

A Guide to Total Knee Replacement

ORTHOPEDICS PROGRAM



University Medical
Center of Princeton
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To Our Patients

Thank you for choosing University Medical Center of Princeton at Plainsboro (UMCPP) for your knee replacement surgery.

We are pleased to provide you with this guide to help address questions you may have about knee replacement surgery. It provides information about the procedure, benefits and risks, pre- and post-surgical care and recovery. We hope you find this information helpful. While this guide is a good general source of information, *it is not intended to replace the advice of a physician*, nor to address your personal condition or healthcare needs. We encourage you to ask your physician any questions you may have about knee replacement and your personal circumstances.

As a patient of UMCPP, you have access to a full continuum of healthcare services, which are available through Princeton HealthCare System (PHCS), to support you before, during and after your surgery. These services include hospital care, subacute care, acute inpatient rehabilitation care, education, testing, inpatient and outpatient rehabilitation, home care, home medical equipment and fitness facilities. Your medical condition and your physician will determine which level of care you need. For more information about our services, call **1.888.PHCS4YOU (1.888.742.7496)** to speak with a service representative.

University Medical Center at Princeton extends our sincere appreciation to Harvey E. Smires, MD, a board certified orthopedic surgeon on our Medical and Dental Staff, for all of his work on this guide and his permission to reprint it for our patients.

A Guide to Total Knee Replacement

The Basics of Knee Replacement

Today, more than 600,000 total knee replacements are performed each year in the United States, with most patients experiencing dramatic pain relief, resulting in restored function, increased mobility, and improved quality of life.

Since the first truly modern total knee replacement design became available in 1974, a wide variety of treatment options have been developed to meet the specific needs of each patient — from total knee replacement to partial replacement. Partial knee replacement may work well for patients with wear in only one of the three parts of the knee joint, or patients seeking some relief and a smaller procedure. It may also be an option for younger patients, however, within 10 years, progressive arthritis may create the need for a total knee replacement.

The decision to have a knee replacement is a highly personal choice that should be made between you and your physician. Surgery is an alternative for those with degenerative joint disease who are facing decreased mobility and independence, with chronic medication. For those who are candidates for surgery, the type of implant and surgical technique performed will vary based on your age, activity level, body weight, bone quality and amount of preoperative deformity.

Degenerative Joint Disease

A joint is where two bones meet and are held together by ligaments. There is also a thick joint capsule that surrounds the knee. The joint is lubricated by fluid, and the ends of the bone are covered with a highly specialized form of cartilage. When damaged by trauma, wear and tear, disease or other conditions, cartilage may be lost resulting in degenerative joint disease. In addition, a buildup of fluid and debris in the joint can cause painful pressure on the joint capsule.

Common causes of degenerative joint disease are:

- Osteoarthritis, which usually occurs after age 50 as a result of trauma, wear and tear, repetitive overload of the cartilage, and in some cases, heredity.
- Rheumatoid arthritis, a condition of the immune system where cartilage is attacked, resulting in destruction and inflammation. This is similar to damage caused by infection.

Recognizing the Symptoms

Degenerative joint disease of the knee results in pain, usually when you begin moving and after prolonged walking or standing. There may also be pain at night or at rest. Pain typically radiates from the front of the kneecap and worn out section of the joint. It may radiate to the tibia or shin bone.

Degenerative joint disease of the knee may also cause bone spurs, which restrict range of motion, and result in a limp and the development of knee mal-alignment (bow-leggedness) or knocked knees, over time.

Total Knee Replacement: Is it the Answer?

Total knee replacement has proven so beneficial and reliable, that for most people, it is the preferred surgical treatment. Surgical alternatives, such as realignment and partial knee replacement, may also be considered, but are much less common.

Unicondylar knee replacement is an alternative for a select group of patients who have a limited amount of arthritis affecting only one compartment in the knee — medial, lateral or patella — with intact cruciate ligaments. This type of partial knee replacement may delay eventual total knee replacement, or offer an alternative for partial relief with adequate function for older patients. Those who undergo unicondylar knee replacement recover twice as fast as those



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who undergo total knee replacement, with near-normal joint function. An MRI or arthroscopy will help determine if you are a candidate for this type of procedure.

