TOTAL KNEE REPLACEMENT - AN OVERVIEW

HISTORY: Joint replacement surgery has been popular since the 1960's. Sir John Chamley was the father of successful total hip replacement. Today's hip replacement surgery was followed by total knee replacement surgery. The person given credit for developing total knee replacement surgery was Frank Gunderson. He was a Canadian surgeon. These were developed in the early 1970's. These prostheses were actually made in his garage prior to surgery and then sterilized for use in the patients. Several advances in design as well as materials used in knee replacement have given us the current state of knee replacement surgery. 90% of patients have a good or an excellent result with this type of surgery. Total knee replacement is generally recommended when patients have unacceptable levels of pain with everyday activities, increasingly severe deformity, or unacceptable function. Current knee replacement design consists of three components. The femoral component sits on the end of the femur bone, the tibial component sits on the upper end of the tibia bone, and the patellar component replaces approximately one-quarter inch of cartilage and bone on the kneecap. This combination of components is frequently referred to as a prosthesis. Some patients have arthritic disease that is confined to one compartment or one area of the knee. These patients maybe treated by a so-called "unicompartmental knee."

INDICATIONS FOR SURGERY: The main indication for total knee replacement arthroplasty is arthritis in the knee accompanied by considerable pain and loss of function that does not respond to conservative treatment. Pain from arthritis of the knee is a personal experience - your friends, family, and doctor do not know how much pain you have. The decision regarding proceeding with surgery is ultimately the patient's decision. Arthritis of the knee is not a malignant condition nor is it life threatening. Quality of life is the main consideration in the decision-making process. The operative goals are to relieve pain, improve function, and restore strength to the knee.

THE PROCESS: Total knee replacement surgery can be divided into phases.

Phase One - This is the phase in which the patient presents to the surgeon or the physician: It is in this phase that the patient comes to see the physician for their arthritic joint. At this time after a variable length of time, it is determined if the patient needs surgery. In addition, the patient has a workup by the surgeon consisting of an interview, physical examination, x-rays, and perhaps even some screening laboratory studies to determine risks and to try and avoid complications that may be identified as possible problems. After it has been decided that surgery is to be performed, we enter into the next phase of treatment.

Phase Two - Immediate Preoperative/Prehospital Period: Phase two involves all the work that is done to prepare the patient for surgery up until the time they are actually admitted to the hospital for the procedure. This is a very labor-intensive clinical workup as we are trying to identify reasons for this patient to vary from their pathway or have complications. Prior to admission to the hospital, you will be required to have laboratory studies, an electrocardiogram, chest x-ray, and a urine analysis and culture. This would

include workup to eliminate any active infections in our patients prior to surgery.

The cardiac and pulmonary status of our patients should be optimized. This may require special testing prior to doing the surgery. Vascular surgery problems such as arterial or venous insufficiency should be addressed. Dr. Bertram will do a nutritional screen on his patients consisting of an albumin level, a transferrin level, and a total lymphocyte count. The total lymphocyte count is calculated based on the white blood cell count and percent of lymphs in the differential on the blood count.

