



## Knee replacement surgery

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. Many knee replacements are performed each year in the United Kingdom.

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



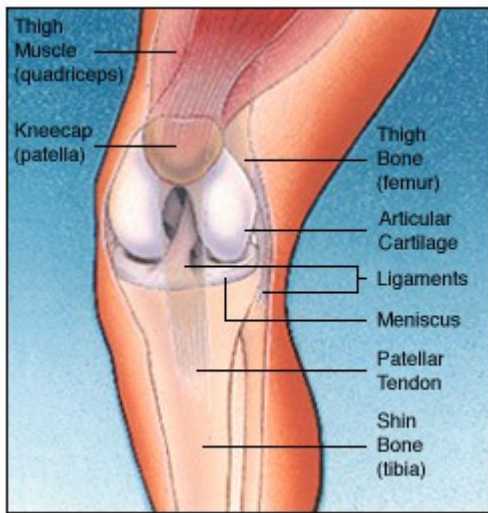
### How the Normal Knee Works

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.

All remaining surfaces of the knee are covered by a thin, smooth tissue liner called the synovial membrane. This membrane releases a special fluid (synovial fluid that contains Hyaluronic Acid) 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.



Normal Knee Anatomy

## 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 (articular cartilage) 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 releases substances that 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.



## Is Total Knee Replacement for You?

The decision whether to have total knee replacement surgery should be a cooperative one between you, your family and Mr Jari. Your GP may refer you to Mr Jari for a thorough evaluation to determine if you could benefit from this surgery. Alternatives to traditional total knee replacement surgery that Mr Jari may discuss with you include a unicompartmental knee replacement or a minimally invasive knee replacement.

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 yards 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 aspirin 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
- \* Failure to substantially improve with other treatments such as cortisone injections, physiotherapy, or other surgeries such as arthroscopic debridement.

Recommendations for surgery are based on a patient's pain, disability and quality of life, 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.

### **The Orthopaedic Evaluation**

The orthopaedic evaluation consists of several components:

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

Mr Jari 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 your function. Other treatment options--including medications, injections, physiotherapy, or other types of surgery--also will be discussed and considered.

Mr Jari also will explain the potential risks and complications of total knee replacement, including those related to the surgery itself and those that can occur over time after your surgery.



## 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.

More than 90 percent of individuals who undergo total knee replacement experience a dramatic reduction of knee pain and a significant improvement in the ability to perform common activities of daily living. But total knee replacement won't make you a super-athlete or allow you to do more than you could before you developed arthritis.

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 replacements can last for many years.

<p><b>Dangerous Activity After Surgery</b>            jogging or running • contact sports            jumping sports • high impact aerobics</p>
<p><b>Activity Exceeding Usual Recommendations After Surgery</b>            vigorous walking or hiking • skiing            tennis • repetitive lifting exceeding 50 lbs.            repetitive aerobic stair climbing</p>
<p><b>Expected Activity After Surgery</b>            recreational walking • swimming            golf • driving • light hiking            recreational biking • ballroom dancing            normal stair climbing</p>

## Preparing for Surgery

### Medical Evaluation

If you decide to have total knee replacement surgery, you will be asked to have a pre-operative assessment by specialist nurses in the hospital where your surgery will be performed a few weeks

before surgery to assess your health and to rule out any conditions that could interfere with your surgery.

## **Tests**

Several tests-such as blood samples, a electrocardiogram (heart tracing), a urine sample and some skin swabs will be needed to help to prepare for your surgery.

## **Preparing Your Skin and Leg**

Your knee and leg should not have any skin infections or irritation. Your lower leg should not have any chronic swelling. Contact your Mr Jari prior to surgery if either of these conditions is present for a program to best prepare your skin for surgery. Do not shave your leg or knee prior to your surgery.

## **Medications**

Tell Mr Jari and your anaethetists about the medications you are taking. He or she will tell you which medications you should stop taking and which you should continue to take before surgery.

## **Dental Evaluation**

Although the incidence of infection after knee replacement is very low, an infection can occur if bacteria enter your bloodstream. Treatment of significant dental diseases (including tooth extractions and periodontal work) should be considered before your total knee replacement surgery.

## **Urinary Evaluations**

A preoperative urological evaluation should be considered for individuals with a history of recent or frequent urinary infections. For older men with prostate disease, required treatment should be considered prior to knee replacement surgery.

