

LATERAL RETINACULAR LENGTHENING

Physical Therapy Protocol

PATIENT

SURGEON

Andrew L. Merritt, MD

DATE OF SURGERY

PT START DATE

For the patient

Your surgery **lengthened** the tight tissue on the outer side of your kneecap. That tissue was pulling your kneecap off-center and causing pain. The most important job in the first few weeks is to **keep your kneecap moving**, especially pushing it gently toward the inside of your knee. As the tissue heals, it forms scar, and scar can tighten back up. If you skip the glides, the surgery can lose its effect. Your therapist will teach you the glides and help your thigh muscle (quad) work again. **Kneecap glides are your most important exercise in the first 3 weeks. Do not skip them.**

PROTOCOL AT A GLANCE

WEIGHT BEARING	As tolerated from day 1, with crutches at first. Most people are off crutches in 1 to 2 weeks
BRACE	None needed. No tape, sleeve, or brace that pulls the kneecap toward the outside
MOTION GOALS	No bending limit. 0–90° by the end of week 3 , 0–120° by week 6, full motion (0–130° or more) by week 8
PHYSICAL THERAPY	Starts 5 to 7 days after surgery, 2 times a week at first. Kneecap glides toward the inside at home, 3 times a day
KEY PRECAUTIONS	Start inward kneecap glides within the first 2 days and keep them up for at least 12 weeks. No resisted leg-extension machine until cleared
RETURN TO ACTIVITY	Running and sport-type training in Phase 4 (from about week 14), once strength and function criteria are met

Recovery Timeline

Phase	When	PT visits	Focus
1	Weeks 0–3	2× a week	Daily inward kneecap glides, crutches, inner quad, 0–90°
2	Weeks 3–8	2× a week	Squats, step-ups, bike; full motion by week 8
3	Weeks 8–14	1× a week + home program	Squats, lunges, step-downs, balance
4	Weeks 14–20+	As needed	Running, jumping, sport work; clearance

For the Therapist

Check the surgeon notes first. They override anything else in this protocol. Questions or setbacks: call (425) 656-5060.

Surgeon notes and special instructions

General principles

- **What the surgery does.** LRL addresses abnormal lateral retinacular tightness that causes lateral patellar overload, excessive lateral tilt or shift, and anterior knee pain. It is a lengthening, not a release.
- **Patellar mobility first.** Restore patellar mobility, especially the medial glide, before scar formation can recreate lateral tightness. Patellar mobilization from the first post-operative week is the critical priority.
- **Activate the VMO and quadriceps** to restore dynamic medial patellar stabilization. NMES and BFR are the primary early tools.
- **Progress functional strength** as tolerated. There is no flexion limit after LRL.
- **NMES** is provided at PT visits when volitional quad activation is poor. No home unit is needed.
- **Cold therapy:** 20 minutes on, 20 minutes off, after exercise and as needed.
- **Criterion-based.** Advance when the goals for each phase are met, not on a set date.

Procedures done at the same time

Chondroplasty

- Concomitant chondroplasty does not change the rehabilitation protocol. Standard progression applies.

PHASE

1

Early Protection and Patellar Mobilization

Weeks 0–3

For the patient: what to expect

In the first 3 weeks, your most important job is to **move your kneecap**, especially pushing it gently toward the inside of your knee, 3 times a day. This keeps the lengthened tissue from tightening back up as it heals. You will also work on waking up your thigh muscle; your therapist may use a small muscle stimulator at your visits. You can put as much weight on the leg as is comfortable. Use crutches at first, and wean off them as your leg gets stronger.

