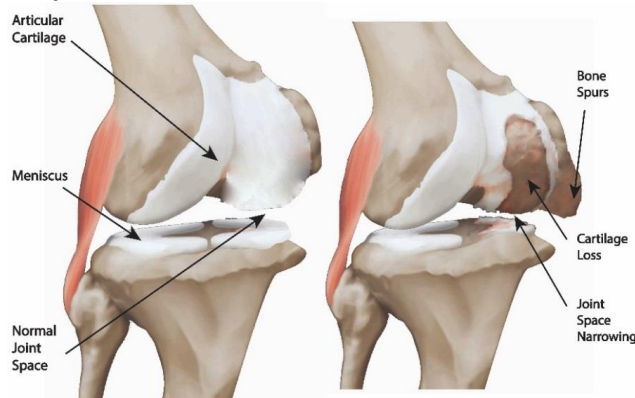


High Tibial Osteotomy: A Guide to Recovery After Surgery

General Information about High Tibial Osteotomies

What is a High Tibial Osteotomy?

A high tibial osteotomy is an operation that may be suggested for a painful arthritic knee and/or an unstable knee. Arthritis (thinning of the cartilage and meniscus) or instability (the knee buckling or giving way because of ligament damage) can be improved by changing the alignment of the knee.



Normal knee on Left, Medial Knee Osteoarthritis on Right

Osteotomy means cutting the bone. Most commonly, osteotomies about the knee are cuts in the top of the shin or "tibia" bone. This is called a High Tibial Osteotomy or H.T.O.

The goals of this operation are to:

- Improve knee alignment
- Shift weight from the arthritic part of the knee onto a healthier part of the knee
- To delay the need for knee replacement surgery

Some of the benefits of this operation are:

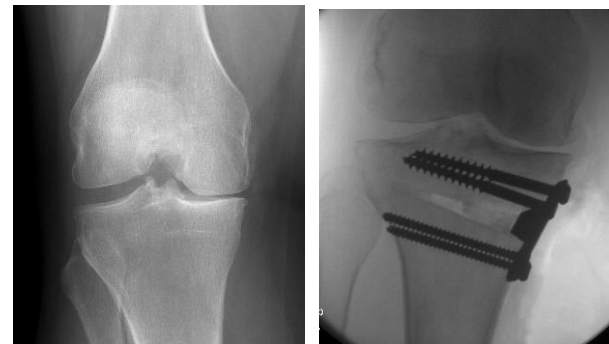
- There are no restrictions on your activity once you have healed from surgery
- Well suited to younger patients who are trying to delay knee replacement surgery

Some of the disadvantages of an H.T.O. are:

- May make a future knee replacement more complicated
- Longer recovery than a partial knee replacement
- Pain relief not as predictable as partial or total knee replacement

What happens during H.T.O. surgery?

During the surgery, an incision or cut is made usually on the inner aspect of the knee. Calculations are made before the operation to plan how much change in alignment of the knee is ideal. A cut is made into the tibia bone and then pried open to make the change in alignment. A plate with a metal wedge is used to hold the wedge open and then fixed with screws. A bone graft is inserted into the osteotomy site. This bone graft helps the bone heal across where it was cut and wedged open.



Preoperative Knee Xray (left). After Osteotomy, wedge & bone graft placement and fixation with plate and screws.

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What kind of Bone Graft will be used?

Your surgeon will recommend the type of bone graft that is best for your situation. Usually, an autograft, a piece of bone that is removed from your own pelvis is recommended as this allows the osteotomy to heal fastest. If an 'autograft' from the pelvis is used, a second incision will be made on over the "iliac crest" of the pelvis and it will take a couple of weeks for the pain from this to settle down. An , a synthetic bone substitute, e.g hydroxyapatite tricalcium, or an "allograft", a piece of donated bone from a cadaver can sometimes be used for smaller (<10mm) corrections.

How will my knee recover after an H.T.O?

