OUTPATIENT TOTAL KNEE REPLACEMENT

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Since you have progressed to the point of serious consideration of total knee replacement, there is a great deal of information that is important for you to understand. Prior to making your final decision and ultimately having your total knee replacement, it is important that you understand everything about the procedure and have realistic expectations about the results. Outpatient total joint replacement is certainly not an option for every patient, so it is important that you understand the process and benefits of a 23 hour hospital stay and home recovery program. You should understand why you are having problems with your knee and when you should make the decision to have knee replacement surgery. It is important to know exactly what is done during the surgery and what to expect from the surgical procedure. These expectations along with the possible complications of the procedure will allow you to decide when to proceed ahead with the operation. I also want you to understand clearly what is expected of you prior to your admission to the hospital, during your admission, and in the rehabilitation period after your discharge. I will try to summarize all this information for you. Certainly if you have any questions, please feel free to contact me.

RATIONALE AND INDICATION

Total knee replacement for disorders of the knee joint has been performed for over 50 years. There has been a rapid evolution in prosthetic design and the surgical technique itself. The great majority of the operations are done for arthritic conditions of the knee. There are many different causes of arthritis all of which cause a deterioration of the knee joint. The knee joint is a hinged joint which moves on a smooth surface called the articular cartilage. The articular cartilage is worn away by the arthritis process to the point that the knee joint becomes painful. The process is usually gradual and may progress for months or

even years before becoming severe. As pain becomes more severe, there will be more pain and limitation of function. There are many types of arthritis that can cause this deterioration of the knee joint. The forms of arthritis include osteoarthritis, rheumatoid arthritis, ankylosing spondylitis, traumatic arthritis (related to injury) and avascular necrosis or loss of blood supply to the knee joint.

A secondary category of causes requiring total knee replacement are those of failed previous knee surgeries. The most common is a previous knee replacement that now has failed either through loosening of the components or wear of the polyethylene liner. This is called a revision total knee replacement while the initial knee replacement is called a primary total knee replacement.

In the early stages of knee disease, the pain and loss of function may be improved by conservative means of treatment including non-steroidal anti-inflammatory agents, intra-articular injection of steroids, or visco-supplimentation (a series of gel type injections into the knee joint). Patients may also use a cane or crutches, and restrict their activities. Weight loss, if possible, can also significantly reduce the level of pain. For many medical reasons, it is best to reach and maintain your optimal weight. This weight loss is difficult and sometimes impossible as you cannot exercise or walk very far with severe disease.

At some point, however, if the arthritic process increases in severity, patients will have increasing pain and decreasing function which is no longer managed by conservative measures. At this point it is time to seriously consider a total knee replacement. The decision to perform the total knee replacement is usually based entirely on the patient's complaints. It is rare when knee replacement is done on an urgent basis. The only potential cause for this necessity is when the arthritic process is so severe it actually wears away or erodes the bone. Once this erosion occurs, the operation must be done within a reasonable period of time as progressive loss of bone will compromise the potential for a successful surgery and result.

SURGERY

The knee is a hinged joint that connects the lower end of the femur or thigh bone and the upper end of the tibia or shin bone. The surfaces of each of the bones are covered by articular cartilage. The hinged joint has an additional component in that the knee cap or patella rubs on the front end of the femur. This serves as a fulcrum for the quadriceps muscle which straightens the knee. The end cap of the femur is removed and replaced by a metal shell that is made of either titanium or combination of chronium and cobalt. The upper end cap of the tibia is replaced by a surface made of high density polyethylene or plastic that is attached to the bone by a metal plate. The hinged joint of the knee, therefore, is replaced by a metal on plastic total knee replacement. The portion of the patella that slides on the femur is replaced also by a high grade polyethylene surface.

The greatest controversy that currently exists in total knee replacement is the method of fixation of the prosthesis to the patient. Two options are available. One is the use of commercially pure acrylic bone cement called methyl-methacrylate. This has been used for over 30 years. Early use was quite crude and the cement fixation was actually quite weak. It has been improved dramatically to the point that it now provides very strong fixation. It is best used in patients who are older or have very weak or osteoporotic bone. In younger patients with stronger bone structure, typically those under the age of 70 years, we prefer the use of a trabecular metal tibial implant. This type of implant does not require the use of cement for fixation but rather allows your bone to in grow into the implant. In this patient population, cement is used for fixation only on the femoral and patellar components.

The type of fixation you will have for your knee replacement will be determined based on your age, your activity levels, your bone quality and your pre-surgery x-rays .

