

Knee replacement

Introduction

Knee replacement surgery (arthroplasty) involves replacing a damaged, worn or diseased knee with an artificial joint.

It's a routine operation for knee pain most commonly caused by arthritis.

Most people who have a total knee replacement are over 65.

For most people, a replacement knee will last for at least 15 to 20 years, especially if the new knee is cared for properly and not put under too much strain.

Types of surgery

There are two main types of surgery, depending on the condition of the knee:

total knee replacement (TKR) – both sides of your knee joint are replaced

partial (half) knee replacement (PKR) – only one side of your joint is replaced in a smaller operation with a shorter hospital stay and recovery period

Learn more in how knee replacement surgery is performed.

Why is knee replacement surgery needed?

The most common reason for knee replacement surgery is osteoarthritis. Other conditions that cause knee damage include:

rheumatoid arthritis

haemophilia

gout

knee injury

A knee replacement is major surgery, so is normally only recommended if other treatments, such as physiotherapy or steroid injections, haven't helped reduce pain or improve mobility.

You may be offered knee replacement surgery if:

you have severe pain, swelling and stiffness in your knee joint and your mobility is reduced

your knee pain is so severe that it interferes with your quality of life and sleep
everyday tasks, such as shopping or getting out of the bath, are difficult or impossible

you cannot work or have a normal social life

Learn more in why knee replacement surgery is used.

Can I have knee replacement surgery?

Adults of any age can be considered for a knee replacement, although it's typically recommended for older people as young, physically active people are more likely to wear the joint out.

The earlier you have a knee replacement, the greater the chance you will eventually need further surgery. However, there is some evidence that replacing the knee joint before it becomes very stiff leads to a better outcome.

Most total knee replacements are carried out on people between the ages of 60 and 80. You will need to be well enough to cope with both a major operation and the rehabilitation afterwards. Read more about getting ready for knee replacement surgery and recovering from knee replacement surgery.

Are there any risks?

Knee replacement surgery is a common operation and most people do not experience complications. However, as with any operation, there are risks as well as benefits.

Complications are rare but can include:

stiffness of the knee

infection of the wound

deep infection of the joint replacement, needing further surgery

unexpected bleeding into the knee joint

ligament, artery or nerve damage in the area around the knee joint

blood clots or deep vein thrombosis (DVT)

In some cases, the new knee joint may not be completely stable and further surgery may be needed to correct it.

Read more about the risks of knee replacement surgery.

Why knee replacement is necessary

Knee replacement illustration

1. Upper prosthesis
2. Lower prosthesis
3. Tibia
4. Femur

Knee replacement surgery (arthroplasty) is usually necessary when the knee joint is worn or damaged to the extent that your mobility is reduced and you experience pain even while resting.

How the knee works

The knee joint acts as a hinge between the bones of the leg and is effectively two joints. The major joint is between the thigh bone of the upper leg (femur) and the shin bone of the lower leg (tibia). The smaller joint is between the kneecap (patella) and the upper leg (femur).

A smooth, tough tissue called articular cartilage covers the ends of the bones, allowing them to slide smoothly over each other. The synovial membrane that covers the other surfaces of the knee joint produces synovial fluid, which lubricates the joint, reducing friction.

If the articular cartilage becomes damaged or worn, the ends of the bones rub or grind together, causing pain and difficulty moving the knee joint.

Replacing the damaged knee joint with an artificial one can help reduce pain and increase mobility.

Causes of knee pain

The most common reason for knee replacement surgery is osteoarthritis.

Osteoarthritis in the knee occurs when the articular cartilage becomes damaged through natural wear and tear. The bones have little or no protection to prevent them rubbing against each other when the knee moves.

The bones may compensate by growing thicker and producing bony outgrowths to try to repair themselves, but this can cause more friction and pain.

Other conditions that may make knee replacement necessary include:

rheumatoid arthritis

haemophilia

gout

disorders that cause unusual bone growth (bone dysplasias)

death of bone in the knee joint following blood supply problems (avascular necrosis)

knee injury

knee deformity

When is surgery necessary?

You may be offered knee replacement surgery if:

you have severe pain, swelling and stiffness in your knee joint and your ability to move the joint is significantly reduced

your knee pain is so severe that it interferes with your quality of life and sleep everyday tasks, such as shopping or getting out of the bath, are difficult or impossible

you are feeling depressed because of the pain and lack of mobility

you cannot work or have a normal social life

Read information about how knee replacement surgery is performed.

