raising your back like an angry cat. This is the extra motion that strengthens the stabilizers of your shoulder blade.

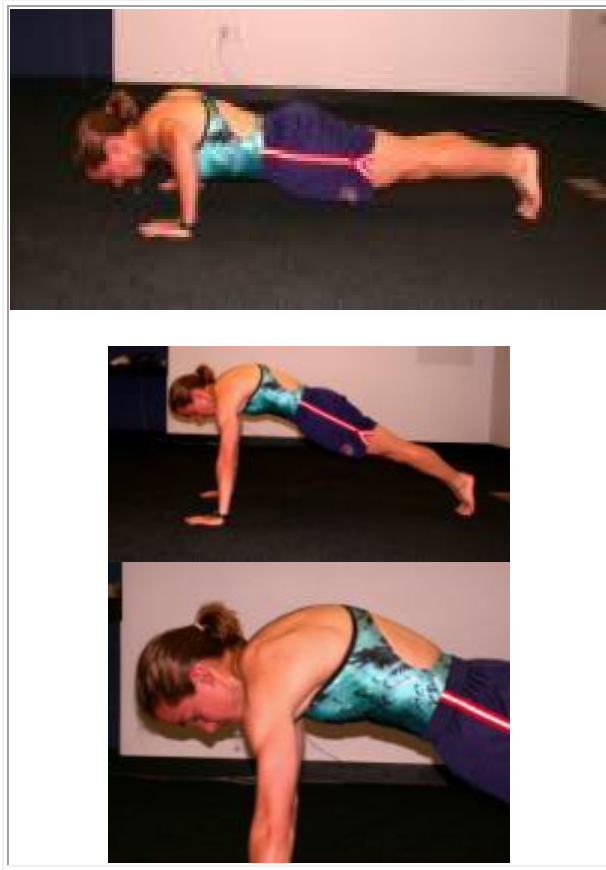
Hold this position for 2 seconds and repeat the action. Continue each set until you fatigue and start to lose form or until you reach 2 minutes, whichever comes first. Complete 3 sets, resting 30 seconds between each set.

As you become stronger, perform the same exercise when kneeling on the floor.



And eventually you will be able to perform normal push-ups with the extra motion.





Primary Core Strength Development

The third series of exercises focuses on developing strength in your abdominal and lower back muscles. These are some of the **core** muscles of your body. The muscles in the core of your body are essential for helping you maintain balance in the water when you swim. Balance is one of the most important skills you can develop. With weak abdominal and lower back muscles you will not be able to achieve a sufficient level of balance using your core. If you are like most swimmers, you will then try to achieve balance by changing your arm position or your stroke pattern. This places added stress on the shoulder and can lead to shoulder problems. There are many abdominal and lower back exercises you can do to strengthen these muscles. We will show you two of these exercises.

Exercise #7 – Dead Bug

Equipment: None.

The Movement: The Dead Bug exercise strengthens your abdominal muscles and gets its name because if you do it correctly you will look like a bug that is flipped over on its back waving its legs in the air.



Lay on the floor and put your hands under your tailbone.

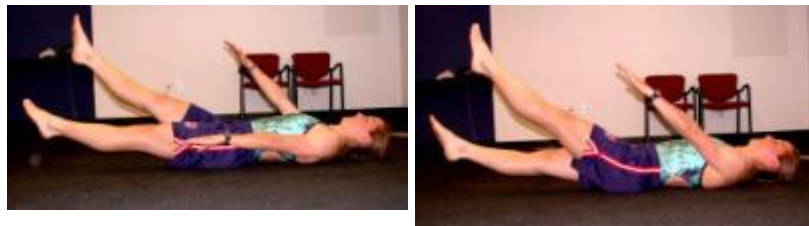
Tighten up your lower abdominal muscles by trying to pull your belly-button in towards your spine. This will help you avoid excessive arching in your lower back. It is important to keep your back FLAT on the floor at all times.



Lift your legs off the floor and perform a light “flutter kick.” Continue this movement for 2 minutes or until you can no longer keep your lower back flat. See the figures below for proper positioning.



When you master this technique, you can remove your hands from under your tailbone and perform a flutter kicking like movement with your straight arms.



This form of the exercise (using the arms) is more difficult. You must make sure you do not allow the lower back to arch very much to avoid injury and work the appropriate muscles.

Exercise #8 – Quadruped

Equipment: None.

The Movement: It's called the Quadruped exercise because initially you resemble an animal walking on all fours. When performing this exercise you will strengthen muscles in the lower back and abdominal region and foster strength development between the two sides of your body.



Start this exercise with your hands and knees on the floor. Get into a “table-top” position by flattening out your back.

