

Tibial Tubercle Osteotomy — Pre-Operative Information

About Your Condition

The kneecap (patella) glides in a groove on the front of the thigh bone (femur) every time you bend and straighten your knee. When the kneecap does not track properly in this groove, it creates abnormal pressure on the cartilage surfaces, causing pain in the front of the knee. This is called patellar maltracking.

In some patients, the bony bump below the kneecap where the patellar tendon attaches — called the tibial tubercle — is positioned too far to the outside or not far enough forward. This creates a mechanical pull that drives the kneecap off-center in its groove, increasing pressure on the cartilage and causing pain. The distance between the tibial tubercle and the center of the groove (called the TT-TG distance) can be measured on imaging to confirm this.

Over time, abnormal tracking wears down the cartilage on the underside of the kneecap and in the groove, and can contribute to patellofemoral arthritis. You may notice pain with stairs, sitting for long periods, squatting, kneeling, or activity.

Surgery is recommended after conservative treatments — such as physical therapy focused on the inner quadriceps (VMO), activity modification, bracing, and anti-inflammatory medications — have not provided adequate relief.

[Learn more at merrittsurgery.com](http://merrittsurgery.com) or [youtube.com @merrittsurgery](https://www.youtube.com/@merrittsurgery)

About Your Surgery

A tibial tubercle osteotomy (TTO) repositions the bony attachment of the patellar tendon on the shinbone (tibia) to improve how your kneecap tracks in its groove. A small section of bone where the patellar tendon attaches is carefully cut and moved to a better position — typically toward the inside of the leg (medialization) and slightly forward (anteriorization). This is sometimes called a Fulkerson osteotomy. The bone is then secured in its new position with screws.

Moving the tibial tubercle inward corrects the lateral pull on the kneecap. Moving it forward reduces the pressure between the kneecap and the groove, which helps relieve pain. The amount and direction of correction are planned specifically for your anatomy.

As a standard part of this procedure, a lateral retinacular lengthening is also performed to loosen the tight tissue on the outer side of the kneecap. This works together with the bony correction to optimize patellar tracking.

The knee is examined arthroscopically to evaluate the cartilage surfaces and confirm the tracking pattern before the osteotomy is performed through an incision on the front of the shin.

Surgery typically takes about 1–1.5 hours. This is an outpatient surgery performed at the Proliance Surgery Center at Valley (PSCV). You will go home the same day. You will have a general anesthetic and receive a nerve block that helps with postoperative pain.

Risks of surgery include stiffness, infection, blood clots, numbness around the incisions, continued pain and swelling, fracture through the osteotomy site (rare), delayed bone healing or nonunion, and hardware irritation from the screws. Approximately 20% of patients may choose to have the screws removed after the bone has fully healed, typically as a minor outpatient procedure. We will work together to optimize your recovery and minimize these risks.

What happens on the day of surgery: A couple of days before surgery, the nursing staff will call you to confirm your check-in time and when to stop eating and drinking. On the day of surgery, check in at the front desk at your assigned time. You will go to the pre-op area with your family where our nurses will help you get changed, start an IV, and review your health history. You will meet with me to review the plan, and the anesthesia team will explain their approach. 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 medications at the pharmacy next to the surgery center. If you are under 18, one family member must stay at the surgery center during the entire surgery. In the recovery room, you will be monitored until you are awake, have some crackers and juice, and be made comfortable. Once ready, you will change into your clothes and be wheeled to your car. **You will need someone to drive you home and stay with you for the first 24 hours.**

After Surgery — What to Expect

After surgery it is normal to experience pain, swelling, limited motion, and soreness around the knee. These are expected and will improve over time. You will be in a hinged knee brace locked in extension for walking during the first 6 weeks. **Because this surgery involves a bone cut (osteotomy), you must remain toe-touch weight bearing (TTWB) for the first 6 weeks to allow the bone to heal.** This is the most important restriction after surgery — the bone must heal before you can put full weight on it.

