

OPENING-WEDGE HIGH TIBIAL OSTEOTOMY

Before Your Surgery

YOUR SURGERY AT A GLANCE

SURGERY	The top of the shin bone is cut and opened into a wedge, filled with bone graft, and held with a plate and screws
HOW LONG	About 2 hours
ANESTHESIA	Anesthesia for surgery, plus a saphenous nerve block that numbs the inner knee and shin for pain after surgery
WHERE	Proliance Surgery Center at Valley (PSCV) or Valley Medical Center (VMC), both in Renton. We will tell you which. You go home the same day
AFTER SURGERY	Hinged brace, unlocked, and crutches. Toe-touch only for 6 weeks. PA visit at 2 weeks. X-ray at 6 weeks
PHYSICAL THERAPY	Starts 5 to 7 days after surgery, 2 times a week. Schedule it before surgery

Do these now, before surgery

- **Schedule physical therapy** for 5 to 7 days after surgery. You will get the referral at your pre-op visit.
- **Arrange a driver** and someone to stay with you for the first 24 hours.
- **Get your handicap placard** at a DMV office, using the application from your clinic visit, so you do not have to deal with it while recovering.
- **If you smoke, stop completely** at least 2 weeks before surgery, and do not smoke for at least 3 months after.

About Your Condition

A knee osteotomy corrects the alignment of the leg by precisely cutting and repositioning bone. This shifts where body weight travels through the knee. It is one of the most powerful joint-preservation tools available.

Picture the **mechanical axis** of the leg: a straight line from the center of the hip to the center of the ankle. In a well-aligned knee, that line passes through the center of the joint and spreads the load evenly. When the leg is bow-legged (varus alignment), the line shifts toward the inside of the knee. Body weight then concentrates on the medial (inner) compartment with every step.

Over years and decades, this imbalance wears down the cartilage and meniscus on the overloaded side. The result is pain, swelling, and arthritis. Nothing failed suddenly: the alignment slowly wore out one side of the knee.

A **high tibial osteotomy (HTO)** cuts the bone at the top of the shin (tibia) and opens a wedge. This shifts the weight-bearing line toward the healthier outer compartment. The knee isn't replaced. It is mechanically rebalanced.

Why surgery: HTO is a joint-preservation procedure. It is designed to reduce pain, slow the progression of arthritis, and delay or prevent the need for a knee replacement.

About Your Surgery

Opening wedge HTO is done through an incision on the inner side of the knee, just below the joint line. A precise cut is made through the tibia, and the bone is gradually opened to create a wedge-shaped gap. The gap is filled with bone graft material and secured with a low-profile **plate and screws**. The plate holds the correction while the bone heals.

Before every osteotomy, a CT scan of your full leg is sent to a specialized engineering team (NewClip). They digitally plan the exact correction angle, cut location, and plate position. A custom 3D-printed cutting guide is then made for your anatomy. This gives millimeter-level precision that standard surgical techniques alone cannot match.

If other procedures are needed (ACL reconstruction, cartilage surgery, or meniscus repair), they can be done at the same time through the same or additional small incisions. Surgery usually takes about **2 hours**. It is an outpatient surgery at Proliance Surgery Center at Valley (PSCV) or Valley Medical Center (VMC), and you go home the same day.

Risks of surgery

Infection, blood clots, numbness around the incision, stiffness, delayed bone healing or non-union (especially in smokers), overcorrection or undercorrection, lateral hinge fracture (a crack on the outer side of the bone cut, found and managed during or after surgery), hardware irritation, and continued pain. Smoking is one of the most common reasons osteotomies fail to heal. We will work together to lower these risks and make your recovery as smooth as possible.

Learn more and watch the videos

My website explains leg alignment, the types of osteotomy, and what recovery looks like in more detail. merrittsurgery.com/surgeries/alignment-osteotomy



Scan to learn more
and watch videos

The Day of Surgery

What to expect, step by step.

1 A couple of days before

The nursing staff will call to confirm your check-in time and when to stop eating and drinking.

2 Check in

Check in at the front desk at your assigned time. In the pre-op area, with your family, our nurses will help you change, start an IV, and review your health history.

3 Meet the team

I will meet with you to review the plan, and the anesthesia team will explain their approach.

4 Surgery

When the operating room is ready, you will walk back with a nurse. After anesthesia is given, you will not remember anything until the recovery room. While you are in surgery, your family can pick up your post-operative medicines at the pharmacy (next to the surgery center at PSCV, or near the operating rooms at VMC).

5 Recovery room and going home

You will be monitored until you are awake, have some crackers and juice, and are comfortable. Then you will change into your clothes and be wheeled to your car. **You need someone to drive you home and stay with you for the first 24 hours.**

After Surgery: What to Expect

Pain, swelling, and limited motion are normal after surgery. You will be in a hinged knee brace and use crutches. The brace is **unlocked from day 1**: the hinge is set at 0–90° the first week, 0–105° the second week, then fully open. Wear it for walking and for sleep.

The most important rule: toe-touch for 6 weeks

In an opening wedge osteotomy, the gap is filled with bone graft, but there is no direct bone-to-bone contact yet. Your foot can touch the floor with **about 10 to 15 pounds, for balance**, but your crutches must carry your weight. Weight cannot increase until your **6-week X-ray** confirms early bone healing (bridging callus).

