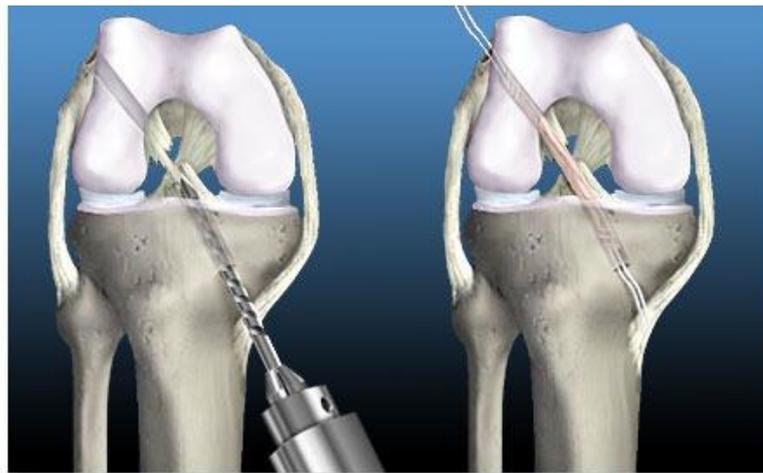




Bruce White
Orthopaedic Surgeon
Hip and knee Surgery

Arthroscopic Anterior Cruciate Ligament (ACL) Reconstruction



This booklet provides information for you and your family regarding Arthroscopic Reconstruction of the knee performed at the Mayo Private Hospital and Forster Private Hospital. Please read it carefully and write down any questions you may have at the end of the booklet so that we can answer these prior to your surgery.



The Knee

The bones of the knee, **femur** (thigh bone) and the **tibia** (shin bone), meet to form a hinge joint. The joint is protected in front by the **patella** (kneecap).

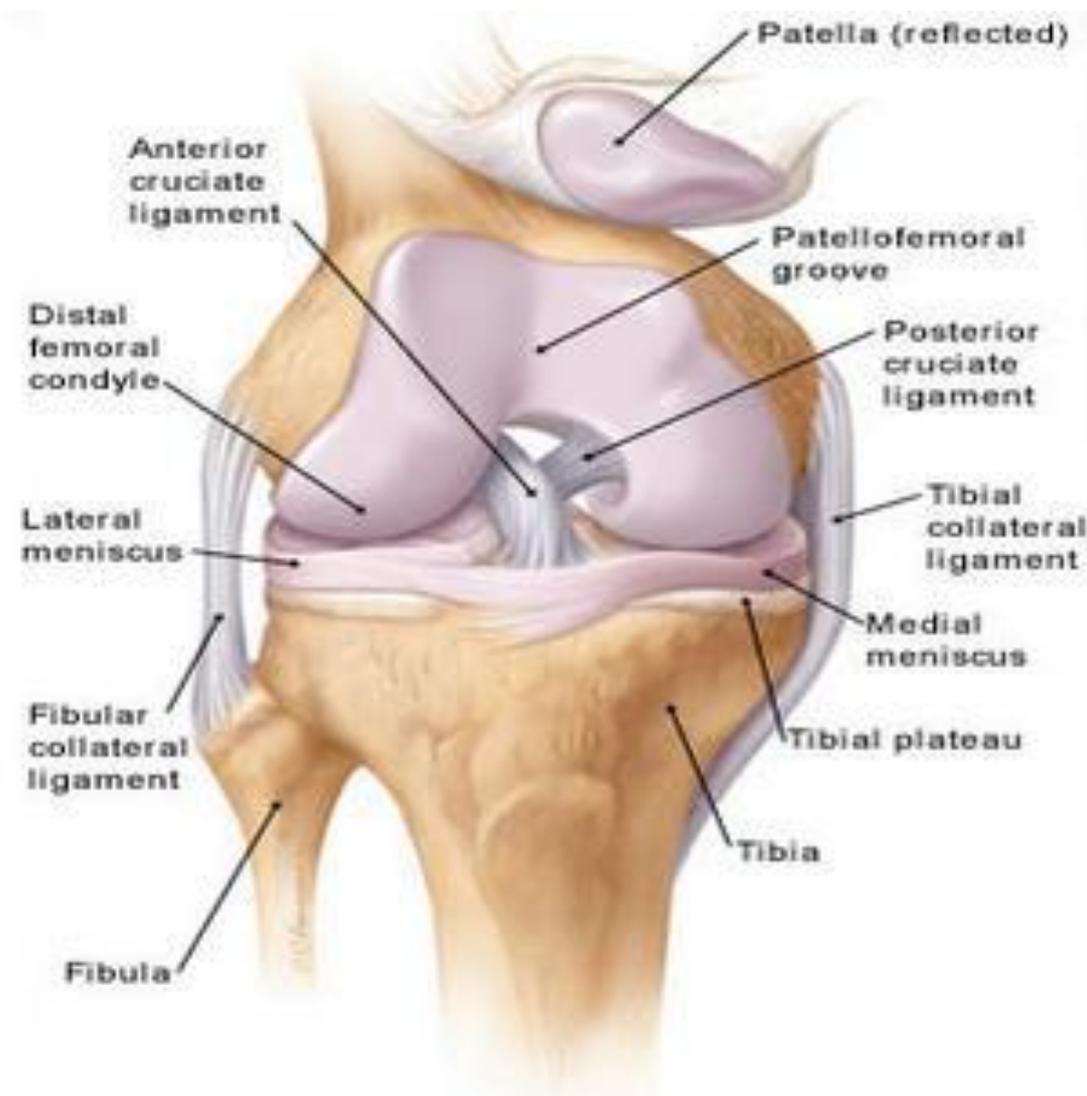
The surface of the knee joint has a very smooth lining 5mm thick, the **articular cartilage**. This covers the end of the tibia and femur, as well as the underside of the patella. This smooth surface is what becomes affected in **Arthritis** by disease, wear and tear or injury.