Surgical alternatives to knee replacement

There are alternative surgeries to knee replacement, but results are often not as good in the long term. These are described below.

Arthroscopic washout and debridement

An arthroscope (tiny telescope) is inserted through small incisions in the knee. The knee is washed out with saline and any bits of bone or cartilage are cleared away. It is not recommended if you have severe arthritis.

Microfracture

A keyhole operation in which small holes are made in the surface layer of bone with a small, sharp 'pick'. This allows cells from the deeper, more blood-rich bone beneath to come to the surface and stimulate cartilage growth. It can be a good option if you have just a small area of damaged cartilage. However, the benefits are not well proven and the results are not as good as knee replacement for severe arthritis.

Osteotomy

An open operation in which the surgeon cuts the shin bone and realigns it so that weight is no longer focused on the damaged part of the knee. It is sometimes used for younger people with limited arthritis, where it may enable a knee replacement to be postponed. However, you will usually need a knee replacement at a later date, and the operation may make knee replacement surgery more difficult if it is needed.

Autologous chondrocyte implantation (ACI)

New cartilage from your own cells is grown in a test tube and introduced into the damaged area. It is usually used for accidental injury to the knee rather than arthritis. As yet, ACI is only available as part of a clinical trial.

Mosaicplasty (cartilage replacement)

A keyhole operation that involves transferring plugs of hard cartilage, together with some underlying bone from another part of your knee, to repair the damaged surface.

Read the NICE guidance on mosaicplasty for knee cartilage defects.

Before the operation

How can I prepare for going into hospital?

Get informed. Find out as much as you can about what is involved in your operation. Your hospital may provide written information or videos.

Arrange help. Arrange for a friend or relative to help at home for a week or two after you come out of hospital.

Sort out transport. Arrange for someone to take you to and from the hospital.

Prepare your home. Before you go for your operation, put your TV remote control, radio, telephone, medications, tissues, address book and a glass on a table next to where you will spend most of your time when you come out of hospital.

Stock up. Buy easy to prepare food, such as frozen ready meals, cans and staples like rice and pasta, or freeze meals and reheat them during your recovery.

Clean up. Before going into hospital, have a long bath or shower, cut your nails (take off any nail polish) and wash your hair. Put on freshly washed clothes. This helps prevent unwanted bacteria coming into hospital with you and complicating your care.

Read more information about preparing for surgery.

How can I prepare for the operation?

Stay as active as you can. Strengthening the muscles around your knee will aid your recovery.

If you can, continue to take gentle exercise, such as walking and swimming, in the weeks and months before your operation. You can be referred to a physiotherapist, who will give you helpful exercises.

What will happen before the operation?

A couple of weeks before the operation, you will usually be asked to attend a preoperative assessment clinic to meet your surgeon and other members of the surgical team.

They will take a medical history, examine you and organise any tests (such as blood tests and urine tests), ECGs (electrocardiograms) and X-rays needed to make sure you are healthy enough for an anaesthetic and surgery.

Take a list of any medication you are taking. Some rheumatoid arthritis medications suppress the immune system, which can affect healing. For this reason, you may be asked to stop taking your medication before surgery. Your surgeon can advise on alternative medications.

There may be leaflets, booklets and videos to look at or take away that can give you more information about the operation.

Read more information about seeing a specialist before an operation.

What happens during knee replacement surgery

You will usually be admitted to hospital on the day of your operation. The surgeon and anaesthetist will usually come and see you to discuss what will happen and answer any questions you have.

Who will do the operation?

A senior-level surgeon, consultant or registrar will perform surgery. You should be told at your preoperative assessment who will be doing the operation. If you are not told, do not be afraid to ask.

How is the operation carried out?

Knee replacement surgery is usually performed either under general anaesthetic (you are asleep throughout the procedure) or under spinal or epidural anaesthetic (you are awake but have no feeling from the waist down).

Modern knee replacements involve removing the worn ends of the bones in your knee joint and replacing them with metal and plastic parts (a prosthesis).

You may have either a total or a half-knee replacement (see below). This will depend on how damaged your knee is. Total knee replacements are the most common.

Read more information about what happens on the day of your operation.