Your jobs in the first 6 weeks

- **Wake up your quad from day 1.** Swelling after knee surgery makes the quadriceps shut down (arthrogenic muscle inhibition). **Quad sets every hour**, plus electrical muscle stimulation (NMES) started at PT, are the best way to fight this.
- **No hamstring curls** (bending your knee against resistance) for the first 6 weeks.
- **Ice 20 minutes on, 20 minutes off**, as often as you can during the first 2 weeks. Swelling keeps your quad from firing. An ice machine is highly recommended.
- **Keep the knee fully straight from day 1.** Do not rest with a pillow under your knee. A knee that cannot fully straighten (a flexion contracture) is very hard to fix later.
- **Bending goals: 90° by 1 week, 105° by 2 weeks, 115° by 3 weeks, and 125° by 4 weeks.** Don't force past these goals, but don't fall behind either.
- **Physical therapy** starts 5 to 7 days after surgery, **2 times a week**. Schedule it before surgery.

Your recovery may be faster or slower depending on your overall fitness and any additional injuries. The key message: **protecting your bone healing is essential**, while you work hard in every phase of recovery.

When	What to expect
Weeks 1–6	Strict toe-touch (10–15 pounds, for balance) with crutches. Brace unlocked (0–90° week 1, 0–105° week 2, then fully open) for walking and sleep. Quad sets every hour; electrical stimulation at PT. No hamstring curls. PT 2× a week. PA visit at 2 weeks. The 6-week X-ray decides when weight can increase.

Weeks 6–12	Once the X-ray shows early bone healing, weight increases in steps: 25% at week 6, 50% at week 8, 75% at weeks 9–10, and full weight at weeks 10–12. The brace stays unlocked if your straight-leg raise has no lag. If not, it is locked for walking until it does. Wean off crutches as quad control and walking improve: the goal is crutch-free by weeks 10–12 . The brace stops after you are off crutches. Stationary bike and closed-chain strengthening begin.
Months 3–5	Full weight bearing. Progressive strengthening: leg press, squats, step-ups, and balance training. Walking program, cycling, swimming, and elliptical from about 3 months. Limb symmetry testing guides progression.
Months 5–6	Return to low-impact recreational sport as strength and X-rays allow. Running begins at 6 months with a structured walk/jog program, after X-rays confirm solid bone healing.
Months 9–12	Return to higher-demand and cutting/pivoting sports with surgeon clearance and passing strength and hop testing ($\geq 90\%$ limb symmetry). Most patients reach full function by 9–12 months.

Driving

- **Right leg:** you must be off crutches, have the brace unlocked or off, be off narcotic pain medicine, and be able to brake hard. Usually about 10–12 weeks.
- **Left leg (automatic car):** about 4 weeks, once you are off narcotic pain medicine.

Hardware: the plate and screws can stay in permanently for most patients. About 20% feel irritation from the plate. If it bothers you, removal is a simple outpatient procedure, usually after 12–18 months once the bone is fully healed.

Preparing for Surgery

Medicines and supplements before surgery

- The pre-op nurse will tell you when to stop eating and drinking.
- **Stop fish oil, vitamin E, and herbal supplements 5 days before surgery.**
- **Tell us** if you take a blood thinner (such as Eliquis, Xarelto, warfarin, or Plavix) or a weekly diabetes or weight-loss injection (such as Ozempic, Wegovy, or Mounjaro). These may need to be stopped earlier.
- **No anti-inflammatory medicines.** Stop ibuprofen (Advil, Motrin), naproxen (Aleve), meloxicam, celecoxib (Celebrex), diclofenac, and anti-inflammatory creams and gels such as Voltaren **7 days before surgery**, and do not take them for **6 weeks after surgery**. They can slow bone and cartilage healing. The low-dose (81 mg) aspirin we prescribe after surgery is different: take it as directed.

Physical therapy before surgery (prehab)

Starting physical therapy before your surgery helps you recover faster afterward. Focus on decreasing swelling, activating the quadriceps, restoring range of motion, and improving overall strength. **Start prehab as soon as possible.**

Stop smoking

If you smoke, you must stop completely at least **2 weeks before surgery** and not start again for at least **3 months** after. Smoking is the single biggest risk factor you can change for non-union (the bone failing to heal). We generally will not perform elective osteotomies in active smokers.

Nutrition

What you eat has a direct effect on how well you heal. Start good nutrition before surgery and continue through your recovery. Our nutrition guide explains what to take and how much: merrittsurgery.com/surgeries/nutritional-optimization



Scan for the nutrition guide

Ice machine: my #1 recovery recommendation

An ice machine is the single best investment you can make for your recovery. It makes icing **20 minutes on, 20 minutes off** easy, without the risk of frostbite, and is far easier than ice bags or gel pads. Our clinic staff can fit you for one before surgery and show you how to get the most out of it. Stock up on bags of ice: the machine can use a bag a day. **Scan the code to learn more or buy one.**



Scan for recovery tools

Get your home ready

- Remove throw rugs or obstacles that might catch a crutch and cause a fall.
- Have clean sheets and comfortable clothes ready.
- Stock the refrigerator with healthy food, and buy bags of ice for the ice machine.

Day-of-Surgery Checklist

- ☐ Verify your check-in time and follow the instructions on when to stop eating and drinking
- ☐ Physical therapy scheduled for 5–7 days after surgery
- ☐ Bring your brace (you will be fitted at your pre-operative visit)
- ☐ Wear comfortable clothes that fit over a brace (sweatpants work well)
- ☐ No perfume or lotion on your skin
- ☐ Remove jewelry or leave it at home
- ☐ Ice machine and bags of ice ready at home for when you return
- ☐ A driver, and someone to stay with you for the first 24 hours
- ☐ If you are under 18: one family member must stay at the surgery center or hospital during the entire surgery

Contact Information

Questions about your surgery	(425) 656-5060
PSCV Surgery Center	(425) 226-2041
Surgery scheduling	(425) 528-7155
Pre-op nurse	(425) 291-1465
Billing	(425) 291-1414
PSCV address	4009 Talbot Rd S, Ste 200, Renton, WA 98055
VMC address	400 S. 43rd Street, Renton, WA 98055