The Anderson Orthopaedic Institute

A Center of Excellence for Orthopaedics

Knee Replacement

PATIENT INFORMATION

Messages from your surgeons

C.Anderson Engh, Jr.,MD

"Knee replacement is major surgery that can dramatically improve the quality of life. This manual will help our patients prepare for surgery."

Dr. Andy is the third generation of his family to practice at the Anderson Orthopaedic Clinic. After graduating from Davidson College, he attended medical school at the University of Virginia and completed his internship and residency in orthopaedic surgery at the Medical College of Virginia. Dr. Andy then joined his father and uncle in practice at the Anderson Orthopaedic Clinic, continuing the family legacy by specializing in joint replacements and performing research studies on hip and knee replacements. He has authored many research and technical articles and presented his findings and surgical techniques to American and international orthopaedic conferences. He is board certified and a member of the American Academy of Orthopaedic Surgeons, American Association of Hip and Knee Surgeons, the Knee Society, and the Hip Society.

According to Dr. Andy, "It is wonderful to work alongside my father and uncle. I'm proud to continue the tradition of caring and innovative treatment that my grandfather started."

William G. Hamilton, MD

"We have collaborated with all members of the care pathway to create this manual. We hope that our teamwork helps provide the optimal experience throughout your surgery."

Dr. Hamilton, a native of Ithaca, New York, received his ScB from Brown University where he was a four year letterman in football. He graduated in the top of his class from The University of Cincinnati Medical School and was inducted into the Alpha Omega Alpha Honor Society. Dr. Hamilton spent his 5-year Orthopaedic residency training at the Hospital of the University of Pennsylvania in Philadelphia. He then completed the one year Adult Reconstruction fellowship here at the Anderson Clinic, and was invited to join the staff at the completion of his fellowship.

The focus of Dr. Hamilton's practice and research has been hip and knee total joint arthroplasty, as well as individualized care of each of his patients. His areas of expertise include muscle sparing anterior approach total hip arthroplasty, minimally invasive total knee arthroplasty, knee replacements, unicondylar knee arthroplasty, and the complex revisions of failed hip and knee replacements.

Kevin Fricka, MD

"The knee replacement of today offers patients both quicker recovery and long lasting results due to recent advances in both surgical technique (minimally invasive) and the prosthetic implants (high flexion, partial knee and gender implants)."

Dr. Fricka was born in Chicago, IL and then grew up in the greater Los Angeles, CA region. Dr. Fricka earned his undergraduate degree at Harvard University where he was also a member of the varsity basketball team. He completed his medical education at George Washington University and is excited to be practicing in the greater Washington area. Upon graduation he was inducted into the Alpha Omega Alpha Honor Society and received the Julius S. Neviaser Award in Orthopaedic Surgery.

He completed his orthopaedic surgery residency at the University of California-San Diego. During his residency he presented numerous scientific papers and was awarded the DePuy Orthopaedic Research Award by the California Orthopaedic Association. He has been published in the Journal of Arthroplasty, co-authored several book chapters and is a member of both the American Academy of Orthopaedic Surgeons and American Association of Hip and Knee Surgeons.

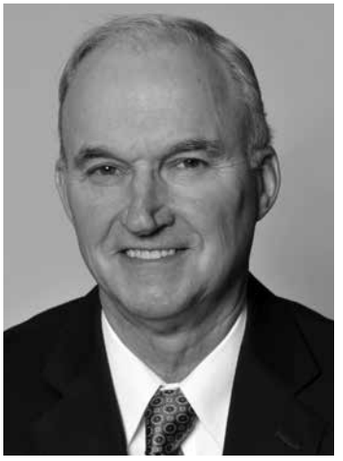
Dr. Fricka finished his training with a one-year fellowship in Adult Reconstructive Surgery at Rush University in Chicago, IL. There he learned his techniques from some of the leaders in adult reconstructive orthopaedic surgery. His particular surgical interests include "minimally invasive" knee replacement surgery, partial knee replacement, "Gender-specific" knee arthroplasty, and complex revision of failed knee replacements.

Nitin Goyal, MD

Dr. Goyal is a fellowship-trained specialist in the field of hip and knee reconstruction (joint replacement) who is a native of Great Falls, Virginia. He completed his medical education at Jefferson Medical College in Philadelphia, Pennsylvania where he graduated at the top of his class and was elected into the prestigious Alpha Omega Alpha Medical Honor Society in his third year. He went on to complete his residency in Orthopaedic Surgery at the world-renowned Rothman Institute & Thomas Jefferson University Hospital. There he received the Everett J. Gordon award as the Chief Orthopaedic resident demonstrating the "most outstanding clinical and surgical achievement."

Dr. Goyal stayed on at The Rothman Institute to pursue specialized training in complex hip and knee reconstruction. His particular surgical interests include computer navigation for partial and total knee replacement, minimally invasive partial knee replacement, muscle sparing anterior approach for hip replacement, complex revision of failed hip and knee replacement, and treatment of hip pain in the younger adult population.

Dr. Goyal has published articles in several major Orthopaedic journals, presented at national meetings, co-authored several book chapters and is a member of the American Academy of Orthopaedic Surgeons and the American Association of Hip and Knee Surgeons. His specific research interests include improved management of postoperative pain following total joint arthroplasty, and the diagnosis and management of infection following total joint arthroplasty.



