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**SURGERY SPECIFIC INFORMATION**  
**High Tibial Osteotomy (HTO)**

**What is HTO?**

A high tibial osteotomy is a surgical procedure that is used to correct for medial compartment early arthritis or overload in the knee. Depending on what anatomy needs to be addressed and corrected, there are a varying degrees of repositioning. This will be determined through the use of physical examination and xray calculations.

The procedure consists of an incision, which is made below the kneecap (patella) along the top portion of the shin bone (tibia). Through the incision tools are used to cut the bone and it is strategically placed in a location determined by the surgeon based on your needs. The new position is held through the use screws and a plate. Depending on your injury your surgeon may recommend additional procedures for cartilage damage or other ligamentous damage.

**How long will I stay in the hospital?**

With this surgery, you will stay overnight. This will allow for better management of your pain. Once you are able to demonstrate successful management of pain with only oral pain medications, you will be discharged home.

**What are the possible risks and complications of surgery?**

As with any surgery there is a risk of DVT, nerve damage, and postoperative infection. Specific risks and complications include but aren't limited to failure to heal, fracture, and hardware complications.

**When can I drive?**

You may not drive while taking pain medication. In addition, if it is your right knee that had surgery, you will not be able to drive for approximately 6 weeks after surgery or until the brace is removed.

**When can I resume jogging?**

You will not resume jogging until cleared by your physician. This typically is around 8-10 months after surgery. You will be allowed to begin biking without resistance once you have adequate range of motion and will begin this with your physical therapist. Once adequate quad strength is demonstrated you will transition to the Elliptical, then running is the next step after that.

**When can I return to my sport?**

There are many factors in returning to sport after surgery. Most patients are able to return around 7-10 months after surgery. Please see "Physical Therapy" below for more information.

## What is the recovery period like?

- Brace
  - You will wear a long brace on your leg, known as a Bledsoe brace, and use crutches. You will wear it day and night, locked straight for 6 weeks. After your 6 week post-op visit, your provider will inform you how to unlock the brace and possibly transition into a smaller brace.
    - While resting, it is ok to remove brace. However, brace must be worn while sleeping, standing, or ambulating.
  - You may be fitted for a smaller brace at 6 weeks, transition to its use typically around 8-10 weeks, and continue its use until you have regained quadriceps strength. This will be determined by your Physical Therapist and typically occurs around the 3-5 month mark.
- Weight bearing precautions
  - Immediately after surgery you will have crutches with the Bledsoe brace locked straight. You will not be able to put any weight on the surgical leg for the first 6 weeks.
  - At the 6 week post-op visit, you will have x-rays to assess bony healing. As long as the x-rays show adequate healing, you will be allowed to begin bearing weight. This is a slow and gradual process and takes about 2 weeks to get back to full weight bearing. The first day, you will take on about 20 percent of your body weight and stay at this weight for 2 days. As long as you do not experience pain, you may increase your weight bearing load by about 20 percent every 2 days, until full weight bearing status is achieved. Continue to use the crutches for another 2-3 days before discontinuing use. If pain is ever experienced during this process, return to the previous pain-free weight.
- Continuous Passive Movement (CPM) Machine
  - This device moves your leg for you to increase your range of motion. You will use this machine for 2 hours per day, three times a day for the first 6 weeks. Remove brace.
    - This machine will be delivered to you during your hospital stay.
    - Start 0-45 and increase to 0-60. You should be at 60° at your first post-op visit.
    - Continue to increase to 0-90, you should reach this by 6 weeks.
    - You may continue to increase up to 0-120, unless otherwise noted.
- Kneehab (quad stimulator)
  - The quadriceps muscle will become very weak and atrophied following surgery. To limit and prevent the extent of this disuse weakness, you will use the kneehab quad stimulator. This consists of a neoprene sleeve with electrodes that stimulates the quadriceps muscle to keep it in shape.
    - Use for 20 minutes twice daily for 6 months
    - Device will be delivered to your home or given to you at your first post op visit.
- Bonestim
  - The bone stimulator is critical to recovery and is non-negotiable. Should insurance fail to cover the device, it is necessary to work out a payment plan. This is an ultrasound machine which encourages the body to create new bone cells. You will feel nothing to minimal tingling during administration of this device.
    - Use for 20 minutes once daily for 6 months
    - Place the electrodes next to the incision. Do not directly apply to incision.
    - Device will be delivered to your home or given to you at your first post op visit.
- Super Vitamins
  - Since bone is cut and repositioned during the surgery, the bone now has to heal, much like after any broken bone. To ensure the best environment for the bone to recovery, you should begin the following vitamin supplementation following surgery for 6 months:
    - 4,000 international units of over the counter vitamin D2 once daily
    - 1,000mg Calcium once daily

### **How will my pain be managed?**

- Cryotherapy to prevent post-op swelling and inflammation
  - o The ice machine may be covered by insurance, depending on your insurance plan. Many patients have highly recommended paying out of pocket for the machine as it significantly helped their progress.
    - This machine will be delivered to you during your hospital stay.
- Pain Medication. See POST-OP PAIN MANAGEMENT handout for details regarding medications.

