

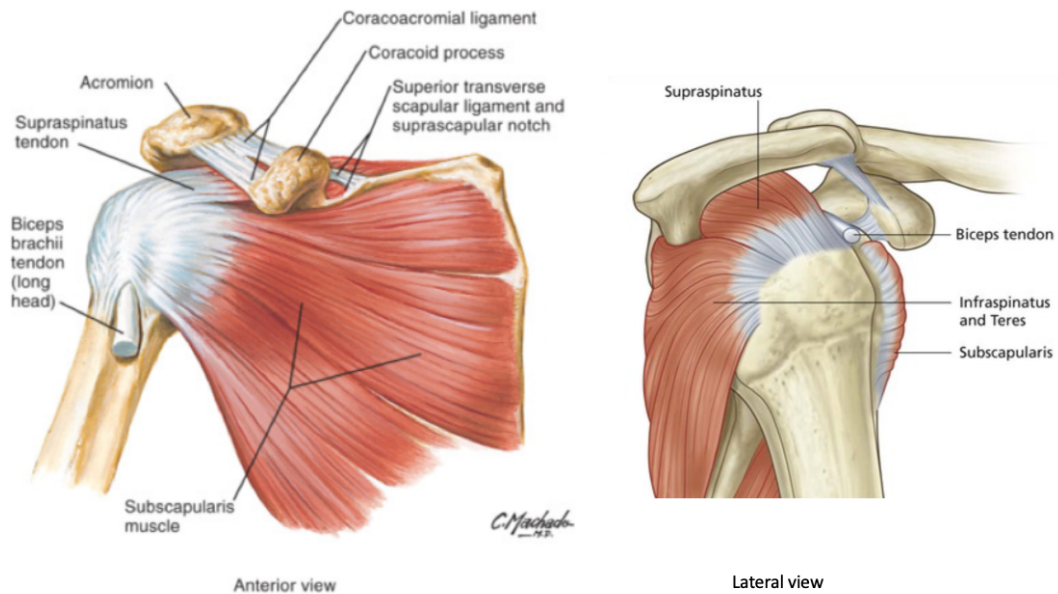
ROTATOR CUFF TEARS: REPAIR/AUGMENTATION/RECONSTRUCTION

This information aims to help you understand your condition and gain maximum benefit from your treatment. It covers the most commonly asked questions. However, every individual is different, and you should ask as many questions as you like. This information is specifically for those patients with rotator cuff tears in which consideration is being given to a repair. Other treatment options exist for some rotator cuff tears (including tendon transfers, reverse total shoulder arthroplasty and 'non-cuff' surgery). These other options are discussed in other information sheets.

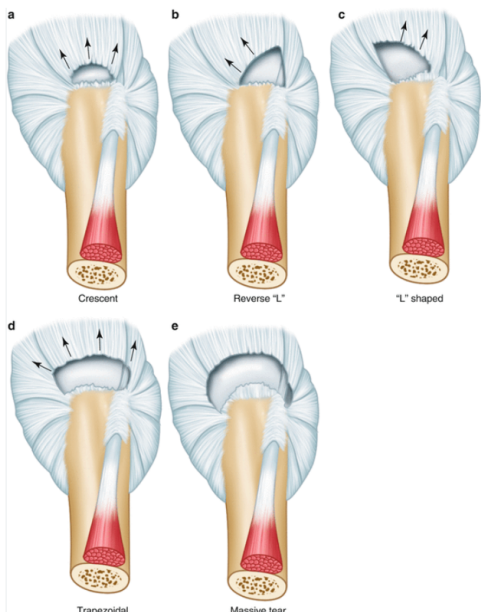
ROTATOR CUFF TEARS

Tendons connect your muscles to bone.

The 4 tendons of the rotator cuff surround the shoulder and help move and stabilize the joint.



In a rotator cuff tear the tendon pulls away from the arm bone.



ROTATOR CUFF TEAR SURGERY

Tears are common. Around 10% of 65-year-olds are affected. But not all tears cause symptoms. Tears do not heal spontaneously. The shoulder can become weak and painful. Over time 40% of tears get bigger and become more symptomatic. This is more common in larger or more symptomatic tears.

Secondary changes can develop in long standing large tears. These are **muscle atrophy** (the muscle becomes smaller), **fatty infiltration** (muscle gets replaced by fat tissue) and **'cuff tear arthropathy'** (where the humerus rides upwards and progressively results in arthritis). These features are considered irreversible even after a rotator cuff repair, and also increase the chances of non-healing after repair and therefore make any attempt at repair/augmentation/reconstruction inadvisable.

