

MINIMALLY INVASIVE UNICONDYLAR KNEE REPLACEMENT

WHAT DOES THIS MEAN?

This simply means that only a part of the knee joint is replaced through a smaller incision than would normally be used for a total knee replacement. The knee joint is made up of 3 compartments, the patellofemoral (knee cap part) and medial and lateral compartments between the femur and tibia (i.e. the long bones of the leg). Often only one of these compartments wears out, usually the medial one. If you have symptoms and X-ray findings suggestive of this then you may be suitable for this procedure.

Unicondylar knee replacements have been performed since the early 1970's with mixed success. Over the last 25 years implant design, instrumentation and surgical technique have improved markedly making it a very successful procedure for unicompartmental arthritis. Recent advances allow us to perform this through a smaller incision and hence are not as traumatic to the knee making recovery quicker.

ANATOMY

The knee joint consists of the femur, tibia and patella. The femur or thighbone is the bone connecting the hip to the knee. The tibia or shinbone connects the knee to the ankle. The patella or kneecap is the small bone in front of the knee. The fibula is a shorter and thinner bone running parallel to the tibia on its outside. The joint acts like a hinge but with some rotation.

The knee is connected by strong ligaments and surrounded by muscles. The muscles at the front of the thigh, used to straighten the knee are the quadriceps and at the back, to bend the knees are the hamstrings. The quadriceps tendon inserts into the patella at the top and the patella tendon comes off the bottom of the patella to attach to the tibia.

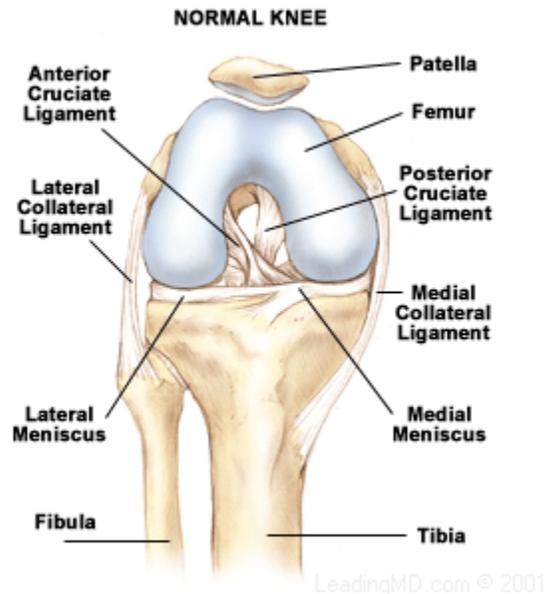
The ligaments of the knee joint stabilize the knee allowing it to function normally. The cruciate ligaments (anterior and posterior) are important structures, which guide the knee in its normal motion. Without these the knee often does not function normally and can result in instability or arthritis.

The medial ligament is on the inner side of the knee running from the femur to the tibia. The lateral ligament is on the opposite side of the knee running from the femur to fibula. These ligaments prevent sideways movement of the knee.

The knee is a synovial joint, which means it is lined by synovium, which produces fluid lubricating and nourishing the inside of the joint.

Articular cartilage is the smooth surfaces at the end of the femur and tibia. It is the damage to this surface, which causes arthritis.

The meniscus is a specialised structure within the knee joint between the femur and tibia. There is a medial and lateral meniscus. These help distribute load, absorb shock, and stabilize the knee and aid in lubrication.



WHAT CAUSES A PAINFUL KNEE?

When one or more parts of the knee are damaged it can become painful and movement becomes restricted. Over time cartilage (the smooth covering at the ends of the bone in the joint) starts to crack or wear away. When this happens the bones making up the joint, rub together.

No matter what age you are, a knee problem may keep you from activities you enjoy. Pain and stiffness may even limit your day-to-day activities. Problems with the knee joint tend to build up over time.

Any of the problems below may lead to joint damage and hence knee pain...

Osteoarthritis

As time goes by, normal wear and tear can add up. Cartilage may begin to wear away (osteoarthritis). As the bones rub together they become rough and pitted. Previous meniscectomies and damage to the anterior cruciate ligament inevitably lead to osteoarthritis.

Inflammatory Arthritis

This is a group of conditions where the lining of the joint becomes inflamed and secretes material that destroys the joint cartilage. In these conditions more than one joint is usually affected. The joints are hot, swollen and painful and deformity is common.

Avascular Necrosis

This can occur for no reason (idiopathic) or can be secondary to a number of conditions such as long-term use of alcohol or steroids. It is due to loss of blood supply to the bone. If the bone dies (necrosis), the joint will become arthritic. This pain often comes on quite suddenly and may increase rapidly. This can happen at any age. There are many other causes of this condition but they are rare.

Fracture

A bad fall or blow to the hip can break (fracture) the bone. If the broken bone does not heal properly the joint may slowly wear down like a tyre that is not balanced.