## **Social Planning**

Though you will be able to walk on crutches or with a zimmer frame from the day of your operation, you will need help for several weeks with such tasks as cooking, shopping, bathing and doing laundry. If you live alone, your GP and a social worker or a discharge planner at the hospital can help you make advance arrangements to have someone assist you at home. They also can help you arrange for a short stay in an extended care facility during your recovery, if this option works best for you.

## **Home Planning**

Several suggestions can make your home easier to navigate during your recovery. The hospital Occupational Therapists can help with this via the Social Services.. 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 raise with arms, if you have a low toilet
- \* A stable shower bench or chair for bathing

\* Removing all loose carpets and cords

\* A temporary living space on the same floor, because walking up or down stairs will be more difficult during your early recovery



## Your Surgery

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

The procedure itself takes about one to two hours. Mr Jari will remove the damaged cartilage and bone and then position the new metal and plastic joint surfaces to restore the alignment and function of your knee.

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). Mr Jari, and many other surgeons, does not resurface your kneecap (patella) routinely. The reason for this is that there is no clear evidence in the scientific literature to support this. So at the end of the operation, the femur and tibia will have been replaced and you will still have your own kneecap.



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. In the recovery room your leg will probably be put in a Continuous Passive Movement (CPM) machine, which will gently move your knee for you and elevate your leg.



Picture of Leg on a CPM machine with a Cryo-cuff on the left knee. This person did not have a knee replacement, but a different operation.



You may also have a Cryocuff (cold compression device) on your knee which will be put on in the operating theatre. This device helps to control your swelling as well as helping with your pain control.



Cryocuff connected to ice/water bucket

Then you will be taken to your hospital room.

### **Unicompartmental Knee Replacement**

Although not as common as total knee replacement, the partial or unicompartmental knee replacement is a viable alternative in limited situations.



Picture of a unicompartmental knee replacement

The designs of the unicompartmental types of knee replacements have improved over the years, as has the sophistication of the instruments used to implant these types of artificial joints. The unicompartmental knee replacement also has smaller, less invasive incisions.

The "uni," as it is commonly called, is used to replace a single compartment of the arthritic knee. The knee joint has three compartments: the medial (inner) compartment, the lateral (outer) compartment and the patellofemoral (kneecap) compartment. If the damage is limited to either the medial or lateral compartment, that compartment may be replaced with the uni. If the damage is limited to the patellofemoral compartment, an isolated patellofemoral replacement can be undertaken.

A patellofemoral joint replacement



If two or more compartments are damaged, the uni may not be the best option. The uni is also less desirable for a young, active person because it may not withstand the extremes of stress that high levels of activity create. It is best suited for the older, slim person with a relatively sedentary lifestyle. Only between six and eight out of 100 patients with arthritic knees are good candidates for a unicompartmental knee replacement.

Because the uni can be inserted through a relatively small incision (about 3" or 4" long), which does not interrupt the main muscle controlling the knee, rehabilitation is faster, hospitalization is shorter and return to normal activities is more rapid than after a total knee replacement.



However, this is still a serious operation, which has all the same risks as total knee replacement. These risks, as well as whether you are a good candidate for the uni, should be discussed with Mr Jari.

### **Minimally Invasive Knee Replacement**

A recent advance in the performance of total knee replacement is the use of minimally invasive approaches. This technique, still in its relative infancy, is more challenging than standard total knee replacement. The incisions are approximately half the size of those used in a standard approach. The smaller incisions and new techniques to expose the joint result in short-term advantages such as a quicker rehabilitation, possibly less pain and a shorter hospitalization, according to some reports.

Photo showing a standard TKR incision on patient's left knee (by another surgeon) and minimally invasive incision TKR by Mr Jari on patient's right knee



The minimally invasive approach to the total knee replacement is appropriate for most patients who have reasonable motion without significant deformity. Hospitalization is usually reduced to one to three days among these patients, and the need for an extended stay for inpatient rehabilitation may be reduced or eliminated in most patients.

### **Your Stay in the Hospital**

Mr Jari's patients following minimally invasive TKR are in hospital an average of 3 days following their operation.

After surgery, you will feel some pain, but medication will be given to you to make you feel as comfortable as possible, including pain killers in your spinal anaesthetic, if appropriate. Pain management is an important part of your recovery. Mr Jari will prescribe you regular pain medication to take including Paracetamol, an Anti-inflammatory drug and a codeine based drug. These must be taken regularly for 3 weeks to prevent you having pain and so allowing you to undertake your rehabilitation exercises. If you develop any side effects to the pain tablets, then you must stop them (you will be told about what to watch out for) and contact your GP for alternate pain medication.

