

Cartilage Repair Center

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What is a Total Knee Replacement (TKR)?

A total knee replacement is a surgical procedure used to treat patients with moderate or severe, “bone on bone” osteoarthritis of knee. This is the joint surface between the “shin bone” (tibia) and the end of the “thigh bone” (femur), as well as between the “kneecap” (patella) and the femur. Total knee replacement is a complete resurfacing of the diseased surfaces of the knee joint, and replacement of the diseased surfaces of the knee joint with metal components and a polyethylene spacer.

Who is a candidate for a Total Knee Replacement?

Patients who are candidates for a TKR are those with moderate-to-severe osteoarthritis of the knee, who have failed conservative/non-operative treatment. These treatments include weight loss, physical therapy, braces, ambulatory aids, and anti-inflammatory oral therapy and Steroid or Hyaluronic Acid injection treatments. Patients with moderate-to-severe arthritis often present with symptoms of knee pain with activity with accompanying, swelling, stiffness, and decreased mobility that may improve with rest or lessened activity. Patients may also experience a crunching or grinding sensation when the knee moves. Total knee replacements are most commonly performed in patients age 50 and older. We do, however, perform this procedure in younger patient populations based on medical necessity. In order to determine whether or not you are a candidate for a TKR, your surgeon will first obtain plain x-rays to assess areas of bone-on-bone osteoarthritis. Your surgeon may then have you get an MRI to evaluate all other parts of your knee.

What is a Custom Total Knee Replacement? Is it necessary?

Although knee replacement surgery is highly successful and durable, patient dissatisfaction has been reported to be anywhere from 20-25%. Complaints include the sensation that the knee feels “Fake”, moves unnaturally, feels tight and stiff, and may have residual pain.

This is not too surprising when you consider that the knee is an asymmetric joint and the standard “Off the Shelf” (OTS) replacements are symmetric, and only in certain sizes. The surgeon must shape the bones to the closest size fit of the implant available and loosen the soft tissues that are tight to “Balance” the soft tissues around the knee. If the OTS implant is a close fit and the soft tissues are balanced well, the patient will do well. Much like an “Off the Rack” suit fitting average size people but failing to fit well for very small or large people

as opposed to a “Bespoke” Custom Tailored suit which always fits well. Custom made implants use 21st century technology now only available because of enhanced computer speeds, software development and ‘Printing’ technology.

A custom-made knee replacement is individualized to only one patient. A CT scan is taken of the entire affected leg to allow software engineers to ‘Print’ individualized Jigs for the surgery to restore the leg to be straight and not ‘Knock Kneed’ or ‘Bow Legged’.

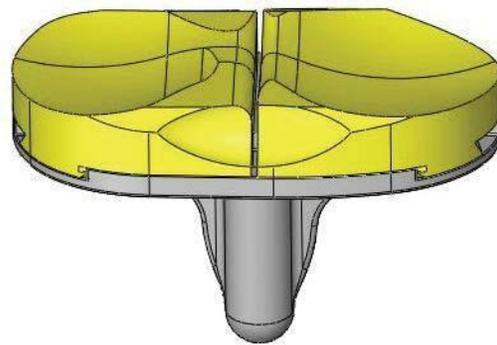
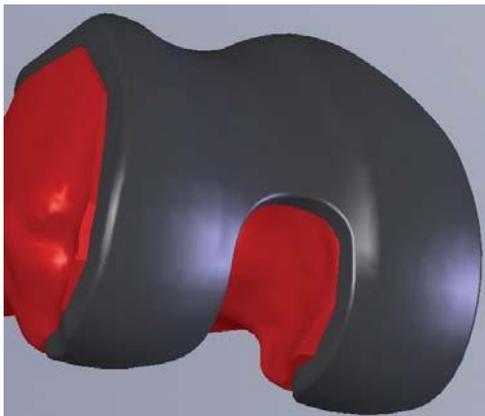
The software engineers then use the images of the knee to restore the exact shape of the knee before it became arthritic and print individualized molds from which the knee is then made precisely to fit that individual patient and no one else.

As the knee has 2 weight bearing surfaces at different levels from each other, 2 plastic inserts are made to restore the exact joint line level as the patient originally had. These plastic inserts use Vitamin E infusion patented technology that has a 40% improved wear rate over standard plastic inserts. As a result of restoring the original form leads to better movement, function and satisfaction.