For you to be considered for total knee replacement surgery, attempts must have been made to treat your condition with conservative, non-surgical techniques. If these treatments fail, total knee replacement may be the solution.

Examples of non-surgical treatments include:

- Activity modification, which consists of non-impact activities to maintain strength, aerobic ability and range of motion. Princeton Fitness & Wellness Center, an affiliate of University Medical Center of Princeton at Plainsboro, offers aquatic and land-based programs that may be of help for patients with degenerative joint disease.
- Medication consisting of non-steroidal, anti-inflammatory drugs (NSAIDs), including aspirin, ibuprofen and naproxen, and prescription medications. In less severe cases, 1,500 mgs of glucosamine sulfate taken daily for at least three months may have a similar effect.
- Weight loss may have a dramatic effect for some patients.
- In some cases, a procedure called viscoelastic supplementation, involving a series of one to three injections, can produce up to eight months of relief, delaying the need for knee replacement. This treatment requires insurance pre-approval.
- Physical therapy, with the use of exercise and the application of modalities, such as ultrasound, may help to restore more normal function to the knee joint.

The main indications that total knee replacement may be necessary are:

- Pain, especially at rest
- Limited function: inability to do daily activities; cannot walk five to 10 blocks; stiffness and loss of muscle function
- Deformity and instability
- Failure of conservative, non-surgical treatment

Possible Risks

Total knee replacement is a major operation. Advancements over the last 10 years have substantially improved the procedure, but some risks do remain. These include:

- Infection. Bacterial infection occurs on average in three out of every 1,000 joint replacements as a result of contamination at surgery or even 10 or more years after surgery due to spread of bacteria through the bloodstream after dental work, urinary tract infections or other causes. The incidence of infection is higher in individuals who also have diabetes, psoriasis and immune system disorders.
- Bleeding during surgery may result in the need for a blood transfusion.
- Deep venous thrombosis (DVT), which can result in swelling or pulmonary embolism.
- Numbness along the lateral side of the incision over the kneecap is common, and should be expected
- Stiffness, and the need for therapeutic manipulation, or a surgical revision of the knee joint.
- Implant wear and tear or loosening over time may also be an issue. There may also be a problem with stability of the knee following surgery.
- Nerve injury due to surgical procedures.

Preparing for Surgery

Pre-Admission Testing

Once you and your physician have determined that knee replacement surgery is right for you, you will be given an appointment for pre-admission testing at University Medical Center of Princeton at Plainsboro. This generally includes a blood test, EKG, chest X-ray and urine analysis. You will also meet an anesthesiologist.

Because a variety of tests will be performed and you will meet with several individuals on the day of pre-admission testing, you can expect to spend several hours at the hospital. You are welcome to bring a music player, magazines, work or other materials with you. Please also bring this booklet, as various specialists may refer to it in their sessions with you.

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In addition to testing during your visit, you may meet with a physical therapist and a social worker, and have the opportunity to tour the facility. There is also a 90 minute Joint Replacement Education Class available to give you even more information about the procedure.

The social worker will discuss your options for discharge to help plan your transition to UMCP's Acute Rehabilitation Unit, or another inpatient rehabilitation facility, if you are unable to go directly home. After an approximate three-night stay in the hospital, you may spend an additional seven to 10 days in inpatient rehabilitation. To help ease your recovery and transition back to home, you may consider homecare services.

Princeton HomeCare, a unit of Princeton HealthCare System, is available to help with visiting nurses, therapists and home health aide assistance.

You may wish to review your durable medical equipment coverage with the social worker during your pre-admission visit. This includes coverage for a walker, crutches, cane, wheelchair and continuous passive motion machine (CPM) if you require it. As a compliment to physical therapy, CPMs are often used in the early stages of recovery to maintain motion for several hours per day, and decrease pain and swelling. The physical therapist can review routine exercises and the CPM with you.

Please familiarize yourself with what will be expected after surgery in terms of exercise. We encourage you to practice any exercises that have been explained to you before surgery. Your cooperation with therapy is crucial to a successful outcome. Knee splint immobilization is often used at night, or for initial movement, to prevent "giving way" or "buckling" and to maintain extension of the knee.

