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. In essence you have been taken out of the game.

If medications, changing your activity level and using walking supports are no longer helpful, you may want to consider total knee replacement surgery to get you back.
in the game. 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. Approximately 300,000 knee replacements are performed each year in the United States.

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.

The most common cause of chronic knee pain and disability is arthritis.

**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, swelling 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. This process is usually found in many joints in addition to the knee.

**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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**Reasons for Surgery**
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 cane 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 (see Picture Below)
- 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.

![Picture of normal joints, bowleggedness (Varus), knock knees (Valgus)](image)

**Evaluation**

The orthopaedic evaluation consists of several components:

- A medical history, in which your orthopaedic surgeon 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.

Your orthopaedic surgeon 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, physical therapy, or other types of surgery--also will be discussed and considered.

Your orthopaedic surgeon 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.

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.

Preparing for Surgery

If you decide to have total knee replacement surgery, you may be asked to have a complete physical by your family physician several 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 cardiogram and a urine sample--may be needed to help your orthopaedic surgeon plan 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 orthopaedic surgeon prior to surgery if either of these conditions is present for a program to best prepare
your skin for surgery. Please be sure to wash your extremity thoroughly with an antibacterial soap the morning of surgery.

**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
- 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 a member of the anesthesia team. The most common types of anesthesia are spinal or epidural anesthesia, in which you are awake but your legs are anesthetized, but occasionally general anesthesia, in which you are asleep throughout the procedure may be used. The anesthesia team will determine which type of anesthesia will be best for you with your input. Newer techniques such as local blocks may be used to further reduce pain.

The procedure itself takes about two hours. Your orthopaedic surgeon 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).

Dr Prince makes a cut over the affected knee. The patella (knee cap) is moved out of the way, and the ends of the femur (thigh bone) and tibia (shin bone) are cut to fit the prosthesis. Similarly, the undersurface of the knee cap is cut to allow for placement of an artificial component.

The two parts of the prosthesis are implanted onto the ends of the thigh bone (femur), the shin bone (tibia), and the undersurface of the knee cap (patella) using a special bone cement. Usually, metal is used on the end of the femur, and plastic is used on the tibia and patella, for the new knee surface. However, newer surfaces including metal on metal, ceramic on ceramic, or ceramic on plastic are now being used.

Dr Prince frequently uses minimally invasive techniques and computer navigation to fine tune the placement of the implants.

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.

You will also return from surgery with several IV (intravenous) lines in place to provide fluid and nutrition. The IV will remain in place until you are able to drink adequate amounts of fluids.

Antibiotics may be given to reduce the risk of developing an infection, which would require removal of the artificial joint.

You will also return from surgery wearing anti-embolism (anti-clot) stockings or inflatable pneumatic compression stockings. These devices are used to reduce your risk of developing blood clots, which are more common after leg surgery.

Additionally, you will be encouraged to start moving and walking on the first day after
surgery. You will be assisted out of bed to a chair on the first day after surgery. When in bed, bend and straighten your ankles frequently to prevent development of blood clots.

You may be instructed on how to use an incentive spirometry device (a plastic device to encourage deep breathing), and cough and deep breathing exercises to gradually increase the depth of your breaths in order to prevent lung collapse and pneumonia.

A foley catheter may be inserted during surgery to monitor the function of your kidneys and hydration level. This will be removed on the second or third day after surgery. You will be encouraged to try to walk to the bathroom with assistance.

**Risks**

The risks of this surgery include:

- Blood clots in the legs (deep vein thrombosis or DVT)
- DVT that breaks loose and goes to the lungs (embolus)
- Pneumonia
- Infection necessitating removal of the joint
- Loosening of the prosthesis
- Dislocation of the prosthesis
- People who have a prosthetic device (such as an artificial joint) need to take special precautions against infection. You should carry a medical identification card indicating that you have a prosthetic device. Also, always inform your health care provider of your prosthetic knee joint. You should receive antibiotics prior to dental work or any invasive procedure.

**Expectations after Surgery**

The results of a total knee replacement are often excellent. The operation relieves pain in over 90% of patients, and most need no assistance walking after recovery. Most prostheses last 10 to 15 years, some as long as 20 years, before loosening and requiring revision surgery.
The hospital stay generally lasts 2-4 days, but the total recovery period is around 6 weeks. Walking and range-of-motion exercises will be started immediately after surgery.

Some patients require a short stay in a rehabilitation hospital to become safely independent in their activities of daily living. It may be necessary to use crutches or a walker for a few weeks or even months after surgery.

The physical therapy started in the hospital will continue after you've gone home until your strength and motion return. Contact sports should generally be avoided, but low impact activities, such as swimming and golf, are usually possible after full recovery from surgery.

Partial Knee Replacement

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