The **lateral meniscus** and **medial meniscus** (lateral = outside, medial = inside) are pads of cartilage that further cushion the joint, acting as shock absorbers between the bones. These are the structures that are affected when someone “tears a cartilage”.

Ligaments help to stabilise the knee. The **Collateral ligaments** (lateral and medial) run along the sides of the knee and limit sideways motion. The **Anterior Cruciate Ligament**, or **ACL**, connects the tibia to the femur at the centre of the knee. Its function is to limit rotation and forward motion of the tibia. (A damaged ACL is replaced in a procedure known as an **ACL or Knee Reconstruction**, see next page.) The **Posterior Cruciate Ligament**, or **PCL** (located just behind the ACL) limits backward motion of the tibia.

The knee **extends** (straightens) by using the **Quadriceps** (front thigh muscle). It **flexes** (bends) by using the **Hamstrings** (back thigh muscles) and **calf muscles** (back leg muscles).

These parts of your knee work together to keep the knee stable and moving freely. When one or more are injured the knee can become painful and fail to perform normally.



Anterior Cruciate Ligament Rupture

How is it Injured?

Most people who tear their Anterior Cruciate Ligament (ACL) do so when they are twisting whilst trying to stop or when they quickly try to change direction. This most often occurs when playing sports such as netball, basketball or football. It may surprise you that most ACL tears occur without contacting another player. You may also tear your ACL during other trauma e.g. car or bike accident.

What are the symptoms of an ACL tear?

At the time of the injury you may have heard a 'popping' sound or felt a snap. You are usually unable to complete the game and the knee is usually very painful and swells over the next few hours. It is common that you cannot fully straighten the knee. It is also common that the cartilage within the knee or another ligament is torn at the same time.

If you recover from the initial injury (which may take many weeks) it is common for the knee to feel unstable. On return to sport it is common for the knee to give way when changing direction.

What should I do if I think I have torn my Anterior Cruciate Ligament?