Gerard A. Engh, MD

GERARD A. ENGH, M.D.
RETIRED 2013

Dr. Jerry Engh devoted his career to improving the quality of his patient's lives through joint arthroplasty. After graduating from Davidson College, he attended medical school at the University of Virginia. Following an internship and residency at Yale-New Haven Hospital, Dr. Engh spent two years as a major in the Army Medical Corps. He then joined his brother working at The Anderson Orthopaedic Clinic, which had been founded by his father, Otto Anderson Engh.

At the Anderson Orthopaedic Clinic, Dr. Engh has helped pioneer research and development of implants for knee replacement. Along with the other physicians at The Anderson Orthopaedic Clinic, he compiled an important database for tracking the outcomes of knee replacement surgery. Using this information and his surgical experience with knee replacement surgeries, Dr. Engh developed the Anderson Orthopaedic Research Institute (AORI) Bone Defect Classification System that many clinicians currently use to describe the extent of bone damage in a knee that requires a revision surgery. Through his clinical experience, research and dedication to improving knee arthroplasty implants and procedures, Dr. Engh was instrumental in bringing issues of polyethylene sterilization and wear to the attention of other orthopaedic surgeons as well as to the manufacturers of the implants.

Dr. Engh is a past President of the Knee Society and the Medical Director and Director of Knee Research at the Anderson Orthopaedic Research Institute. In 2001, he co-founded Alexandria Research Technologies with the goal of pursuing a new implant design ideas for knee replacement surgery. This led to the concept of Tissue Guided Surgery – a surgical procedure that optimizes the placement of the knee implants based on the patient's own knee motion and an implant designed specifically for this type of surgery. Dr. Engh maintains a keen interest in implant technology and innovative new options for joint replacement surgery and provides consultancy to designers and manufacturers of implants for knee arthroplasty.

Dr. Jerry is also passionate about farming and his cattle ranch. He has always loved the outdoors and "relaxes" in the fields on his tractor. When work on the farm is finished, he challenges his family to a round of golf.

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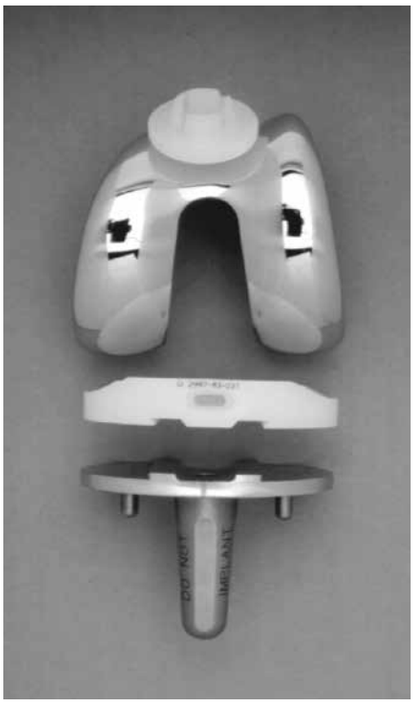


A typical total knee implant covers all parts of the knee joint that contact each other as the knee bends.

INTRODUCTION

Welcome to the Anderson Orthopaedic Institute, one of the foremost U.S. institutions specializing in joint replacement surgery. Over the past 40 years more than 25,000 hip, knee, and shoulder replacements, along with vast numbers of arthroplasties of the small joints of the hand, have been performed by the highly specialized team of orthopaedic surgeons at the Anderson Orthopaedic Clinic. This long-term experience, as well as the training and expertise of our staff, will ensure a safe, comfortable, and satisfactory outcome of your surgery.

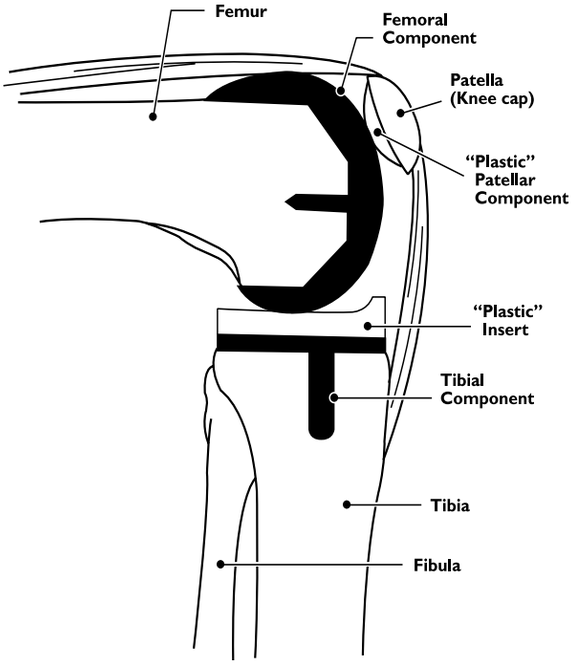
This booklet addresses many of the most frequently asked questions about knee replacement. Please remember that this information does not substitute for direct communication with your surgeon's office. If you have questions, you are welcome to call to clarify any issues that concern you.

TYPES OF KNEE REPLACEMENTS

Total Knee Replacement

Patients frequently ask, *"What exactly is a total knee replacement?"* The simplest answer is that it is a replacement of the worn and arthritic surfaces of the knee joint. We often tell our patients that a *total knee replacement* is similar to resurfacing a road full of potholes. In this procedure all parts of the joint that contact each other as the knee bends are covered with an artificial surface.

With arthritis, the cartilage covering the ends of the bone within the knee joint is badly worn. In a knee replacement, the damaged cartilage, along with a very small amount of bone, is removed with precise guides and instruments. The knee replacement implant, which is made of metal and plastic, is then fitted to the bone to provide an artificial surface that eliminates pain. In this operation little bone is actually removed; it is better to think of the procedure as a refinishing of the knee surfaces.



