



# Cartilage Repair Center

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## **What is a Total Knee Replacement (TKR)?**

A total knee replacement (TKR) is a surgical procedure used to treat patients with moderate-to-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) and between the “kneecap” (patella) and the femur. A TKR is a complete resurfacing/ replacement of the damaged 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 and who have failed conservative/non-operative treatments. Conservative treatments include weight loss, physical therapy, braces, ambulatory aids, anti-inflammatory oral medications, and injection treatments (cortisone, hyaluronic acid, etc.) 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 ages 50 and older. This procedure is, however, performed in younger patients based on medical necessity. 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 arthritis. 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 with 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 available 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 properly balanced, the patient will do well. This is similar to how an “off-the-rack” suits fits average size people but fails to fit very small or

large people. Whereas a “bespoke” custom-tailored suit will always fit well no matter the size of the person. Custom-made implants use 21st century technology now only available because of enhanced software development and ‘printing’ technology.

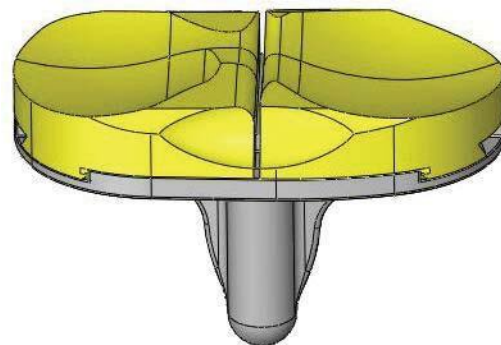
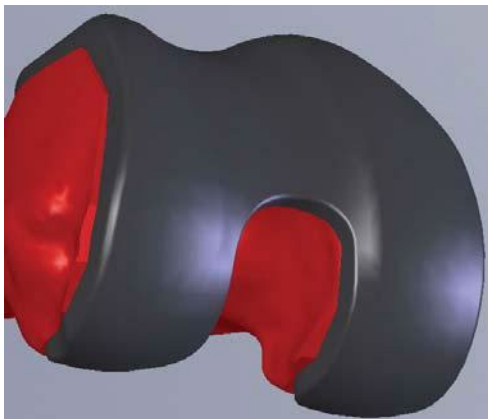
A custom-made knee replacement is individualized to only one patient. A CT scan is taken of the entire affected leg to allow software engineers to print’ individualized jigs for the surgery that will restore the leg alignment to be straight and not ‘knock kneed’ or ‘bow legged’.

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 of the knee. These molds are made precisely to fit that individual patient and no one else.

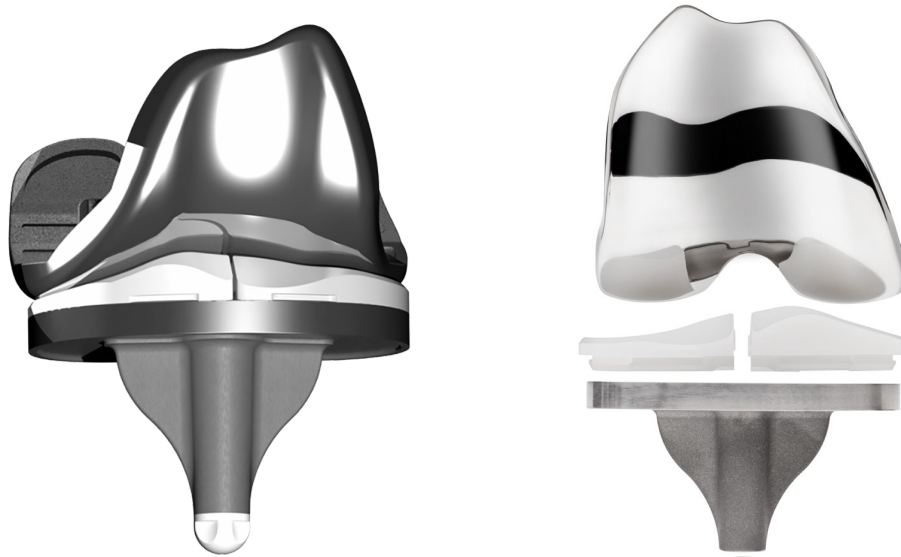
As the knee has 2 weight bearing surfaces at different levels from each other, 2 plastic inserts are made to restore the exact joint line level as the patient originally had. These plastic inserts use vitamin E infusion patented technology that has a 40% improved wear rate over standard plastic inserts.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

- 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 exact fit printed molds, restoring the patient's knee 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. 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 these components are held in place using cement. Two polyethylene spacers will be placed between the tibial and femoral components.

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.

Your surgical incision will be closed with all subcutaneous or “dissolving” stitches. This means that you will not have any stitches that need to come out. You will have a long plastic bandage on the incision that should stay on for 7 days after the surgery. You can shower directly on this plastic bandage. After 7 days, the bandage can be removed, and you can shower directly on the skin.

**X-rays of both knees showing “bone-on-bone” arthritis**



**Same patient's x-rays after custom-fit total knee replacement**



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

When you wake up from surgery, you will have a soft knee brace (immobilizer) on your leg to keep your leg straight. It is important to wear this brace at night, so your leg stays straight and does not curl up.

You will also be given a walker or crutches. You will be able to fully weight bear on your operative leg immediately following surgery. You will use your walker/ crutches anywhere from 1-2 weeks depending on your muscle strength. You will spend 1-2 nights in the hospital. This is 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 walkers/ crutch training. You will begin working with a physical therapist in the first few days following surgery. It is recommended that you make arrangements with an outpatient physical therapy office within the same week of surgery. Compared to home physical therapists, outpatient physical therapy facilities, 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 healthcare providers.

## How will my pain be controlled after surgery?

During your hospital stay, your pain will be controlled using IV pain medication. 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 and tramadol. Most patients will require regularly scheduled doses of pain medication for the first 1-2 weeks. Following week 2, you will begin to decrease your pain medication use to prior to physical therapy and before bedtime. Most patients will not require any pain medication past week 4-6.

**For pain medication refills, you will need to come to the office for a face-to-face, in-person appointment. Florida State Law does not allow us to call in prescriptions or refill pain medication without an office visit. We are only allowed to give 7 days 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), 3 months, and one year after surgery. After the first year you will follow up with your surgeon every 3 years.

**What restrictions will I have after a TKR?**

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, 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 your 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. You will continue physical therapy once you are discharged 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.

**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 walker or crutches for a period of approximately 1-2 weeks. You may come off your walker/ 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 weeks 4-6.

**When can I shower?** You can remove the ACE wrap and gauze/ foam dressing 24 hours following surgery. Under the ACE wrap and gauze/foam dressing, you will have a large plastic bandage covering your incision. You can shower directly on the large plastic bandage and allow water to run over the bandage. This bandage can be removed 7 days after surgery at home. You can then shower normally with the incision uncovered. Do not submerge your operative knee in a bathtub, pool, ocean, etc., until cleared by the surgeon.

**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 1–2-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 without 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.