WEIGHT BEARING	As tolerated with crutches. Progress to 1 crutch or none as quad control improves and swelling settles, typically at 1–2 weeks
BRACE	None needed
MOTION	0–90° by the end of week 3. Prioritize full extension. Flexion limited by pain and swelling at first. Gentle passive and active-assisted motion from day 1

Goals

- Motion 0–90° by the end of Phase 1
- Full medial patellar glide excursion (≥ 2 quadrants) to prevent lateral retinacular re-tightening
- VMO and quadriceps activation, with NMES and BFR as the primary tools
- Swelling and pain controlled
- Independent walking with crutches; start weaning as quad control returns

Move on when

- ☐ Motion 0–90° by the end of week 3
- ☐ Medial patellar glide ≥ 2 quadrants (patellar width)
- ☐ Straight-leg raise without an extension lag
- ☐ Walking without crutches with an acceptable gait
- ☐ Swelling controlled; minimal effusion at rest

Exercises

Exercise	How
Patellar mobilization (priority)	Medial glide (push the kneecap toward the inside), 2–3 sets of 10 glides, 3× a day. Also superior and inferior glides and lateral tilt correction. Start day 1–2. The most important Phase 1 exercise
Quad sets	3 × 15, every hour
NMES	To the VMO and quad, 20–30 min sessions at PT, at the therapist's discretion
BFR	Low-load quad sets and straight-leg raises with the BFR cuff, to build the VMO while keeping patellofemoral stress low
Straight-leg raises	Hip flexion, abduction, and extension
Ankle pumps · calf stretch	Daily
Heel slides	Active-assisted knee flexion; progress to 90°
Hamstring stretch	Supine
Ice and elevation	After exercise, 20 min on, 20 min off

Precautions

- Do not apply lateral patellar tape or a brace that pulls laterally; it recreates the tightness that was surgically corrected
- Medial patellar mobilization must begin within the first 2 post-operative days to prevent scar-mediated re-tightening
- No resisted knee extension on the leg-extension machine during Phase 1
- If the patient reports a sudden loss of medial patellar mobility, contact Dr. Merritt

Why: The lateral retinaculum heals with scar tissue that can recreate the pre-operative tightness if it is not mobilized early and regularly. Early medial glide mobilization is the main strategy to prevent failure from re-tightening.

PHASE

2

Progressive Mobility and Quad Strengthening

Weeks 3–8

For the patient: what to expect

You are now working toward full bending and building real strength in your thigh. **Keep doing your kneecap glides at home every day.** They stay important throughout your recovery. You will add squats, step exercises, and the stationary bike. Your therapist may keep using the muscle stimulator and the thigh cuff at your visits to help your inner thigh muscle fire.

WEIGHT BEARING	Full, without a walking aid
BRACE	None needed
MOTION	0–120° by week 6; full motion (0–130° or more) by week 8. Progress active motion; gentle overpressure at end-range flexion as tolerated

Goals

- Motion 0–120° by week 6, toward full motion by week 8
- Keep the full medial patellar glide gained in Phase 1
- Quad strength 60% of the other side on testing
- Full weight bearing without a walking aid
- Normal gait on level ground and stairs

Move on when

- ☐ Motion 0–120° by week 6
- ☐ Medial patellar glide maintained at ≥2 quadrants
- ☐ 4-inch step-up without pain
- ☐ Stationary bike 20 min continuously without pain
- ☐ Quad strength ≥60% of the other side

Exercises

Exercise	How
Patellar mobilization	Continue daily: medial glide 2–3 sets × 10, 2× a day as a home program
BFR	Low-load squats, leg press, and straight-leg raises with the BFR cuff
NMES	At PT as needed for VMO facilitation; wean as voluntary activation improves
Stationary bike	Once 100–110° of flexion is reached; low resistance, 15–20 min
Mini squats	0–60°, progressing to 0–90° as tolerated
Step-ups	4-inch step, progressing to 8-inch
Hip strengthening	Side-lying hip abduction and clamshells
Pool walking · aquatherapy	If available
Hamstring curls · calf raises	Progress as tolerated

Precautions

- Patellar mobilization must continue as a daily home exercise through Phase 2 and beyond
- No resisted knee extension on the leg-extension machine until cleared by Dr. Merritt
- Watch for patellofemoral pain with new loading; regress if pain is above 3/10
- No running, jumping, or cutting in Phase 2

Why: Scar tissue keeps maturing through weeks 6–8. Ongoing medial mobilization is needed throughout this period to prevent progressive lateral re-tightening. Once the scar has matured (about 3 months), mobilization frequency can be reduced.