Walking and knee movement are important to your recovery and will begin immediately after your surgery. You may initially be on a CPM machine (see above) to restore movement in your knee and

leg. The CPM machine, decreases leg swelling by elevating your leg and improves your venous circulation by moving the muscles of your leg. You will also do regular 2 hourly active exercises as will be explained to you by the physiotherapists. The physiotherapists will also get you up and walking on the day of your operation, if all is well.

To avoid lung congestion after surgery, you should breathe deeply and cough frequently to clear your lungs. It is advisable to take 10 deep breathes and cough 10 times every hour, for the first week after your operation.

Mr Jari will prescribe one or more measures to prevent blood clots and decrease leg swelling, such as special support stocking (TED), inflatable leg coverings (compression boots) and blood thinners (Asprin or Heparin).



A TED stocking on the left leg to help reduce knee swelling and reduce the risk of clots forming in the leg. These are worn on both legs all the time for 6 weeks except when showering. The stockings must not be allowed to roll down the leg or they can cause increase swelling in the leg by constricting blood flow.

Foot and ankle movement also is encouraged 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 of their 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. Your prevention program will 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 optimized, wear of the bearing surfaces or loosening of the components will occur over the years. If this becomes a problem, you may need a revision of your knee replacement.

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. In general terms you should expect to get back a similar, but greater, range of movement than you had before your operation.

Finally, while rare, injury to the nerves or blood vessels around the knee can occur during surgery as can fracture to the bones around the knee, especially if your bone density is reduced (Osteoporosis).

Discuss your concerns thoroughly with Mr Jari prior to surgery.

### **Your Recovery at Home**

The success of your surgery also will depend on how well you follow your Mr Jari's instructions at home during the first few weeks after surgery.

### **Wound Care**

You will have stitches or staples running along your wound or a suture beneath your skin on the front of your knee. The stitches or staples will be removed 10-12 days after surgery. A suture beneath your skin will not require removal.

Avoid soaking the wound in water until the wound has thoroughly sealed and dried (about 3 weeks). The wound may be bandaged to prevent irritation from clothing or support stockings.

## **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.

## **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
- \* Specific exercises several times a day to restore movement and strengthen your knee. You probably will be able to perform the exercises without help, but you will have a physiotherapist help you at home or in the hospital the first few weeks after surgery.

Driving usually begins when your knee bends sufficiently so you can enter and sit comfortably in your car and when your muscle control provides adequate reaction time for braking and acceleration. Most individuals resume driving about four to six weeks after surgery.

## **Avoiding Problems After Surgery**

### **Blood Clot Prevention**

Follow your Mr Jari's instructions carefully to minimize 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
- \* Increasing swelling in your calf, ankle and foot

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

- \* Sudden increased shortness of breath
- \* Sudden onset of chest pain
- \* Localized chest pain with coughing

Notify your GP or go to the A&E department 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 during dental procedures, urinary tract (bladder) infections, or skin infections. These bacteria can lodge around your knee replacement and cause an infection.

For the first two years after your knee replacement, you must take preventive antibiotics before dental or surgical procedures that could allow bacteria to enter your bloodstream. After two years, talk to Mr Jari and your dentist or urologist to see if you still need preventive antibiotics before any scheduled procedures.

Warning signs of a possible knee replacement infection are:

- \* Persistent fever (higher than 100 degrees orally)
- \* Shaking chills
- \* Increasing redness, tenderness or swelling of the knee wound
- \* Drainage from the knee wound
- \* Increasing knee pain with both activity and rest

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

### **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 stick, crutches, a zimmer frame, hand rails or someone to help you until you have improved your balance, flexibility and strength.

Mr Jari and your physiotherapist will help you decide what assistive aides will be required following surgery and when those aides can safely be discontinued.

### **How Your New Knee Is Different**

You will 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.
- \* Notify your dentist that you had a knee replacement. You should be given antibiotics before all dental surgery for the rest of your life.
- \* See Mr Jari periodically for a routine follow-up examination and X-rays.

Mr Jari is a medical doctor with extensive training in the diagnosis and non-surgical and surgical treatment of the musculoskeletal system, including bones, joints, ligaments, tendons, muscles and nerves.

*This information has been prepared by the Mr Jari using documents from the American Academy of Orthopaedic Surgeons and is intended to contain current information on the subject. However, it does not represent any official policy and its text should not be construed as excluding other acceptable viewpoints. Persons with questions about a medical condition should consult a doctor who is informed about the condition and the various modes of treatment available.*