You should see your General Practitioner as soon as possible and make arrangements to see a sports Physiotherapist. It is important your knee is assessed and early exercises and therapy started to reduce the swelling and wasting of the leg muscles and prevent further injury. It is usual for someone with a suspected tear of the ACL to be referred to a knee surgeon for assessment.

What does the Knee Surgeon do?

The first thing the surgeon will do is examine your knee to get an idea of the damage. If this is not clear then a Magnetic Resonance Imaging (MRI) Scan may be ordered to give a three dimensional computer image of all the structures within the knee. This will clarify if the ACL is torn as well as show what other structures have been damaged. Once the diagnosis is made they will outline the stability of your knee as well as the associated structures which are damaged. They will clarify the sports and activities that you wish to pursue and give you a realistic idea if you are likely to achieve this without an ACL reconstruction. Their job is to give you the appropriate information so that *you* can decide if you feel your knee needs an ACL reconstruction.

Do I need an Anterior Cruciate Ligament Reconstruction?

This will depend on how badly you have injured your knee (i.e. how unstable the knee is) and what activities you wish to return to. For people who have a low level of instability and who do not wish to perform activities that involve cutting or side stepping, rupturing the ACL may present minimal problems. For these people, a rehabilitation program may give good relief of symptoms. These programs can help to train the surrounding leg muscles (particularly the hamstring muscles) to become stronger and therefore offer extra support to the knee joint.

Who should have an Anterior Cruciate Ligament Reconstruction?

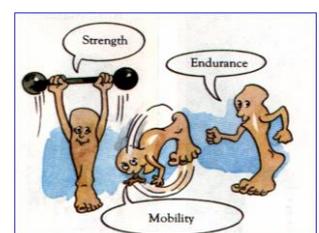
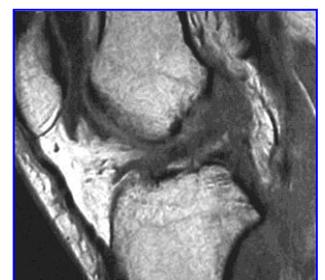
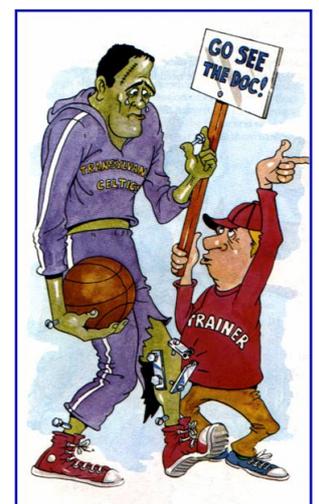
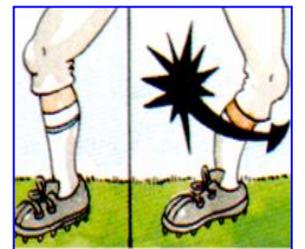
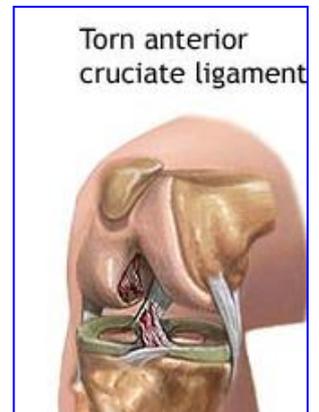
If you wish to return to sports involving side stepping or rapid change in direction (Netball, Basketball, Hockey, Soccer or any of the football codes) then it is unlikely that you will be able to return without knee reconstruction.

There is also a large number of people with a ruptured ACL that have severe instability in their knee that the knee gives way with normal day to day activities despite an appropriate rehabilitation program. These people should also consider knee reconstruction.

Will reconstructing the knee prevent arthritis occurring in the future?

Serious trauma to the knee can result in damage to the bearing surface of the knee. If the trauma is serious enough or repeated often enough, this can result in *Post-Traumatic Osteoarthritis*.