### **When will I start Physical Therapy?**

- Physical Therapy
  - o The first 6 weeks after surgery, you will do home exercises, no formal PT sessions.
    - Quad sets : 3 sets performed three times a daily.
      - Sit or lie on your back with leg straight. Tighten your quadriceps muscle on the front of the thigh. Hold for 3 seconds, relax. Repeat x 10.
    - Heel pumps: 3 sets performed three times daily.
      - Sit or lie on your back with leg straight. Bend your foot up and down at your ankle joint, pumping the foot. Complete 10 pumps.
    - Straight Leg Raises: 3 sets performed three times daily.
      - Lie on your back with leg straight, flat on the bed. Start by tightening your quads. Then lift your leg off the bed until your heel isn't touching it anymore. Lower your leg down. Repeat as tolerated, work up to 10.
      - This is an advanced exercise, start after your first post-op appointment.
  - o 4 weeks post-op you will have a 1x session at HSS Sports and Performance to evaluate your progress and give you more home exercises. Call 212-606-1005 to schedule.
  - o At 6 weeks you will start formal PT. You will go 2x/week for 6-9 months.
    - Dedication and attendance to your sessions are critical to your recovery.
  - o Return to Play Assessment
    - This is a specific evaluation that is performed by HSS Sports and Performance center. It is a two part evaluation; the first part is at post-op month 5-6 and is to demonstrate specific areas that need continued work. You will then be given a detailed program to increase strength in specific areas. The second part is 6-8 weeks later to determine your readiness to return to sport. The two part evaluation costs \$300 and is typically not covered by insurance.

### **Will I be able to remove the screws?**

You don't have to remove the screws, however, if you would like to, the procedure is done after the osteotomy is well-healed, typically around the 4 month mark. This is a simple same-day procedure done in the OR. The surgeon makes a small incision using the same healed incision from the first surgery. She then packs the hole where the screw was located. After the removal of hardware procedure, you may have to modify some activity with physical therapy. There is an increased risk of fracture until the hole fills in with new bone, this typically takes about 6 weeks.

### **\*\*\*\*IF YOU HAD CARTILAGE REPAIR IN ADDITION TO HTO:**

- Contact the office with questions or concerns. However, these surgeries usually do not change the above protocols.
- You may require follow-up MRIs at 3 months, 12 months, and 24 months after surgery.

## INSTRUCTIONS FOR IMMEDIATELY AFTER SURGERY:

- Activity
  - Apply ice to your knee but keep the bandages dry
  - Elevate your leg on 2-3 pillows or rolled up towels placed under the **heel** so that the heel is elevated higher than your knee. This will help reduce swelling and achieve full extension of the knee. **Avoid pillows under the knee.**
  - For the first 1-2 weeks after surgery, the **most important goal is to regain the ability to fully straighten the knee.** It is much more important initially than being able to bend the knee.
  - Follow the CPM and weight bearing precaution guidelines above.
  - Start your home exercise program
- Bandage and Incision Care
  - Under your brace is an ace wrap- leave this ace wrap on for the first 2 days. You may then remove the ace wrap. Underneath will be several waterproof bandaids. Keep these bandaids in place. However, if the bandaids become wet, dirty, or start to peel off, then replace with Nexcare waterproof bandaids. Under the bandaids is Dermabond, this is a surgical glue and tape that is used in conjunction with absorbable sutures to close the incision. Do not touch the Dermabond.
  - You may re-apply the ace wrap as this helps to decrease swelling.
  - Do not apply creams, ointment or lotions to your incisions for at least 4 weeks.
- Showering
  - You may shower after you have removed the ace wrap. Although the bandaids are waterproof, you should wrap the leg in saran wrap to provide an extra waterproof layer.
  - You must wear the brace and be seated in the shower.
  - **Do not get the incision or brace wet**, however, you must wear the brace when standing. You should use a shower chair, or if you have a bathtub-shower, you can sit in the tub. If you take a bath, keep the leg out of the bath. The leg should not be submerged.
- Pain Management
  - See POST-OP PAIN MANAGEMENT handout. Around 2-3 weeks out, you should only be taking the pain medication at night and after strenuous activity as needed.
- Normal sensations after surgery
  - Pain
  - Swelling and warmth up to 2 weeks
  - Small amounts of bloody drainage for first few days
  - Numbness around the incision area
  - Bruising
  - Low grade temperature less than 101.0 for up to a week after surgery.
  - Small amount of redness to the area where the sutures insert in the skin
- **IF ANY OF THE FOLLOWING OCCUR, CONTACT THE OFFICE IMMEDIATELY**
  - Calf pain or ankle swelling in either leg
  - Change is noted to your incision (i.e. increased redness or drainage)
  - Temperature greater than 101.0
  - Fever, chills, nausea, vomiting or diarrhea
  - Sutures become loose or fall out and incision becomes open
  - Drainage becomes yellow, puss like or foul smelling
  - Increased pain unrelieved by medication or measures mentioned above.
- Post-op visit
  - Please ensure that you have a post-op visit scheduled for 7-14 days after surgery.
  - Please arrive 30-45 minutes prior to your appointment time to obtain X-rays.