



Banff Sport Medicine

High Tibial Osteotomy (HTO)

What is an “HTO”?

A High Tibial Osteotomy is an operation that involves cutting your tibia bone to realign the weight-bearing axis of the leg. The purpose is to take body weight off an arthritic part of the knee. It can also be used in certain cases to treat instability of the knee. When the tibia bone is wedged open, the gap is filled with bone graft. This can come from your pelvis (autograft) or from the bone bank (allograft). Synthetic bone graft can also be used along with, or as an alternative to, the autograft or allograft. Your surgeon will discuss your options with you.

Diagnosis:

- A history of medial or lateral compartment osteoarthritis of the knee.
- Physical examination shows either varus (bow-legged) or valgus (knock-kneed) alignment of the knee
- A three-foot standing x-ray is used to determine the degree of correction that is needed to unload the affected compartment of the knee.

Why perform an “HTO”?

- To alleviate pain and functional limitations from unicompartmental arthritis of the knee
- To prevent increased severity of osteoarthritis and additional damage to the cartilage of the affected compartment of the knee
- To treat certain types of knee instability

Options other than HTO Surgery

- General treatment modalities for osteoarthritis include weight loss, muscle strengthening, physiotherapy, medications, and supportive shoes
- **Knee brace:** some people with osteoarthritis can use a custom-made unloading knee brace to manage pain and symptoms
- **Hyaluronic Acid Injections:** Synvisc, Durolane, Orthovisc, Neovisc etc.
- **Total knee replacement or partial knee replacement:** not all patients with unicompartmental osteoarthritis are candidates for HTO. Other factors such as age, general health and activity level may make full or partial knee replacement surgery a more suitable option

About the Surgery Timing

- We recommended all patients stay as active as possible before surgery by following the pre-surgery rehabilitation program. This will allow you to improve or maintain range of knee motion, improve your strength and balance, and build your endurance by doing non-impact sports (biking, swimming, elliptical). Regaining strength, increasing movement in your knee, and maintaining your fitness will prepare you for surgery and also help you to recover faster after surgery.
- If your knee symptoms improve significantly while you are preparing for surgery and you would like to discuss non-operative management of your knee problem, please call the office to arrange a follow-up appointment before your surgery date.

The Procedure

- Described here for medial opening wedge HTO for the treatment of medial compartment osteoarthritis
- A vertical skin incision 6-8 cm long is made along the inside of the upper shin bone (tibia) just below the knee joint line.
- The medial side, front and back of the upper tibia are carefully exposed to prevent injury to blood vessels, nerves and tendons.
- Under x-ray guidance, the upper tibia is cut from medial to lateral and wedged open to correct the mechanical alignment of the knee.
- The osteotomy is stabilized with a metal plate and screws, and bone graft is inserted into the wedge-shaped opening in the tibia bone to improve healing of the osteotomy.
- Usually, the skin layer is closed with dissolving sutures, but occasionally metal staples, or clips are used, and these must be removed at about 2 weeks after surgery.
- Your surgeon may perform an arthroscopy of your knee at the same time as the HTO to assess all knee structures, remove cartilage debris and smooth out rough joint surfaces.



RISKS OF SURGERY

Infection: less than 3 in 100

- Intravenous antibiotics are given before surgery to help prevent infection.
- If an infection occurs, it will usually happen within 5-7 days of your surgery. Some minor wound infections can be treated with a short course of oral antibiotics, whereas more severe wound or skin infections may require a longer course of intravenous antibiotics. If the osteotomy site becomes infected, surgery is required to wash out the infection, followed by 4-6 weeks of intravenous antibiotics. In less than 1 in 200 cases, a deep infection can occur in the joint or bone. In these cases, surgery is required to wash out the infection, followed by 2-3 months of intravenous antibiotics.

Clot in Leg Veins (deep vein thrombosis): less than 5 in 100

- If severe calf, ankle and foot swelling occurs 3 days to 2 weeks after surgery, you could have a clot in a deep vein of your leg (DVT). See a doctor as soon as possible. Treatment for a blood clot is usually blood-thinning medication (anticoagulants) for 3-6 months.

Clot in Lungs (pulmonary emboli): less than 1 in 500

- It is possible for a blood clot to travel to your lung; this is called a pulmonary embolism. If you suddenly get short of breath or have chest pain, go to the nearest emergency room or call 911. A pulmonary embolism is a medical emergency and can cause death.
- In certain patients with risk factors for a blood clot, preventive blood thinners will be prescribed for a short period of time after surgery.

Injury to Artery or Nerve: less than 1 in 500

- This is a very rare occurrence but can happen if an artery or nerve is stretched too much or cut during surgery.

Non-union: less than 5 in 100

- The gap created in your tibia bone must heal in a similar manner as a fracture. In some people, bone healing may be delayed or not heal at all. This is much more likely if you are a smoker or need to have a larger bony correction of your alignment.
- When non-union occurs, it may require additional surgery with more bone grafting to encourage healing. In some situations, a patient may be required to purchase or rent a bone stimulator machine to enhance healing.

Compartment Syndrome: less than 1 in 100

- Usually occurs 24-48 hours after surgery when severe swelling develops in the muscle compartments below the knee and requires repeat surgery to release the pressure (fasciotomy).