EXPECTATIONS

Total knee replacement is very successful in terms of its main goal which is pain relief. Approximately 90 percent of people have complete pain relief. The additional 10 percent of patients may have mild and intermittent discomfort if they overuse the knee or become too active. The same high percentage of people no longer have a limp after the surgical procedure. A limp may occur or persist even though pain relief occurs. This occurs in situations where the muscles around the knee are very weak or in cases where the postoperative exercises are not performed. Most patients do not require any assistive devices to walk, although in some cases, patients choose to use a single prong cane for safety or balance reasons.

You are usually able to increase your activity level dramatically after surgery. Patients are encouraged to walk, hike, ride a bicycle or exer-cycle, swim and even play golf/doubles tennis. Sports that cause significant impact or twisting such as running, singles tennis or downhill skiing are not ideal. Getting up from a low chair without arms and going up and down stairs places significant stress on your knee replacement. These activities can be accomplished but you should not do them excessively. Finally, kneeling with direct pressure on the knee replacement is uncomfortable for many patients but is not considered restricted activity.

Another complaint of patients is the development of an angular deformity, such as becoming progressively knock-kneed or bowlegged. This occurs because the arthritic process is wearing more on one side of the knee joint than the other. Either process may occur in any given patient. Normally a patient should be slightly knock-kneed. An advantage of the operation is that the knee is realigned so it has a normal appearance with the patient being slightly knock-kneed.

Some patients complain that one leg is shorter than the other. After the knee replacement surgery, the leg may be straighter but the leg can rarely be made longer. The ligaments of the knee limit any intentional lengthening of the leg. In patients who are undergoing hip replacement one is usually able to correct leg length discrepancies. That is a distinct difference between hip replacement and knee replacement surgeries.

The final critical issue is how long the knee replacement will last. At this point we have very good information that suggests a modern cemented knee replacement will last approximately twenty to twenty-five years. After many years of use and walking, the knee prosthesis can loosen from the bone or the plastic can wear out. If this occurs and pain is present, it may be necessary to revise or re-do the knee replacement. This technically can be accomplished successfully but obviously it is best to have the initial knee replacement last as long as possible.

Bone in growth knee replacement is a newer technique. It is my belief that if it is done in the patients with very strong bone, it may actually last as long as, or longer than cemented knee replacements. But, the results of bone in growth total knee replacements are not good in patients with weak bone.

COMPLICATIONS

The results of total knee replacements are excellent. Therefore, there must be some reason that prevents us from performing knee replacements except in patients with significant arthritis. Potential complications are rare but nonetheless exist. These complications include infection, blood clot formation or thrombophlebitis, stiffness, slippage or dislocation of the knee cap from its grove at the end of the femur, nerve injury, fracture and other general complications. The issues especially important to address are the potentials for infection, blood clot formation, and stiffness.

The chance of infection in a total knee replacement is 1 out of 200 or 0.5%. This is a very low number but, nevertheless, can occur. If this occurs, it can be a very difficult problem as it is often necessary to have other surgeries to remove the infection and, in some cases, actually remove the implant for a temporary period of time. Obviously, the best way to treat the infection is to prevent it. The surgical team also uses air exhaust systems which are operating room apparel often called spacesuits. This prevents the operating room staff from breathing on the area of your knee operation. In addition, all patients receive preventative or

prophylactic antibiotics for 24 hours. Our hospital infection rate for all primary joint replacements last year was 0.2%

Blood clot formation or deep venous thrombosis is the formation of a blood clot in one of the deep veins of the lower leg. This is a common complication that occurs despite all methods of prevention. There are multiple ways to try to prevent this. Early mobilization decreases blood pooling your lower extremities. We put most patients on ASPIRIN twice per day, which is a blood thinner, and for a short period of time after hospital discharge. All patients also wear thigh high stockings on both legs throughout their time in the hospital and for a week or two after discharge. These white stockings improve blood flow thus decreasing the formation of blood clots in your legs. The best result, of course, is that you do not form a blood clot. If you did form a blood clot, and it is not treated, there is a chance the blood clot could break loose and embolize/or move to your heart or to your lung. This could potentially be fatal. Therefore, the safest approach is: 1) attempt to prevent DVT and 2) diagnose deep vein thrombosis in a timely manner. With this protocol the incidence of blood clots following knee replacement is minimized.

Total knee replacement rarely requires blood transfusion. Because it is rare that our patients require blood transfusion we do not suggest pre-surgery blood donation by our patients. We routinely use a medication during surgery that decreases blood loss. By avoiding blood loss, you can avoid the concerns of hepatitis and AIDS transmission. The chance of this occurring is exceedingly small with the estimated incidence of hepatitis transmission being 1 in 4,000 blood transfusions and AIDS being 1 in 1,000,000 transfusions. In the rare occasion that blood transfusion becomes necessary, the blood is very carefully screened and tested for these two problems.

