

**TOTAL  
KNEE REPLACEMENT**

**UT ORTHOPAEDICS  
JOINT REPLACEMENT SERVICE**

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**THE UNIVERSITY of TEXAS ★ HOUSTON**  
**PHYSICIANS**

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# THE HISTORY OF KNEE REPLACEMENT

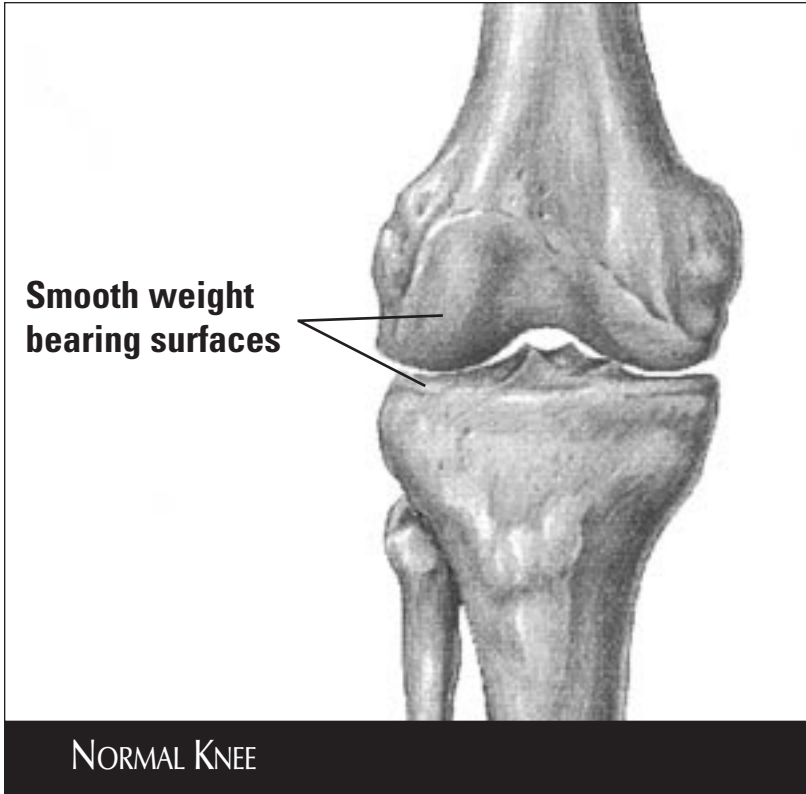
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**K**nee replacements have been performed for about 40 years. There are more than 200,000 total knee replacements performed annually in the United States. We have now collected data from tens of thousands of knee replacement cases and we know that knee replacement offers excellent relief of pain with improved function, and a longer lifetime of use than some joint replacements in the hip.

Total knee replacements have undergone several advancements since they were first introduced. The early design flaws of the artificial knee or "prosthesis" have been modified and improved to provide greater durability, improved stability, and increased motion for the patient. In addition, the difficulty with loosening of the prosthesis has also been addressed. Improvements in cement techniques, better instrumentation, and greater attention to leg alignment have resulted in improved long term results.

Today, prostheses are designed to be used either with or without bone cement. The metal parts of the prosthesis are coated with special surfaces designed to allow bone to grow directly into the metal, thus anchoring the prosthesis and eliminating the need for cement. Such prostheses have been used for about 20 years. Interestingly, we have found that certain parts of the knee do extremely well when used without cement. Improvements in the bone cement itself and the techniques used to insert it are far better today than in past decades. The decision to use cement or not is made by the surgeon based on the patient's age, expected activity level, the quality of the bone, and the individual's weight.

Prostheses design and materials have continued to change and improve, and will continue to do so. However, we can safely assume the average lifespan of a prosthesis implanted today should be 15 to 20 years or more.

