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Patients Information for Knee Replacement Surgery

Anatomy of Knee

The knee joint is formed where the thigh bone (femur) meets the shin bone (tibia). A smooth cushion of articular cartilage covers the ends of both these bones. Healthy cartilage absorbs stress and allows the bones to glide across each other smoothly. This cartilage is kept slippery by joint fluid (synovial fluid) made by the joint lining (synovial membrane). The fluid is contained in a soft tissue enclosure around the knee called the joint capsule.

The ligaments give the knee stability, and the muscles power the knee and leg for movement.

The kneecap (patella) is the moveable bone on the front of the knee. It is situated within a tendon that connects the muscle on the front of the thigh (quadriceps) to the lower leg. The surface on the back of the patella is covered with articular cartilage also. It glides within a groove on the front of the femur.

Why joint replacement is needed?

A healthy joint is one that bends easily. It absorbs stress and allows pain- free movement and activities. When the joint is damaged, it may lose the ability to cushion stresses placed upon it, and movement may become painful. Sometimes a damaged knee joint will swell and hurt even when you are at rest.

It is the articular cartilage that covers the ends of the bones that becomes damaged. It starts to crack and wear away. The cartilage is not able to heal itself, and the damage may keep increasing. At first, the knee may be just a little stiff, but as the bones begin to rub together you are more likely to feel pain.

A joint replacement gives the knee new surfaces, which move smoothly and less painfully. It is not the same as a healthy joint, but works well. The goal of joint replacement is to give pain relief, which may help you return to many of your activities.

Osteoarthritis (OA)

This is a degenerative disease. Years of normal use can cause articular cartilage to crack and wear away. As the ends of the bones rub against each other they become rough and pitted, and eventually the cartilage may wear away altogether. This results in stiffness, pain and loss of function.

Being overweight, or having alignment problems, (e.g. bow legs or knocked knees) puts extra stress on the joint, which may speed up the damage process.

According to the World Health Organisation osteoarthritis affects half the world's population over the age of 65. The causes are not well understood. Ageing is the factor most strongly associated with OA. Genetic factors are among the major causes.

Onset of OA can also occur as a secondary effect of injury. For example, a bad fall, blow to the knee, previous fracture, or ligamentous injury can injure the articular cartilage leading to OA.

Rheumatoid Arthritis (RA)

This is an inflammatory joint disease. It can cause swelling and heat in the joint lining. It usually affects multiple joints throughout the body. As the disease progresses, the articular cartilage is destroyed and, eventually, the bone itself is also affected. Joints are usually painful, hot, swollen and stiff.

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Benefits of Surgery

Once your new joint has healed properly, you should look forward to some or all of the following benefits:
• Greatly reduced joint pain.
• Increased leg strength. Without knee pain you will be able to exercise more and this will help to build up the muscles around the knee.
• Improved quality of life by allowing you to do daily tasks and low-impact activities in greater comfort.
• Correction of angular leg deformity i.e. knock-knee or bow-legs.

Alternatives to Surgery

Not everyone wishes to have, or requires, knee joint replacement when they have damage to their articular cartilage. Some people will have different pain tolerances, and others may not wish to undertake the risks this surgery carries.

Alternatives to surgery include:

• Regular pain medication.
• Using walking aids to reduce stress on the joint.
• Weight loss to reduce stress on the joint.
• Special shoe inserts that help to cushion the joint.
• Exercises to maintain joint movement, muscle strength and help with pain relief.
• Activity modification.

Only when these measures fail to give acceptable pain relief, is a total knee replacement offered.

Satisfaction with Surgery

It is important that you should be satisfied with the result of your knee replacement. It is said that a knee replacement that works well can give you the knee of a sixty year old.

Satisfied patients with realistic expectations:

• Follow instructions better
• Recover quicker
• Their replacement lasts longer

Satisfaction has been shown to depend on these three factors:

1. Severity of preoperative pain and stiffness. The more pain you have before the operation, the greater the relief the surgery may give.