Side view of knee with total knee components.

Partial Knee Replacement

Surgeons at the Anderson Clinic are at the forefront of research and development of *unicompartmental, or partial, knee replacements.* This procedure greatly benefits patients who have localized types of knee arthritis. In this procedure only the inside (medial) or outside (lateral) portion or kneecap of the knee is replaced. We do not recommend this surgery for mild problems; rather, we suggest it to patients whose pain persists after conservative treatment.

Improved techniques and instruments make it possible to perform a partial knee replacement (implant above) with much smaller incisions.

Unicompartmental knee replacements have been performed at the Anderson Clinic for over 30 years. Because the surgery is less extensive and because healthy portions of the knee are maintained, the procedure is safer and less painful. Patients recover more easily and quickly. Because there is less bleeding and pain, the procedure can be done safely with an outpatient or short hospital stay. Following a unicompartmental knee replacement most patients can go home the day of surgery.

Looking to a patient's future, another benefit of minimally invasive unicondylar surgery, especially for today's active patients, is the ease with which it can be changed to a complete replacement if the first replacement wears out. In most instances, the revision of a unicompartmental surgery is straightforward and yields very good results.

Although we can be 80-90% sure before an operation that a partial knee replacement is best for a patient, we make the final decision between a partial or total knee replacement during surgery. We only will opt to perform a total knee replacement if the patient's arthritis proves to be so severe that a total knee replacement is necessary to improve knee function and relieve pain.

Revision Total Knee Replacement

About one in ten total knee implants will fail over a 20-year period and will require a revision of the prosthesis. Since a revision is performed to replace failed knee implants, a revision is more complex and often requires an implant specially designed for a knee replacement that has failed. The bone is not as strong when an implant is removed, and the ligaments supporting the knee may be damaged. A revision prosthesis can help address these problems. For example, the surgeon can fit a stem inside the canal of the bone to provide more support for the prosthesis.

Your surgeon or his assistants will be glad to answer your questions about revision surgery and will review the advantages and disadvantages of different techniques with you.

Possible Complications

Along with the benefits of a knee replacement, there is a small chance of complications, which may include blood clots, infection, fracture, or nerve damage. There may be stiffness and wound complications. The risks of these problems are small, and the problems are almost always correctable. At The Anderson Clinic we use the latest technology and techniques to give you the optimum care, but we also believe it is important that you are aware of potential complications, so you will understand your surgery and our efforts to minimize risks.

A possible complication of any knee surgery is a deep venous thrombosis (a blood clot in the leg). If a blood clot occurs, treatment may include medication to prevent additional blood clots. Infection occurs in less than 1% of all patients; however, when it does occur, it is serious. The implants may be removed so that the infection can be treated with antibiotics. After the infection is cured, new knee components can be reimplanted with antibiotic cement in most cases.

Nerve injuries occur in less than 1% of knee replacement patients and usually result from scar tissue from previous surgeries forming around the nerve. Fractures during surgery also occur in less than 1% of patients. A fracture is more common in revision surgery when bone loss has occurred or a well-fixed implant must be removed. Treatment can range from restricted weight bearing, wearing a cast, or surgery, depending on the nature and location of the fracture.

This list covers the most common complications associated with knee replacement surgery. We hope that in discussing your procedure with you – its risks and benefits, our techniques, alternative treatments, and expected outcomes – we can assure you we are providing the best care possible.

PREPARING FOR A KNEE REPLACEMENT

Your Joint Replacement Team

A team of professionals will help you through all phases of your surgery. This team includes your physician and his clinical staff, physical therapist, case manager, physician assistant, nurse and support personnel. Other important members of our Joint Replacement Team include our four orthopaedic Fellows. Having completed their orthopaedic training, these surgeons have dedicated a year to further professional development in total joint replacements with the Anderson Clinic. They are among the brightest young orthopaedic surgeons in the country. You may meet one of these doctors on your first visit to our office. Under the supervision of Anderson Clinic Physicians, each Fellow assists in the clinic and in surgery, provides postoperative patient care with daily rounds, and participates in our research.

Scheduling Surgery

If you do not schedule surgery at the time of your office visit, our scheduling secretary, who will help you select a surgery date, is available to answer any questions. To allow adequate time for the necessary preparations, a surgery date is usually set well in advance of your decision to proceed with knee replacement surgery. You will initially get a date for surgery but the time of your surgery will not be determined until the week before the surgery date.

Preoperative Planning

Once you have a surgery date, you will need to prepare for surgery. This includes preoperative interviews and tests within 30 days of surgery. We also encourage you to bring someone with you to help you get to your appointments and function as your “coach” and advocate throughout the joint replacement process.

Discharge Planning

Most patients recuperate much better at home with the help of family and friends; therefore, our care map promotes discharge to your home. Your team will assist in identifying the kind of help you may need after discharge and advise you of care options. It is important that your discharge plan be worked out with the case manager before surgery.

Stopping Medications Before Surgery

Patients should stop taking aspirin and other anti-inflammatory medicines at least ten days before surgery to avoid increased bleeding associated with these medications. You may take Tylenol for pain during this time.

If you are taking blood thinners, such as Plavix, Coumadin or Pradaxa, these can also create bleeding problems; it is important to discuss their use with the prescribing physician to determine the dosage program that will best prepare you for surgery.

Ten days prior to surgery, you should also discontinue the use of most herbs/supplements: echinacea, ephedra, feverfew, garlic, ginger, gingko, biloba, ginseng, goldenseal, kava, saw palmetto, St. John's Wort, valerian, vitamin E, gingko/biloba, and fish oil.