Recovery from an H.T.O. a slow and gradual process. During the first few months after surgery, you will focus on getting over the pain and swelling of the operation and making sure that the knee gets all of its movement back. During this period, you will protect the healing osteotomy by not putting all of your weight on the leg.

After the HTO is healed, the patient is able to do all activities within his or her own limits of pain or tolerance. The amount of residual pain after an HTO varies and depends a lot on how much arthritis there was before the operation. If there is a lot or 'advanced' arthritis, there may be more pain than if there was 'moderate' arthritis.

Will my knee be normal after Surgery and Recovery?

As an HTO is usually done for severe knee instability or arthritis, it is not realistic to expect a completely normal knee when surgery and recovery are complete. However, it is possible to return to whatever

activities can be tolerated within the limits of one's pain and discomfort. Some patients may be able to return to running and jumping, but this is not the rule.

The knee will still have arthritis, but most patients can expect to delay knee replacement surgery by at least a decade.

Most patients do not need to wear a brace for activities once they have recovered from surgery.

Where is HTO Surgery Done?

High Tibial Osteotomeis are performed in the operating room. Most commonly, general anesthesia ('going to sleep') is used. The surgery takes usually takes around 90-120 min. Most patients spend one or two nights in hospital.

Information for Recovering after HTO Surgery

Going Home after Surgery:

- Most patients will be in hospital for 1 or 2 nights after surgery
- If pelvic bone graft is used, you will likely spend 2 nights in hospital because of the additional pain around the graft site
- You will need to have someone take you home after surgery, even if you are taking a taxi

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Bathing:

- Keep your wound covered and dressings dry until you see your surgeon for follow up, around 2 weeks after the operation
- Bathing or soaking the wound is not allowed until at least 2 weeks after surgery, if the wound is healed and dry
- Cleanse around the area , cover dressings with a waterproof covering to shower or bathe leaving the leg out of the tub
- If the dressings get wet, change them

Care of your Incision & Wound:

- Do not change your dressings unless they become dirty, soiled or wet
- The tensor band should be snug but not too tight. If the tensor is applied too tight (causes tingling or change in skin colour), loosen and reapply
- If the tensor is too loose, take it off and re-wrap it snugly, starting near the foot and working up to above the knee
- If you have had an iliac crest pelvic bone graft, avoid tight fitting clothing over this incision

How to change your dressings if they are wet or dirty:

- Wash your hands with soap & water before you take care of your wound
- Remove tensor bandage
- Throw out the white gauze bandages—the dressings will be stained with blood - and remove the white mepore dressings.
- Do not remove the Steri-Strips- small tapes that are right on top of the wound. They will fall off themselves..
- Cover wounds with new dressing. Apply new 'mepore' or waterproof 'aquacell' dressing.

- Buy 'mepore' dressings at pharmacy. You must apply a new mepore dressing after each shower.
- Buy waterproof 'aquacell' dressing at One Bracing @ Rebalance^{MD}. You may shower with the aquacell dressing on.
- After you change your dressing, put the tensor back on starting to wrap the leg below the knee and then work your way up.

Using Crutches and Weight bearing:

- All patients will require crutches for at least 9-12 weeks
- For the first 6 weeks after the operation, feather weight bearing (only putting the toes down to rest the leg, but not putting any real weight through the leg) is recommended
- After this, the amount of weight that you are allowed to put through your leg will be increased depending on how much healing has occurred and how large a wedge was needed to correct the alignment.
- Full weight bearing is usually allowed by 9-10 weeks after the operation for small wedges (<10 mm) and by 12 weeks for larger wedges.