There should not be an arch in your back, nor should there be a dip. This will require tightening up your abdominal and lower back muscles. Think about pulling your belly-button in towards your spine.



Once you’ve achieved the proper starting posture, simultaneously lift your left arm and right leg – straightening them out so they are parallel to the floor. Hold in this position for a second making sure you maintain a flat back.



Slowly bring the hand and knee back to the floor. Repeat the action lifting the right arm and left leg.



Alternate in this fashion for 2 minutes or until you become fatigued. You are fatigued if you cannot lift the arm or leg parallel to the floor or if you are not able to maintain your flat back posture. Perform 3 sets with 30 seconds rest between each set.

As you become more experienced, try performing the exercise while closing your eyes. This will force you to use your postural muscles to a greater level while developing balance and stability.

Stretching

We have talked a lot about strengthening muscles so far. However, stretching is also important to make certain you can use your newfound strength.

Strengthening + Stretching = Function.

By combining the strengthening and stretching exercises, you will help reduce the likelihood of shoulder injury when you swim.

Exercise #9 - Hamstrings Stretch

Equipment: Towel

The Movement: The Hamstrings Stretch engages the group muscles in the back of your thigh. These muscles, the hamstrings, help you bend your knee and also are involved in straightening out your hip. They have a lot of control over the position of your pelvis and therefore impact your body position and balance in the water. You are much better able to control your balance in the water if your hamstrings are loose. This exercise is designed to help you stretch these muscles.

Lay flat on your back on the floor.



Keeping the leg that is not going to be stretched flat on the floor, loop the towel around the ball of your foot. Gently straighten your leg, and pull it towards your body. Do not lock your knee. A slight bend in the knee is necessary for safety reasons, but it should not be bent a lot.



Keep your pelvis on the floor and do not rotate your body to help you get your leg closer to your torso. Pull until you feel a moderate stretch in the back of your thigh and hold that position for 30 seconds.



Perform the stretch 2 times on each leg. You should not feel pain in this stretch or in any stretch. If you feel pain stop the stretch immediately.

Exercise #10 – Upper Back Stretch

Equipment: None.

The Movement: The Upper Back Stretch targets the trapezius (tra-pee-zee-us) muscle, which connects your neck and your middle back to your shoulder blades. Good flexibility is needed in this muscle in order for the shoulder blades to move normally. This exercise is designed to stretch the upper part of the trapezius muscle since it tends to get tight in swimmers, and a tight muscle may contribute to shoulder pain.



Stand up straight and push the palms of your hands together in front of your chest.

Push your hands straight away from your body while continuing to squeeze your palms together. Try to keep your shoulders from moving upward towards your ears by pushing straight away from the body. Continue to push your hands away from your body until you feel a moderate stretch in your upper back and between your shoulder blades. See the front, side and back views of the stretch below.



Hold this position for 30 seconds and repeat after a 15-second rest. Be sure to breathe (do not hold your breath!) as you perform this exercise.

Exercise #11 – Neck Stretch

Equipment: None.

The Movement: The Neck Stretch is another way to stretch the muscles of your upper back. This stretch targets the upper trapezius muscle.

Stand up straight and do not roll or hunch the shoulders. Place one arm in the small of your back. The elbow should be bent so that the forearm is parallel to the floor. Press your arm into the small of your back to provide some stability for the movement, but you do not have to “grab on” to anything.



Place the other hand on the top of your head. Gently guide your head towards your shoulder, bending it to the side until you feel a moderate stretch on the opposite side of your neck. Remember, bring your head to your shoulder and do not raise the shoulder to meet the head.

Hold this position for 30 seconds. Rest 15 seconds, then repeat.



You can also stretch a different part of the muscle by looking at the armpit of the pulling arm.

Try both to stretch as much of the muscle as possible.

Perform the same stretch on the other side of your body.

Shoulder Replacement

When is a Shoulder Replacement indicated for Arthritis of the Shoulder?

Most people with arthritis of the shoulder can manage with pain-killers, exercise and physiotherapy.

A shoulder replacement is considered if you have the following:

1. Severe pain which wakes you at night.
2. Pain which prevents you doing your daily activities.
3. Pain not controlled by pain-killers.

There are few contra-indications, if you have the above criteria. With modern techniques and implants, such as the Copeland surface replacement age is no longer a limiting factor.

What activities can I safely do after shoulder replacement?

The goal of shoulder arthroplasty is to relieve the pain from glenohumeral arthritis. It is unrealistic to expect to return to repetitive, heavy, overhead activities, which would put the replacement components at risk. Shoulder function after arthroplasty is also unlikely to allow the motions required by these activities.