After total knee replacement, it is very important for you to faithfully follow your exercise and physical therapy program. Nevertheless, it is still possible for the knee to gain less than the expected flexibility. For you to have a well functioning knee implant the goal is to gain 90 degrees or more of bend or flexion. This must be gained in the first three months after surgery. If excessive scarring

occurs or you do not perform your exercises, stiffness may prevent you from gaining the knee flexion necessary for daily activities. If this occurs, manipulation under anesthesia must be performed to break the adhesions or scar tissue. The chance of requiring manipulation should be less than 1 to 2 %, and the percentage of stiffness (arthrofibrosis) is increased if you have had any type of surgery on your knee prior to replacement.

Other complications that might occur are rare. They are potentially associated with any major surgery and anesthesia. The potential complications include death, heart attack, heart failure, stroke, pneumonia, lung congestion, gastrointestinal problems such as nausea, vomiting, diarrhea, constipation, urinary tract infections and decubitus or bedsores, etc.

The long-term complication is that the total knee replacement may fail by either loss of fixation or mechanical loosening of one or all of the implants or by wear of the plastic polyethylene surface. Since a patient with painless knee replacement may walk one to two million steps per year, it is reasonable to expect that eventually it may fail. Many total knee replacements have lasted more than twenty years.

It is advisable to stay in good physical health, avoid excessive weight gain, avoid excessive impact activities as previously noted, and exercise frequently. Although revision surgery is usually very successful, hopefully it will never be required for most patients.

PREPARATATION FOR SURGERY

Once you have made your decision to have a total knee replacement, you should contact our Surgery Coordinator, Renee Wood at 910-295-0224. She will help you choose a surgery date and will also schedule you for a pre-surgery appointment with my Physician's Assistant: Michelle (Shelley) Moore. This pre-surgery appointment with Michelle is mandatory for surgery. The time you must wait for your surgery is variable depending on the surgery schedule and your other medical conditions. We will make every attempt to schedule the surgery at

your convenience. Renee can answer many questions about preparation for surgery, the pre-operative sequence of events, inpatient vs. outpatient total knee replacement and insurance matters.

It is important to have a physical examination by your primary care physician/internist and/or cardiologist (if your have cardiac disease of any type) prior to your total knee replacement surgery. Since this is a serious operation, you should be in your best medical health with all medical problems under good control. If you have had a recent physical examination it may not be necessary to have a new examination.

Once you have discussed your upcoming knee replacement with your primary care physician and/or cardiologist they will then mail or fax the results of your examination and tests results to our office. It is preferable that these documents are received by our office prior to your pre-surgery appointment with Michelle. Additionally, we request that your dental health be at its optimum. We must ensure that you do not have any active oral/dental infection prior to joint replacement surgery, and therefore require that if you have any teeth in your mouth you see a dentist and undergo evaluation. Your dentist may also mail or fax results of your examination to our office prior to your admission to the hospital.

We will provide you with a letter to give to your primary care provider/ other medical providers detailing our plans to proceed with surgery. **It is your responsibility to make certain your pre-operative primary care physician, cardiology, and dental appointments are completed prior to surgery.**

As mentioned above, at the time that our surgery coordinator schedules your knee replacement she will also be scheduled an in depth preoperative history and physical examination with my Physician's Assistant, Michelle Moore (Shelley). This appointment typically occurs 3-4 weeks prior to your surgery date, and we do encourage you to bring a spouse, family member or friend with you to this appointment if you would like to involve them in your care. Michelle will be involved in your whole surgical experience as she is my operative assistant during surgery, she is involved in your post-operative care and will also be seeing you

during various clinic follow up visits. At your pre-surgery appointment Michelle will ensure that you are medically and surgically prepared for surgery, and that all of your questions have been answered. She will help you understand what will happen just prior to surgery, during surgery, during your stay in the hospital, and after your discharge from the hospital. You should bring copies of your medical and/or cardiac preoperative evaluation and dental evaluation to this appointment if they have not already been faxed to our office.

