



DR MICHAEL MCAULIFFE

ORTHOPAEDIC SURGEON

Knee, hip and lower limb specialist

Total Knee Replacement

If your knee is severely damaged by arthritis or injury, it may be hard for you to perform simple activities such as walking or climbing stairs. You may even begin to feel pain while you're sitting or lying down.

If medications, changing your activity level and using walking supports are no longer helpful, you may want to consider total knee replacement surgery. By resurfacing your knee's damaged and worn surfaces, total knee replacement surgery can relieve your pain, correct your leg deformity and help you resume your normal activities.

One of the most important orthopaedic surgical advances of the twentieth century, knee replacement was first performed in 1968. Improvements in surgical materials and techniques since then have greatly increased its effectiveness. Over 35,000 knee replacements are performed each year in Australia.

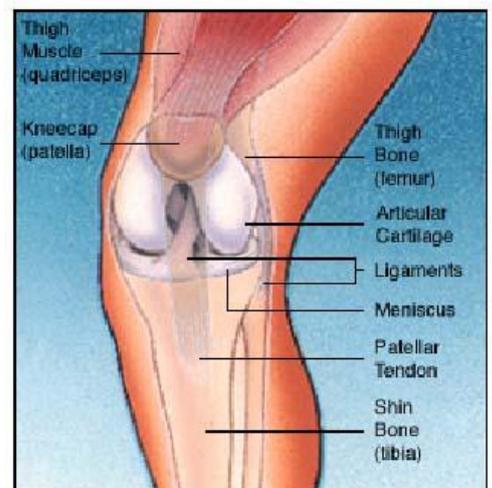
Whether you have just begun exploring treatment options or have already decided with your orthopaedic surgeon to have total knee replacement surgery, this booklet will help you understand more about this valuable procedure.



How the normal knee works

The knee is the largest joint in the body. Nearly normal knee function is needed to perform routine everyday activities. The knee is made up of the lower end of the thigh bone (femur), which rotates on the upper end of the shin bone (tibia), and the knee cap (patella), which slides in a groove on the end of the femur. Large ligaments attach to the femur and tibia to provide stability. The long thigh muscles give the knee strength.

The joint surfaces where these three bones touch are covered with articular cartilage, a smooth substance that cushions the bones and enables them to move easily.



Normal Knee Anatomy



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All remaining surfaces of the knee are covered by a thin, smooth tissue liner called synovial membrane. This membrane releases a special fluid that lubricates the knee, reducing friction to nearly zero in a healthy knee.

Normally, all of these components work in harmony. But disease or injury can disrupt this harmony, resulting in pain, muscle weakness and less function.

Common causes of knee pain and loss of knee function

The most common cause of chronic knee pain and disability is arthritis. Osteoarthritis, rheumatoid arthritis and traumatic arthritis are the most common forms.

Osteoarthritis

– usually occurs after the age of 50 and often in an individual with a family history of arthritis. The cartilage that cushions the bones of the knee softens and wears away. The bones then rub against one another, causing knee pain and stiffness.

Rheumatoid Arthritis

– is a disease in which the synovial membrane becomes thickened and inflamed, producing too much synovial fluid that over fills the joint space. This chronic inflammation can damage the cartilage and eventually cause cartilage loss, pain and stiffness.

Traumatic Arthritis

– can follow a serious knee injury. A knee fracture or severe tears of the knee's ligaments may damage the articular cartilage over time, causing knee pain and limiting knee function.





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Is Total Knee Replacement for you?

The decision whether to have total knee replacement surgery should be a cooperative one between you, your family, your general practitioner and your orthopaedic surgeon. Some patients will be suitable for a partial knee replacement. This operation has excellent results in suitable patients but is not appropriate for many patients.

