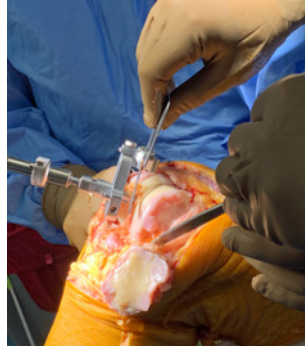


Knee Replacement/Arthroplasty

Knee replacement (also called knee arthroplasty) is an operation that is performed principally to relieve pain from an arthritic knee. Although the range of motion of a knee may improve following surgery, this is not the primary aim of surgery and extra motion should be regarded as a bonus.

Surgery

Knee replacement involves replacing the bearing surfaces on the ends of the bones with a synthetic surface. This is usually metal on the femur and plastic (high density polyethylene) on a metal base plate on the tibia. The surface of the patella (knee cap) can also be replaced with high-density polyethylene. The bones are shaped with a series of cuts to match to inside of the components.

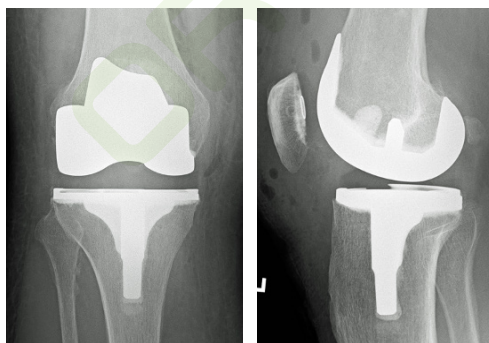


Components can be fixed to the bone using one of two techniques.

One can either use bone cement or one can use components coated in such a way that bone grows onto and into their surface. Both methods of fixation have their advantages and disadvantages. A decision will be made regarding the most appropriate fixation for your particular situation.

Depending on the nature of your arthritis, your knee may be suitable for a partial replacement rather than a total replacement. The knee can be thought of as having three compartments. There are a medial and a lateral compartment between the femur (thigh bone) and tibia (shin bone). The medial compartment is on the inner side (left side of right knee) and the lateral compartment is on the outside (right side of right knee). The patellofemoral compartment is between the patella (knee cap) and the femur.

In a total knee replacement the medial and lateral compartments are resurfaced and the patella may be resurfaced as well. In a medial (or lateral) unicompartmental replacement only the medial (or lateral) compartment is resurfaced. Medial unicompartmental replacement is more common than lateral. Patellofemoral replacement involves resurfacing of only the patellofemoral compartment and is less commonly performed.



X-rays of a total knee replacement from the front and from the side. The patella has been resurfaced. The "gap" between the white metal components is polyethylene (plastic).



Medial unicompartmental (partial) replacement; operation, X-rays from the front and from the side

In general, the principles of partial and total knee replacement are similar but a partial replacement is a smaller operation and has a shorter hospital stay and quicker recovery.



X-rays of a patellofemoral replacement

There are different ways of achieving the desired alignment of the components during knee replacement. Standard instrumentation, as the name implies, is the original and basic method. It is the method against which other methods are compared. Navigation involves using a series of markers and a computer during the operation to get feedback about the planned alignment of the components. Patient specific cutting blocks are prepared prior to surgery based on a combination of X-ray, CT or MRI images. More recently, robotic surgery has become readily available. This combines navigation and robotics to guide the surgeon whilst making the bone cuts. All methods can give good results and it is really up to the surgeon to use the technique with which they are most comfortable.

As a rule of thumb, total knee replacement involves a hospital stay of 3 nights (1 or 2 for partial replacements). In most instances patients are able to go directly home and inpatient rehabilitation is not usually required. Depending on your private health insurer, a physiotherapist may be able to visit you at home. When you are discharged you will be walking with the aid of two elbow crutches and will be independent in terms of showering and dressing. You will have been taught how to manage steps and stairs.

The main problem that patients face after a knee replacement is getting their movement back, despite the fact the most knee replacements can bend fully during surgery. Pain levels vary considerably from one individual to another, but most people find the period from 24 hours to 48 hours after surgery the most difficult. It is important to keep working at the exercises, particularly bending the knee. This applies both in hospital and after discharge. Pain may persist for 6-8 weeks following the procedure, particularly at night.

Preadmission

Prior to admission a number of steps are taken to reduce the risks of surgery. A number of routine investigations may be performed and these include blood tests, an electrocardiograph (ECG), and analysis of a urine specimen. You may be asked to have a pre-admission assessment

by a physician. You may need additional X-rays either prior to or on admission to hospital.