PHASE

3

Functional Strengthening

Weeks 8–14

For the patient: what to expect

You are now building strength with harder exercises: squats, lunges, and step-downs. The goal is to build the thigh and hip strength that holds your kneecap in place during everyday activity. Keep your kneecap glides going once a day. By the end of this phase, most people are ready for low-impact activity and controlled sport training.

WEIGHT BEARING	Full, unrestricted
MOTION	Full, unrestricted (target 0–130° or more)

Goals

- Full motion (0–130° or more)
- Quad strength $\geq 80\%$ of the other side
- Pain-free single-leg movements (step-down, single-leg squat)
- Independent in the home strengthening program without BFR or NMES

Move on when

- ☐ Full motion 0–130° or more
- ☐ Single-leg squat $\times 15$ without pain or dynamic valgus
- ☐ 8-inch step-down pain-free with symmetric mechanics
- ☐ Quad strength $\geq 80\%$ of the other side on isokinetic or functional testing

Exercises

Exercise	How
Squats	0–90°, progressing load
Leg press	Progress to single-leg and add resistance
Step-downs	8-inch step, eccentric quad control
Lunges	Reverse and forward; progress range and load
Hip thrust · single-leg bridge	With weight
Lateral band walks	Increase resistance
Leg-extension machine	Full arc, light load, only if cleared by Dr. Merritt
Low-impact cardio	Elliptical, cycling, swimming
Patellar self-mobilization	Maintenance: medial glide 1 $\times$ a day as a home program
VMO-focused work	Quad sets with VMO biofeedback; single-leg squat with a lateral tap cue

Precautions

- Patellofemoral pain with more loading should not exceed 2/10
- Continue daily medial self-mobilization through at least 12 weeks after surgery
- No running until quad strength is $\geq 80\%$ and step-down mechanics are normal

Why: Progressive loading builds dynamic patellar stabilization. Too much patellofemoral stress before the VMO and hip are strong enough can trigger pain and undermine the result.

PHASE

4

Return to Activity

Weeks 14–20+

For the patient: what to expect

This is the final phase. You will build toward your full activity or sport goals, including running, jumping, and sport-type movements if they matter for you. You are cleared for full activity when you meet strength and function goals, not just because time has passed. Keep up your hip and thigh exercises for the long term; they help keep your kneecap where it belongs.

WEIGHT BEARING	Full, unrestricted
MOTION	Full, unrestricted

Goals

- Return to full sport or recreational activity without pain
- Quad and hip strength symmetric with the other side
- Good neuromuscular control during sport-specific movements

Move on when

- ☐ Running 20 min continuously without pain
- ☐ Hop test $\geq 90\%$ limb symmetry index
- ☐ Sport-specific testing passed per PT assessment
- ☐ Clearance from Dr. Merritt

Exercises

Exercise	How
Sport-specific work	Strength and agility progression
Running program	Walk-run intervals on a flat surface; progress distance and speed over 4–6 weeks
Plyometrics	Two-leg jumping, then single-leg landing (if relevant to the sport)
Cutting · deceleration	If relevant to the sport
Maintenance	Continue hip strengthening and VMO work long term

Precautions

- A long-term hip and quad maintenance program is recommended to prevent recurrence
- Watch for signs of lateral re-tightening (returning lateral patellar tilt, pain with medial glide) and treat with targeted mobilization

Why: Lateral retinacular re-tightening can occur months after surgery if mobilization stops too early. A maintenance program protects the surgical result long term.

Return to Activity Criteria

All criteria must be met before clearance.

Measure	Target
Motion	Full, pain-free (0–130° or more)
Quadriceps strength	≥80% of the other side (isokinetic or functional testing)
Hip strength	Abductor and external rotator strength symmetric
Single-leg squat	× 15 without pain or dynamic valgus
Hop test	≥90% limb symmetry index (sport patients)
Running	20 min continuously without pain
Clearance	Clearance from Dr. Merritt

LRL done together with MPFL reconstruction or TTO follows that surgery's protocol; therapist-performed patellar glides are enough there. The daily home glide program in this protocol applies to LRL done alone.