Frequently Asked Questions about High Tibial Osteotomy

Are there limitations on my activity after an HTO, similar to after a knee replacement?
Unlike knee replacement surgery, there are significantly less limitations on activity following HTO surgery. With a knee replacement, mechanical parts are present which can eventually break down over time leading to failure if too aggressive of activities are resumed.

After HTO surgery the patient is able to resume any or all activities within one's own limits or tolerances of residual pain. The amount of residual pain following an HTO is often dependent on the severity of the osteoarthritis (OA) within the knee at the time the HTO is performed.

If the HTO is performed at a stage where significant OA is already present within the knee, then the pain relief may not be as great as compared to the situation where the HTO is done at a stage where the OA is not as advanced.

Similarly, the patient that has the HTO done at a stage where the OA is not as advanced will probably be able to tolerate a higher activity level (possibly including running and jumping) than the individual that has had the HTO done when the OA is more pronounced.

Will my knee be normal after surgery and recovery?
As an HTO is usually done for OA or for severe knee instability, it is not possible to expect a completely normal knee when surgery and recovery are complete. As indicated earlier however, it is possible to return to whatever activities can be tolerated within the limits of one's own residual level of pain and discomfort.

In general the HTO should severely slow down future further development of degenerative osteoarthritic change and allow improved but probably not completely pain free function post-op. If the OA is moderately severe at the time of the HTO, most people will be able to delay the possible future knee replacement by at least a decade.

Do I need to wear a brace on return to activity?
Generally no. Many patients have worn an unloader brace for some time prior to HTO surgery. Once the HTO has been performed, there should be no further need for the unloader brace as the mechanical alignment should have been corrected.
What are my options for bone grafting besides using my own from the pelvis?

Most frequently, HTO is surgery is done using the patient’s own autograft bone from the iliac crest (pelvis). Using one’s own bone allows for the introduction of live bone building cells (osteoblasts) plus it provides the important bone marrow elements to help new bone to form on the scaffold provided from the harvested bone.

For smaller HTO corrections, i.e. <10mm, an artificial bone graft substitute material is sometimes used which avoids the pain associated with the donor graft site. HATriC (HydroxyApatite TriCalcium) is a common substitute used but it does not contain osteoblasts or the important bone marrow elements used to help promote healing.

Allograft (cadaver) bone is another alternative but carries with it the risk of disease transmission such as HIV or Hepatitis despite irradiation in most instances. The risk of contracting HIV or Hepatitis from allograft bone is approximately 1 in a million (similar to a blood transfusion). Like the artificial bone graft substitutes, allograft does not contain live osteoblasts or any of the active bone marrow elements.

Generally, using one’s own bone as graft material provides the best chance of getting the osteotomy to heal in the shortest period of time. Although, it does produce another painful site immediately following the surgery, the pain does usually settle significantly over the first 2 weeks post-op, and long term problems at the donor site are uncommon.

Will I have a lot of pain after surgery?

Although, everybody’s response to pain is very variable, one should expect the HTO operated on knee to be fairly sore for the first several days. Frequent icing is very helpful during the first few days, along with elevation to help control associated swelling.

If the iliac crest (pelvis) has also been used as the source for autograft intraoperatively, this will act as a second site of pain post-op. Immediately after the surgery, the pain will be lessened by the effect of local anesthetic injected by your surgeon about the osteotomy site around the knee and the pelvis if bone graft has been harvested. A spinal anesthetic intraoperatively can also make a large impact on the postoperative pain immediately following the surgery and can be a very good adjunct for pain control post-op.

Often a narcotic medication such as Hydromorphone or Oxycodone is prescribed immediately post-op which can be taken with regular around the clock Tylenol ES 1000mg 4X per day. The narcotic is often given in both a slow acting sustained release form to begin with in addition to a more rapid acting form for breakthrough pain relief.

In conjunction with the narcotic medication and Tylenol, an anti-inflammatory medication such as Celebrex, Naproxen or Voltaren may be prescribed. For additional pain relief, sometimes adjunctive medication like Gabapentin or Lyrica are prescribed in the early postoperative period.

After the acute surgical pain has settled after approximately the first week, usually it is possible to get off of the stronger narcotic medication and transfer over to Tylenol with codeine tablets (Tylenol #3 or Emtec 30) or alternatively to Tylenol with Tramadol tablets (Tramacet) or simply plain Tylenol.
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**How long will I be in hospital after the surgery?**
Generally, patients are kept in hospital for one or two nights following an HTO. If iliac crest (pelvic) bone graft has been used for the surgery, patients are usually kept 2 nights in hospital because of the additional pain about the bone graft site. When the correction is small enough that iliac crest bone is not necessary or when an alternative other than autograft is used, often patient scan be discharged from hospital following one day in hospital.

**How long do I have to be on the injectable blood thinner post-op?**
The usual duration of Low Molecular Weight Heparin (Dalteparin) post-op is for 10-14 days. The Dalteparin is prescribed to help reduce the risk of a blood clot or DVT (Deep Venous Thrombosis) post-op. Perhaps more importantly is the reduced risk of PE (pulmonary embolism or clots in the lung) that the Dalteparin is thought to impart. If the patient has risk factors for a DVT or PE such as a previous occurrence, recent cancer, hormone replacement therapy or obesity, the duration of prophylaxis may be extended to 3 or 4 weeks postoperatively.

**How long will I use these crutches and brace post-op?**
The time when most post-op HTO patients can get rid of their crutches following surgery is in part related to the size of the wedge correction but also influenced by patient specific health factors. Increased age, impaired nutrition, smoking, impaired glucose control, the use of allograft (cadaver) bone over autograft, and infection can all negatively impact the rate of healing of an HTO.