Medical Clearance

At the time of surgery, it is important that you be free from infections. Any source of infection, such as teeth or ingrown toenails, should be treated prior to surgery. Please schedule a visit with the dentist as soon as possible, preferably several weeks before your surgery. A cleaning and exam will point out any sources of potential infection that need to be completely taken care of before surgery. Since your risk of infection due to dental work remains elevated for two years after surgery, you should not undergo total knee replacement if you have temporary crowns, etc.

Please also schedule an appointment for medical clearance with your personal physician or cardiologist well before surgery. If you have risk factors or need special cardiac attention, we may recommend a consultation with a cardiologist. There are several board certified cardiologists on staff at UMCP.

Please plan ahead. It can take time to arrange preoperative clearance and stress testing, which can be recommended by a physician or cardiologist prior to surgery. If this cannot be arranged, your surgery will need to be rescheduled.

Medications

Your surgeon and the anesthesiologist will advise you about which medications you may take prior to surgery. Generally, you should stop taking drugs containing aspirin three weeks before surgery and certain anti-inflammatory drugs one week before surgery. If you are on Coumadin, Plavix, Pradaxa or any other anti platelet medication, or recently on MAO inhibitors, let your surgeon know as soon as possible. Notify the surgeon of any unusual allergies, such as metals (nickel), latex and skin adhesives.



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Please bring a list of all medications with dosages and frequencies as well as any over-the-counter drugs, vitamins and herbal supplements you are taking to your pre-operative visit with the surgeon and to your pre-admission testing visit at the hospital. Bring any unusual medications, eye drops and inhalers to the hospital on the day of surgery.

Home Preparation

Setting up your home for your return will help make you more comfortable during your recovery. You will have limited joint movement and stair climbing ability initially after surgery. In anticipation of your return home, try to do the following:

- Stock up on frozen foods, microwave foods and easily prepared items.
- Find someone to help you with shopping, getting to your two-week visit to the doctor, getting to physical therapy (three times per week) until you are driving, and light housecleaning. Keep in mind you may have difficulty driving for up to four weeks after a knee replacement.
- Rearrange items for easy access, including cooking items, toiletries, personal items and shoes.
- Remove throw rugs and check to make sure handrails are secure.
- Consider moving onto one floor temporarily to avoid stairs completely.
- Obtain a height adjustable shower seat and rubber mat for the shower.
- Arrange bedside books, telephone, water and other items conveniently.

Princeton HomeCare can provide visiting nurse services, home health aides, and home physical therapy for the first two weeks or so after surgery, depending on your medical needs and medical plan. Please call 609.497.4900 for more information.

Packing Your Bag

It is recommended that you include the following items in your bag when packing for your stay:

- Toiletries
- Underwear and socks
- Loose pajamas or nightgown

- Robe and slippers
- Rubber soft-soled walking shoes or sneakers
- Lightweight workout outfit
- Hearing aid or dentures (if used)
- Music player, laptop, books, magazines and glasses

Please do not bring any valuables or jewelry to the hospital with you.

The Day Before Surgery

If you wish to take a cathartic or laxative, please do so two or three days before surgery. If you do, you may not need to worry about bowel movements for a few days.

Do not have anything to eat or drink after midnight the night before surgery. An exception is a medication the anesthesiologist has told you to take with a sip of water.

Your surgery will be rescheduled if you have had anything to eat or drink after midnight. Surgery occasionally is moved up or back, even on your scheduled day, due to cancellations or delays.

The Day of Surgery

Pre-surgery Preparations

You will be called the night before the surgery and notified of your expected time of arrival. This is usually two hours prior to your surgery. Family and friends may accompany you to the Surgical Services unit. Once you enter pre-anesthesia, your guests will be directed to the Surgical Waiting Room.

You will be asked to change into a hospital gown and remove any jewelry, glasses, hearing aids, contact lenses and piercings. Preparations will then begin for your surgery, including cleansing and marking the knee to be replaced.

Just outside the operating room, you will meet and talk to your anesthesiologist, who will interview you and review the anesthesia plan, whether spinal, epidural or general.