Financial Arrangements

The Anderson Orthopaedic Clinic will make every effort to assist you in meeting the policy requirements of your insurance company. You need to determine whether your insurance requires pre-authorization for surgery and whether a second opinion is required. A call to your insurance carrier will answer these issues, if they are not clearly stated in your policy.

We accept a number of health care plans with fixed fee schedules. We will be happy to provide you with information about our participation in your plan. The Anderson Orthopaedic Clinic will bill Medicare or your commercial insurance for the cost of the surgery. You as a patient are responsible for the balance stipulated by your type of insurance. The Anderson Orthopaedic Clinic will also bill you for the services of the Fellow who assists during surgery and throughout your hospital stay as well as with your follow-up care. The Anderson Clinic billing office and our staff are available to assist you with questions about reimbursement and billing procedures. Your hospital or surgery center bills are handled by the individual facility's billing offices. To contact billing with Inova Mount Vernon Hospital, please call (571) 423-5750. To contact billing with Harborside Surgery Center, please call (240) 493-6110.

If you are responsible for a deductible associated with the surgery, you will be responsible for paying this prior to the date of surgery.

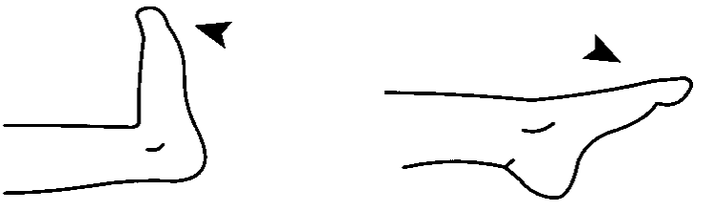
Preoperative Physical Therapy Session

Because of the many months of pain and decreased physical activity you may have experienced before surgery, your muscles may not be in the best condition. We have found that patients do better after surgery if they do exercises before surgery. They also will discuss any special home equipment needs and safety precautions. Your coach who will assist you after discharge is encouraged to attend this session.

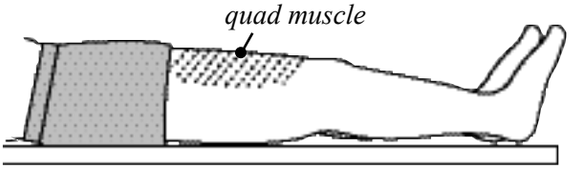
Preoperative Exercises

Many of the preoperative exercises are the same exercises that will be part of your postoperative therapy program. We recommend that you work on the following exercises several times throughout the day. If necessary, start out gradually and build up the number of repetitions. If you are unable to tolerate any of the exercises due to pain, DO NOT continue.

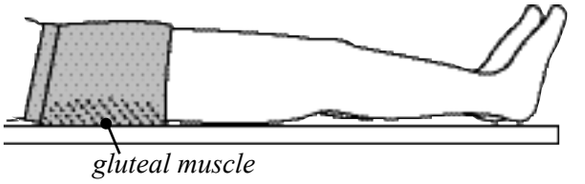
1. **Ankle Pumps:** Move your foot up and down. Repeat up to 25 repetitions, two times a day.



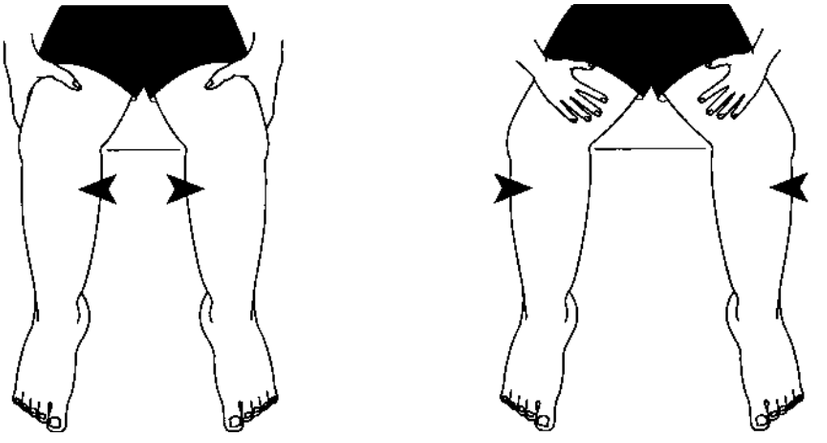
2. **Quad Sets/Knee Tighteners:** Lying on your back with your legs straight, push down the back of the knee against the bed. Maintain the muscle contraction in the thigh for five seconds. Relax. Repeat up to 25 repetitions, two times a day.



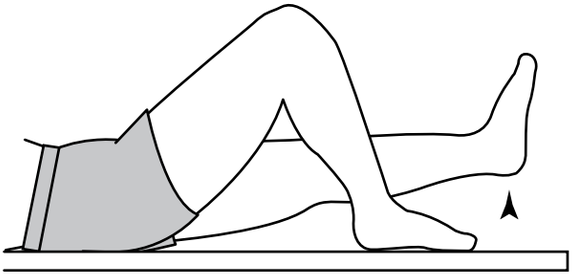
3. **Gluteal Sets/Buttock Tighteners:** This exercise can be done lying down, sitting, or standing. Squeeze the buttock muscles together and hold for five seconds. Relax. Repeat up to 25 repetitions, two times a day.