Upon arrival and check in at Pinehurst Surgical Clinic for your appointment with Michelle, one of our nurses will accompany you to one of our examination rooms for an anticipated 45-60 minute appointment. During this appointment, please be prepared to complete specialized x-ray examination needed specifically for surgery purposes. Additionally, you will be accompanied to our Pinehurst Surgical Clinic laboratory for routine laboratory tests of your blood. It is not necessary that you fast prior to your appointment with Michelle as the laboratory testing that will be completed does not require so. You will also undergo an electrocardiogram at this time (please inform us if you have undergone EKG testing by any other provider within the past six months and bring a copy of this study with you to your appointment if you have). It is important that you come to your history and physical examination with the actual bottles of medications you are taking, including those daily and those used on an as needed basis, both prescription and over the counter. We will be carefully documenting the dosages of the medications you take including the time of day your medications are taken. Please do not bring a list of your medications, as we prefer the medications in their original bottles instead insuring accuracy.

I would also like for you to compile a comprehensive list of all the medical providers you see including their name, and contact information. This will allow us to keep all of your medical providers updated with your progress before your knee replacement surgery, during your hospitalization and also during your recovery. Michelle will request this list at your pre-surgery appointment with her. At this appointment, Michelle will also provide you with individualized written instructions detailing any medications that need to be discontinued prior to surgery, medications that must be taken the morning of surgery and any other

necessary instructions. She will also provide you with an application for a temporary handicapped license tag, which you might use up to six months after your knee surgery.

HOSPITALIZATION

Most insurance plans do not approve admission to the surgery center prior to the surgery day, therefore, you will be admitted to the surgery center the same day of surgery in all cases. At admission, if necessary, additional blood testing might be required.

Renee Wood, our Surgical coordinator, will call you one business day prior to your surgery date and inform you of your arrival time to Surgery Center of Pinehurst located on Memorial Drive across from Pinehurst Surgical Clinic. We do not assign surgery times for our patients as there are instances where certain surgeries may take longer than others. It is likely that you will wait a period of time between your arrival to the surgery center and the start of your surgery. We advise that you bring a family member or friend to keep you company during this waiting period as well as some reading materials to help in passing the time. It is important that we have current, accurate contact information for you in order to facilitate the provision of information in a timely manner. Michelle will confirm your current phone number at the time of your pre-surgery appointment and also discuss the best methods of providing your arrival time to you (i.e. telephone vs. email).

You will find that the pre-medication process begins immediately upon hospital admission. We will be administering medications to prevent post-surgical nausea and pain. You will then be taken to the preoperative holding area in the operating room. This will allow for consultation with the anesthesiologist and starting of the intravenous line. At this point a preoperative sedative will be given to you by your anesthesiologist. In almost all cases, a spinal anesthetic is administered. You will be numb from the waist down. Although you may choose

to be wide awake or we can sedate you as heavily as you would like so that you are completely relaxed and will not remember anything about the operation. This is safer than a general anesthetic and your recovery is more rapid. A general anesthetic is used in rare cases.

As an adjunct to your spinal anesthetic, our anesthesiologist will also perform a femoral nerve block on you. This type of block causes numbness in the anterior portion of the thigh, most beneficial in reducing pain after your surgery. You will have received sedation prior to the procedure so you are not likely to remember the introduction of the medication for this procedure.

Primary total knee replacement requires approximately one hour of surgery time. While you are in the operating room, your family may wait in the surgical waiting area or at home. As soon as surgery is completed, I will contact them in person or by telephone.

You will be in the recovery room for one to three hours until the effect of the spinal anesthesia is worn off. Once that occurs and your vital signs are stable, you will be taken to your surgery center hospital room.

After surgery, you will be able to move about the bed. You will not need to remain rigidly immobilized in one position. With the bed controls you may elevate the head of the bed or remain perfectly flat. It is not typical that we would insert a catheter into your bladder during surgery so we will be getting you out of bed for purposes of urination. Additionally, with the assistance of our physical therapists, you will begin your bed exercises, standing and walking on the evening of surgery. In addition to your daily walking exercises, the therapists will instruct you on the use of the CPM machine you will be using until your knee motion is optimal (continuous passive motion machine). When you are independent, you should be able to get in and out of bed by yourself and walk with the assistance of a walker. Home physical therapy will be arranged by our surgical coordinator prior to discharge from the surgery center. You should expect that once home a physical therapist will come to your home daily for the first 5 days and then three times a

week for approximately two additional weeks there- after. We do also offer patients the opportunity to choose to do their physical therapy as an outpatient rather than in their homes. Should you consider outpatient therapy rather than home therapy please keep in mind you will need assistance with transportation, as you will not be driving in the first weeks of your recovery. Outpatient physical therapy can be done in the region you live or at Pinehurst Surgical Clinic.