It is the episodes of instability that cause the damage to the knee. If your knee is not unstable (i.e. it does not give way) then having a torn Anterior Cruciate Ligament is unlikely to make any difference. If your knee gives way or it is likely to because of the sport you wish to play, then ACL reconstruction is likely to reduce these episodes of instability and thereby reduce your chance of developing arthritis in the future.



Anterior Cruciate Ligament Reconstruction

ACL reconstruction is performed via knee arthroscopy under general anaesthesia and consists of 5 parts.

Assessment under Anaesthesia

Your knee is carefully examined whilst you are asleep to ensure there is no damage to other structures around the knee.

Knee Arthroscopy

A routine knee arthroscopy is performed. This is “keyhole surgery” using 2 incisions 1cm long. The **Arthroscope** is inserted into the knee joint using one of the **Portals** (incisions) and the image is passed to a small camera then projected onto a television screen. The other portal is used to insert different tools to make a full assessment of your knee and to operate on the damaged parts of your knee. To be able to see the inside of your knee accurately we inflate the knee with a saline solution that is slowly resorbed by the body. It is during this stage of the surgery that any tears to the meniscus of your knee are addressed by either repair or, if irreparable, by removing the torn section of meniscus.

Graft Harvest

It is not possible to repair i.e. suture the ligament back together. We need to obtain other tissue (graft) that will eventually act like the old ACL ligament. The two most common sites for obtaining the graft are the Hamstring tendons and the Patellar tendons. We usually use the hamstring tendon as it has less damage on the leg than harvesting the patellar tendon. The tendon is harvested by passing a small tube (harvester) from your knee into the thigh to obtain two tendons. These tendons are folded over to give a graft, 4 tendons thick and long enough to pass across the knee. These are sutured together for passing through the knee.

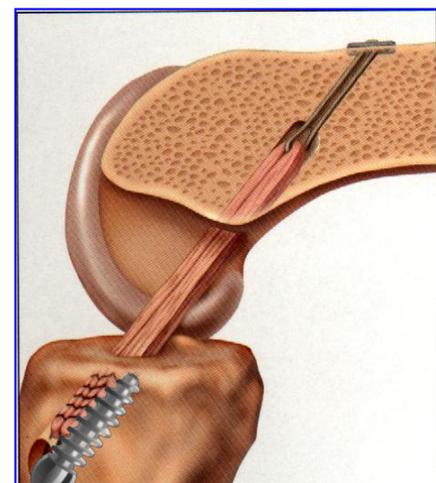
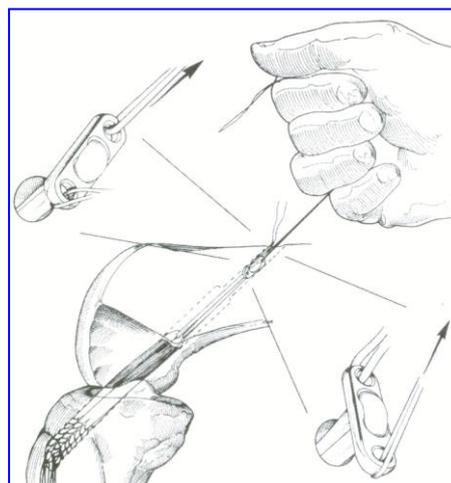
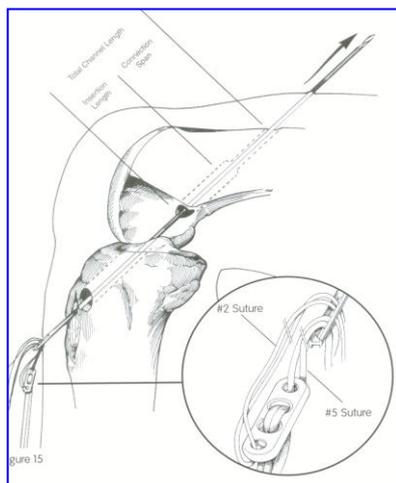
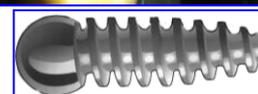
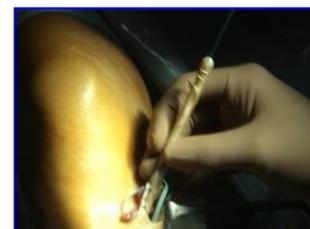
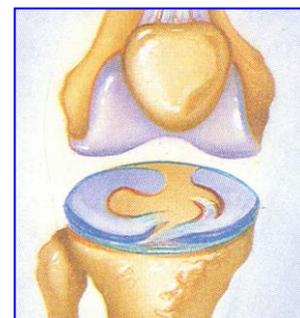
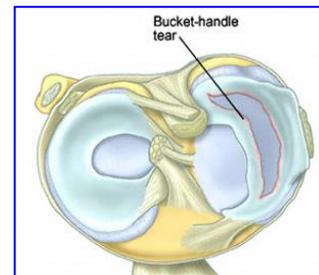
Preparing the graft tunnels