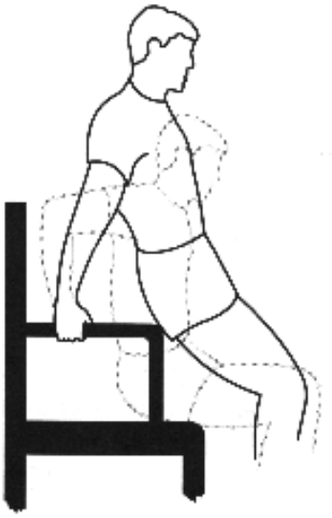


4. **Isometric Adduction/Abduction:** Sitting in a chair, place your hands along the outside of your thighs. Tensing your thighs, pretend as if you are trying to push your them apart; maintain the tension for 5 seconds. Then, place your hands on the inside of your thighs and pretend you are pushing your thighs together by tensing them for 5 seconds. You should be exerting your thigh muscles, not your hands or arms. Repeat up to 25 repetitions, two times a day.



5. **Straight Leg Raise:** Lie on your back with your right leg bent. Tighten your left knee and thigh and lift your left leg off the bed. Hold for the count of three. Do the same exercise with the opposite leg. Repeat the exercise using your right leg. Repeat up to 10 repetitions, two times a day.





6. **Chair Push-Ups:** Sitting in a chair with arm rests, push yourself up using your arms. Begin by using your feet to assist you, then progress to putting more weight onto your arms to lift yourself. Hold three seconds. Repeat up to 10 repetitions, two times a day.

Blood Donations and Iron Supplements

We no longer advise patients to donate their own blood before surgery. With less invasive surgery techniques there is less than a 5% chance you will need to be transfused.

You should take an iron supplement starting a week prior to your surgery. This can be purchased at your local drug store without a prescription. The iron supplements should be taken after meals. Iron will change the color of your stools to a tarry black. In addition, the supplement may be constipating, in which case a laxative may be needed.

Medical Clearance

All patients must be evaluated by a medical doctor prior to surgery to determine if it is safe to proceed. This visit will include a medical history, physical examination, and laboratory tests (blood count, chemistry profile, and urinalysis). You may also need a chest x-ray and electrocardiogram that has been done within the past year. Additional tests may be required if you have other specific medical problems. The examination must be completed within 30 days of surgery.

Reducing the Risk of Infection

Any source of bacteria within your system must be eliminated before your surgery. Abscessed teeth and pending dental work should be taken care of prior to your knee surgery. A urinary tract infection is an additional source of contamination. Although frequency, urgency, and burning are symptoms of a urinary tract infection or prostate problems, you may have an infection without symptoms. The doctor who clears you for surgery will order a test of your urine. If an infection is found, antibiotic treatment will be required prior to your knee operation.

Our goal is to reduce the number of bacteria you carry on your skin prior to surgery. We will instruct you to use an antibacterial wash in the days prior to surgery. Because certain bacteria are carried in your nostrils, we may instruct you to use an ointment to treat this bacteria. Furthermore, the skin around your knee and operative extremity should be free of any open lesions suchs as cuts, scrapes, bug bites, etc. If you have any questions, please call your physician's office.

DAY OF SURGERY

Reporting to the Hospital or Surgery Center

On the day of surgery, you will report to the Registration Desk. Bring your photo ID and Insurance Cards for verification. You will be escorted to an area where you will change into a hospital gown. An identification bracelet will be placed on your wrist. An admissions nurse will make sure that your medical work-up has been completed. You will then be escorted to an area where a nurse will make you comfortable and provide warm blankets. An intravenous line will be started. You will see your surgeon, the Fellow who will be assisting with your surgery and the anesthesiologist before going into the operating room.

Clothing

You are encouraged to bring loose fitting jogging clothes, t-shirts, pajamas, sweat pants, or shorts for your stay after surgery so that you will be more comfortable when you are walking around. Tennis shoes, loafers, or comfortable support shoes should be worn; we do not recommend bringing new shoes.

Anethesia

On the day of surgery you will meet with the anesthesiologist and anesthesia staff (nurse anesthetist) to go over your medical history and the type of anesthesia that will be utilized for the surgery. Most patient will have a spinal/epidural anesthesia and will also be given medication that allows them to sleep during the procedure. This avoids the use of a breathing tube during the operation. A spinal/epidural anesthesia is generally our preferred method of anesthesia for joint replacement surgery, however there are some situations in which it may not be indicated, and the anesthesiologist will discuss any such situation with you.

Post-Anesthesia Care Unit (PACU)

A typical knee replacement operation takes approximately one to one and one-half hours. Revision surgery often takes longer since it is more complex.

After surgery, you will be moved from the operating room to the post-anesthesia care unit (PACU), often referred to as the recovery room, where the nurses will monitor your vital signs and oversee your recovery from anesthesia. Your stay in the PACU lasts at least 1-2 hours.

When you awaken in the PACU, you will notice that there may be a drainage tube under the knee bandages to drain blood from the knee and prevent swelling.

You may receive oxygen through nasal breathing tubes for 24 hours. To empty the bladder, you may have a urinary catheter, which will be removed on the first or second postoperative day. Pneumatic compression boots are also placed on both feet to help improve circulation. An air pump inflates and deflates air-filled pressure compartments within the boot. This rhythmic change in pressure promotes blood flow and also helps prevent blood clot formation.

Family Waiting Area

Family members are usually not permitted to visit with patients in the PACU. At the end of the surgery, the surgeon or the Fellow will discuss the details of the procedure with your family members. If family members leave the waiting area, they should let the staff know where they will be. If members of your family are unable to be present on the day of surgery but would like to talk with your surgeon, they should leave a phone number where they can be reached.