Total knee replacement

In a total knee replacement (TKR), both sides of your knee joint are replaced. The procedure takes one to three hours:

Your surgeon makes a cut down the front of your knee to expose your kneecap. This is then moved to the side so the surgeon can get to the knee joint behind it

The damaged ends of your thigh bone (femur) and shin bone (tibia) are carefully cut away. The ends are precisely measured and shaped to fit the appropriately sized prosthetic replacement. A dummy joint is positioned to test that the joint is working properly. Adjustments are made, the bone ends are cleaned, and the final prosthesis is fitted

The end of your femur is replaced by a curved piece of metal, and the end of your tibia is replaced by a flat metal plate. These are fixed using special bone 'cement', or are treated to encourage your bone to fuse with the replacement parts. A plastic spacer is placed between the pieces of metal. This acts like cartilage, reducing friction as your joint moves

The back of the knee cap may also be replaced, depending on the reasons for replacement

The wound is closed with either stitches or clips. A dressing is applied to the wound, and sometimes a splint is used to keep your leg immobile

Total knee replacement is a common procedure and the replacement should last around 15-20 years.

However, you are still likely to have some difficulty moving, especially bending your knee, and kneeling may be difficult because of the scar.

Read more information about recovering from knee replacement surgery.

Partial (half) knee replacement

If only one side of your knee is damaged, you may be able to have a partial (half) knee replacement (PKR). PKR is a smaller operation, which uses a smaller incision, and involves less bone being removed. It is suitable for around one in four people with osteoarthritis.

There are advantages to PKR including a shorter hospital stay and recovery period. Blood transfusions are also rarely needed. PKR often results in more natural movement in the knee and you may be able to be more active than after a total knee replacement.

However, PKR does not always ease pain as well as a total knee replacement and it does not usually last as long, which is likely to mean further surgery at a later date. It is also less suitable for a young, active person.

Talk to your surgeon about the type of surgery they intend to use and why they think it is the best choice for you.

Other procedures

In some cases, there may be other types of procedure used. These are described below.

Kneecap replacement

If only your kneecap is damaged, an operation called a patellofemoral replacement or patellofemoral joint arthroplasty can be performed. This involves less major surgery with a faster recovery time. However, the long-term results are still unclear and it is not suitable for most people with osteoarthritis.

Mini-incision surgery (MIS)

The surgeon makes a smaller cut over the front of the knee than in standard knee replacement surgery. Specialised instruments are then used to manoeuvre around the tissue, rather than cutting through it. This should lead to a quicker recovery.

Read the NICE guidance on mini-incision surgery for total knee replacement.

Image-guided surgery

The surgeon performs this operation using computerised images, which are generated by attaching infrared beacons to parts of your leg and to the operating tools. These are tracked on infrared cameras in the operating theatre. Results so

far suggest that this may enable the new knee joint to be positioned more accurately.

Most hospitals do not yet have the equipment to do this and only around 1% of knee replacements are performed in this way.

Patient-specific knee replacement

This is a more recent advance in knee replacement surgery. A patient-specific alignment guide is created using magnetic resonance imaging (MRI) scans. This helps to create the best fitting technique for each individual patient's implant.

The potential advantage of this procedure is that the implant may last longer due to the most accurate fitting possible. However, as this is a new technique the results and the long term effects are not fully known yet.

Risks of surgery

When to call the doctor

Call the doctor if:

you develop hot, reddened, hard or painful areas in your legs in the first few weeks after your operation – although this may just be bruising from the surgery, it could mean a blood clot has developed

you experience pains in your chest or breathlessness – although it is very rare, you could have a clot on your lung which needs urgent treatment

As with any operation, knee replacement surgery has risks as well as benefits. Most people who have a knee replacement do not experience serious complications.

Your anaesthetist and surgeon can answer questions you may have about your personal risks from anaesthetic or the surgery itself.

Complications occur in about one in 20 cases, but most are minor and can be successfully treated. Possible complications include:

Infection of the wound – this will usually be treated with antibiotics, but occasionally the wound can become deeply infected and require further surgery.

In rare cases it may require replacement of the artificial knee joint

Unexpected bleeding into the knee joint

Ligament, artery or nerve damage in the area around the knee joint

Blood clots or deep vein thrombosis (DVT) – clots may form in the leg veins as a result of reduced movement in the leg during the first few weeks after surgery. They can be prevented by using special support stockings, starting to walk or exercise soon after surgery, and by using anticoagulant medicines

Fracture in the bone around the artificial joint during or after surgery – treatment will depend on the location and extent of the fracture

Excess bone forming around the artificial knee joint and restricting movement of the knee – further surgery may be able to remove this and restore movement

Excess scar tissue forming and restricting movement of the knee – further surgery may be able to remove this and restore movement

The kneecap becoming dislocated – surgery can usually repair this

Numbness in the area around the wound scar

Allergic reaction – you may have an allergic reaction to the bone cement if this is used in your procedure

In some cases, the new knee joint may not be completely stable and further surgery may be needed to correct it.