In a healthy individual with a correction of <10mm, full weight bearing is usually commenced around the 9-10 week mark post-op after an initial 6 weeks of feather weight-bearing. For corrections of >10 mm, full weight-bearing is usually delayed until close to 12 weeks postoperatively, again after an initial 6 weeks of feather weight-bearing.

The post-op hinged rehab brace is generally used for the duration of time that the patient is partially weight-bearing on the surgical leg. The brace should be worn full-time for the first 6 weeks except when showering or doing non weight-bearing exercises. After partial weight-bearing is introduced 6 weeks post-op, the brace can be removed at night to sleep. The hinge should be fully open immediately after the surgery although the patient may find it helpful to lock the brace in extension for the first day or two while sleeping or ambulating with crutches.
**What do I do to care for the surgical wound(s)?**

After an HTO reconstruction, the initial postop dressing should be left intact for the first 48 hours. It is possible to rewrap the overlying tensor bandages without disturbing the underlying dressing if it is determined the tensors are too tight or too loose. One is encouraged to apply ice to the knee frequently (approximately 4-6 times) for 20 minutes at a time the first several days following the surgery. If iliac crest (pelvic) bone has been used as autograft for the procedure, this dressing can also be changed in 48 hours and tight clothing covering this incision should be avoided.

The first dressing change is often done in hospital before discharge. When the dressing is changed for the first time postoperatively, all of the wrapping and underlying gauze can be removed but the steristrips or tapes directly over the incisions should be left in place for 7-10 days. The small arthroscopic portals can thereafter be covered by bandaids for a few days as dictated by any residual drainage and the other incisions can be covered with a simple mepore strip or other simple gauze type dressing.

Generally one can begin getting the wound wet in the shower 3-5 days following the surgery as long as there is no ongoing bleeding occurring at the incision sites. The wound and overlying steristrips should be patted dry and covered with a sterile dressing for approximately the first week post-op.

Because patients are prescribed a blood thinner (low molecular weight heparin injection) post-op, sometimes bleeding can continue for a few days after the surgery has been completed. On occasion, the does of the injectable blood thinner needs to be reduced if bleeding continues, or alternatively it may be stopped altogether if the ongoing surgical site bleeding is significant.

**Is swelling normal?**

Everybody is expected to get swelling on the knee following an HTO. The amount of swelling immediately post-op can be quite variable but often is quite dramatic. Due to the effect of gravity, swelling is often noted to extend down to the foot and ankle region (depending on the amount of time spent in an upright position). Swelling may also be seen to accumulate into the thigh if the leg is propped up for a lot of the time in the first few days.

A tensor wrap from foot to thigh over the first few days can help to reduce some of the immediate postoperative swelling. Your doctor may prescribe for you an anti-inflammatory medication in the early postoperative period which can help control some of the swelling and is also an effective adjunct for pain control.

If you are developing significant swelling in the calf or thigh associated with a lot of posterior tenderness, this may be a sign that a DVT (blood clot) is developing. This warrants mentioning to your treating surgeon who will then decide whether a Doppler ultrasound study is indicated to help rule out a DVT.

**Is numbness normal?**

Most patients will develop numbness immediate medial opening wedge HTO incision about the anterior shin. Occasionally the area of numbness over the front of the leg can extend further down the lateral aspect of the leg besides just immediately lateral to the graft harvest incision.

In general, the area of numbness does universally get smaller over time and is not usually bothersome. There can be recovery of some of the sensory nerve pathways as time goes on.
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**What exercises should I be doing?**
Around the time of surgery, you will generally be given a packet of exercises to work on post-op. The main focus of the exercises at the beginning is to recover knee range of motion and also to bring down swelling on the knee.

Strengthening of the leg muscles that support the knee cannot be started in an aggressive fashion until the HTO is healed or very close to healed (around 3 months post-op). Quad set exercises, and straight leg raises can be commenced soon after surgery, and patients should be able to get on the stationary bicycle within the first 4-6 weeks following the procedure.

**When can I start physiotherapy?**
Physiotherapy after an HTO reconstruction can commence within the first 2 weeks postoperatively in most instances. Sometimes, some people feel that there is really no benefit seeing a physiotherapist until the post-op pain and swelling have settled but this can take several weeks and in fact your physiotherapist can hasten this process along.

**When can I go back to work?**
Return to work is largely dependent on the type of work one is returning to and also how long it takes for the acute pain after surgery to settle.

A general guideline would be that most people returning to a sedentary type position (eg. Office work) should be able to return some time in the first 6-12 weeks post-op.

There are many factors that may allow some individuals to return to work sooner than this ie. rapid resolution of pain post-op, a less pronounced swelling response, the ability to work from home, the possibility of modifications being made in the work environment ie. ability to accommodate an initial return on crutches.

An individual returning to a more physically demanding labouring type position would likely return sometime between 4-6 months postoperatively.

Depending on the size of the wedge correction and the actual physical demands of one’s job, the time to return could be in some cases extended to even beyond 6 months. An earlier return might be possible if modifications could be made in the work environment to allow avoidance of heavy tasks and a more gradual return.
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*When can I drive?*

It is possible for patients to drive sooner if it has been the left leg that has undergone surgery if there is access to a vehicle with an automatic transmission.

Driving should be generally delayed until one is off narcotic pain medication, and once reasonable mobility has returned. If the left leg is the operative leg, most patients should be able to drive approximately 6 weeks post-op. If on the other hand, the right leg has been the operative leg, driving should be delayed until full weight bearing has been commenced and the patient is ambulating well ie. usually not before 3 months post-op.