Skin Numbness around Incision

- Every patient gets some numbness around their incision because some small surface nerves are cut during surgery. This can be along the incision or can affect a larger area of the leg (up to 20 sq. cms). This may disappear slowly over time, depending on the patient.

Knee Stiffness: less than 5 in 100

- Some patients have problems with knee stiffness after HTO surgery. These patients will need intensive physiotherapy and may need another surgery to mobilize the joint.

Persistent Swelling and Pain: less than 5 in 100

- The HTO improves the biomechanics of your knee but doesn't change the amount of wear in your knee. Some patients will have ongoing pain and swelling from their osteoarthritis. This can be managed with injections and other non-operative treatments for arthritis.

Your Stay in Hospital

- You will be admitted to the hospital on the day of your surgery. Your admission time will be approximately 3 hours prior to your surgery time. Your surgery will take 1-2 hours. You will be called approximately 5 days prior to your surgery date with your arrival time.
- You can have your HTO with either a general anesthetic (go to sleep) or spinal anesthetic (freeze from the waist down). Your anesthetist will discuss these options with you on the day of surgery.
- Although HTO is usually day surgery, in rare instances, your surgeon or the anesthetist may recommend that you be admitted to the hospital overnight, so be prepared for this.
- Please provide the office with any insurance forms you have prior to the day of your surgery, as it can take up to 2 weeks to have them completed and returned to you. Please note we do charge a fee as completion of forms is not covered by Alberta Health Care.

Medical Aid Products

- **Crutches:** can be purchased at the Banff Mineral Springs Hospital or from our clinic. If you bring your own with you, please make sure they are clearly labeled.
- **Cold Therapy Unit:** is used to help control pain and swelling after surgery. You can order a Cold Therapy Unit, complete with a knee pad, through the Shop found on our website or at our clinic. Alternatively, you can purchase a Cold Therapy Unit from your local healthcare provider or from an online health supply store. For portable use you can purchase a battery pack, which allows you to use your Cold Therapy Unit without an electrical outlet. We recommend that you buy your Cold Therapy Unit at least a week before your surgery to make sure that you have it delivered in time.
- **Brace:** A hinged knee brace may be prescribed by your surgeon to protect your knee for the first 6-12 weeks. This can be purchased from the hospital or from our office.

Postoperative Pain Control and Wound Care

- Rest, ice, compression, and elevation of your surgery leg.
- You will be given a prescription for anti-inflammatory medication (ie Naproxen) and a narcotic analgesic (ie Oxycodone) depending on the surgeon's preference and the patient's history of allergies and drug intolerances, before you leave the hospital.
- Refer to the Post Op Concerns and Opioid Medications sheets included in your surgery package for more information.
- We recommend you wait 4 days before removing your bandages and taking a shower. To minimize the risk of post-operative infection, please do not soak in a bathtub, swim, or go into a hot tub until your incisions are completely healed. This will be a minimum of 3-weeks after surgery.
- Redness and pain along the shin (caused by blood and inflammation in the area) can occur 3-7 days after surgery. This usually goes away 7-10 days after surgery and is not a concern unless your incisions are also red.

Discharge from Hospital

- Ensure you have your prescriptions for pain and anti-inflammatory medications before you leave the hospital.
- You must have someone to drive you home
- A hospital physiotherapist will instruct you on brace use and crutch walking.
- Minimum 1-week resting at home with leg elevated and regularly icing your knee
- No or minimal weight bearing for 4-6 weeks
- Crutches may be used for up to 12 weeks depending on bone healing
- Discuss any travel plans with your surgeon as long trips can increase the risk of blood clots for the first 6-8 weeks after surgery

Follow-up Visits

- Your surgeon will follow you after surgery at: 2-4 weeks, 3-months, 6-months, 1-year and 2-years.
- Our office will provide you with the time, date and location of your first post-operative appointment, usually included in your physiotherapy prescription email approximately one week after your surgery.

Return to Work Guidelines

- Sedentary work: 2-6 weeks- must be able to stay non-weight bearing
- Light manual work: 3-4 months
- Heavy manual work: 6-9 months

Physiotherapy

- See your physiotherapist between 7 – 10 days after your surgery. You will be provided with a physiotherapy prescription via email from our office approximately a few days after your surgery.
- Please note if you reside in Alberta you may be eligible for physiotherapy funding, please refer to the AHS website for more information: <https://www.albertahealthservices.ca/rehab/page17783.aspx>
- The hospital will provide you with the Banff Sport Medicine Post-operative Rehabilitation Protocol, it may also be found on our website: <https://banffsportmed.ca/resources-ortho/#surgeryinfo>

Return to Sport

- The surgeon will be able to tell you when you can go back to sport. For most patients this is between 12 and 18 months after surgery. The type of sport, and your level of strength and function, will help to guide the surgeon's recommendations.
- Some patients who have more damage inside their knee may be told to protect their knee by doing fewer sports and activities that require a lot of running, jumping or pivoting. Doing this will help you avoid too much load on damaged joint surfaces and may help to delay arthritis. Your surgeon will give you advice about return to sport based on the amount of damage seen inside your knee at the time of surgery.