Repair/augmentation/reconstruction is generally recommended when:

In patients < 65 with a 'full thickness' tear of any size

Or patients > 65 with

- A large 'full thickness' tear (involving 2 or more tendons).
- A 'full thickness' tear with weakness that affects day to day activities.
- A 'full thickness' in whom symptoms have not improved with physiotherapy.

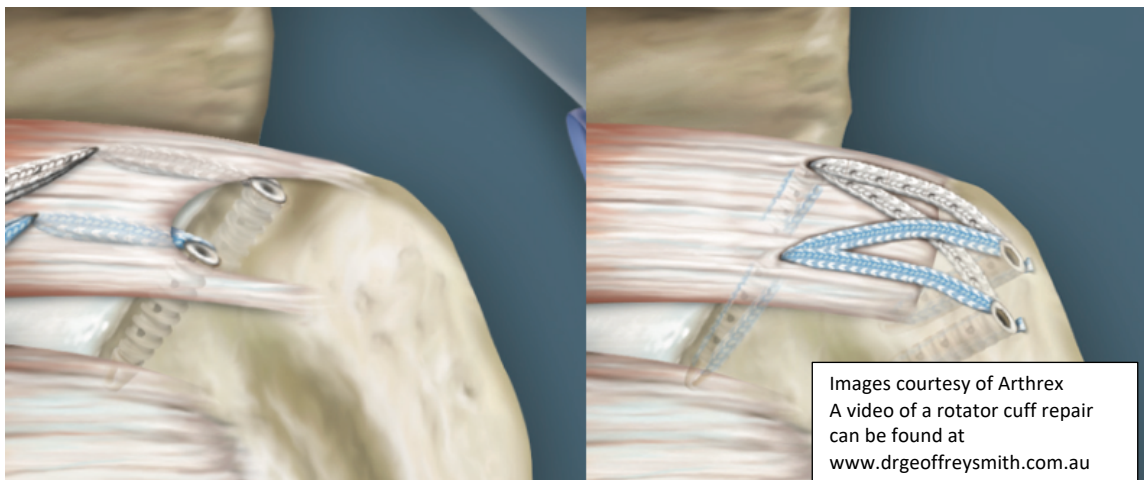
You will see the size of each tendon tear noted in your clinic letter, written as 'Cuff:' followed by PT or FT (short for partial thickness or full thickness) and a numeral 1,2,3 for each of the tendons.

The degree of muscle fatty infiltration is noted in your clinic letter, written as 'Goutallier:' followed by a series of numbers. Each number reflects the amount of fatty infiltration in each of the cuff muscles. Repair is generally not advisable if there is Stage 3 and 4 changes of fatty infiltration in subscapularis (the first number listed) or infraspinatus (the third number listed).

The degree of cuff tear arthropathy this noted in your clinic letter written as: Hamada: 1, 2, 3, 4 or 5. In Hamada 1 and 2 cases either cuff repair/augmentation/reconstruction or tendon transfer are options. In stages 3, 4 or 5 an attempt at repair/augmentation/reconstruction or tendon transfer is not advisable.

STANDARD ROTATOR CUFF REPAIR:

Almost all tears are able to be completely repaired. The aim of surgery is to reattach the tendon to the bone. The tendon is reattached using several small anchors and stitches.



HEALING AFTER ROTATOR CUFF REPAIR

Modern repair techniques are very strong but our ability to help the tendon heal has been a weak point and has meant that some cuff repairs do not result in healing. Complete non-healing occurs in around 10% of cases; partial non-healing occurs in another 10% of cases.

Healing is a biological process we try to identify those tears that are at particular risk of not healing and often use additional '**augmentation**' techniques that may promote healing.

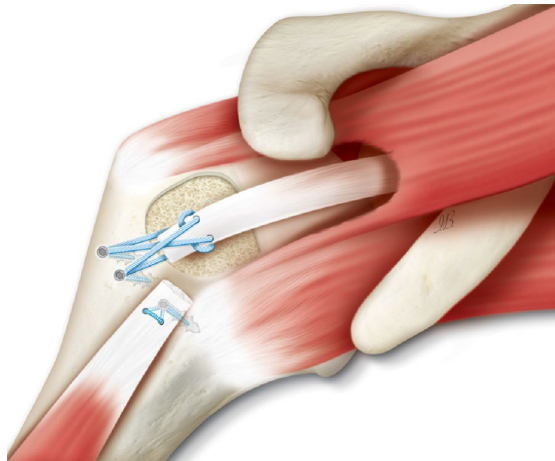
This is particularly considered when the 'rotator cuff healing index' is 5 or higher – as noted in your clinic letter as a number after RCHI) or where tendon quality or healing potential is a concern (such as a 'delaminated' tear, a thin tendon or a revision repair).