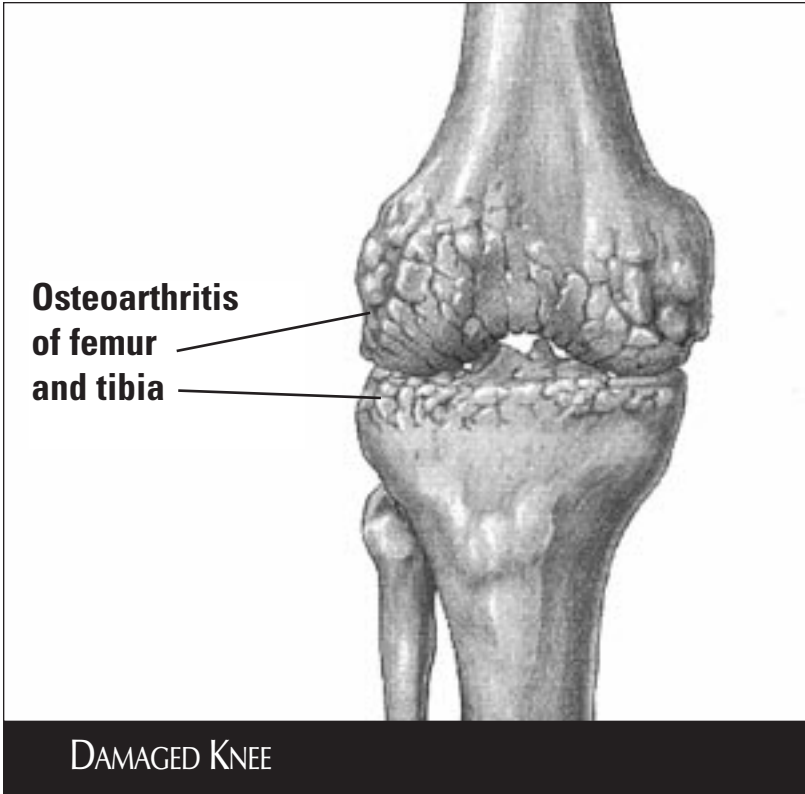


## WHEN IS KNEE REPLACEMENT NECESSARY?

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Conditions that cause joint destruction with loss of normal-cartilage (the normal smooth lining of the joint) may be treated with knee replacement.

Your doctor must first determine that there is no useful life in your knee, and that nonsurgical treatment would not significantly reduce any pain that you may be experiencing. Diseases such as osteoarthritis, rheumatoid arthritis, or an old infection can cause damage resulting in the need for knee replacement.



When the x-ray shows **severe** destruction of the joint, you must decide if the degree of pain experienced is **severe** enough that you are prepared to undergo the operation. We feel that the risks of surgery are acceptable given that you should be able to return to a more active lifestyle in comparison to your pre-surgery lifestyle, when you may not have been able to do the things you enjoy or must do on a daily basis. Your age is not a consideration in this decision.

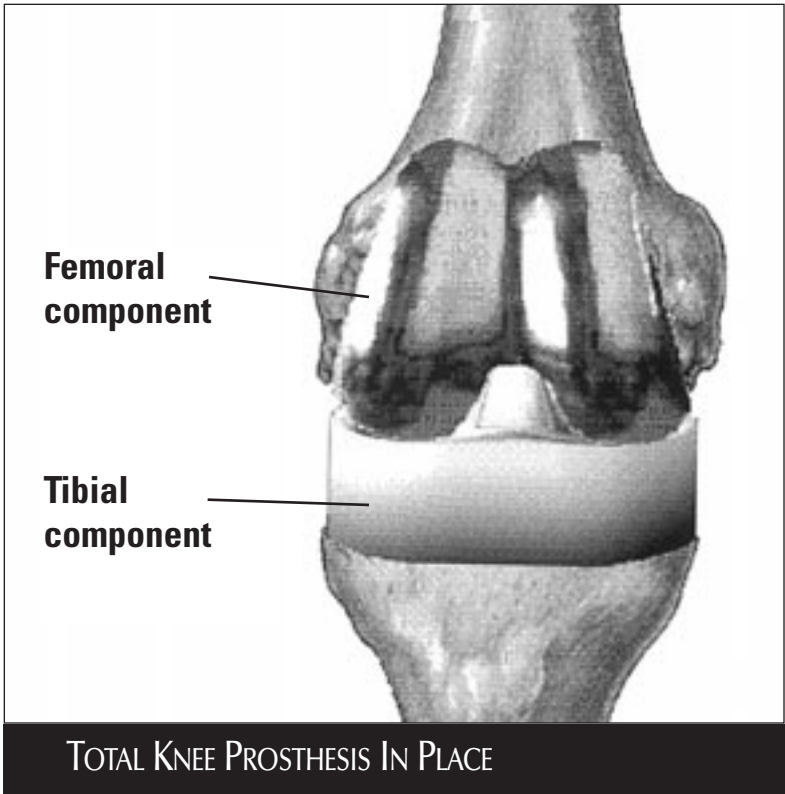
# WHAT IS KNEE REPLACEMENT?