2. Outcome of the operation. The less the operation relieves the pain the lesser the satisfaction will be.

3. Expectations before the operation. Very high expectations usually are not satisfied by knee replacement.

It is important to realise that not all your knee pain may be abolished after your surgery. Immediately after surgery, the gnawing severe pain will have gone and be replaced by surgical pain. This may last up to 6 months but should lessen over time. Pain medication may still be needed because of this.

You may experience occasional pain in your new knee after walking and other activities. The relief of this type of pain is individual, depending on the severity of preoperative deformity in your knee, on the state of your muscles, and so on.

Remember your surgeon replaced only the damaged joint surfaces but could do nothing to the muscles, ligaments and other soft tissues equally damaged by the “joint” disease.

Post Operation Complications

As with all major surgical procedures, complications can occur although everything possible is done to minimise the risks. It is important you understand the following before undertaking joint replacement surgery.

• Anaesthetic risks – will be discussed with you by your Anaesthetist.
• Deep Vein Thrombosis (DVT) – “clot in the calf” – 10% risk.
• Complex Regional Pain Syndrome. (An abnormal pain reaction to any surgery, which may need prolonged physiotherapy or pain clinic).
• Infection – this can occur while you are still in hospital, or may not become apparent for months or even years later. The overall risk is 1-3%
• Stiffness – occasionally the ability to bend the knee does not return to normal. If your knee is still stiff and not improving 3 months after surgery, it may mean a return to theatre to regain movement when you are under anaesthetic.
• Loosening – This is the major reason replacement joints fail. A loose prosthesis is a problem because it causes pain. Eventually it will lead to a further operation to revise the joint.
• Damage to nearby blood vessels and nerves are very rare but may sometimes happen.
• Death 1% - commonest causes are blood clots on the lungs or heart problems.

Preparation for Surgery

The decision to proceed with surgery should be made jointly by you, the patient, and your surgeon. This decision should only be made after you feel that you understand both the benefits and the risks involved with this surgery and have had chance to ask questions.

If you decide to proceed, you will have to attend a pre-operative clinic when the time for your surgery is near. At this time, you will be assessed to determine your fitness for anaesthesia, after reviewing all the reports. There will also be another opportunity to ask questions.

Once you are listed for surgery, make sure that you have any tooth or gum problems treated before your operation. If you don’t, there is a risk that germs in your mouth could enter the blood stream and infect your new joint. If for any reason you change your mind about surgery, it is not a problem, but it is better to let us know in advance of your surgery date, so that we can allocate another patient in your place.

Your stay in hospital

What do I have to do before my surgery?

• You will come to show the reports and meet the Anaesthetist about a week prior to your date of surgery. Usually you will be admitted on the day before your surgery.
• For 72 hours prior to your admission, avoid alcoholic drinks and drink 3-4 litres of fluid e.g. tea, water every day.
• If you smoke, try to stop prior to your admission to hospital.
• If you develop a cough, cold, chest or skin infection, or an infected in-growing toenail, please let us know, as it may be necessary to postpone surgery until you have recovered.

What will happen on admission to hospital?

• The anaesthetist will see you. They will discuss the anaesthetic with you and your pain management after the operation. You can also discuss any worries you may have.
• If you did not see a doctor at your pre-operative visit, the doctor will see you, explain the operation again and you will sign the consent form and go for an x-ray if necessary.
• The doctor will also mark your appropriate leg with a felt tip.

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What will happen on the day of my operation?

• You will not be able to eat or drink (including water, sweets) for a minimum of 6 hours before your surgery.
• You will be asked to take a bath or a shower before the operation.
• You will be taken to theatre, on a trolley, by a nurse.

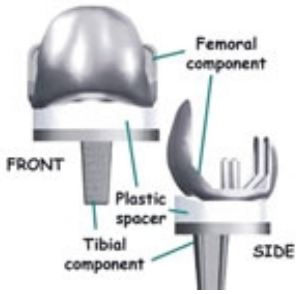
The artificial knee

A cemented prosthesis is used at Kokilaben Hospital.

The surgeon makes the decision regarding which prosthesis to use, based on your age, your lifestyle and the surgeon's experience.