Activity & Physiotherapy:

- Focus on resting for the first week after surgery
- Slowly restart your regular activities
- Physiotherapy exercises should be started on your own within a few days of surgery
- A [physiotherapy or rehabilitation protocol](#) can be found on the website
- Give the physiotherapy protocol to your physiotherapist
- Most patients should see a physiotherapist for the first time within 1-2 weeks of surgery

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- A physiotherapist can help you reduce some of the pain and swelling from the surgery

Post-Operative Hinged Knee Brace:

- All patients will wear a hinged knee brace until the osteotomy has healed and full weight bearing is allowed, ie. For around 9-12 weeks after surgery.
- The hinge should be fully open (i.e. no restriction to motion) immediately after surgery
- For the first few days after surgery, patients may be more comfortable if the brace is locked in extension(knee straight) while they are sleeping or up on crutches.
- Wear the brace full time for the first 6 weeks after the operation except when showering or doing non-weight bearing exercise
- After partial weight bearing is allowed (6 weeks after surgery), the brace can be removed at night for sleep

Pain:

- Everyone responds to pain differently, but on average discomfort will be moderate and may occasionally be severe for the first few days and will gradually get better
- Use pain medications as instructed by your surgeon
- Usually, a strong narcotic (such as hydromorphone (Dilaudid) or oxycodone and an anti-inflammatory (such as Celebrex, Naproxen or Voltaren) are prescribed
- The narcotic can be prescribed in a long acting form (taken twice a day) and with an extra short acting dose for 'breakthrough' pain that can be taken as needed
- Tylenol (up to 3000 mg per day) can be taken with the narcotic and anti-inflammatory to help reduce pain even more.

- Sometimes additional pain medications like gabapentin (Neurontin) or pregabalin (Lyrica) are prescribed for the first week after surgery.
- Most patients are able to stop using the strong narcotics around 7-10 days after surgery and use a 'lighter' narcotic like Tylenol# 3 or Tramacet or plain Tylenol for mild pain
- Gradually reduce pain medications as your pain decreases

Swelling & Bruising:

- Expect swelling & bruising for weeks to months following the surgery. This is due to inflammation and bleeding
- It is common for the swelling and bruising to go down to the toes and even up into the thigh
- There can often be quite a lot of swelling.
- To reduce swelling:
 - elevate the leg on pillows
 - avoid keeping the foot down for the first few days after surgery
 - wrap your leg with a snug tensor bandage, starting at the toes and working your way up above the knee to the middle of the thigh
- If you have increasing swelling in the calf and thigh along with calf or thigh pain and doesn't go away with rest and elevation, this may be a sign of blood clot in the leg and you should contact your surgeon's office.

Numbness:

- Most patients will have some numbness along the front or inside of the shin
- Usually this numbness gets better and becomes a smaller patch of numbness, but this takes many months

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- Most patients do not find this bothersome in the long term

Icing:

- Apply ice packs or use a Cryo Therapy 'Ice Machine' to reduce pain and swelling
- Apply ice for 15-20 minutes, every 2-3 hours while awake or 4-6 times per day
- Ice before and after exercises
- Do not apply ice directly to skin

Return to Work:

- When you are able to return to work depends on:
 - the kind of job you have and its physical demands
 - how much pain & swelling you have after surgery
 - how your physiotherapy is progressing
 - if you are able to modify your job or do limited duties
 - if you are able to work from home
- Your surgeon will help you decide when to return to work
- Expect to take off at least 6-12 weeks for a desk job that does not require much walking
- Expect to take off at least 4-6 months for more physically demanding work. Sometimes longer is required.

Healthy Eating:

- Start with clear fluids after surgery
- Gradually increase to a well balanced diet as your appetite allows
- Drink at least 6 cups of fluids daily

Going to the Bathroom:

- Changes in medications, activity and diet can cause constipation (hard, dry bowel movements)

- To avoid constipation: drink lots of fluids, eat high fibre foods such as prunes, fruits, bran, whole grains and vegetables
- Take a stool softener or laxative if needed. Ask your doctor or pharmacist to suggest one.

Driving:

- Do not drive while taking narcotic medications.
- Discuss with your doctor when it is safe to drive
- If your right leg was operated on or if you drive a manual car, you will not be safe to drive until you can confidently walk on your left leg without crutches, that is around 3 months after surgery
- If your left leg was operated on, you may be able to drive an automatic car around 6 weeks after surgery
- If your ability to safely drive (e.g swerve sharply, perform an emergency stop) is impaired, your insurance may not be valid in the case of an accident

Your Medications:

- Resume your regular medications unless instructed otherwise by your doctor
- Oral contraceptive Pills (Birth Control Pills) should not be taken for 1 month before and after the surgery because of the risk of blood clot. Use a different method of birth control.