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A knee replacement is the replacement of all or part of the (gliding) cartilage surfaces of the knee's three working parts. This may include:

1. *Femoral Condyles:* Femoral condyles are at the lower end of the thigh bone. The part that replaces the femoral condyles, the femoral component, is made entirely of metal. It fits over the end of the femur like a cap. This part may be cemented to the bone, but is frequently inserted without cement.
2. *Tibial Component:* This is the upper part of the tibia (shin bone). The tibial component is made entirely of plastic, or a combination of metal and plastic. The metal forms the base of this part and is in direct contact with the tibia. The plastic, which is a very durable type of polyethylene, is inserted on top of the metal. This serves as a cushion and a smooth gliding surface between the metal of the femoral and the metal of the tibial parts. Most tibial components are secured to the bone with bone cement. However, the tibial component may be used without cement and secured with bone screws instead.
3. *Patella Component:* This is undersurface of the patella (knee cap). The patella component is made of polyethylene. This part is anchored with cement. The decision to use the prosthesis with or without cement is made by the surgeon based on a complete understanding of your case and all factors involved.

A total knee replacement involves replacement of all the cartilage surfaces of your knee. In certain patients, a partial or unicompartamental knee replacement is indicated when the arthritis involves only a part of the knee. This procedure preserves more of your natural knee. The decision on how much of your knee to replace is determined before and during your surgery.



## YOUR EVALUATION

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Your evaluation begins with a long, but very important questionnaire. It helps us to understand your pain, limitations, and medical history. We must know all of your medications and any medical problems such as heart disease, lung disease or diabetes. It is very important for us to know if you have any infectious problems that could cause an infection in your new prosthesis. Some of these problems are:

- active gall bladder disease
- diverticulitis
- gingivitis (gum disease)
- active infection of the skin
- urinary tract infection
- prostate gland disorders
- psoriasis

After your history is taken, a physical exam is performed. Your leg lengths are measured, the range of motion of your hips and knees are measured, and the muscle strength evaluated. Your gait (the way you walk) may be observed and other involved joints examined.

Next, your x-rays are evaluated. It is very helpful if you can obtain any x-rays of your knees that have been previously taken. A number of additional x-rays may be obtained in our office to help us evaluate your knees and thoroughly plan surgery. You will be allowed to see the x-rays and we will explain the findings.

## DECIDING ON SURGERY

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Frequently after the initial evaluation, we may recommend further nonsurgical treatment if we feel that other possible alternatives to surgery have not been considered. If we are comfortable that you have tried all possible nonsurgical means of pain relief, or if your x-rays show such severe involvement that further conservative measures cannot be expected to be of benefit, then a partial or total knee replacement is recommended. Again, the final decision must be made by you based on the amount of pain and disability you experience combined with your thorough understanding of the benefits and risks of knee replacement.

# PROCEEDING TO KNEE REPLACEMENT

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Once you have decided to have a knee replacement, a number of things must be done. You may be asked to see an internal medicine specialist for a more thorough medical evaluation. If your own doctor works at our hospital you should see him. You will need to see someone who can see you regularly while you are in the hospital. You may return to your regular doctor after you leave the hospital. In some cases, we will ask you to see a rheumatologist before your surgery. A rheumatologist is a specialist in the medical treatment of arthritis.