AUGMENTED ROTATOR CUFF REPAIR

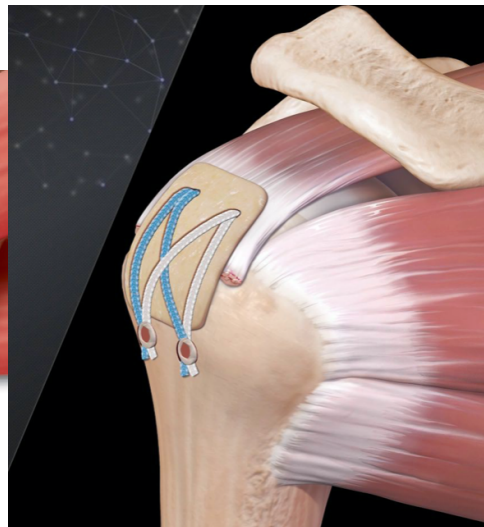
The aim of augmentation techniques is to improve healing rates after rotator cuff repair in tears in which healing is predicted to be less reliable (as above).

SUPERIOR CAPSULAR AUGMENTATION (SCA) UNDERNEATH THE CUFF REPAIR (LEFT IMAGE BELOW)

The superior shoulder capsule is located immediately below the supraspinatus tendon and is always torn in large supraspinatus tears. Augmentation of the superior capsule can help strengthen the rotator cuff repair. It can be performed using a 'human dermal allograft' Allovance patch or the LHB tendon. It is nice to use the LHB because it is your own tissue. This can be done if the LHB is of good quality and the area that needs reinforcement is small. If not, a patch is used. The rotator cuff tendons are then repaired on top.



Images courtesy of Arthrex



'BURSAL SURFACE AUGMENTATION' (BSA) ON TOP OF THE CUFF REPAIR (RIGHT IMAGE ABOVE)

There is some evidence that outcomes in patients with poor tissue quality or larger tears may be improved by placing a patch (Regeneten patch or Allovance patch or synthetic patch or the LHB) to the upper surface of the tendon.

These additional techniques are new and long-term outcomes are not yet known. Both are done at the same time as the cuff repair, adding time and complexity to the surgery. The decision which to perform can only be made at the time of surgery. The extra implants and the procedure may not be covered by your insurance and therefore an extra out of pocket cost may be involved to pay for the additional implants and the extra procedure.

CUFF RECONSTRUCTION AND PARTIAL CUFF REPAIR

Sometimes part of the tear can be repaired but others cannot because of deficient tendon. Partial repair combined with cuff reconstruction is an option. The type of reconstruction depends on the area of deficiency.

BURSAL SURFACE RECONSTRUCTION AND PARTIAL CUFF REPAIR

A patch or LHB graft can be used to 'bridge' between the rotator cuff tendon and the humerus

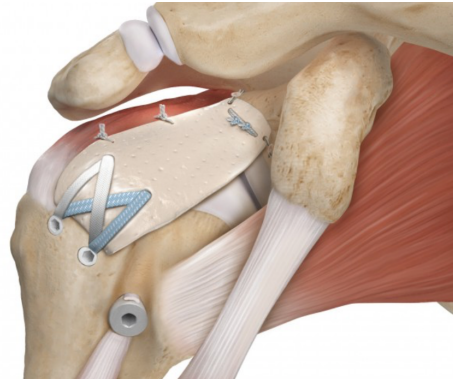


SUPERIOR CAPSULAR RECONSTRUCTION AND PARTIAL ROTATOR CUFF TEAR

The concept is the same as in a superior capsular augmentation, but there is no repair on top.