Specific jigs are used to place the tunnels in exactly the correct position. The tunnels are drilled to match the graft.

Graft placement and fixation

A wire is passed through the tibial tunnel and into the femoral tunnel and then out through the skin on the outside of your thigh. The graft is attached to the wire and pulled through the knee into place.

To hold the graft firmly in place we use a small plate (Endobutton) on the side of the femur which is pulled through the tunnel end-on, and then ‘flipped’ so the graft can’t pull back into the knee. The graft is pulled tight and a screw passed beside the graft at the tibia to hold it tightly in place. The graft position is checked with the Arthroscope and the knee stability and movement ensured to be satisfactory. X-rays are taken in theatre to check the graft is positioned correctly.



What is required before admission to hospital?

After discussing the surgery with Dr. White he will give you a booking form and ask you to see one of his secretaries who will ensure we have your correct details and a suitable date for surgery is arranged. Dr. White will arrange any tests that are required. You will need to book in for your surgery with the hospital concerned by taking your signed booking form to the hospital with you.

You will need to stop taking blood thinning tablets (Aspirin, Cartia, and Plavix etc) 5 days prior to surgery. Please let me know if you are on Warfarin.

Please phone the hospital the afternoon before the surgery (2:30 – 4:00) to obtain your fasting and admission instructions. If concerned ring the **Mayo Private Hospital on 65393600 & Forster Private hospital on 65551333.**

What happens on admission to hospital?

You will need to bring any **x-rays or scans** of your knee to hospital with you.

The surgery usually requires an overnight stay in hospital. The nurses will ask you questions about your health; take your blood pressure, pulse and temperature. They will ask you to change into a theatre gown but there is no need for you to remove your underwear.

You will be asked to mark the knee to be operated on with a felt pen. The nursing staff will clip any hair and paint your knee with antiseptic solution before covering the knee with a surgical towel. You will have an armband for identification. The anaesthetist will place a cannula (drip) in a vein of your arm so that he can put you to sleep.

What happens after the surgery?

You will wake up in recovery with a mask on your face giving you Oxygen, leads on your chest to monitor your heart and the drip in your arm providing you with fluid.

Once you are fully awake you will be taken back to the ward. The nursing staff will ensure you have enough pain relief and have had something to eat and drink before removing the intravenous cannula. The following morning you can shower over the dressings (below), the physiotherapist will ensure you are safe on crutches. When you are comfortable and have had the dressing changed you can be discharged. ***You are not allowed to drive yourself home.***

Your Dressing

The incisions are closed with dissolving sutures. Waterproof dressings will cover the incisions; these can remain in place for a week. The bandage will be changed to a section of Tubigrip prior to discharge. The Tubigrip is helpful in reducing the swelling of your knee. You can remove it and shower over the waterproof dressings. After your shower dry your leg well and reapply the Tubigrip. It is common for the small incisions to leak slightly for the first few days after surgery, if this is excessive return to the hospital and the nursing staff will change the dressing for you.

Seven days after your surgery remove the waterproof dressings in the shower; if the incisions bleed cover with a Band-Aid type dressing, and reapply the Tubigrip.