If you smoke it is important for you to quit two weeks prior to surgery.

If you are taking any anti-inflammatory medications, discontinue them at least 10 days prior to surgery. Anti-inflammatory medications that should be discontinued include:

- Ascriptin
- Aspirin products
- Clinoril
- Indocin
- Meclomen
- Motrin/Ibuprophen
- Nalfon
- Naprosyn/Alleve
- Feldene
- Tolectin
- Voltaren
- Anaprox
- Ansaid
- Advil
- Nuprin
- Mediprin
- Lodine
- Relafen
- Daypro

Estrogens (Premarin) should be discontinued one month prior to surgery.

Vioxx and Celebrex may be taken up to the day of surgery.

If you are taking Methotrexate, please discuss this with us.

If you are taking steroids (i.e. Prednisone), they should be continued. Ask your doctor if you have any questions about any medications you are currently taking.

## WHAT ABOUT BLOOD DONATIONS?

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It is not unusual to have a blood transfusion after a knee replacement. Blood transfusions are quite safe at this time. Very sensitive tests are used to screen for AIDS, some forms of hepatitis, and other transmittable diseases. However, there is no safer blood than your own! We can now collect your own blood at the blood bank and save it for the time of your surgery. You can donate blood every seven to ten days prior to your surgery. A two week period is allowed for the body to build itself up before surgery. During this entire period, iron tablets are taken three times a day to help the body build new red blood cells. This method is called autologous blood transfusion.

We occasionally prescribe injections that stimulate your bone marrow to produce more red blood cells.

We are very careful to minimize the need for blood transfusion and we use other methods to save blood. We use a tourniquet during surgery to minimize blood loss. We may use a device after surgery that drains any blood from the wound and saves it so it can be reused.

## YOUR HOSPITAL STAY

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In most cases you will be admitted the day of surgery. You will be admitted to the orthopaedic floor and may have additional blood tests, x-rays, or an E.K.G. performed. You may have an IV started in order to receive antibiotics. You will be asked to wash your knee and groin area with an antiseptic cleansing solution.

## YOUR ANESTHESIOLOGIST

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Someone from the anesthesia group will speak to you the morning of your surgery. You, along with your surgeon, will choose whether to have a general anesthetic that induces sleep, or a spinal (epidural type) anesthetic in which only your knees and legs are anesthetized. The small epidural catheter may be left in the back for about two days after the surgery.

The anesthesiologist may perform a block, which causes the leg to be numb.

# WHAT IS AN OPERATIVE PERMIT?

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You will be asked to sign a permission form to allow us to perform surgery. It is important that you read and understand it. It is a legal form that must be completed before surgery can be performed. The form will state that you have a condition of the knee, such as arthritis and that a total knee replacement is to be performed. It may request your permission for photographs. We occasionally photograph the knee during surgery for teaching purposes.

Some surgery risks are listed that you should be aware of:

- Whenever anesthesia is given, there is always risk. However, now that there is extensive monitoring, improved drugs and techniques, problems with anesthetics are greatly reduced.
- Infection is a risk associated with any surgery. In the case of knee replacement, infection occurs in about 1 in 100 cases. We take every possible precaution to prevent infection including the use of antibiotics before and after surgery. A number of special devices including "space suits" are worn by the surgical team to prevent our own germs from entering the wound. If an infection occurs, it can be successfully treated in the majority of cases by cleaning the wound and giving appropriate antibiotics. On very rare occasions, it is necessary to remove the prosthesis. You will be expected to wash your leg with antiseptic solution prior to surgery. This is very important.
- Nerve or blood vessel damage may occur during surgery. These structures are very near the knee and although damage is rare, there is the slight possibility this may occur. We take every precaution to protect these structures.
- Mechanical failure may occur including dislocation of the knee, breakage of one of the artificial parts, or loosening of a component from bone or cement.