Some medications may need to be ceased prior to your surgery to reduce the risk of bleeding. You should check with your surgeon as preferences vary. Normal painkillers and low dose (100mg) aspirin can generally be continued. Some surgeons prefer you to stop taking anti-inflammatory tablets one week before your surgery. Other blood thinners such as warfarin, clopidogrel, Pradaxa, Xarelto, Eliquis which are typically used for patients with coronary artery stents or atrial fibrillation **MUST** to be stopped prior to surgery and you should check with your surgeon regarding timing. Newer drugs being used to treated diabetes and obesity may also need to be stopped prior to surgery. It is important that you have a list of your current medications that you can provide to office staff. Similarly, if you have an artificial heart valve or another implant that requires antibiotic protection when surgery is being performed, you should also notify the office staff.

Admission

Admission to hospital is on the day of surgery.

Anaesthesia

The surgery can be performed using a number of different types of anaesthesia. The anaesthetist will select the most appropriate type of anaesthetic for your situation. Usually a combination of spinal and general anaesthesia is used. A spinal anaesthetic involves an injection into the lower spine, which makes the body numb from the waist down. It wears off after a few hours.

After Surgery

Following surgery, adequate provision is made for pain control. The nursing staff will explain to you what has been prescribed. Adjustments to your pain relief medication are frequently made during your admission.

Physiotherapy will commence either on the day of surgery or on the first morning following surgery, depending on the time of day you get back to the ward. Initially you will walk with a walking frame and later with crutches. The physiotherapist will guide you through the various phases of rehabilitation. Depending on your surgeon's preference, you may spend some time each day with your knee on a CPM (continuous passive motion) machine, which slowly bends and straightens your knee.

Usually you can be discharged directly home from hospital. The length of hospital admission can vary but most patients can go home on the third and sometimes the second morning after surgery. Be assured that you will not be discharged until you are safe to go home. Occasionally it may be appropriate to transfer you to a rehabilitation hospital. A follow up appointment will be made for you, 2-4 weeks after the operation.

You will notice that your knee is warm and swollen after surgery. This has usually settled significantly by three months from surgery, although the swelling and some warmth may persist for a further few months. You will also notice that the skin on the lateral (outside) side of the incision will be numb. This is normal. The area of numbness usually decreases with time but there will always be some numbness of the skin in this area. Fortunately it does not usually cause any problems.

Risks

Knee replacement procedures are usually very successful in relieving

pain. However, they are associated with some risks and although these are uncommon, they do need to be kept in mind in assessing whether this type of surgery is warranted for you. These risks include:

Wear and loosening

With time, the bearing surfaces do have a tendency to wear. As a result small particles of debris are produced. The body's reaction to these particles can cause loosening of the components from the bone, which in turn can cause a recurrence of pain. This may necessitate a second (revision) operation, which is usually a more complicated procedure and generally does not lead to as good a result as a primary procedure.

Venous thrombosis

This is a blood clot in the veins of the leg and occurs more frequently after knee replacement surgery than other types of surgery. Precautions are taken to reduce the risk and this may involve the administration of a daily injection of a blood-thinning agent such as Clexane, which you may be asked to continue for a few weeks after discharge from hospital. Additional measures may be taken if it is felt that you are at greater risk than the average person undergoing surgery. If a venous thrombosis does occur this will usually need to be treated with blood thinning injections followed by anticoagulant tablets, which would need to be continued for at least three months. A small but nonetheless important risk of venous thrombosis is the potential for the blood clot to break off and lodge in the lungs (pulmonary embolus). This can cause significant breathing problems and very rarely can be fatal.

Infection

Infection can occur after any operation. It is potentially more serious following joint replacement surgery, because it can be more difficult to eradicate. This can mean that further surgery is required including the possibility of removal of all components for a period of two months during which antibiotics are given intravenously. If the infection has been eradicated, another knee replacement is then performed. Rarely, the knee may need to be permanently stiffened (arthrodesis). Precautions are taken to reduce the risk of infection including the administration of intravenous antibiotics around the time of surgery.

Stiffness

As mentioned earlier, the biggest challenge after a knee replacement is to regain knee movement, especially flexion (bending). Sometimes stiffness is a persistent problem and a manipulation under an anaesthetic is required. This involves coming back into hospital, usually for one night. Occasionally the stiffness may be permanent and may cause difficulties with activities of daily living.

Despite all of these potential problems, most patients are happy with their procedure and recover quite quickly from surgery. However, it is important to remember that improvement occurs for up to 2 years after surgery.

These notes have been prepared by orthopaedic surgeons at OrthoSport Victoria. They are a general overview and reflect their views, opinions and recommendations. The contents are provided for information and education purposes only and not for the purpose of rendering medical advice. Please seek the advice of your surgeon or other health care provider with any questions regarding medical conditions and treatment.