The continuous passive motion machine is used throughout the hospitalization. You will be on the machine a minimum of four hours per day. Because some patients become tired of being in the machine continuously, it is satisfactory to have the nurses take you out of the machine approximately two hours every shift. If you do not require that, I would suggest you stay in the machine a maximum of 6 hours per day if possible.

Your therapy will be tailored to the type of operation that you received. Regardless of the use of cemented components vs. bone in growth components, patients can be weight bearing as tolerated, which means you can put as much weight on the leg as you desire. While you are walking in the surgery center, you will initially be using a walker but you can advance to the use of crutches if you can master the technique. It is your personal preference whether you go home on a walker or on crutches. Prior to the discharge from the surgery center, the physical therapist will be certain that you understand very clearly your discharge exercise program and have all the assistive devices that will help you cope in the immediate postoperative period. You will also accomplish stair climbing prior to your discharge home from Surgery Center of Pinehurst.

In order to prevent blood clot formation you will be placed on aspirin and compression stockings. We will also have you continue aspirin at home for a 6 week period.

By three to five days after surgery, your incision should be healing well. You will not have staples placed for knee closure after surgery as choose, rather, to close your would with absorbable sutures.

When you go home you may still have some clear, yellow drainage (serous

drainage). This is not an indication of any type of infection but just a part of the healing process in the tissue below the skin level. This may continue from one to five days. You will be able to take a shower at home with an airstrip in place immediately after hospitalization.

When you are home you will have a prescription for several narcotic pain medications, one that is taken on a schedule for the first two days and one that is taken as it is needed. As your recovery progresses you should be requiring less of the medication each day. You should moderate your activities to reduce the amount of stress that is put on the incision and muscles about the knee. This is the appropriate way to manage your pain after your discharge. It is common to have swelling in the leg, especially, if you are becoming more active in your activities at home. The one type of swelling that can be worrisome is swelling in the entire leg starting at the ankle or foot level. This is common when you sit for prolonged periods of time. If this occurs you need to spend less time sitting and more time lying down on the bed or couch with the leg elevated. If the swelling does not resolve significantly with this rest and elevation, you should contact me so that we might further evaluate this.

You should make arrangements to have intermittent help at home (spouse/ family member/friends) for the first 5-7 days after your outpatient total knee replacement surgery. Although we will arrange for home physical therapy to come to you, you might need help with meal preparation, with medications and with general activities of daily living that are made safer with an extra helping hand.

You should stay on your crutches or walker for the entire first six weeks after the surgical procedure unless otherwise informed.

FOLLOW-UP

Once you have had a total knee replacement, it is important to monitor

closely the healing process in the first three to six months following the surgical procedure. It is also important to monitor the long-term fixation of the implant over a period of many years to be certain there is no adverse effect on the bone or any sign of loosening of the prosthesis. Therefore, the usual follow-up schedule involves your return to the office for examination and x-rays at the following times after the surgical procedure: two weeks, six weeks, six months, and one year. After the first year, you are seen on an annual basis. In some situations because of difficulty of travel, I can make arrangements for you to be seen by your local family physician who can obtain x-rays and send those to me for evaluation. Unfortunately, this is not the ideal situation. I will try to be as flexible as possible because I know travel is often quite difficult and expensive.

PROPHYLACTIC ANTIBIOTICS

Patients with knee replacements can develop infections of the joint in special circumstances. Any infection you might acquire in any other part of your body could potentially spread to your replaced knee. As a result, antibiotics should be taken before certain types of medical, urologic, and dental procedures. An instruction sheet has been prepared and will be given to you in your educational packet.

PROBLEMS OR QUESTIONS

If you have any concerns or questions about the scheduling or preoperative sequence of events, you should contact Renee Wood at 910-295-0224. She can answer questions about the surgical scheduling, any insurance concerns or preparation for surgery. She can also help you after your discharge from the hospital with questions about your recovery and will forward any other specific questions to me or my Physician's assistant, Michelle. If we are not in the office at the time of your call, they will make certain that we receive the message as soon as possible. Either myself, or Michelle will return your phone call as soon as we are able.

I want you to understand completely your arthritis and the proposed surgery. It is best that you clearly understand all information about total knee replacement surgery. If you have any additional questions, please ask me when I see you prior to your admission to the hospital or at the time of your preoperative history and physical examination with Michelle. You may also contact Michelle via the intranet at mmoore@pinehurstsurgical.com.

John R Moore, IV, M.D.

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SUGGESTED ADDITIONAL INTERNET RESOURCES

- www.aahnks.org
- www.nih.gov/medlineplus
- www.aaos.org
- www.edheads.org
- www.zimmer.com