Pain Relief

Resting the leg helps to give the healing process a head start. Often pain is the first sign of over activity and your body's signal to take it easy.

Ice helps to numb the area and control swelling by slowing the circulation to the area. Dr. White uses a **ThermoActive Knee Support Brace after surgery.** You can use this brace every two hours through the day for 30min intervals. This has a bladder which can be frozen and placed inside the brace. The brace can then be inflated to provide an even pressure around the knee to reduce the pain and swelling. **Never put the icesleeve directly on your skin.** The cost of this brace is \$100.00 and needs to be purchased from Dr. White's office prior to your surgery. Unfortunately you are not able to claim the cost of this from Medicare but your private health fund may give you a refund (not all funds cover this).

Elevation of the leg will help to reduce swelling which in turn relieves pain and promotes healing. It also helps to prevent pooling of blood in your leg. When elevating your leg, make sure your knee and ankle are above the level of your heart. Lying down with your leg on at least two pillows (lengthways) is the best position.

Medication to reduce the pain will be arranged prior to your discharge. If taken as directed on the packet it should minimise any further discomfort you may be feeling, particularly at night. When these tablets are finished, tablets which include Panadol with a small amount of Codeine can be purchased from a chemist without a script.



What happens after the surgery? (Cont'd)

Circulation Exercises

These are designed to prevent stiffening of the joints as well as blood clots in the legs. Just point and flex your foot and wiggle your toes as often as you can for a week or so after the surgery.



Walking aids

You can certainly take all the weight through your knee shortly after surgery. We do arrange crutches for you to make it easier to mobilise. Knee braces are used on patients at risk of rupturing the graft.



Exercises after knee arthroscopy

Rebuilding the muscles that support your knee is important to help your knee fully recover. You should begin the following exercises as soon as you leave the hospital. Attempt each exercise several times each day however remember to stop if you feel fatigue or discomfort. Use slow, steady movements and perform the exercises on both legs. This helps to maintain good muscle balance.



1. Ankle Rolls

Whilst sitting or standing supported, roll your ankle in a large circular motion, first clockwise and then anti-clockwise. Repeat this 5-10 times for each ankle.

2. Leg Raise

Lie on your back and with your knee slightly bent gently lift the leg 25cms (about 10 inches). Hold for 5-10 seconds and slowly lower the leg to the ground. Repeat 10 times.



Then, lying on your stomach, bend your knee slightly and lift your leg gently off the floor or bed, hold for 5 seconds and slowly lower. Repeat 10 times.



3. Foot Slide

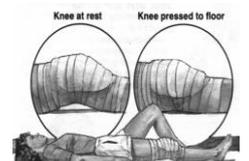
Lying or sitting on a firm surface, bend your knee as you slowly slide your heel along the surface towards your buttocks. Bring your heel as close to your buttocks as you comfortably can. Hold for 5 seconds and slowly slide the heel away from you until the knee is straight.



4. Knee Press

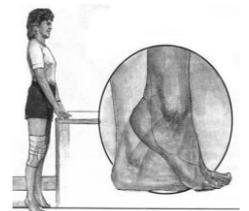
Lying or sitting with your legs in front, gently press your knee downwards so that it becomes flat along the floor or bed.

Hold 5-10 seconds, and then relax. Repeat 10 times.



5. Calf Raise

Holding on to something for support, rise onto the balls of your feet, hold for 10 seconds and slowly lower your heels back to the ground. Repeat 10 times.



Physiotherapy

The above exercises are all that are required for the first 10 days. We will arrange long term follow-up with your physiotherapist. There is a 6-stage protocol we use to maximise your return of function that the physiotherapist is very familiar with.



What are the risks of ACL Reconstruction?

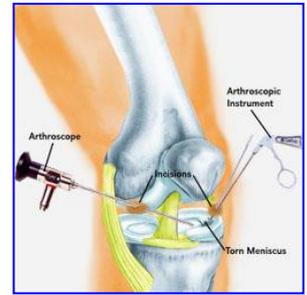
Serious complications after ACL Reconstruction are uncommon. The following are a list of the more significant complications.