Reasons that you may benefit from total knee replacement commonly include:

- Severe knee pain that limits your everyday activities, including walking, going up and down stairs, and getting in and out of chairs. You may find it hard to walk more than a few blocks without significant pain and you may need to use a stick or walker;
- Moderate or severe knee pain while resting, either day or night;
- Chronic knee inflammation and swelling that doesn't improve with rest or medications;
- Knee deformity – a bowing in or out of your knee;
- Knee stiffness – inability to bend and straighten your knee;
- Failure to obtain pain relief from non-steroidal anti-inflammatory drugs. These medications, including moxib and ibuprofen, often are most effective in the early stages of arthritis. Their effectiveness in controlling knee pain varies greatly from person to person. These drugs may become less effective for patients with severe arthritis;
- Inability to tolerate or complications from pain medications; and
- Failure to substantially improve with other treatments such as cortisone injections, physiotherapy, exercise programs, or other operations.

Most patients who undergo total knee replacement are aged 60 to 80, but you will be evaluated individually. Recommendations for surgery are based on your pain and disability, not age. Total knee replacements have been performed successfully at all ages, from the young teenager with juvenile arthritis to the elderly patient with degenerative arthritis.



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The orthopaedic evaluation

The orthopaedic evaluation consists of several components:-

- A medical history, in which information about your health and about the extent of your knee pain and your ability to function is gathered;
- A physical examination to assess your knee motion, stability, and strength and overall leg alignment;
- X-rays to determine the extent of damage and deformity in your knee; and
- Occasionally blood tests, a Magnetic Resonance Image (MRI) or bone scan may be needed to determine the condition of the bone and soft tissue of your knee.

I will review the results of your evaluation with you and discuss whether total knee replacement would be the best method to relieve your pain and improve our function. Other treatment options – include medications, injections, physical therapy, or other types of surgery – will also be discussed and considered.

As your surgeon I will explain the potential risks and complications of knee replacement surgery, including those related to the surgery itself and those that can occur over time after your surgery. These risks and complications are discussed later in this booklet. **Please feel free to ask questions, it often helps to write a list of questions prior to your consultation and bring it along to discuss with me.**

Realistic expectations about knee replacement surgery

An important factor in deciding whether to have total knee replacement surgery is, understanding what the procedure can and can't do.

Between 80-90% of patients who undergo knee replacement surgery are highly satisfied and would repeat the procedure.

Following surgery, you will be advised to avoid some types of activity, including jogging and high impact sports, for the rest of your life.

With normal use and activity, every knee replacement develops some wear in its plastic cushion. Excessive activity or weight may accelerate this normal wear and cause the knee replacement to loosen and become painful. With appropriate activity modification, knee replacement can last for many years.



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New Technologies in Knee Replacement Surgery

Computer Assisted Knee Replacement Surgery

Computer assisted knee replacement surgery has been available for many years. Michael has found it particularly useful in younger or more active patients.

Computer assisted surgery has been shown to improve the alignment of the implants as implant position can be optimised prior to the surgeon making any bone cuts. This decreases the rate of further surgery.

Robotic Surgery

Robotic Surgery was introduced in Australia a few years ago. Michael has had the use of the first NAVIO Surgical System in Queensland and he is an instructor on the use of this system.

Robotic Surgery has been shown to be particularly useful in partial knee replacements and Michael is able to utilise these robotic surgery techniques whenever it is appropriate to do so.

Robotic Surgery, while impressive and useful in these particular cases, is only one part of a multi functional treatment plan.



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Preparing for surgery

Medical Evaluation

– if you decide to have knee replacement surgery, you will be asked to have further assessment by an anaesthetist and you may be asked to see a physician. This is needed to assess your health and find conditions that could interfere with your surgery or recovery.

Tests

– Several tests such as blood samples, an ECG, chest X-rays and urine samples may be needed to help plan your surgery.

Preparing Your Skin

– Your skin should not have any infections or irritations before surgery. If either is present, contact Michael via the rooms

Medications

– Have a complete list of medications you are taking. You may need to stop some of these prior to surgery.

Weight Loss

– If you are overweight, you may be asked to lose some weight before surgery to minimise the stress on your new knee, and possibly decrease the risks of surgery.

Dental Evaluation

– Infections after knee replacement are not common but can occur if bacteria enter your bloodstream. This can happen during dental procedures therefore consider getting treatment for significant dental diseases before your knee replacement surgery. Delay routine dental work for several weeks after surgery.

Urinary Evaluation

– Individuals with a history of recent or frequent urinary infections and older men with prostate disease should consider a urological evaluation before surgery.