Each prosthesis is made up of three main parts:

1. The tibial component (bottom portion) replaces the top surface of the lower bone the tibia, and is made of titanium or cobalt-chrome.
2. The femoral component (top portion) replaces the bottom surface of the upper bone (the femur) and the groove where the patella fits, and is made of cobalt chrome. A high-density polyethylene spacer sits between them.
3. A plastic patellar component (kneecap portion) is sometimes used to replace the surface of the patella where it glides in the groove on the femur.



The cemented prosthesis is held in place by acrylic cement that attaches the metal to the l

The operation

To begin the procedure, your surgeon makes an incision on the front of the knee to allow access to the joint. Once the knee joint is opened, a special positioning device (cutting guide) is placed on the end of the femur. This cutting guide is used to ensure that the bone is cut in the proper alignment to the leg's original angles (even if the arthritis has made you bow-legged or knock-kneed). With the help of the cutting guide, your surgeon cuts several pieces of bone from the end of the femur.

The artificial knee will replace these worn surfaces with a metal surface. Next, the surface of the tibia is prepared. Another type of cutting guide is used to cut the tibia in the correct alignment. Then the articular surface of the patella may be removed, if your surgeon wants to replace this surface also.

The metal femoral component is then placed on the femur and secured. The metal tray that holds the plastic spacer is then attached to the top of the tibia. The plastic spacer is then attached to the metal tray of the tibial component. If a patellar component is to be used, your surgeon then sizes this and puts it into place behind the patella. This piece is usually cemented in place.

Finally the soft tissues are sewn back together and staples or sutures are used to hold the skin incision together.

After the operation, you will wake up in the recovery room in your bed.

The following may be attached to you:
• An oxygen mask - take occasional deep breaths.
• A drip in your arm.
• A blood transfusion may rarely be necessary.
• Catheter: a tube into your bladder.
• Heavy bandage and splint to the full length of your leg.
• Medication will be administered to prevent blood clots.
• Drains- inserted into your knee (not all patients will have these) these can collect the blood that would otherwiseremain inside the joint.

• Pain relief system- remember, we can only help you with pain if you tell us how the pain is.
• Your leg may be elevated on pillows.

Once you are stable in recovery, you will be taken back to the ward. That evening you will rest and the nurses will check you regularly. You can have visitors but you are likely to be tired and drowsy, so try and keep them to a minimum.

If you feel up to it, you will be made to stand up and take a few steps.

What will happen on the days following my surgery?

Day one
• You will be assisted with a full bed bath.
• You will have a blood test.
• The drip will be taken down if you are drinking well, not feeling sick and do not need a blood transfusion.
• The drains and dressings will be removed.
• You will be able to start some exercise, under the supervision of the physiotherapist. The exercises are shown later in the booklet. You will be given breathing exercises to help your chest after the anaesthetic, and they also help circulation. Moving both your feet and ankles up and down and in circles quite vigorously also helps circulation.
• If you feel well enough, you will be able to sit out of bed, with assistance. You may feel tired so take it slowly.
• When lying in bed, or sat in the chair, keep moving feet and ankles up and down to help with your circulation.
• The physiotherapist or assistant will see you 1or 2 times a day.
• Use the advice and exercises in this booklet to help you treat yourself regularly.

Day two
• The drains and dressings will be removed.
• The bandages will be removed.
• The splint may still be used when walking, but will be removed for exercise.
• You will start to walk, usually with a walker.
• The physiotherapist will instruct you on exercises to get your knee bending. Should this prove difficult, then a continuous passive motion (CPM) machine may be used. This bends the knee for you and can be left on for long periods. The aim is to get the knee to bend to at least 90 degrees. It does not replace the need for you to continue with your own exercises. The knee will feel tight and sore to bend but will get easier with time.
• The knee will still be sore, so keep taking pain relief medication as needed.
• If the knee is swollen, ice will be offered, do not keep this on for more than 15-20 minutes. You may ask for ice at anytime.
• Elevating the leg on a stool or bed will also help reduce swelling.