Ligament injury

Injuries to ligaments causing instability of the knee can and usually do lead to premature arthritis.

Childhood Knee Problems

Occasionally knee pain results from a problem, which may have started in childhood such as osteochondritis dissecans, trauma, and juvenile rheumatoid arthritis.

Note - Osgood Schlatter's disease does not cause arthritis.

Infection

Can destroy the cartilage lining leading to osteoarthritis.

Other causes

- A bad injury that did not heal properly
- Obesity
- Long term exposure to sports
- Heavy manual labour
- Long term high intensity high mileage running (controversial)
- Other rare diseases affecting bones or soft tissues can also cause severe pain in the knee and may lead to arthritis.

WHAT ARE THE ALTERNATIVES?

- non-operative measures should be exhausted, i.e. weight loss, analgesics, modification of activities, antiinflammatories etc.
- osteotomy which means cutting the bone and realigning it to put your weight through the good part of the knee
- total knee replacement which means replacing the whole knee.

WHAT ARE THE ADVANTAGES AND DISADVANTAGES OF THIS COMPARED TO A TOTAL KNEE REPLACEMENT?

ADVANTAGES

- smaller operation.
- smaller incision.
- not as much bone removed.
- shorter hospital stay.
- shorter recovery period.
- blood transfusion rarely required.
- better movement in the knee.
- feels more like a normal knee.
- no need for blood transfusion.
- less need for physiotherapy.
- able to be more active than after a total knee replacement.

The big advantage is that if for some reason it is not successful or fails many years down the track, it can be revised to a total knee replacement without difficulty.

DISADVANTAGES

- not quite as reliable as a total knee replacement in taking away all pain.
- long term results not quite as good as total knee replacement.

WHO IS SUITABLE?

- ideally should be over 50 years of age.
- when pain and restricted mobility interferes with your lifestyle.
- one compartment involved clinically and on X-ray.

WHO IS NOT SUITABLE?

- patients with arthritis affecting more than one compartment.
- patients with severe angular deformity.
- patients with inflammatory arthritis eg. rheumatoid arthritis.
- patients with an unstable knee.
- patients who have had a previous osteotomy.
- patients who are involved in heavy work or contact sports.

WHAT ARE THE RESULTS?

There are some reported results in the literature of 98% ten year survival, but most series report 10 year survival rates of 80-90%. There is continual improvement in design and instrumentation and results will continue to improve with this better technology.

PRE-OPERATIVELY

- cease anti-inflammatories 10 days prior to surgery.
- consult with your doctor regarding ceasing aspirin.
- cease hormone replacement medications 6 weeks prior to surgery.
- cease smoking for as long as possible prior to surgery.
- cease any herbal medications.

You will usually have a preoperative physician consult that will look after any medical problems postoperatively.

You will have completed a health questionnaire on your first visit in which you record your past and present illnesses, previous operations, medications and allergies. It is important to notify your surgeon of any changes in your medications or health status.

Routine blood tests, ECG and X-rays will be done. Don't forget to bring all X-rays with you to hospital.

It is helpful to strengthen the muscles in your leg as much as possible before the operation. Useful exercises include cycling (gradually increasing to half an hour per day) and swimming with flippers.

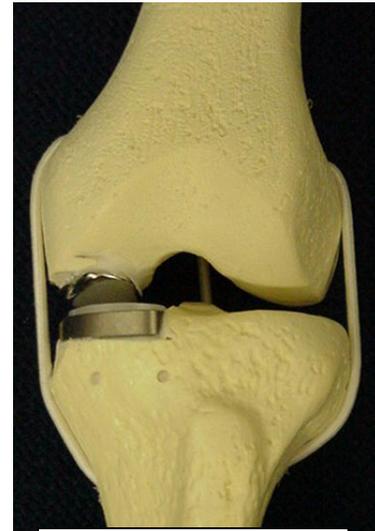
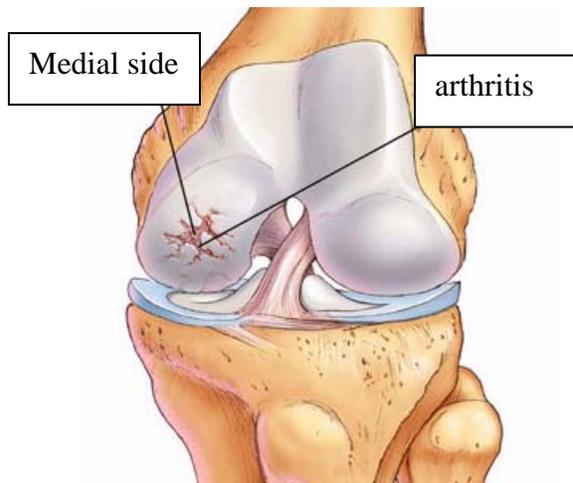
It is useful to practice using crutches prior to the operation.