POSTOPERATIVE COURSE

Pain Medicine

We want you to be comfortable but also awake and alert enough to do exercises, including breathing exercises to prevent lung congestion and leg exercises to prevent blood clots. When you have recovered from anesthesia, your pain usually is managed by oral or intravenous pain medications.

We recognize that post op pain is a significant source of fear for patients. Adequate pain control is very important to us. We have designed a comprehensive program to improve your experience by decreasing pain with a "multimodal" pain program. This process starts before surgery, using a combination of different medications that work together to reduce the amount of narcotic medications you require. These can cause side effects such as nausea, itching and constipation, all of which we want to avoid.

Wound Care

Your wound will be covered by a dressing after surgery. It should usually be removed after 7-10 days. You can shower as long as there is no drainage from the wound. After the dressing is removed it is not recommended to apply any cream, ointment or lotion to the wound unless specific instructions are given by your surgeon.

Most of the time, your stitches will be under the skin and will dissolve of their own. If you have staples, or external stitches they can be removed 10 days after surgery as long as there is no drainage.

If the wound is draining, the dressing should be changed daily. The wound should be dry and without drainage by about 7 days postoperative. If there is persistent drainage from the wound after this time period, you should call our office immediately. If there is worsening redness around the incision, you should also call the office immediately. These may be signs of a superficial or deep wound infection and you may have to return to the office for an evaluation by one of our staff.

Other common concerns after knee replacement surgery include swelling and bruising. These can be quite significant in nature and can appear anywhere from the thigh to the toes. These are typically worse at night which can contribute to trouble sleeping comfortably for more than one to two hours at a time.

REHABILITATION:
REGAINING CONTROL THROUGH EXERCISE

A set of leg exercises will also be posted at the foot of your bed. These exercises should be performed each hour. We prefer that you rest with your legs slightly elevated and straight. To prevent heel sores, place a pillow under your heel to keep it off of the bed. The pillow should not be placed under your knee, because it is important to keep the knee stretched out and flat.

Following knee replacement surgery, all patients receive therapy. Joint Replacement nurses and physical therapists work together to help strengthen your muscles and increase the motion in your knee. Our goal is to ensure your independence and to discharge you to the comfort of your own home.

Before discharge you should have practiced and be able to:

- Dress yourself
- Get in and out of a bed, chair, shower, or bathtub
- Use bathroom adaptive equipment if needed, including an elevated commode seat
- Walk with a walker or crutches
- Go up and down stairs
- Manage pain
- Do your home exercise program

Your Rehab Team

We believe that your family is an important part of the rehab team that will work with you to develop goals based on your individual needs. The rehab team includes your surgeon, the surgical Fellows, nurses, therapists and case managers. Family members or friends are urged to attend all therapy sessions to learn appropriate techniques of care and how to assist you at home.

Postoperative Physical Therapy

A comprehensive physical therapy regimen is crucial to your recovery. As soon as possible, we want you to try to lift your operated leg. Initially, you will have some discomfort with this exercise. After two or three leg lifts, the discomfort will decrease. Gaining muscle control to lift and move your leg will speed up your recovery and help you to get in and out of bed safely and easily.

Regaining knee motion early prevents stiffness that might interfere with the way you walk and will help ensure the successful result we want for your knee. Your therapists know from experience how much to push you, and you are encouraged to work hard with them. Your physical therapy will be uncomfortable at first, but taking pain medicine before therapy allows you to participate. Your rewards will be regaining motion and strength in your knee and a return to your favorite activities.

Usually, patients can bear full weight on the operated leg within several hours after surgery. After surgery, we conduct a thorough therapy session of exercises and walking. If you meet our goals, you can go home safely and comfortably.

You are given exercises to do at home and usually begin outpatient therapy in the days or weeks after surgery after surgery.

A spouse, family member, or friend who plans to assist you after discharge is encouraged to attend practice sessions to learn appropriate techniques and how much assistance to provide. By being independent you will be using your own muscles to strengthen and protect your new knee.

After discharge, you are encouraged to attend outpatient physical therapy several times a week. The activity of getting out of your house and going to a therapy center is part of your recovery. Therapy improves your knee motion, strength, and endurance. If you are not ready for outpatient therapy, your case manager will assist in arranging therapy in your home.

DISCHARGE INFORMATION

Final Discharge Instructions/Prescriptions

Your nurse will see you on the day of discharge and answer any questions you may have. At the time of discharge, the nurse will give you your prescriptions and review discharge instructions. Most patients have some discomfort at home when they perform their exercises. You will receive a prescription for pain medication, but once home, you should begin to decrease the number of pills you take and increase the interval of time between doses. Pain medication should be taken before therapy or sometimes at bedtime, as needed for your comfort; a non-narcotic medicine can be used in between. Applying ice to your knee after therapy helps to control discomfort.

Written Discharge Instructions

You should receive a copy of our discharge instructions to remind you that:

1. It is normal to have some swelling and bruising in your lower legs after surgery. Walking every hour during the day and doing your exercises will help strengthen your muscles and resolve the swelling. If you have swelling, we recommend that you lie down every two hours, elevate your legs with pillows, and apply ice to your knee for 15 minutes. If the swelling does not go away overnight, or if you develop pain with the swelling, please call the doctor's office.

2. You are permitted to shower at home if you do not have drainage. If you have drainage, you should take a sponge bath. Ask for assistance from a friend or family member when getting in and out of the shower.