Blood Thinners:

- To reduce the risk of developing a blood clot in the leg (a Deep Vein Thrombosis) or lungs (a Pulmonary Embolism) your surgeon will prescribe you a blood thinner to take for 10-14 days after surgery.

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- Usually, an injectable form of low-molecular weight heparin called Dalteparin will be used in hospital
- You may be prescribed injections or use at home or a different blood thinner such as aspirin
- If your risk of blood clot is higher (e.g you have had a blood clot in the past, in obese patients or those with recent cancer), blood thinners will be prescribed for a longer period of time
- It is important to take your blood thinners as prescribed as blood clots can be life threatening

Supplies/special equipment:

- **Crutches:** are required and can be obtained from a medical supply store, some pharmacies or One Bracing @ Rebalance^{MD}. Bring your crutches with you to your surgery. Some patients prefer to use forearm crutches compared to standard armpit crutches
- **Post-Operative Hinged Knee Brace:** This brace will be prescribed by your surgeon and can be bought One Bracing @ Rebalance^{MD} or other medical supply stores such as McGill & Orme, Island Orthotics and others. Have your brace properly fitted and set up prior to your surgery. Bring your brace with you to your surgery.
- **Cryotherapy "Ice Machines":** are an alternative to ice packs. They can be extremely helpful to reduce pain and swelling. These can be bought at One Bracing @ Rebalance^{MD} or other medical supply stores such as McGill & Orme, Island Orthotics and others.
- **Knee Compression Sleeve:** a compression sleeve such as the Bauerfeind GenuTrain may help to control swelling and

pain during recovery, used either with a hinged brace or without. This type of brace can also be worn when returning to sport. These can be bought at One Bracing @ Rebalance^{MD} or other medical supply stores such as McGill & Orme, Island Orthotics and others.

- **Waterproof Aquacell Dressing:** The dressing is waterproof and can be worn in the shower to making showering more convenient. This can be purchased at One Bracing @ Rebalance^{MD} and other medical supply stores.
- **Compression Socks:** an above the knee compression sock can help to control swelling in the foot and leg after surgery. This may be more comfortable than using a tensor bandage. 15-30 mm Hg compression is suggested. These can be bought at One Bracing @ Rebalance^{MD} or other medical supply stores such as McGill & Orme, Island Orthotics and others.

Follow Up Appointment:

- A post-operative appointment should be scheduled for approximately 10-14 days after surgery
- Call the office if you do not have an appointment scheduled
- Write down your questions for the doctor before the appointment

Call your Surgeon if you have:

- Worsening pain or swelling that does not get better with rest, elevating the leg, loosening the tensor bandage and icing. These may be signs of a blood clot.
- Incisions that are red, puffy, hot or leaking fluid more than 48 hrs after surgery
- Fever greater than 38.5°C

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- Signs of circulation problems in your leg (e.g coolness, change in skin colour, numbness that is getting worse) which is not relieved by loosening the tensor and elevating the leg
- Irritation or blisters from your dressings, Steri-Strips or tape
- Nausea and vomiting that continues for hours
- Difficulty passing urine
- Trouble breathing or pain in your chest that is unusual for you

Physiotherapy Protocol:

Please print the [HTO Rehabilitation Protocol](#) from the website and bring it to your physiotherapist.

If you cannot reach your Surgeon:

- Call your family doctor, go to a walk-in clinic or hospital emergency department

Non-emergency health information and services:

- HealthLinkBC www.healthlinkBC.ca
- Tel: 811 from anywhere in BC
- Tel: 711 for deaf and hearing impaired assistance (TTY)

The information in this handout is intended only for the person it was given to by the health care team. It does not replace the advice or direction given to you by your doctor.