Acceptable activities after a shoulder arthroplasty are:

- bowling, doubles tennis, cross-country skiing, swimming
- for those with previous experience in the activity: golf, shooting, and downhill skiing

Unacceptable activities are:

- football, gymnastics, hockey, rock climbing
- throwing sports

How painful is shoulder replacement surgery?

The anaesthetist takes great care to eliminate pain with appropriate analgesia both immediately after surgery and during the rehabilitation process. A long acting local anesthetic infused around the nerves of the joint is often used with general anaesthesia during surgery. These regional blocks will provide several hours of pain relief even after a patient has emerged from general anaesthesia. Alternatively a patient-controlled intravenous pump (PCA) is used in the early post-operative period for pain control. By the second or third day after surgery, oral pain relief medication is adequate through the early rehabilitation period (4-6 weeks).

How long before I can return to my normal activities after shoulder arthroplasty?

The time it takes to return to normal activity varies greatly from patient to patient. Most individuals have less pain at night or at rest in the first 2-4 weeks after surgery. Pain with activity persists longer, but generally decreases as the strength and function of the shoulder muscles improve. Full recovery usually takes 6-12 months.

I've heard that joint replacements sometimes "wear out" and need to be redone. What are the chances I may require a second shoulder arthroplasty?

Long-term studies show that 85-90% of total shoulder replacements are functioning well ten years after implantation, and 75-85% are doing well fifteen years after surgery. Over time, current advances in materials and techniques should improve these percentages even more.

What is the incidence of nerve damage in shoulder surgery?

Nerve damage following most common shoulder procedures is extremely rare. Large complex open procedures, such as revision shoulder replacements or complex fracture surgery are more likely to have a risk of significant nerve damage, but again this is not common.

What are the indications for a Reverse Geometry Shoulder Replacement?

The ball is fixed to the glenoid and the socket to the proximal end of the humerus in a reverse geometry shoulder replacement. This improves the mechanics of a cuff deficient shoulder joint. It is indicated in severe cuff arthropathy (shoulder arthritis in the presence of a massive irreparable rotator cuff tear) and salvage for failed shoulder replacements in the elderly.

Acromio-clavicular (AC) joint injuries

Do all AC separations require surgery?

No. In fact the vast majority of AC separations do very well with conservative treatment of the symptoms. Most AC injuries are grade I, II, or III and these generally do not require surgery. Usually the joint remains sore for two to six weeks and then full return to activity is the norm. Only unstable grade III injuries and high-energy AC separations, which are often the result of motor vehicle accidents, require surgery for full recovery.

Will the prominence over the AC joint ever go away?

The clavicle will become stable in its newly elevated position, but without surgery the "bump" will remain. The joint will function normally and will not remain tender to touch or movement. This minor cosmetic deformity will persist but will not interfere with overhead activities or participation in sports.

Are there downsides to a resection of the AC joint?

An AC resection is a procedure in which the AC joint (8mm) is removed through either an open or arthroscopic technique. Once the initial injury has healed and the clavicle has regained stability from scar tissue there is no functional loss with an AC resection. In the rare instance that the AC joint remains painful after a separation, but does not require stabilization, an AC resection is very effective in relieving pain without sacrificing function. If, however, the clavicle is unstable at the time of resection, a reconstruction procedure such as Weaver-Dunn

is necessary to maintain the stability of the upper extremity.

Will I be able to return to athletics if an AC injury is not treated?

Absolutely. Most athletes in contact sports have had a low energy AC separation at some time in their careers. Except for the slight deformity that remains, there is no clinical significance to a healed AC separation. Occasionally high-energy AC separations that have disruption of the AC and CC ligaments will require surgery, but these injuries are usually apparent early on with a correct X-ray evaluation. Grade I, II, and most grade III AC separations will heal without treatment and a full return to sports can be expected.

I recently fell on the point of my shoulder and have been told I sprained my AC Joint. What is the best treatment and when is surgery indicated?

When a joint is first sprained, conservative treatment is certainly the best. Applying ice directly to the point of the shoulder is helpful to inhibit swelling and relieve pain. The arm can be supported with a sling which also relieves some of the weight from the shoulder. Gentle motion of the arm can be allowed to prevent stiffness, and early physiotherapy is often of benefit. Occasionally a steroid injection to AC joint may speed recovery if the injury is slow to settle. Most AC Joint injuries settle within 6 months, but a small proportion of patients continue to experience pain. This is usually because the small cartilage in the AC joint may have been torn and not healed. At this stage surgery is an option - in the form of an arthroscopic AC joint excision.