- Occasionally blood clots may form in the legs. Rarely, if they are severe, blood clots can move to the lungs (pulmonary embolism). We use medications, special stockings, and rapid mobilization of the patient to minimize this risk. Blood clots can be a complication of any surgical procedure.
- Occasionally fat can escape from the bone and go to the lungs.

## THE DAY OF YOUR SURGERY

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Enjoy your dinner the night before surgery, but remember not to eat or drink anything after 12 midnight. The day of surgery, you will be taken to the operating room about a half hour early. Your surgeon will see you before your operation. Do not be alarmed if you are asked several times what knee is to be operated on. This is just one of the many safety checks made to assure your good results. Your family should wait either in the waiting room or in your room so that we can let them know when you are out of surgery.

Your actual surgery will take approximately two to three hours if you have had no prior knee surgery. However, you should tell your family that there may be some additional time spent from the time you leave your room until the surgery begins. Once out of surgery, you will be taken to the recovery room to be monitored while the affects of the anesthesia wear away. The usual time for this process is one and a half to two hours.

If there is any question about your medical condition, or if you arrive in the recovery room late in the day, you may be taken to the surgical intensive care unit (SICU). This is another safety precaution and should not cause alarm. If your condition allows, you will go back to your regular room the next morning.

When you awaken, a continuous passive motion machine (CPM) may be on your bed. Your leg may be resting in this machine and it will slowly move your knee. The CPM helps speed recovery by starting movement early. We often do not start CPM until the day after surgery

You may have a small tube coming from your knee attached to a suction bottle at the side of your bed. This is to drain blood from the knee. You may have pumps on your feet or legs to help prevent blood clots.

## IF YOU EXPERIENCE PAIN

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You may experience some pain the evening after your surgery, but this will gradually subside over the next couple of days. Pain medicine is given either into the epidural catheter or into your I.V. The I.V. system is called patient controlled analgesia (PCA), allowing you to give yourself a predetermined dose of medication directly into the I.V.

## YOUR PHYSICAL THERAPY

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A physical therapist works with you throughout your hospital stay. If possible, the therapist will see you prior to therapy to familiarize you with the exercise program. As soon as you awaken from surgery, your leg may be in the continuous passive motion machine (CPM). You should begin as soon as possible to tighten the muscles of your thigh (quadriceps) and your calf muscles (gastrocs). The therapist will see you the day after surgery to help with these exercises and help you to sit up on the side of the bed.

Your therapy program begins the morning following your surgery. The therapy program is designed to improve your knee strength and stability. Many patients find that gym clothes or shorts are more comfortable than pajamas for their exercise sessions.

The occupational therapist helps determine what special devices you may need at home to help you in your daily activities. This may include an elevated commode seat or shower bench.

# GOING HOME AFTER KNEE REPLACEMENT

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The usual hospital stay for total knee replacement is 4 to 7 days. You may stay longer if necessary. If so, you will go to the rehabilitation unit of the hospital. By the time of discharge, you should be able to move from your bed to a chair and back, and move independently with a walker or crutches. You should also be progressing well, regaining your knee motion, and leg strength.

You will be expected to continue a number of your exercises at home without supervision. It is very important that you do this to fully rehabilitate the knee as quickly as possible. We do everything we medically can to assure excellent results, and we encourage our patients to work very hard to help achieve these goals.

It is not unusual to experience an increase in swelling or to note a slight warmth or reddening of the knee as you become more active and vigorous in your exercise. Usually this will go away if you elevate your leg and apply ice if necessary. If it does not, you may have overdone it, and should rest your leg for a day. You can then resume your exercises less vigorously the next day. If the swelling, warmth or reddening is severe, persistent or associated with a fever above 100 degrees Fahrenheit, then you should notify our office.

The TED stocking given to you in the hospital should be worn for six weeks after discharge. If pain, swelling or redness occurs in the calf, please notify your physician.

You should eat a balanced, nutritious diet and take a multivitamin with iron. It is very important to maintain a normal body weight following total knee replacement, because the body needs plenty of calories and nutrients in order to heal. Eat sensibly and avoid dieting at this time.