Day three and onwards
• You will have a check x-ray taken, if it hasn't already been taken.
• Your walking will continue to improve as you become more confident.
• The catheter in your bladder, if you have needed one, will be removed when you are able to walk to the toilet, and you will be given an intramuscular injection of antibiotics.
• Knee exercises will continue and, when you are able to lift your leg without help, the knee splint will be discarded.
• When you are safe on your crutches, the physiotherapists will show you the correct way to negotiate stairs (if appropriate).

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1 Bend and straighten your ankles briskly.Repeat ___ times.
2. Lying on your back or sitting rotate your ankles. Change directions. Repeat ___ times
3 Lying on your back or sitting with legs straight. Pull your toes up towards you and push your knee down firmly against the bed. Hold 5 seconds. Repeat ___ times.
4 In lying/sitting with leg straight. Lift your leg 2-3 inches only keeping knee straight. Hold 5 seconds. Repeat ___ times.

Length of stay in hospital

You will be allowed to go home when your knee is bending well, and your consultant is happy with your progress. You will also need to be safe on your crutches, be able to negotiate stairs, manage to get off a chair, toilet and bed, and generally be able to look after yourself at home if necessary.

Most people leave hospital 5-7 days following their surgery (8 days if they have had both knees replaced). If there are any postoperative complications, then you may need to stay longer. You can travel home in a car. An ambulance may be arranged on request.

What to do at home

Continue with all your exercises and keep progressing your walking. You will be given the contact details of a physiotherapist who will come home on a daily basis to ensure that you are progressing well. Do not drive until you can safely do so.

This is an operation that requires hard work and determination. Your knee will be sore at times and to get the knee bending and the muscles working again will be hard work, which only you will be able to do.

Remember, every patient and every joint is different, and that this booklet is only meant as a guide as to what may happen during your hospital stay. Don't worry if some days your knee is more stiff, swollen or painful than others, it will get better.

Physio/Rehabilitation

The success of this operation depends on the surgery, and also your rehabilitation afterwards. It is important you are aware of this and willing to put lots of effort in yourself. You may need to exercise your knee for 6 months following your surgery, or longer if necessary.

Seating/Furniture Heights

You need to be sure that anything you sit on is high enough - your bottom should be at least as high as your knees, and your thighs should slope away from you. You may need a raised toilet seat, and your chair or bed may need to be raised up. Your physiotherapist will advise you on the ideal furniture heights and help to arrange this prior to your discharge.

Try to arrange your chair so that telephone, coffee table etc can be reached without twisting.

Sleeping

You will need to sleep on your back for the first 6 weeks. From 6-12 weeks you are allowed to sleep on your operated side when comfortable to do so. After 12 weeks you are able to sleep on either side.

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Cooking

You will still be able to make your meals, but remember, you may feel more tired when you first come home You will need to use walking aids, so you won't be able to carry meals from one room to another.

Social

You may still want to go out – just remember that you will need something suitable to sit on. You may need to take your toilet seat. Try to avoid crowded places where you would be tempted to twist, or be jostled.

Transport

Most people can travel in a car as a passenger after surgery.

To get into and out of the car on the passenger side:

· Park the car away from the kerb, so that you are standing on the same level as the car.

· Have the seat pushed as far back as possible.

· Have the seat reclined.

· Place a cushion on the seat to increase the height of the seat.

· Place a plastic bag on the seat; this will make it easier to swing your legs around.

· Before sitting down, put your left hand onto the top of the passenger seat for support, and with the door window fully wound down, grip the open door window frame with your right hand. Someone should hold the door to prevent you pulling it towards you.

· Gently lower yourself down and remember to keep your operated leg straight out in front of you and do not twist.

· Slide back over the passenger seat until your bottom is well back, use the drivers seat too if necessary.

· Swing both legs around together, remembering to keep your leg in line with the shoulder on the same side.

· Remove the plastic bag before travelling and re-insert the plastic bag when getting out of the car.

· To get out of the car, do the same procedure in reverse.

Physiotherapy Rehabilitation

The following exercises will be taught to you during the first few days of your hospital stay. These exercises will help you to recover more quickly from the surgery. They should be performed 3-4 times a day, 5-10 repetitions of each.