3. You should have a copy of your home exercises from the physical therapist. Do your exercises three times a day.

4. You should be walking in your home frequently. Use your crutches, cane, or walker as instructed by your therapist. You are encouraged to walk outside with assistance, weather permitting, for 20 minutes a day. Often people will notice some clicking in the knee with activity. THIS IS NORMAL and does not mean there is something wrong with the prosthesis.

5. Your knee will be sore but pain will dissipate over time. You will be given a prescription for pain medicines that can be used primarily BEFORE THERAPY and AT BEDTIME. Extra-Strength Tylenol, antiinflammatories or Ultram can be used instead of or in addition to narcotics. To ease your discomfort, apply ice to the knee after activity.

6. Some doctors and dentists recommend that joint replacement patients take antibiotics for dental and medical procedures. If so, they will prescribe the appropriate antibiotic. We leave this to their discretion.

Going Home By Car

Patients are able to go home by car after knee replacement surgery. If your trip home will take more than two hours, plan on allowing one or more stops for walking and exercising your legs. Please arrange your ride home prior to surgery.

By Airplane

If you need to travel by air, it is important to request a bulkhead or first class seat, so that you will have enough room to stretch out your leg during the flight. It is advisable to have a travel companion, who can help with your luggage and with getting on and off the plane. Occasionally, your surgeon may recommend that a long airplane ride be postponed for several days after discharge from the hospital.

Getting into Your House & Using Stairs

The physical therapist will teach you how to go up and down steps. You should have someone help you with steps until you are comfortable and secure with them. Remember that when you use a staircase, your crutches go under your arm on the opposite side from the railing. To go up the stairs, start with your unoperated leg; to go down, begin with crutches and the operated leg.

RETURNING FOR YOUR FIRST POSTOPERATIVE VISIT

Our physician assistants see all our postoperative knee replacement patients approximately four to six weeks from the time of their surgery. This will be arranged for you by our staff.

This first follow-up visit will include an examination of the knee. X-rays of the operated knee will be obtained to evaluate the alignment and fixation of the implant. You will receive new instructions concerning your allowed activities and the amount of weight you can put on the operated leg. Arrangements can be made on an individual basis for out-of-state patients.

LONG-TERM CONSIDERATIONS

Use of Antibiotics to Prevent Knee Infections

Each year in the United States more than 800,000 knee and hip replacements are performed. The infection rate for these procedures is very low. Joint replacement surgeons attempt to lower the infection rate by using prophylactic antibiotics during surgery.

Infections that develop around the knee weeks or months after discharge are a rare but serious complication. Infections that occur after six months are usually the result of an infection elsewhere in the body, which spreads by bacterial “seeding” and travels to the knee through the bloodstream. Urinary tract, skin, dental, or respiratory infections are potential causes of such knee infection and should, therefore, be treated aggressively.

In addition, since bacteria are normally found in the mouth and intestines, “seeding” might occur during some dental procedures, bronchoscopy, cystoscopy, or endoscopy and cause infection around your joint. Let your dentist and internist know that you have an implanted knee

prosthesis. Your dentist or internist will decide whether you need to take antibiotics before and after dental or diagnostic procedures.

Annual Follow-up Visits

We strongly recommend a return visit to the Anderson Clinic to confirm that your prosthesis is functioning well.These visits are important whether or not you are having problems with your knee. Over 90% of total and partial knee replacements continue to function well for more than ten years, but it is important to remember that with the increasing years of pain-free use, the implant may wear. The plastic part of the implant eventually may show signs of deterioration. This can only be determined by studying your follow-up x-rays.

Ongoing Resources

Anderson Orthopaedic Research Institute

Founded in 1972, the Anderson Orthopaedic Research Institute (AORI) is a not-for-profit organization dedicated to scientific research and progress in the joint replacement field. The AORI project directors, Anderson Clinic physicians, and the Engh Fellows collaborate on long-term outcome studies of knee replacements. We also evaluate the quality of all aspects of our joint replacement program.

AORI maintains a clinical database of over 5,000 patients treated for knee disease by knee replacement. Before surgery and at each postoperative annual office visit, the doctors ask their patients to fill out a questionnaire. Important information from your physical examination, your postoperative x-rays, and the patient satisfaction questionnaire is documented on computer forms. Analysis of this data allows us to accurately inform our patients about the expected long-term outcomes of knee replacement surgery. This information also helps us to modify the joint replacement program to ensure the highest quality of care and patient satisfaction.

AORI has become renowned for studies examining implant wear and the response of human tissues to implants. We believe that our research benefits others by providing more durable materials and improved techniques for joint replacement surgery.

AORI's research is published in the most respected orthopaedic journals in the U.S. and abroad. We also present research findings at meetings of orthopaedic societies and at medical universities and institutes. The AORI staff and physicians have received many prestigious awards for their articles and presentations.

The Joint Journal Newsletter

Several times a year, AORI produces the *Joint Journal*, a patient newsletter that provides up-to-date information about knee and hip replacement topics. In each issue, we brief you on the progress of some of our past Anderson Clinic patients and inform you of the research at AORI. Following your surgery, your name will be added to the *Joint Journal* mailing list. We invite you to send interesting information or general questions about knee replacement for us to include in the newsletter. Your personal experiences with knee replacement surgery often are of interest to our other readers. You may contact the editor by mail or email at **Research@aori.org**.

APPENDIX

I. Common Questions About Knee Replacement

Why does my knee click?

A knee prosthesis is made of hard metal and plastic. Gravity will create a slight separation of the components. When you tighten your muscles or swing your leg, the pieces come in contact and may make a clicking sound. This is normal. It should not cause pain and does not mean that something is loose or wrong.