This will help to identify patients that may be at risk for either delayed wound healing or increased risk for infection preoperatively. This is particularly important for larger procedures such as revision total joint surgery as well as primary total joint surgery. This phase requires careful integration of the primary care physician and the orthopedic surgeon. It is important that the patients be honest with their surgeon regarding their medical condition and social habits. Unrecognized alcoholism and the development of postoperative delirium tremens is a serious complication, which has as high as a 50% postoperative mortality rate. It is extremely important to stop all alcohol at least three weeks prior to surgery. Also during this phase, the physician will review the x-rays of your operative joint and plan for appropriate prosthesis selection and sizing. This may require additional x-rays as we use the magnification markers to get an accurate sizing of your bone so that we can match a prosthesis that will fit you. This may involve additional x-rays if you have not had those studies done prior to your surgery. If your surgeon prefers that you donate your own blood in preparation for the surgery, it will be done at this time. Other options include shots of a medication, which will help to stimulate your blood count prior to surgery. It has been our experience over the last couple of years that when we use platelet gel, our patients do not need blood transfusions. Any type of blood thinner medication needs to be stopped at least two weeks prior to surgery. These medications include Coumadin, aspirin, or Persantine. Anti-inflammatory medications such as Motrin, Advil, Aleve, Indocin, Feldene, Naprosyn, and Clinoril should also be stopped. Medications such as Bextra, Celebrex, or Vioxx do not need to be stopped because they do not effect bleeding. Herbal supplements and vitamin E do effect bleeding and perhaps even your anesthesia. Therefore, these need to be stopped at least four weeks prior to surgery. You can use Tylenol as a pain medication or the medications such as Bextra, Celebrex, or Vioxx. You will also be enrolled in this phase in a patient education class at the hospital that will teach you as much as possible about joint replacement surgery during the hospital stay. We feel that if your patients know exactly what to expect, they will have a better outcome and a better hospital experience, and this has been proven by studies that have been performed.

Phase Three - Preoperative/Inhospital: Once you present to the hospital, everything is geared toward getting you ready for surgery. Do not bring any valuables or jewelry to the hospital. You will wear a hospital gown into the operating room. Jewelry, wigs, or nail polish are not allowed. Glasses and dentures will be secured for you and given back to you when you are awake after surgery. You will be given medication prior to surgery to help you to relax. The medication may cause drowsiness or dry mouth. Your family should wait in the waiting room during the surgery. The doctor will call the waiting room to talk with family or come over and talk with them after the surgery. If you need to call someone outside the hospital, please let us know. For most total knee replacement patients, an epidural catheter will be administered in the holding area prior to going back to the operating room, and if you use platelet gel, the blood for the platelet gel will be drawn in the holding area, as well.

Phase Four - Surgery: As you enter the operating room, you will be impressed by the brightness of the lights, the number of people busily preparing for your operation, and your anesthesiologist who will be immediately attentive. Your name, age, and operative site will be verified to ensure proper identification. An intravenous line will be started at this time if it is not done previously to provide a route for your fluids and antibiotics. A blood pressure cuff and EKG electrodes are routinely applied to monitor your blood pressure and heartbeat during surgery. Your anesthetic is administered and surgery will begin. You will be given medication through your IV before you receive any gases through a mask. This is if you are having a general anesthesia. If you had an epidural catheter placed, you will not need this. If your doctor prefers that a catheter will be placed in your bladder, it will be placed in the operating room while you are asleep, and you will not feel this. A total knee replacement usually takes approximately sixty to ninety minutes. In the event that both knees are being done at the same time, the operative time will be approximately three hours. Dr. Bertram will do the surgery and will be assisted by another physician or a physician's assistant.

You may receive a bill from an assistant surgeon or physician's assistant. The surgery will usually be done through a straight midline incision anywhere from 4" to 8" long. If you have old scars that precludes use of this approach, we may have to use and incorporate these old scars in our approach. This may result in a curvilinear incision or an incision that is not straight. The skin is usually closed with metal staples. A drain may or may not be used. This is at the discretion of the surgeon. It is our routine at this time not to use a drain. Upon leaving the operating room, you will have a heavy dressing on your leg and from the operating room, you will be transferred to the recovery room.