Other benefits to custom total knee replacements:

- Thinner implants with 40% less bone removed
- Less bleeding
- Excellent return of motion earlier
- Patient satisfaction has improved from 80+% to mid-90%

**Software Engineers depiction of an exact fit, asymmetric,
Individualized custom made knee replacement**



**Custom Made Knee Replacement made from Printed Molds as an Exact fit to a patient's knee and restoring their joint surfaces precisely to what they originally were.
(Made from Cobalt Chrome metal and Vitamin E infused polyethylene)**



What will happen during my surgery?

Your surgery will be performed using either a general anesthetic or a spinal anesthetic depending on your preference. (At the end of the surgery your surgeon will use a pharmacy prepared mixture of medications that he will inject into all the pain sensitive areas of the knee that may provide relief of pain after surgery for 12-24 hours without a nerve block.) During your surgery the surgeon will make an open incision along the front of your knee running up and down your leg about 6 inches long. Through this incision the surgeon will be able to access the damaged area of your joint. The femoral and tibial side of your knee will be resurfaced with a metal implant made from cobalt chrome. The back side of your patella will be resurfaced with a “button” made of polyethylene plastic. All of these components are held in place using cement. Two polyethylene spacers will be placed between the tibial and femoral components. Once the cement is hardened and your implant is well fixed your surgical incision will be closed. This will be done using all subcutaneous or “dissolving” stitches. This means that you will not have any stitches that need to come out. You will have a plastic dressing on the incision that should stay on for 7 days after the surgery with which you can shower. After 7 days the dressing can be removed and you can shower directly on the skin. There are no stitches to be removed.



Above-X-rays of both knees showing “Bone on Bone” arthritis

Below- Same patients x-rays after Custom Total Knee Replacement



What can you expect post-operatively after a Total Knee Replacement?

When you awaken from surgery depending on your surgeon you may have a brace on your leg that will keep your leg straight. It will be important for you to wear this brace at all times when you are up and about until you are able to do a strong unsupported straight leg raise (usually 7-10 days). You should wear your brace to sleep so that you do not curl up at night and have difficulty keeping the leg straight during gait the next morning. You will also be given crutches; some patients feel more secure initially using a walker. You will be able to fully weight bear on your operative leg immediately following surgery however, it is a good idea to use your crutches for support as your muscles will be weak following surgery. You will use your crutches anywhere from 1-2 weeks depending on your muscle strength. Depending on your surgeon and how you are feeling you will spend 1-2 nights in the hospital. Do plan on spending at least one night. This is in order to make sure that you are comfortable and that your pain is well controlled. This time in the hospital also allows you to also meet with physical therapy and get some early exercise and crutch training. You will begin working with a physical therapist in the first few days following surgery. You can elect to have a visiting physical therapist come to your home for the first 1-2 weeks, but it is preferable that you may make arrangements at an outpatient physical therapy office within 7-10 days after surgery. They will have more equipment and modalities to move your recovery along quickly. After surgery you will also be on baby aspirin 81 mg twice daily for 3 weeks after surgery to prevent blood clots in the legs (DVT- deep venous thrombosis), or if you are on a blood thinning medication the doses will be adjusted around your surgery as recommended by your surgeon and internist.

How will my pain be controlled after surgery?

Immediately following surgery during your inpatient stay your pain will be controlled using IV pain medication. During your inpatient stay one of the goals of your care will be to transition you from IV pain medication to oral pain medication. This is often achieved on the first day after surgery. You will be sent home from the hospital with a prescription for oral pain medication to be filled at your local pharmacy. The most prescribed post-op pain medications include Oxycodone, Nucynta (tapentadol), or Dilaudid. Most patients will require regularly scheduled doses of pain medication (every 4-6 hours) for the first 1-2 weeks. Following week two you will begin to decrease your pain medication use to prior to physical therapy and prior to bedtime. Most patients will not require any pain medication past week 4-6. You will need to come to the office to refill pain medication once a week. Florida State Law does not allow us to mail prescriptions or refill pain medication without an office visit. We are only allowed to give a week of pain medication at a time. Be sure to follow the directions carefully. It is important to know how to obtain your pain medication refills appropriately and in a timely manner.

When will I follow-up with my surgeon after surgery?

Your first post-operative visit will take place 2 to 3 weeks after your surgery. This appointment is critical for checking your incision healing and range of motion as well as to answer any questions you may have in the first few weeks following surgery. You will then follow-up with your surgeon 6 weeks (if necessary), 12 weeks, 6 months, and one year after surgery. After the first year you will follow up with your surgeon every 4 years.