Circulatory exercises – to be performed hourly for the first 1-3 days after your operation.

Bend and straighten your ankles briskly.
Repeat ___ times.

Lying on your back or sitting rotate your ankles. Change directions.
Repeat ___ times.

Lying on your back or sitting with legs straight.
Pull your toes up towards you and push your knee down firmly against the bed. Hold 5 seconds.
Repeat ___ times.

Lying on your back.
Squeeze buttocks firmly together. Hold 5 seconds.
Repeat ___ times.

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The following exercises may be performed, as your discomfort settles and your leg becomes stronger. You should be able to do these exercises whilst you are in hospital, if not, they should be introduced soon after returning home.

5 Lying on your back. Squeeze buttocks firmly together. Hold 5 seconds. Repeat ___ times.

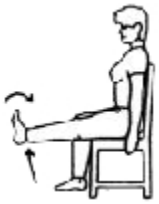
Sitting with back supported. Place a rolled towel under your knee. Pull your toes up towards you, straighten your knee and push it down against the towel. You can add a small weight over the ankle to make the muscle stronger.
Hold 5 seconds.
Repeat ___ times.

Diaphragmatic breathing.

Lie on your back.

Put your fingers in the fleshy part of your abdomen just below your breastbone.

Gently breathe in allowing your fingers to rise; your upper chest should remain still. As you breathe out your fingers should lower.



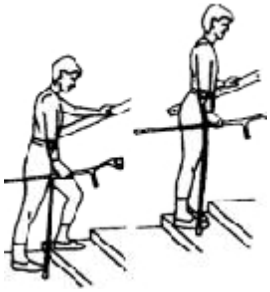
Sit on a chair. Pull your toes towards you, tighten your thigh muscle and straighten your knee. Hold 5 seconds. Repeat ___ times

Sit with leg straight. Push your kneecap outwards. Hold 5 seconds. Repeat ___ times.

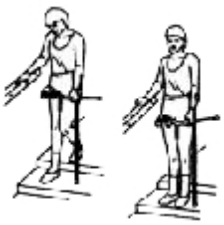
Sit with leg straight. Push your kneecap towards your opposite leg. Hold 5 seconds. Repeat ___ times.

Sitting on the bed place a sock on your foot. Place a slippery board/tray under your foot and a band around it. Bend your knee as far as possible. Gently pull the band to bend a little more. Hold 5 seconds. Repeat ___ times.

Sit on a chair with your feet on the floor. Bend your knee as much as possible. Repeat ___ times.
You can cross ankles and use opposite foot to pull the operated leg further under.



First take a step up with your healthy leg. Then take a step with your affected leg. Then bring your crutch up onto the step. Always go one step at a time



First put your crutch one step down. Then take a step with your affected leg. Then take a step down with your healthy leg, onto the same step as your affected leg. Always go one step at a time.

Stand with support. Push up on your toes.
Repeat ___ times.

Stand with support. Bend your operated knee behind you and lift your foot off the floor.
Repeat ___ times.

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Sit on a chair, with a cushion under your knee and a ___kg weight around your ankle. Pull your toes up towards you, tighten your thigh muscle and straighten your knee. Hold 5 seconds.
Repeat ___ times.

Lying on your back with knees bent. Squeeze your buttocks together and lift your bottom off the floor. Return to starting position.
Repeat ___ times.

Stand in front of a 20-40 cm step. Step up ___ times with one leg leading and then repeat with the other leg leading.
Repeat ___ times

Sitting with your arms crossed. Stand up and then sit down slowly on a chair. (This can be made easier or more difficult by changing the height of the chair).
Repeat ___ times.

Stand with/without support. Lift one leg and balance.

General Information

When you return home, keep your leg elevated for the majority of the time when you are resting, to help with the reduction of swelling. It is very normal for your leg to swell and this can take many weeks to get better.

If your knee becomes more swollen and warm it may be worth using ice to reduce your symptoms. To do this, make sure the ice is in a sealed bag, and then wrapped in a damp towel. Apply the ice for no longer than 10 minutes at any one time. You can use ice every hour if necessary.