How long will a replacement knee last?

Wear and tear through everyday use means your replacement knee will not last forever. However, for most people it will last at least 15-20 years, especially if cared for properly and not put under too much strain.

Revision knee replacement surgery (replacing the replacement knee) is usually more complicated and a longer procedure than the original surgery. There is no set limit to the number of times you can have revision surgery, but it is widely accepted the artificial knee joint becomes less effective each time it is replaced.

Recovering from a knee replacement

Recovery times can vary depending on the individual and type of surgery carried out. It is important to follow advice the hospital gives you on looking after your knee.

After surgery

In the surgical ward, you may be given a switch that enables you to self-administer painkillers at a safe rate. You may also be given oxygen through a mask or tubes. If necessary, you will be given a blood transfusion.

You will have a large dressing on your knee to protect your wound. Various drains will syphon off blood from the operation site to prevent it collecting inside the wound.

Your wound dressing will be changed regularly until it has healed over.

Read more information about what happens after an operation.

How soon will I be up and about?

The staff will help you to get up and walk about as quickly as possible. If you have had minimally invasive surgery or are on an enhanced recovery programme, you may be able to walk on the same day as your operation.

Walking with a frame or crutches is encouraged. Most people are able to walk independently with sticks after about a week but this can vary depending on the individual.

During your stay in hospital, a physiotherapist will teach you exercises to help strengthen your knee. You can usually begin these the day after your operation. It is important to follow the physiotherapist's advice to avoid complications or dislocation of your new joint.

It is normal to experience initial discomfort while walking and exercising, and your legs and feet may be swollen.

You may be put on a passive motion machine to restore movement in your knee and leg. This support will slowly move your knee while you are in bed. It helps to decrease swelling by keeping your leg raised and helps improve your circulation.

When can I go home?

You will usually be in hospital for six to 10 days, depending on what progress you make and what type of knee replacement you have. Patients who have a half knee replacement usually have a shorter hospital stay.

If you are generally fit and well, the surgeon may suggest an enhanced recovery programme where you start walking on the day of the operation and are discharged within one to three days.

Read more information about getting back to normal after an operation.

How will I feel when I get home?

Do not be surprised if you feel very tired at first. You have had a major operation and muscles and tissues surrounding your new knee will take time to heal. Follow the advice of the surgical team and call your DOCTOR if you have any particular worries or queries.

You may be eligible for a home help and there may be aids that can help you. You may also want to arrange for someone to help you out for a week or so.

The exercises your physiotherapist gives you are an important part of your recovery. It is essential you continue with them once you are at home. Your rehabilitation will be monitored by a physiotherapist.

How long will it be before I feel normal?

You should be able to stop using crutches or walking frame and resume normal leisure activities three to six weeks after surgery. However, it may take up to three months for pain and swelling to settle down.

Your new knee will continue to recover up to two years after your operation. During this time, scar tissue will heal and muscles will be restored by exercise.

Even after you have recovered, it is best to avoid extreme movements or sports where there is a risk of falling, such as skiing or riding a bicycle. Your doctor or a physiotherapist can advise you.

When can I drive again?

You can resume driving when you can bend your knee enough to get in and out of a car and control the car properly. This is usually around four to six weeks after your surgery, but check with your physiotherapist or doctor whether it is safe for you to drive.

When can I go back to work?

This depends on your job, but you can usually return to work six to 12 weeks after your operation.

When can I do housework?

For the first three months, you should be able to manage light chores, such as dusting and washing up. Avoid heavy household tasks such as vacuuming and changing the beds. Do not stand for long periods as this may cause ankle swelling and avoid stretching up or bending down for the first six weeks.

How will it affect my sex life?

You may find that having the operation gives your sex life a boost. Your surgeon can advise when you can have sex again. As long as you are careful, it should be fine after six to eight weeks. Avoid vigorous sex and kneeling positions.

Will I have to go back to the hospital?

You will be given an outpatient appointment to check on your progress, usually six to 12 weeks after your knee replacement. The surgeon will want to see you again a year later, and every five years after that to X-ray your knee and make sure it is not beginning to loosen.

Will I need another new knee?

The knee can be replaced as often as necessary, although results tend to be slightly less effective each time. Recovery may take longer, but once you have recovered, results are usually good.