Please consider what he or she has to say before insisting on a specific technique. For knee surgery, regional or general anesthesia is used. Regional anesthesia speeds recovery from sedation and lessens nausea.

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Once in the operating room, the anesthesiologist will begin administering the anesthesia. Be sure to let him or her know if you have questions, concerns, discomfort or problems during the surgery.

Post-surgery Procedures

Surgery will usually last between 60 and 150 minutes, depending on its complexity. You will then be transferred to the post-anesthesia care unit (PACU) while you recover from the anesthesia. Your stay in the PACU will depend on the type of anesthesia you received and how long it takes to wear off. If your anesthesia is spinal, your stay could last from one to four hours. General anesthesia usually wears off in about 90 minutes. Constant passive motion may be used immediately after surgery or beginning the next day.

When you are stable, you will be transferred to the orthopedic nursing unit, which is designated for joint replacement patients. Please discuss any private duty nursing needs with the nursing department.

Surgical Waiting Room

During your surgery your guests are welcome to await word of your progress in the Surgical Waiting Room. The Surgical Waiting Room staff will keep you updated. Since visitors are generally not allowed in the PACU, the wait can be long. It may be advisable for those waiting for you to bring a cell phone and leave the number on your chart. That way, your guests can wait in the café at the front of the hospital or at home, and the surgeon can notify them by phone of your status.

Your Hospital Stay

Typically, a total knee replacement requires a three-night hospital stay. During that time you will be instructed in proper care of your incision, the use of pain medications,

and CPM. You may be out of bed and walking with the help of a walker or crutches on the day of your surgery. During your stay, you will receive both physical and occupational therapy to help strengthen and protect your new knee replacement.

Incision Care

Following surgery, your incision will be covered with a sterile, dry dressing. It must stay clean and dry. The dressing will be changed by your surgeon or a physician assistant on the second day after surgery, and will then require daily dressing changes until the incision is sealed and dry. To protect against infection, your surgeon will inform you about when you may shower or soak in a tub.

If your incision is secured with tape strips, please do not remove them or trim off the suture ends, which look like clear, monofilament fishing line.

Pain Control

While in the hospital, you will be provided with patient-controlled pain medication such as and morphine or Dilaudid®. The amount of medication available to you will depend on your body weight and age. If the dosage seems inadequate for the pain, or if you feel nauseous or suffer from itching while taking this medication, please notify your nurse. Oxycontin®, Oxycodone or Percocet® may be ordered after your patient-controlled analgesia medication is discontinued by your physician.

In some cases a nerve block may be used for pain control. There is also a nerve catheter that will stay in for two to three days providing long-term pain control options. Medications such as Motrin® or aspirin are not recommended if you are on an anticoagulant.



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Diet

You will be able to resume a regular diet while in the hospital, but be aware that spinal anesthesia, general anesthesia and narcotics, depending on dosage, may cause your bowel motility to temporarily slow down. Because of this, it is wise to wait until you are passing gas to resume a full diet.

What feels like indigestion could also be angina, especially in cardiac and diabetic patients. You should notify the nurse immediately of any discomfort.

Occupational & Physical Therapy

Our highly skilled occupational therapists and physical therapists will help restore function with your new knee replacement. Your therapy will include stretching, various strengthening exercises, walking, stair training, CPM, and active assisted range of motion exercises.

Leaving the Hospital

You will be able to travel home by car, with assistance getting in and out of the vehicle. To make your trip more comfortable, a larger car is recommended for the trip so you can stretch out your legs.

If you are being transferred to an inpatient rehabilitation facility, a social worker will facilitate your transportation.

Once You Are at Home

Following three to four days in the hospital, and possibly an additional seven to 10 days in UMCP's Acute Rehabilitation Unit, or another inpatient rehabilitation facility, you will be going home. The following are some things to keep in mind while you are recuperating at home.

Anticoagulants

Your surgeon will order a medication such as Lovenox® or Coumadin after your surgery to help prevent blood clots. You will receive specific directions while you are in the hospital and after discharge.

You will take your Lovenox® or Coumadin as directed by your physician at the same time everyday. Your surgeon will discontinue this medication at one of your post-operative visits to the office.