Make sure you continue to do your exercises at least 2-3 times a day. Gradually increase the distance you walk over the coming days and weeks.
Avoid standing for long periods, as this will be uncomfortable and lead to more swelling in the knee joint.

Do not twist your knee, as can happen when you turn your body without moving your feet.

Skin care

Once the wound has healed, you can massage the scar and surrounding area with a non-perfumed moisturising

cream or oil. This helps to keep the skin supple and mobile, which can make the knee easier to bend. Please ask your therapist if you are unsure when or how to do this. If you expose your knee to the sun, make sure you apply a sun block or high factor sun cream to the scar, as initially it is very sensitive and can burn easily.

Remember to let your dentist know that you have had a joint replacement. The dentist may need to give you antibiotics following certain dental procedures to prevent infection.

Please seek advice if you experience any of the following

- The wound bleeds or discharges continuously.
- You feel feverish, shivery, have a temperature or feel sick.
- Your knee becomes very hot and red (It is normal for the wound to feel warm to touch).
- Increased pain not helped by medication or rest.
- Increased painful swelling not helped by ice and elevation.
- Increased pain in the calf muscle.
- Sudden onset of shortness of breath and pain when you take a breath in.

Goals to aim for

The following are general goals. You may find you achieve most or none of these, but it is important to remember every person is an individual and you will progress at your own rate. Everyone's joint and surrounding tissues are also different at the time of surgery so try and avoid comparing your progress to that of others you see during your rehabilitation.

- To regain 90 degrees of knee bend by 1 week post operatively – ideally prior to discharge from hospital.
- To be able to get the knee fully straight within 2 weeks.
- Be able to walk without walking aids between 6-12 weeks.
- Back to driving at the earliest 6 weeks.
- Be able to climb stairs normally 3-4 months.
- If your knee is your only painful joint, you should be able to stop your pain relief by 6-12 weeks.

Commonly Asked Questions

Can I return to playing sports after my total knee replacement?
You can return to playing low-impact sports. This means sports that don't put high stresses on your knee. These include golf, bowling, cycling or swimming.

When will I experience the full benefit from surgery?
Although you will experience relief of your pre-operative pain quite soon after the operation, the return of full function can take much longer. After three months, you will probably have regained some of the strength in the muscles around the knee, and range of movement will be improving. However, it may take up to 18 months to feel the full benefits.

When will I be able to drive?
You are able to drive 6 weeks after the operation, providing there have been no problems in your rehabilitation. If you have an automatic car, and have had a left knee replacement, you could return to driving once the wound is healed, which is usually around 2 weeks post op.

How long will my joint replacement last?
Research shows at 10 years 97% of knees are functioning satisfactorily this reduces to 95% at 15 years and 70% at 20 years.

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When will I be able to fly?
You are able to fly no sooner than six weeks after your operation. Your risk of having a DVT (clot in the calf) is still high within this time period.

Will I set off the alarm at the airport?
The prosthesis is made of titanium and cobalt chrome and, in theory, shouldn't set off the alarms. If the alarm does go off, then the scar on your knee will help confirm that you have had knee surgery. If you are worried then you could ask your consultant for a letter to confirm you have had a joint replacement.

Is it normal for my knee to make a noise when I move it?
Yes. This is the metal and plastic components moving over each other.

Can I kneel after my knee replacement?
A third of patients find this is difficult and painful to do following this type of surgery. Kneeling on hard surfaces is not recommended but special kneeling mats can sometimes help.

Will any further surgery be required?
On a few occasions, some patients may find their knee is very stiff even though they have tried hard to get it to bend. Your surgeon may then recommend a manipulation. This involves going back to theatre and being put to sleep again. The knee is then bent as far as it will go and you return to the ward. Your knee is then placed on a machine, which keeps the knee bending. There is no wound to heal like with the initial operation, but it is still hard work for you to maintain the movement that has been gained. Eventually, the knee replacement can wear out and another (revision) knee replacement may be needed.

Will I be pain free?
The majority of patients may well be pain free and no longer need painkillers. About a third of patients will have some pain, but it should be much less than the pain they had before the operation.