# FOLLOW UP DOCTOR APPOINTMENT

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Follow-up visits are extremely important after knee replacement surgery so that the condition of your new implant can be monitored at scheduled intervals. Visits are scheduled for six weeks, three months, six months, and annually after surgery. The same x-ray techniques are used at each visit, so that the x-rays can be properly compared to earlier x-rays and subtle changes identified.

If your sutures are in when you leave the hospital, you should make an appointment to return to your doctor's office within one week of discharge to have them removed. If these were removed before you left the hospital, your doctor will need to see you in about six weeks.

The wound does not need to be covered, but if you like, you can cover it with a light gauze dressing. If there is drainage from the wound, it should be cleaned several times per day with peroxide and a fresh dressing applied.

Once you have had a total knee replacement, it is necessary for you to see your doctor every year for life. This is extremely important as it allows us to detect any problems that may occur at the earliest possible date. If you live out of state, or if you move, please let us know. We want to maintain contact with you and we can refer you to a physician in your area with expertise in total joint replacement.

You should always tell your dentist or physician that you have an artificial joint. Please take this booklet with you when you see your doctor or dentist in case he has questions about antibiotics.

# INFECTION PRECAUTIONS

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Any infection in the body can spread from one area to another through the blood stream. This is a difficult problem if infection spreads to your artificial joint. This can occur many years after surgery and you should seek prompt attention if you develop an infection.

All total joint replacement patients are placed on antibiotic therapy during their surgery and for several doses postoperatively. This is done to prevent infection. Fortunately, less than one out of every 100 patients develop an infection around their joint replacement during hospitalization.

Infections occurring after six months are usually the result of an infection occurring elsewhere in the body, which then spreads to the joint. Urinary tract, skin, dental or respiratory infections are potential causes for infection in the new implant. Infections in other parts of the body should therefore be treated aggressively in an attempt to avoid their spread to the joint.

We recommend prophylactic antibiotics for patients having certain dental work done and for any invasive diagnostic studies. This prevention is recommended for as long as you have the implant.

## Antibiotic Prophylaxis

- For patients not allergic to Penicillin: Cephalexin, Cephadrine or Amoxicillin 2gm orally 1 hour prior to dental procedure.
- For patients who are not allergic to Penicillin but unable to take oral medications: Cefazolin 1gm or Ampicillin 2gm intramuscularly or intravenously 1 hour prior to dental procedure.
- For patients allergic to Penicillin: Clindamycin 600mg orally 1 hour prior to the procedure.
- For patients allergic to Penicillin and unable to take oral medications: Clindamycin 600mg intramuscularly or intravenously 1 hour prior to the procedure.

No second doses are recommended for any of these dosing regimens

# RESUMING NORMAL ACTIVITIES

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1. **Work:** Depending on the physical demands of the job, work may be resumed any time you feel comfortable. It takes four to six weeks to be able to return to a relatively sedentary job and longer if your job has physical requirements.
2. **Driving:** Driving may be resumed four to six weeks following surgery when you feel you have the strength to meet the demands of controlling the vehicle. We would recommend that you drive the car up and down the driveway and practice moving your feet from accelerator to brake. Make sure you are able to do this quickly and safely.
3. **Marital Relations:** Sexual intercourse may be resumed at any time.
4. **Sports Activities:** Remember that your new knee is artificial and although made of extremely durable materials, is subject to wear and tear. We encourage you to be active in order to control your weight and muscle tone. This will help prolong the life of the prosthesis. You should not begin any exercises other than those prescribed for several months, and then you should limit them to low-impact exercises such as walking, swimming or bicycling. Jogging, high-impact aerobics, and sports that may result in a knee injury should be avoided. Golf may be gradually resumed. Although tennis is discouraged, a number of patients have successfully returned to doubles play.

## IN SUMMARY

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We believe that total knee replacement is a safe and successful procedure when performed on properly selected patients by surgeons with expertise in the technique. It is expected to provide many years of improved and excellent functions.

We wish you the best of luck and remind you once more that we are always available. This booklet is provided to help you understand the procedure. We encourage your questions.



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