Phase Five - Postoperative/Inhospital: You remain in the recovery room until your blood pressure is stable and until you are alert enough to return to your room on the orthopedic floor. This will usually take approximately one to one and a half hours. At times a bed is not available upstairs, you will wait in the recovery room until your bed is available. In the recovery room, your vital signs will be monitored, and you will have oxygen delivered through a plastic tube which will be on your nose. This helps to rid the body of anesthetic agents used during surgery. If your doctor orders a PCA (patient-controlled analgesia) pump, it may be started in the recovery room. You will have your IV in place for several days until you are eating and drinking well and all of your antibiotics have been administered. At this time, we use antibiotics for 24 hours, and this is the current recommendation. Oral pain medication is available after one to two days and may be given every 4 hours upon request. If you have a Foley catheter in place at the time of surgery, it will be removed on the second day after surgery. If you have problems voiding after that, you may have to be catheterized intermittently, and this may require a urology consult. The incidence of this is greatly decreased when we place a catheter in your bladder in the operating room. To prevent the development of respiratory problems, you will be asked to use your incentive spirometer every hour while awake. You will be instructed in the use of this device when you arrive to the floor. Your diet will be advanced from clear liquids to a regular diet on the first postoperative day. You are encouraged to take liquids by mouth to maintain normal body temperature and an adequate intake and output level. You will be placed in a CPM (continuous passive motion) machine after surgery. The timing of this varies. It may be placed on you in the recovery room or it may be placed on you later in the evening of surgery. It is routinely put on your leg for one to two hours three times a day. This routine may vary depending upon your surgeon's preference. The goal with this machine is to gain full bending and full straightening of the knee. Full straightening or extension is routinely measured at 0 degrees, and full bending or flexion is routinely approximately 120 degrees. We would like you to have at least 90 degrees of bending (a right angle) prior to discharge from the hospital, but this is not critical. The CPM machine helps to achieve this. We prefer that after surgery you not place anything under the knee joint so that we can get the knee to straighten as soon as possible. You can place a pillow under your ankle, but not under your knee.

During your hospital stay, you may be given medication that contains iron. This may make your bowel movements very dark. This is normal. Physical therapy is under the control of your physician, and you will be visited by your physical therapist on the first day after surgery. You will progress to sitting and standing usually on the second or third day postoperative. You will ambulate with crutches or a walker once you do get up. If your prosthesis was put in with cement, you will bear weight right away and you can bear weight fully. We usually cement the prostheses in place. There are rare exceptions to this. An occupational therapist will teach you how to perform activities of daily living after knee replacement surgery if this is appropriate.

Phase Six - Discharge from the Hospital: Most patients leave the hospital after three to four days. Upon leaving the hospital, you will either go home, to a rehabilitation facility in the hospital, or to a facility outside the hospital that specializes in caring for patients after surgery until they can return home. When you leave, you will go home with instructions regarding your therapy at home and the use of your CPM machine if you surgeon wants you to have one. You will have prescriptions for pain medications, iron supplements, and blood thinners. Arrangements for your followup visit with the surgeon should have been made prior to your hospital stay, but if not, you can call to arrange this.

ADDITIONAL GUIDELINES TO FOLLOW:

- Remain on your crutches or walker at all times during the first four to six weeks until you are told otherwise.
- Only take a shower or sponge bath, not a bath, for the first six weeks to avoid excess strain on your knee. You may get in a whirlpool if supervised by a therapist after five days if you have no drainage from your incision. It is okay to take a shower after your incision is dry and clean. Your staples will not rust.
- Driving a car is usually not allowed for four to six weeks after surgery, but it is at the discretion of your surgeon.
- Even after your crutches or walker are discontinued, you may never lift heavy objects.
- Sports allowed four to six months after surgery are golf, swimming, bicycling, bowling, and doubles tennis.
- Activities not allowed are contact sports, running, jogging, racquetball, football, and skiing.
- For information regarding antibiotic prophylaxis, see the portion of our web page devoted entirely to that subject or just refer to the other part of this packet which is entitled "Antibiotic Recommendations After Surgery".

CALL FOR ANY OF THE FOLLOWING:

- Sudden and extreme knee pain.
- Fever greater than 101.5 degrees Farenheit
- Unusual redness, swelling, or drainage from your incision.
- Sudden chest pain, shortness of breath, or coughing up blood.
- Any sudden onset of increased swelling in either leg.

Good luck, and call us if you have any problems to our 24-hour phone number (239-262-6641)