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Social Planning

– Although you will be able to walk with crutches or a walker soon after surgery, you may need help around the house with daily duties and activities. You may also benefit from a short stay in a rehabilitation unit after surgery. You can discuss this option with Michael and your Physiotherapist.



Home planning

Several suggestions can make your home easier to navigate during your recovery. Consider:-

- Safety bars or a secure handrail in your shower or bath;
- Secure handrails along your stairways;
- A stable chair for your early recovery with a firm seat cushion (height of 18-20 inches), a firm back, two arms, and a footstool for intermittent leg elevation;
- A toilet seat riser with arms, if you have a low toilet;
- A stable shower bench or chair for bathing;
- Removing all loose carpets and cords; and
- A temporary living space on the same floor, because walking up or down stairs will be more difficult during your early recovery.





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Your surgery

You will most likely be admitted to the hospital on the day of your surgery. After admission, you will be evaluated by a member of the anaesthesia team. The most common types of anaesthesia are general anaesthesia, in which you are asleep throughout the procedure, and spinal or epidural anaesthesia, in which you are awake but your legs are anaesthetised. The anaesthesia team will determine which type of anaesthesia will be best for you with your input..



The procedure itself takes about two hours. The damaged cartilage and bone in your knee will be removed and then the new metal and plastic joint surfaces to restore the alignment and function of your knee will be positioned.

Many different types of designs and materials are currently used in total knee replacement surgery. Nearly all of them consist of three components: the femoral component (made of a highly polished strong metal), the tibial component (made of a durable plastic often held in a metal tray), and the patellar component (also plastic).

After surgery, you will be moved to the recovery room, where you will remain for one to two hours while your recovery from anesthesia is monitored. After you awaken, you will be taken to your hospital room.

Your stay in hospital

You will most likely stay in the hospital for 3-5 days. After surgery, you will feel some pain, but medication will be given to you to make you feel as comfortable as possible. Pain management is an important part of your recovery, talk with Michael and the anaesthetic team if postoperative pain becomes a problem. Walking and knee movement are important to your recovery and will begin immediately after your surgery.

To avoid lung congestion after surgery, you should breathe deeply and cough frequently to clear your lungs.

One or more measures to prevent blood clots and decrease leg swelling, such as special support stockings, inflatable leg coverings (compression boots) and blood thinners will be prescribed by Michael to diminish the risk of DVT's (Blood Clots). You will be individually risk assessed by the practice nurse and Dr McAuliffe prior to your operation.



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Foot and ankle movement also is encourage immediately following surgery to increase blood flow in your leg muscles to help prevent leg swelling and blood clots Most patients begin exercising their knee the day after surgery. A physiotherapist will teach you specific exercises to strengthen your leg and restore knee movement to allow walking and other normal daily activities soon after your surgery.

Possible complications after surgery

The complication rate following total knee replacement is low. Serious complications, such as a knee joint infection, occur in less than 2 percent of patients. Major medical complications such as heart attack or stroke occur even less frequently. Chronic illnesses may increase the potential for complications. Although uncommon, when these complications occur, they can prolong or limit your full recovery.

Blood clots in the leg veins are the most common complication of knee replacement surgery. Michael will outline a prevention program, which may include periodic elevation of your legs, lower leg exercises to increase circulation, support stockings and medication to thin your blood.

Although implant designs and materials as well as surgical techniques have been optimised, wear of the bearing surfaces or loosening of the components may occur. Additionally, although an average of 115 degrees of motion is generally anticipated after surgery, scarring of the knee can occasionally occur and motion may be more limited. This is particularly true in patients with limited motion before surgery. Finally, while rare, injury to the nerves or blood vessels around the knee can occur during surgery.

Discuss your concerns thoroughly prior to surgery and remember no question is silly it is only silly not to ask.

Your recovery at home

The success of your surgery also will depend on how well you follow instructions at home during the first few weeks after surgery. This booklet, along with the discharge information you recieve from hospital will help in your recovery.

Wound Care

Your will have stitches beneath your skin on the front of your knee. A suture beneath your skin will not require removal.