DAY OF SURGERY

- you will be told what time to arrive and when to fast from.
- the anaesthetist will see you on the ward prior to surgery.
- you will be checked in by the nurse looking after you and prepared for surgery.
- you will then be taken to the operating room and have a drip inserted and monitors connected to measure vital signs during the procedure.

THE OPERATION

A tourniquet is applied to the upper thigh and the leg is prepared for the surgery with a sterilising solution. An incision approximately 8cm long is made in the knee and the arthritic part of the knee is removed. Roughly 5 mm of bone is taken from the femur and the tibia. This is replaced with special components cemented or press fitted to the femur and the tibia and a plastic insert placed in between.



REPLACEMENT

POST-OPERATIVELY

You will wake up in the recovery room connected to monitors to measure your vital signs. You will have a bandage on your leg and usually a drain coming out of the operative site. You will usually have a button to press for pain relief. This will be explained to you by the anaesthetist. When you are awake and your observations are stable you will be taken back to the ward.

Mobilisation will begin usually the next day .A physiotherapist will show you exercises to do and show you how to use crutches or a frame. The drain will be removed the next day and the dressing reduced. When you are safe to go home you will be discharged.

HOME

You will need assistance at home for the first week and will need to continue with your exercises.

Physiotherapy will be arranged as required and can often speed recovery and motion. It is important to begin thigh strengthening exercises as soon as possible following surgery.

It is normal to take prescription pain killers for the first 3 to 4 days and usually panadeine which can be bought over the counter at the chemist is sufficient. Pain and movement is very individual and hence recovery times vary enormously.

You should ice your knee 20 minutes at a time to reduce swelling for the first 3 or 4 days. When applying ice packs ensure you place a wet cloth between your skin and the ice pack to prevent ice burn. Swelling can take weeks or even months to go down fully.

Crutches are for your own safety and can be changed to a walking stick or nothing when you are safe.

Normal activities can usually be resumed 6 weeks following surgery. You can drive a car when you can walk without crutches and have control of your leg. This is usually at 2-4 weeks. You **MUST** be in control of your vehicle to be able to drive.

The dressing you have when you leave hospital should remain intact until the first post-operative visit. If this leaks it can be replaced with a clean dressing. If you have doubts about this it should be changed by your local doctor. You can shower with these but do not bath or swim.

If you get excessive swelling, redness or discharge or temperatures contact the rooms immediately as these may be signs of infection. If it is after hours contact the hospital where the operation was performed and they will be able to contact the surgeon.

To minimise the risk of developing blood clots (DVT) it is recommended to take CARTIA (aspirin 100 mg per day) for 4 weeks. This can be obtained from the chemist without a prescription. TED stockings are recommended to be worn for 4 weeks.

RETURN TO WORK

You may return to normal duties when your knee function improves enough for you to do your particular job.

As a general guide you will be unfit for sedentary duties for 3 weeks and more manual type work for 6 weeks.

Work involving a lot of bending or kneeling or climbing stairs may take 3 months to return to.

COMPLICATIONS

Any operation, big or small, has risks. The following can occur with any surgery and some rarer complications may also be possible. It is impossible to discuss every complication and there will be some, which no surgeon may anticipate or may never have heard of. The utmost care is taken at all times during surgery to prevent these complications. At Orthosports we are all subspecialised and operate within our defined area of expertise. We believe this minimises the risk of complications.

The following list is not exhaustive and some are explained in more detail in the various sections to which they may be more appropriate...

Specific to Unicompartamental knee Replacement

Infection

One of the risks after surgery is infection. Infection may be superficial (i.e. in the skin) or deep (around the prosthesis). The risk of this is 1-2%. If you do get an infection it will be treated aggressively with antibiotics but occasionally re-operation is necessary to clean out the infected material. In very rare circumstances, sometimes the knee replacement is removed and another one put in at a later time, six to eight weeks later when the infection has cleared up.

Fracture (break) of the Femur, Tibia or Patella

This may occur during surgery and may at times not be recognised. It may require more extensive surgery during the operation and very occasionally re-operation a few days later.

Stiffness (lack of movement)

Some people form excessive scar tissue after unicompartamental knee replacement. The average long-term bend is 120 degrees. If you are not bending past 90 degrees by six weeks you are readmitted to hospital and under epidural or spinal anaesthetic the knee is forcibly manipulated to break the scar tissue, which is stopping you bending.

Damage to nerves or blood vessels

During the operation, nerves or blood vessels may be damaged. These may be repaired at the time if recognised but may require a second operation to explore or repair any damage. It is very rare that a damaged nerve does not recover on its own. If a damaged nerve does not recover it can lead to poor function of the leg below the joint replacement such as a foot that does not work properly due to weakness or sensory loss.