Blood Clots

Clots (deep venous thrombosis or DVT) can occur in the veins of the legs after surgery. Occasionally these clots travel to the lungs causing a clot in the lung (pulmonary embolus or PE). A pulmonary embolus has the potential to cause death. If you develop pain or swelling in your calf or find you suddenly become short of breath, please contact Dr White, the hospital or your local doctor immediately. Failing all 3 call an ambulance and go to hospital. Better safe than sorry.

To reduce the risk of clots forming we:

- Apply special compression sleeves to your calves during the operation
- Teach you calf muscle exercises to perform after the surgery (see section 'exercises after arthroscopy')
- Help you to mobilise as quickly as possible after surgery.



Infection

This can be a very serious complication which occurs in approximately 1 in a thousand cases.

We take measures to reduce this risk by:

- Ensuring there is no infection present in your body at the time of the surgery
- Appropriately preparing the limb on the ward prior to your surgery
- Giving antibiotics at the time of surgery
- Promptly treating any infection which may develop after the surgery.

If an infection does occur then it is important to seek treatment immediately. An early arthroscopy and washout of the knee combined with antibiotic treatment will usually result in a normal outcome.



Bruising

During the arthroscopy we apply a tourniquet to your leg and place your leg in a special knee clamp. It is not uncommon for there to be a bruise over your thigh and occasionally for the bruising to slowly extend down to your foot after the operation. This bruising will slowly resolve.



Swelling

As outlined previously, the knee is filled with fluid to perform the arthroscopy and this fluid takes a couple of weeks to resolve. Occasionally this fluid persists, particularly in patients with a moderate degree of arthritis within their knee. The swelling usually improves if you reapply the Tubigrip. If the fluid hasn't resolved by 4 weeks after the arthroscopy you should phone Dr. White's secretary and arrange a further review.



Nerves and Arteries

Important nerves and arteries lie immediately behind the knee joint and it is possible, although very rare, for these to be injured during knee arthroscopy. Should this occur, further surgery may be necessary to repair the nerve or artery and reduce the chance of permanent damage occurring.

Graft Rupture

There is a 5-10% risk that the graft will re-rupture. This can occur even if the graft is placed correctly, the surgery goes well and the normal rehabilitation is followed. There is a 5% chance of rupturing the ACL in the other knee. It is certainly possible to revise (redo) a ruptured ACL reconstruction.



Frequently asked questions

When can I drive?

When you are strong and confident enough to be safe, usually after 10-14 days.

When can I play football?

The graft takes almost 12 months to incorporate fully so for sports involving cutting and change in direction you are out for a full season.

How much will I be out of pocket for the operation?

Dr. White, his Assistant Surgeon and the Anaesthetist are all covered by Veteran Affairs, and the “no-gap” health fund schemes. Any prosthesis used is fully covered by Veteran Affairs and all the health fund schemes. Please check with your health fund to ensure you have appropriate cover. The Item number for the procedure is 49536.

For patients covered by sports insurance or those that do not have any insurance Dr. White’s secretaries can formalise a quote for you.



What should I be concerned about after the operation?

If:

- There is undue pain
- You experience pain in the calf or back of the thigh
- You become breathless
- You develop a fever
- The knee becomes red or swollen
- You are unable to cope at home
- **If you are in any way concerned**



Then

Don’t hesitate to contact Dr White by calling his secretaries on **65500705**. If it is out of hours call the hospital where the surgery was performed and they will contact Dr. White.

Call the Mayo Private Hospital on **65393600** and Forster Private Hospital on **65551333**.

Your Follow-Up Appointment – Dr White

You are required to see Dr White several days after your surgery to ensure you are recovering appropriately. Dr White will discuss his surgical findings and your outcome.

If you have any concerns in your post-operative period please call my office on **65500705** and **my secretary will be able to contact me for advice.**



Questions?