Contact your doctor immediately if you notice any bleeding — bloody nose, dark/tarry stools, easy bruisability — or calf pain, swelling or breathing difficulties, chest or back pain, or difficulty breathing.

Physical Therapy

Princeton HomeCare can provide you with physical therapy in your home one to three times per week until you are strong enough to attend an outpatient program.

Therapy in the outpatient program will be provided three times a week, for a total of approximately six to 12 weeks. You will also be given a set of daily exercises to complete.

Remember, your ultimate success depends on cooperation and commitment to therapy. UMCP's Outpatient Rehabilitation Network provides outpatient physical and occupational therapy at several convenient service sites.

Medical Follow-ups

Please schedule an appointment with your physician 10 to 14 days after surgery for suture removal, X-rays and to review your medication and physical therapy. Follow-up visits are usually required in six weeks, 10-12 weeks, six months, one year, and every one to two years thereafter, unless problems are noted that require more frequent visits.

Reasons to Notify Your Surgeon

- Incision drainage
- Calf pain
- Ankle swelling
- Chest pain, including on inhalation
- Unexplained indigestion
- Trouble breathing, shortness of breath
- Persistent fever, chills or sweats
- Bleeding or easy bruisability
- Dark or tarry stools

Driving

Most people may resume driving in two weeks following a left knee replacement and in four to six weeks following a right knee replacement. This is highly variable. With approval from your surgeon, you can drive if you are agile enough to apply the brake with your right foot in an emergency.

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Physical Activities

In general, activities you had experience with before surgery or the onset of degenerative joint disease are generally safe, provided they do not involve excessive running or contact sports. Many patients enjoy hiking, cycling, tennis, golf, swimming and even skiing. It is important to keep well within your abilities. Sexual activity can also be resumed as soon as it is comfortable.

Life With Your Total Knee Replacement

Body Weight

It is beneficial to use your new ability to exercise to maintain a healthy body weight. Thirty minutes of aerobics per day, along with a healthy diet mixing fats, carbohydrates and protein in a balanced fashion, will help you maintain good health. Low-impact activity and decreased body weight will increase the longevity of your total knee replacement.

Wear of Your Knee Replacement

Usually, X-rays are taken at one- to two-year intervals after surgery to evaluate the wear of your total knee replacement and prevent future problems. For younger, heavier or active patients, X-rays should be taken more frequently, while for older, more sedentary or lighter patients, less frequent evaluations may be acceptable. Future revision surgery may be necessary at some point due to infection, wear or loosening, or in the case of a partial knee replacement, due to the progression of osteoarthritis to other parts of the joint.

Antibiotic Precautions

You should take antibiotics for any infection and prior to certain medical procedures to prevent the spread of bacteria to your knee replacement through the blood stream. The antibiotic will vary according to the circumstance and your allergies.

The most common procedures requiring antibiotics are dental and urological. You should inform your dentist of your total knee replacement and be given antibiotic prescriptions for dental procedures, including cleanings. If you should undergo cystoscopy or a prostate operation, inform your urologist as well. He or she can administer effective IV antibiotics to protect you.

Skin and Foot Care

The prevention and aggressive treatment of toe and foot infections, psoriasis and other skin and foot conditions is important to prevent infection of your total knee replacement implant. These problems are more common in patients suffering from diabetes, obesity or chronic venous stasis (vein-related swelling).

Metal Detectors

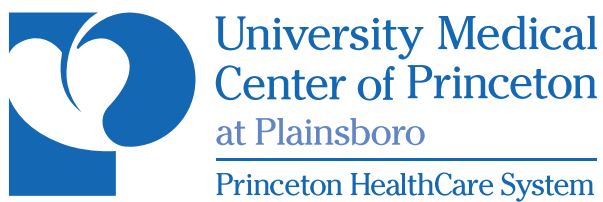
Your new knee replacement will probably set off the metal detector at the airport and other secured facilities. We will give you a card for your wallet with information and our office phone, but in these days of heightened security, it is likely you will be searched.

When in Doubt, Don't Hesitate to Call

When it comes to total knee replacement, each patient's needs and concerns are unique. Should you have any additional questions, please feel free to contact your surgeon's office for advice.







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