Images courtesy of Arthrex



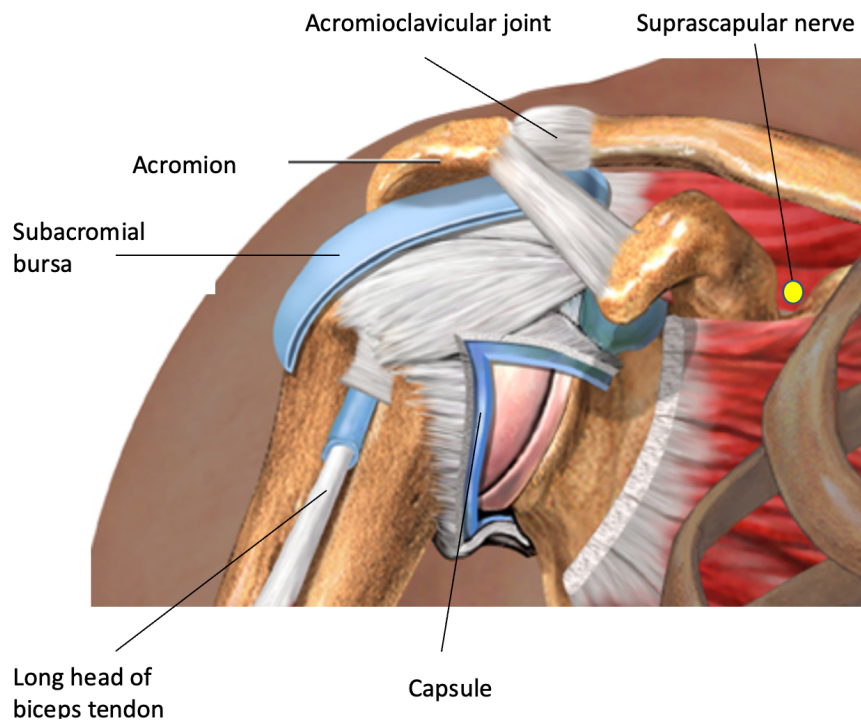
COMBINED BURSAL SURFACE AND SUPERIOR CAPSULAR RECONSTRUCTION

Sometimes these procedures are combined so there is a reconstruction underneath and above the partially repaired tendon.

These additional techniques are new and long-term outcomes are not yet known. Both are done at the same time as the cuff repair, adding time and complexity to the surgery. The decision which to perform can only be made at the time of surgery. The extra implants and the procedure may not be covered by your insurance and therefore an extra out of pocket cost may be involved to pay for the additional implants and the extra procedure.

COMMONLY ASSOCIATED PROBLEMS

Other associated issues (or 'symptom generators') are often present as well as the cuff tendon tear



SUBACROMIAL BURSITIS

The subacromial bursa is a bag of fluid that sits above the rotator cuff. The bursa is commonly inflamed in rotator cuff tears.

ACROMIAL SPUR AND / OR INCREASED 'CRITICAL SHOULDER ANGLE'

The shape of the acromion bone may have a role in the development of rotator cuff tears

LONG HEAD OF BICEPS INFLAMMATION AND WEAR

The LHB lies in a groove between supraspinatus and subscapularis. It is commonly inflamed or worn. The LHB may also be 'unstable' because of tears in the adjacent tendons.

ARTHRITIS OF THE ACROMIOCLAVICULAR JOINT

The ACJ is a small joint at the top of your shoulder at the outer end of your collarbone. It is very commonly arthritic, but this is not always a source of pain. Sometimes bone spurs from the undersurface of the ACJ can press down on the rotator cuff tendons.

CAPSULAR CONTRACTURE

The capsule is the lining of the shoulder. It may be inflamed and thickened, causing pain & stiffness. In a capsular release, the capsule is cut from the inside to improve range of motion and pain.

SUPRASCAPULAR NERVE TETHERING

The suprascapular nerve sits just next to the supraspinatus and can be trapped in very large tears.

ADDITIONAL PAIN-RELIEVING SURGICAL PROCEDURES

Other procedures may be performed in addition to the rotator cuff repair to treat commonly associated conditions (often referred to as 'symptom generators').

SUBACROMIAL BURSECTOMY

The inflamed subacromial bursa is removed at the time of surgery

SUBACROMIAL DECOMPRESSION AND/OR LATERAL ACROMIOPLASTY

Any excess bone is shaved away from the acromion at the time of surgery.

LONG HEAD OF BICEPS PROCEDURES

LHB TENOTOMY

In older people the best treatment is usually a 'tenotomy' (the worn tendon is removed from the shoulder). This can sometimes mean that the biceps muscle looks different after surgery (called a 'popeye' sign) but otherwise functions well though there may be some cramping pain in the biceps muscle that lasts for a few months.

LHB TENODESIS

In younger people a 'tenodesis' is performed because people who use the arm more for heavier tasks can get more pain after a tenotomy. In a tenodesis the LHB is removed from the shoulder and then reattached to the arm bone a few centimetres below the shoulder. If a tenodesis is performed the shape change of the muscle is less. This may be done arthroscopically (suprapectoral) or through a small incision (subpectoral). This choice between the two depends on where the worn part of the tendon is.

ACJ COPLANING OR EXCISION

ACJ EXCISION

The outer 5-10mm of the clavicle is shaved away so the arthritic bone surfaces no longer rub together.