During the TTWB period, you will use crutches for all walking. You may remove the brace for range of motion exercises while sitting or lying down. ROM exercises begin from Day 1 — the goal is to prevent stiffness while protecting the bone.

Physical therapy should start within the first week after surgery, typically 2–3 times per week. You will receive a PT referral at your pre-operative clinic visit. Please schedule your first PT appointment before your surgery date.

VMO (inner quadriceps) strengthening is a critical focus throughout your recovery. The VMO is the primary dynamic stabilizer of your kneecap and supports optimal tracking through the newly corrected position. Quad activation and straight leg raises begin immediately. Neuromuscular electrical stimulation (NMES) and blood flow restriction (BFR) training may be used in PT to help maintain muscle strength during the early recovery period.

An important sequence: **crutches are weaned before the brace.** After the 6-week bone healing period, you will first work on walking without crutches, and the brace comes off after you have regained a normal walking pattern.

The timeline below outlines what to expect during your recovery. Every patient heals at a different pace — this is a general guide, not a strict schedule. Dr. Merritt will guide your progression based on your individual healing.

Timeframe	What to Expect
1–2 weeks	First clinic visit to check incisions and early recovery. Pain, swelling, and limited motion are normal. Strict toe-touch weight bearing with crutches and brace

	locked for walking. Begin ROM exercises in non-weight-bearing positions. PT starts within the first week (2–3x/week).
2–6 weeks	Continue strict TTWB and brace use. ROM should progress toward 90° in supine position. Quad activation, VMO exercises, straight leg raises, and stationary bike (no resistance). Second clinic visit around 6 weeks with X-rays to confirm bone healing.
6–12 weeks	Begin progressive weight bearing once bone healing is confirmed on X-rays. Wean crutches first, then brace. Mini-squats, step-ups, and leg press as tolerated. Pain and swelling decrease. Most people can return to desk work or school.
3–5 months	Single-leg strengthening, jogging can begin around 14–16 weeks. Bilateral plyometric exercises with PT guidance. Continue VMO and quad focus. Limb symmetry testing at 3–4 months.
6+ months	Return to sport with PT clearance and formal testing. Full cutting and pivoting activities resume once criteria are met. Minimum 6 months for moderate-demand sport; 9 months recommended for cutting and pivoting sports. Clearance by Dr. Merritt is required.

Driving: If surgery was on your right leg, typically 6–8 weeks (after the TTWB period ends and you can safely control the pedal). If your left leg, typically 2–4 weeks. You must be off narcotic pain medications before driving.

Preparing for Surgery

Pre-surgical physical therapy (prehab): Physical therapy before surgery is recommended to strengthen the VMO (inner quadriceps), improve range of motion, decrease swelling, and restore normal walking mechanics. This typically takes 4–8 weeks after your most recent injury episode. Working on these things before surgery leads to a faster and better recovery afterward.

Nutrition: A good diet with increased protein and collagen supplementation helps speed your recovery and prevent muscle weakness after surgery. Vitamin C can help with inflammation and stiffness. Start these before surgery and continue through your recovery.

Ice Machine — My #1 Recovery Recommendation

I highly recommend purchasing an ice machine to help your recovery. An ice machine is the single best investment you can make — it allows for continuous icing without the risk of frostbite and is far easier than using 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 go through a bag a day when used regularly.

Prepare your home: Remove throw rugs or obstacles that might catch a crutch and cause a fall. Make sure you have clean sheets and comfortable clothes ready. Stock the refrigerator with healthy food and buy bags of ice for the ice machine.

Handicap placard: You will be given a handicap parking pass application at your clinic visit. Get this at a DMV office before your surgery so you do not have to deal with it while recovering.

Day-of-Surgery Checklist

- ☐ Verify your check-in time and follow instructions on when to stop eating and drinking
- ☐ Schedule Physical Therapy for 5–7 days after surgery (do this before 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 or leave jewelry at home
- ☐ Have the ice machine and bags of ice ready at home for when you return

If surgery is at PSCV:

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
Surgery Center Address:	4009 Talbot Rd S, Ste 200, Renton, WA 98055