Blood Clots (Deep venous thrombosis or pulmonary embolus)

Blood clots can form in the calf muscles and they can travel to the lung. These can occasionally be serious and even life threatening. These blood clots will be treated immediately and every measure is taken to avoid these occurring. You will be given a blood thinning agent by injection during your stay in hospital. Stockings will be provided for you which aid in trying to prevent blood pooling in the veins in the calf and you should wear these for four weeks post operatively.

Wound Irritation or Breakdown

The surgical scar will always cut some skin nerves so you will have numbness around the wound. This does not affect the function of your joint but may be irritating to you over the short to medium term. Eventually this numb feeling improves slightly and does not worry most people. Occasionally, instead of a numb sensation you will have burning or a hypersensitive sensation in the wound. This usually settles down over many months but occasionally can be long term and troublesome. Wound breakdown is rare but if it does occur it may require surgery to repair it. You can also get a reaction to the sutures used, causing a stitch abscess, this usually appears as a small pimple on your scar. They can usually be treated with an antiseptic dressing but occasionally require a short course of antibiotics.

Wear

The long-term complication of unicompartmental total knee replacement is wearing of the plastic liner. The joint is like a tyre and if you are hard on the joint, such as someone who does heavy manual labour, plays a pounding sport like jogging or is overweight; it will wear out faster than a more sedentary person.

Conventional unicompartmental knee replacements have about an 85 percent fifteen year survival. There are a large number of factors which affect the survival rate. If there is significant wear in the joint, then the liner may need to be replaced. Wear can sometimes causes loosening of the joint and the whole joint may then need replacing. This is why we need to follow you up forever. We need to assess your x-ray every few years to make sure that nothing worrying is occurring in the knee joint before you get symptoms. It is extremely important that you do not lose contact with your surgeon during the life of your knee replacement and if you move away from Sydney you should consider talking to your surgeon to recommend a surgeon in another part of Australia.

Osteolysis

This means part of the bone is reabsorbed or disappears. This is a result of small wear particles setting up a reaction in the body causing this bone resorption.

Damage to ligaments

There are ligaments (collaterals, quadriceps, patella) surrounding the knee, which can be damaged before or after surgery. Damage to these ligaments can cause instability of the knee or the inability to straighten the knee. Depending on the circumstances this may require a brace or further surgery.

Dislocation

An extremely rare complication of unicompartmental knee replacement is dislocation of the prosthesis. It is where the two major components, the femur and tibia, lose contact with each other.

Heterotopic Ossification

This means bone forms in the soft tissues surrounding the knee. This can cause discomfort and stiffness and occasionally needs to be excised. This is quite rare in the knee.

Breakage of the Implant

This is very rare. If this were to occur, re-operation to remove the broken implant and replace it with a new one would be required.

SPECIAL PRECAUTIONS TO TAKE

- remember this is an artificial knee and must be treated with care.
- in general, the more active you are the quicker your knee will wear out.
- you can drive when you have regained muscle control, usually by 4 weeks.
- avoid situations where you might fall.
- your knee may go off in a metal detector at the airport. You can receive a note from the doctor's rooms to say you have had a joint replacement.
- prevention of infection is vital. If you have any infections anywhere make sure you see your local doctor straight away for treatment. If you get increasing pain in your joint and are sick and have temperatures you should go to hospital to get checked out.
- **USE OF ANTIBIOTICS** - Antibiotics should be prescribed if you have an infection anywhere in the body, if you have surgery in contaminated areas such as teeth, nose, bowel or bladder, podiatry treatment or urinary catheterization.

ACTIVITIES

- you should avoid pounding activities, which put a lot of stress on the joint.
- walking is good.
- swimming in a pool or light surf between the flags is safe.
- doubles tennis is allowable but anything more aggressive will lead to premature wear of your joint.
- contact sports are forbidden and jogging can be detrimental to the long term survival of your joint replacement.
- skiing on groomed slopes if you are a good skier is acceptable as long as you are aware you can cause significant damage if you fall.
- bowls and golf should not be a problem

CONCLUSION

This is an excellent operation in the right patient. The biggest advantage is that it feels more like a normal knee and is quicker to recover from. Its biggest disadvantage is that it is not quite as reliable as a total knee replacement, in other words it may not last quite as long. If for some reason it does not relieve your pain then it is relatively easy to convert it to a total knee replacement. By far the majority of people are happy with their joint replacement.

Although there is a lot of information above it is important to read it all so you can make an informed decision to undergo surgery. You must not proceed until you are confident that you understand this procedure and particularly the complications.

Although every effort has been made to explain the complications there will be complications that may not have been specifically mentioned. This is because they are extremely rare. Feel free to access other sources of information from the Internet, other patients and your local doctor. A sound knowledge of this operation will make the stress of undertaking the operation easier for you to bear.