Why does the skin feel funny around my incision?

The nerves in the skin cross the front of the knee in an inside-out direction. When an incision is made down the front of the knee, these tiny nerves are divided and the skin on the outside will feel fuzzy or numb. This sensation will lessen with time and is normal for all patients with knee replacement surgery.

Why is my leg discolored?

You may develop some discoloration (like a bruise) in the leg. This discoloration, which may extend to the hip or ankle, will slowly disappear.

When can I get my knee wet?

You can take a shower when your wound is dry. If you have a plastic dressing, it is waterproof. If you have a telfa dressing, remove it before you shower and replace after the shower. You may wash around the incision but do not scrub the incision. Water does not hinder the healing, but a strong soap could irritate the skin. Be sure to gently pat the area dry.

What about cocoa butter and vitamin E oil?

Do not use either of these until after your four week postoperative visit. Ask for clearance to use during that visit. Your skin will heal fine with or without these topical applications.

A stitch is sticking out. What do I do?

We often suture the skin from underneath to reduce scarring. The knot at the end of the stitch sometimes will protrude from the skin. Redness and a small amount of drainage may appear. Cleanse the skin with peroxide. Please notify your surgeon's office.

When can I drive my car?

Usually after 4 weeks. A patient's decision to drive sooner is a personal decision related to their mobility and pain control.

How long will I have pain?

The surgical pain tends to resolve in the first week or two. You may continue to have some soreness, stiffness and swelling anywhere from six weeks to three months. This should disappear gradually with exercise and increased activity. If you develop pain after exercising with weights or walking without a walker or crutches, you may be overworking the knee. The following should help: using the walker or crutches, decreasing the amount of weight used during exercises, and periodically elevating your leg with ice on it. If the pain does not resolve in a day or two, you should contact your surgeon.

When can I go in the swimming pool?

Ordinarily, patients may resume pool activities after the first follow-up visit. Be sure to check with the surgeon or fellow at that time.

II. Implant Retrieval Program

Patients interested in the advancement of medical science that will benefit others have agreed to donate their implants, surrounding bone, and the opposite knee for intensive studies of artificial knee replacements after the time of death. This research enables scientists to determine the best materials for prosthetic devices and the most effective methods for attaching them to the bone. AORI encourages and gratefully appreciates your participation in this program.

Commonly Asked Questions About the Program

Who should participate in this program?

We encourage all patients who have had a hip or knee replacement to participate. We are interested in cemented, non-cemented (cementless), and a combination of both types of implants. This program involves all consenting patients in the United States at the time of death.

Who does the removal?

A team of Anderson Orthopaedic researchers will remove the artificial joint(s) and the surrounding bone. All expenses for the retrieval are covered by the Anderson Orthopaedic Research Institute.

What is removed at the time of retrieval?

The staff will remove the artificial joint and the adjacent bone attached to the implant. It is also necessary to remove the corresponding amount of bone on the opposite leg so that we may compare the implanted side and the normal side. The incision and closure are performed like the original surgical procedure. All bone that is removed is replaced with artificial bone. The tissue is treated with the same respect as tissue donated for organ transplants.

Where will the retrieval take place?

The retrieval will take place in a hospital or in a funeral home. Once the Anderson Orthopaedic Clinic has been notified of the death, the retrieval team contacts the funeral home or hospital to make the necessary arrangements. Ideally, the implant should be removed within 24 hours of death. It does not matter if the body has been embalmed. Much consideration will be given to the funeral or cremation plans.

What should be done at the time of my death?

At the time of death, the family should immediately notify the Anderson Orthopaedic Clinic switchboard (703-892-6500). At night or on weekends, this call will be received by an answering service that will notify the physician to plan the retrieval. The family will not be burdened with the arrangement.

How do I enroll?

If you would like to enroll in the Implant Retrieval Program, please send your full name, address, and phone number to the Implant Retrieval Program, Anderson Orthopaedic Research Institute, P.O. Box 7088, Alexandria, Virginia 22307. We will send you a consent form and instructions to enroll in the program. When we receive the completed consent form from you, we will send you a donor card stating that you are participating in our Implant Retrieval Program.

III. Surgeon Disclosures

Throughout the years, othropaedic surgeons and industry have maintained a strong and collaborative relationships, working together to develop new and improved technologies, techniques and devices. These interactions result in innovative and improved technologies which enhance patient care.

Some of the doctors have relationships with industry. These relationships are either a royalty or consulting agreement. Royalty agreements occur when the surgeon develops a new and unique implant, instrument or technique. The surgeon is paid a percentage of the sale price of that implant or instrument. The surgeons at Anderson Clinic often use the implants that they have developed but do not receive payments for implants used in their own patients. The only receive royalties when other surgeons at other hospitals use those implants.

Consulting agreements usually involve education of surgeons in new techniques or advising orthopaedic companies. These agreements result in payments to the surgeon based on the amount of work done.

At the Anderson Clinic the doctors are committed to the highest ethical and patient care standards. A primary goal of any financial agreement between a company and an Anderson Clinic doctor is to enhance patient care. We encourage you to ask your doctor about this relationship with industry and have disclosed below the companies that we have or have had financial relationships.

We include companies that have provided research support to Anderson Orthopaedic Research Institute.

DePuy a Johnson and Johnson Company
Smith and Nephew
Zimmer
LifeNet
Wright Medical
Inova Hospital System
Medtronic
Innomed
Alexandria Research Technologies
Biomet
Ivivi
Ceramtec
Stryker

The
Anderson
Orthopaedic
Institute

A Center of Excellence
for Orthopaedics