AC JOINT COPLANING

Bone spurs from the undersurface of the ACJ are removed but the AC joint itself is left intact

CAPSULAR RELEASE

In a capsular release, the capsule is cut from the inside to improve range of motion and pain

SUPRASCAPULAR NERVE DECOMPRESSION

The nerve can be released by cutting a small ligament to give it more room. I perform this if a lot of pain is felt at the top and back of the shoulder.

THE OPERATION

You will come to hospital on the day of surgery. You will have a general anaesthetic. A nerve block may also be used. The surgery usually takes 1-2 hrs.

Almost all surgeries can be done through arthroscopic (keyhole) surgery involving 3-5 small cuts.

AFTER SURGERY

You may go home either on the same day or the day after surgery

You will see a physiotherapist before you leave hospital.

You will use a sling for 4-6 weeks.

The speed of recovery is variable. It can be rapid or seem slow. Most improvement occurs in the first 6 months. The end of recovery is around 12-24 months after surgery.

Further general information is available in the 'Information for patients undergoing surgery' leaflet.

APPOINTMENTS AFTER SURGERY

10-14 days; 6 weeks, 3 months, 6 months, 12 months.

REHABILITATION EXERCISES

Specific rehabilitation exercise sheets will be given to you in hospital and during your follow-up visits.

Only do the exercises shown to you in hospital and demonstrated to you in clinic. Do not remove the sling until you are told to do so. Your therapist will suggest whether you can do the exercises yourself at home or would be better with regular supervised physiotherapy sessions. You will need to get into the habit of doing the exercises several times a day for around 6 months.

MILESTONES

0-6 weeks (0-4 weeks if Type 1 Rehab Protocol)

Sling full time

6-12 weeks:

Sling is removed.

Normal day to day use of the arm is allowed.

3-6 months:

Formal strengthening starts

6 months +:

Full activity

RETURN TO WORK/SPORTS

Work (light duties / office)	1-2 weeks
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Swimming (breaststroke)	6-8 weeks
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Driving	6-8 weeks
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Work (manual)	3-6 mnths
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Light lifting:	3-4 mnths
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Heavy lifting	4-6 mnths
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Swimming (freestyle)	3-4 mnths
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Golf	3-4 mnths
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Maximum recovery	12 mnths
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DRIVING

You cannot drive while you are using a sling.

Once you have been told that you can remove the sling you can drive when you feel that you have full control of the vehicle. It is your responsibility to make this decision.

LIFTING

In the long-term regular lifting of >10kg and any repetitive lifting over shoulder height is not recommended

LIKELY OUTCOMES

The main aim of surgery is to improve pain and function. Range of motion and strength may also improve although this is more difficult to predict. Patient satisfaction rates after surgery are around 95%. No surgery will result in a joint that feels and functions completely normally.

HELPING HEALING – ALL CUFF REPAIRS

There are a few simple non-surgical things that we do to try and improve the chances of healing.

VITAMIN D

Vitamin D deficiency can be associated with poor healing after rotator cuff repair.

Many patients are Vitamin D deficient. I recommend that you take Vitamin D (800 IU) for a month prior and for at least 12 weeks following rotator cuff repair surgery.

NSAIDS (ANTIINFLAMMATORIES SUCH AS VOLTAREN, NUROFEN, CELEBREX)

NSAIDS modulate bone and soft tissue healing processes.

We therefore only use them at specific times.

We prescribe 3 days of anti-inflammatories (if they are safe for you) to help with the immediate pain post-operatively.

Then you should avoid NSAIDs from 3 days-6 weeks following surgery as they may interfere with healing

Then you should use NSAIDS (if tolerated and they are safe for you) from 6-12 weeks as they may improve tendon remodelling.

STIFFNESS AFTER ROTATOR CUFF SURGERY

Some stiffness is universal during the rehabilitation phase after rotator cuff repair and takes some time to resolve.

Some patients remain stiff after 6 months and occasionally an arthroscopic release of scar tissue is required to accelerate the rehabilitation process.

PARTIAL/COMPLETE LACK OF HEALING AFTER ROTATOR CUFF SURGERY

It is very difficult to work out whether a tendon has healed or not based on pain levels after surgery. We tend to rely on ultrasound and MRI. The pictures from MRI are superior but are difficult to assess before 6-12 months after surgery because the healing process can distort the images.

I always ask for an MRI to be done 6 months after surgery to confirm that healing has occurred.

Because outcomes are still generally good even if the tendon doesn't completely heal (better than before surgery; because of the additional pain-relieving procedures), and the alternative options involve more complex surgery, a prolonged period of rehabilitation is usually recommended before thinking about further surgery.