Avoid soaking the wound in water until the wound has thoroughly sealed and dried. The wound may be bandaged to prevent irritation from clothing or support stockings.





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Diet

Some loss of appetite is common for several weeks after surgery. A balanced diet, often with an iron supplement, is important to promote proper tissue healing and restore muscle strength. Be sure to drink plenty of fluids and avoid constipation, which is a common side effect of some pain medication. Dr McAuliffe will send you home with medication to assist in preventing constipation.

Activity

Exercise is a critical component of home care, particularly during the first few weeks after surgery. You should be able to resume most normal activities of daily living within three to six weeks following surgery. Some pain with activity and at night is common for several weeks after surgery. Your activity program should include:-

- A graduated walking program to slowly increase your mobility, initially in your home and later outside;
- Resuming other normal household activities, such as sitting and standing and walking up and down stairs; and
- Specific exercise several times a day to restore movement and strengthen your knee. You probably will be able to perform the exercises without help, but you may have a physical therapist help you at home or in a therapy centre the first few weeks after surgery.



Driving After Surgery

It is safe to resume driving after knee replacement surgery once you are able to perform an "emergency stop" and you are no longer taking narcotic pain killers. The timing of this is usually between 4 to 6 weeks after surgery. If you have any concerns about driving, please discuss this with Michael or your GP. (This advice is based on recommendations from the Australian Arthroplasty Association).



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Avoiding problems after surgery

Blood Clot Prevention

Follow your instructions carefully to minimise the potential of blood clots that can occur during the first several weeks of your recovery.

Warning signs of possible blood clots in your leg include:-

- Increasing pain in your calf;
- Tenderness or redness above or below your knee; and
- Increasing swelling in your calf, ankle and foot.

Warning signs that a blood clot has travelled to your lung include:-

- Sudden increased shortness of breath;
- Sudden onset of chest pain; and
- Localised chest pain with coughing.

Notify your doctor immediately if you develop any of these signs.

Preventing infection

The most common causes of infection following total knee replacement surgery are from bacteria that enter the bloodstream as a result of other infections such as; urinary tract infections, or skin infections. These bacteria can lodge around your knee replacement and cause an infection. It is important to see your GP for treatment of these other infections if they occur.



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Warning signs of a possible knee replacement infection are:-

- Persistent fever
- Shaking chills;
- Increasing redness, tenderness or swelling of the knee wound;
- Drainage from the knee wound; and
- Increasing knee pain with both activity and rest.

Avoiding falls

A fall during the first few weeks after surgery can damage your new knee and may result in a need for further surgery. Stairs are a particular hazard until your knee is strong and mobile. You should use a cane, crutches, a walker, hand rails or someone to help you until you have improved your balance, flexibility and strength.

Michael and the physiotherapist will help you decide what assistive aides will be required following surgery and when those aides can safely be discontinued.



Dental Procedures

The Australian Arthroplasty Society has recommended that there is no longer a need to have prophylactic (preventative) antibiotics prior to undergoing dental procedures (unless immunocompromised or there are concerns about mouth infection).



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How your new knee is different

You may feel some numbness in the skin around your incision. You also may feel some stiffness, particularly with excessive bending activities. Improvement of knee motion is a goal of total knee replacement, but restoration of full motion is uncommon. The motion of your knee replacement after surgery is predicted by the motion of your knee prior to surgery. Most patients can expect to nearly fully straighten the replaced knee and to bend the knee sufficiently to go up and down stairs and get in and out of a car. Kneeling is usually uncomfortable, but it is not harmful. Occasionally, you may feel some soft clicking of the metal and plastic with knee bending or walking. These differences often diminish with time and most patients find these are minor, compared to the pain and limited function they experienced prior to surgery.

Your new knee may activate metal detectors required for security in airports and some buildings. Tell the security agent about your knee replacement if the alarm is activated.

After surgery, make sure you also do the following:-

- Participate in regular light exercise programs to maintain proper strength and mobility of your new knee;
- Take special precautions to avoid falls and injuries. Individuals who have undergone total knee replacement surgery and suffer a fracture may require more surgery;
- Attend periodically for a routine follow-up examination and x-rays, usually once a year, even if your knee replacement seems to be doing fine.