What restrictions will I have following this procedure?

Once you have fully recovered from your surgery, you will return to activities as tolerated. You will still be able to be highly active following surgical intervention. Approved activities include things such as walking, swimming, biking, elliptical trainer, golf, doubles tennis, hiking, skiing, and skating. Long distance running and hard pivoting sports such as soccer, basketball, squash, and racquetball are not recommended as they may cause loosening and premature failure of your implants requiring revision surgery.

Frequently Asked Questions

What are other common symptoms after total knee replacement surgery?

Numbness – The area to the outside of your kneecap and the incision will be numb. Due to the position of the sensory nerves running from the inside to the outside of the knee, they are cut when we make the incision expose the knee. This is normal, and may or may not resolve, but will continue to improve over the next 12 months.

Swelling – Everyone heals differently post-operatively. It is normal for you knee to be swollen, and maybe even bruised up to 4 weeks post-operatively. In most people the swelling begins to subside in 4 weeks. In some people, the knee will remain swollen up to 3-6 months. If the swelling does not hinder your range of motion, and isn't painful, it is not a concerning sign.

Stiffness – Stiffness due to pain is normal post-operatively and can be improved with early movement and physical therapy. You will be encouraged to move your knee as much as you can tolerate, and you will receive physical therapy in the hospital. A stiff knee is a painful knee, and the more you move it, the better your overall outcome will be.

When will I start physical therapy? You will start physical therapy beginning the day after surgery in the hospital this will be continued once you are discharged either on an in-home basis, or at an outpatient clinic.

What will I do during physical therapy? The primary goal of physical therapy is to initially increase ROM so that you do not get stiff following surgery. You will then begin to work on increasing strength after surgery. You will be provided with protocols for each phase of the post-operative period.

How long will I need to use my crutches? Depending on how quickly your muscle strength returns you will likely only need to use your crutches for a period of approximately 1-2 weeks. You may come off your crutches sooner than 2 weeks if you feel comfortable to do so. You will transition to 1 crutch/cane for weeks 2-4, and then work your way to walking normally by week 4-6.

When can I drive? For patients undergoing right leg surgical intervention you may not return to driving until you have discontinued using your crutches (approx. 3 weeks). For patients undergoing left knee surgery that do not drive standard transmission vehicles you may return to driving between 1 and 2 weeks when you are no longer taking pain medication.

When can I shower? You may shower 5 days after surgery but may not submerge your incision in a pool, hot tub, bathtub, lake, or the ocean for 3 more weeks.

When can I go back to work? This will be different for each patient and depends largely on the type of work you do. Most patients who work in a sedentary position or desk work will be back to work by 6 weeks. Those patients who work in more labor-intensive jobs may be out of work for up to 12 weeks.

When can I resume my regular activity? Return to regular activity depends highly on each individual patient's definition of regular activity. Non-impact activity such as walking, swimming, bike riding, and elliptical trainer can all be resumed by 3-4 months. Higher level activity such as hiking and skiing may require 6-9 months before they can safely be resumed.

Will I need to stay in the hospital? Most patients require a 1-3 night stay in the hospital.

I don't like how narcotic pain medication makes me feel, can I take something else?

You may use Tylenol (acetaminophen) for pain control following surgical intervention. Anti-inflammatories are also effective including Advil, Aleve, Ibuprofen, Naproxen, and Celebrex. A continuous ice flow machine such as PolarCare™ is very effective for pain and swelling of the knee with sedating side effects but the skin should be checked regularly, every ½ hour to ensure you do not get frost bite.

How long do I take my anticoagulation medicine for? Anticoagulation medicines prescribed are commonly Aspirin or Lovenox, and less commonly, Xarelto or Coumadin. Aspirin is usually 81 mg twice daily x 3 weeks. Lovenox is usually 40mg injected subcutaneously x 3 weeks. These medications are subject to change from patient to patient and are evaluated on a case by case basis. Follow the instructions given to you when you are discharged from the hospital.

Will I need antibiotics for dental procedures? Yes, you will be given your first prescription for 2 grams of Amoxicillin/Ampicillin, (1 gm Erythromycin if you have a penicillin allergy), one hour prior to any dental procedure. After that, your PCP or dentist can cover the prescription. Currently, we have you take the antibiotics for life after joint replacement.

Who do I call if I have a question prior to my appointment? If you have questions regarding your upcoming surgery, you may call your surgeon's nurse practitioner or research assistant.