

TOTAL KNEE REPLACEMENT

Physical Therapy Protocol · Proliance Progressive Recovery

PATIENT

SURGEON

Andrew L. Merritt, MD

DATE OF SURGERY

PT START DATE

For the patient

The surgery replaces the worn joint. **Physical therapy is how you get your knee working again.** In the first two weeks, the most important thing is not how far you bend your knee. It is **how well you control the swelling.** Swelling shuts down your quad muscle, and your quad is what makes everything else possible. You move to the next phase when your knee is ready, not just because a number of weeks has passed. **Getting your knee fully straight comes before bending,** and getting your quad working comes before everything else.

PROTOCOL AT A GLANCE

WEIGHT BEARING	Full weight as tolerated from day 1, with a rolling walker
WALKER · CANE	Walker at first. Most people move to a cane around weeks 2 to 3 and walk without anything by 4 to 6 weeks
MOTION GOALS	Full straightening (0°) is the first priority. About 80° of bending by 2 weeks, past 110° by 6 weeks, past 120° by 12 weeks
PHYSICAL THERAPY	Starts 5 to 7 days after surgery, 2 times a week at first. Many people finish formal PT around 6 weeks and keep going with a home program
KEY PRECAUTIONS	Never put a pillow under the knee, only under the calf or heel. Ice 20 minutes on, 20 minutes off while awake. Don't force bending in the first week
RETURN TO ACTIVITY	Most people reach their activity goals by about 3 months. Running, jumping, and contact sports are not recommended

Recovery Timeline

Phase	When	PT visits	Focus
1	Weeks 0–2	2× a week	The Quiet Knee: control swelling, full straightening, quad sets and ankle pumps, safe walking with a walker
2	Weeks 2–6	2× a week	Bend past 110° with full straightening, wean off the cane, step-over-step stairs, build quad strength
3	Weeks 6–12+	1–2× a week + home program	Leg press, squats, treadmill, balance; return to walking, cycling, golf, pickleball, hiking

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

- **The Quiet Knee.** In the first 14 days, less is more. Avoid intensive PT immediately after surgery. Cryotherapy is mandatory: 20 min on, 20 min off while awake, with an ice machine or ice bags. Controlling effusion is the prerequisite for everything that follows.
- **Never place a pillow under the knee.** It promotes a flexion contracture. Elevate the leg straight with a pillow under the calf or heel. Full extension is the first priority from day 1.
- **Quad activation before aggressive motion.** Quad sets and ankle pumps begin on day 1 to combat arthrogenic muscle inhibition (AMI).
- **NMES** is provided by the therapist at PT visits only (no home unit) and is encouraged throughout for quad re-education.
- **Criterion-based progression.** Advance phases when milestones are met, not by the calendar alone. Swelling and pain must be controlled at each phase transition.
- **Weight bearing as tolerated from day 1** with a walker. Progress the assistive device as quad control and gait quality improve. Do not rush device weaning: a fall costs far more than an extra week with a cane.
- **PT frequency:** 2× a week in Phases 1–2.

PHASE

1

The Quiet Knee

Weeks 0–2

For the patient: what to expect

The first 14 days are the most important. **Ice 20 minutes on, 20 minutes off** while you are awake, with the ice machine or ice bags. Protect your skin from frostbite. Keep your leg up and straight. Your job right now is **controlling swelling, not gaining motion**. Do your ankle pumps and quad squeezes every hour. The less your knee swells now, the faster everything goes later.

WEIGHT BEARING	As tolerated from day 1 with a walker. Progress to a cane or crutch as quad control and pain allow. Most patients are on a cane by weeks 2–3
BRACE	None. Pillow under the calf or heel only, never under the knee, to encourage the leg to rest fully straight rather than slightly bent

Goals

- Control inflammation and swelling with cryotherapy and elevation
- Active quad contraction (quad sets) and ankle pumps from day 1
- Safe functional mobility: transfers and household walking with a rolling walker
- Non-reciprocal stair training sufficient for home discharge
- Active flexion about 80° and extension with a lag <10° for discharge readiness

Move on when

- ☐ Active flexion about 80°; active extension lag <10° in supine
- ☐ Pain controlled; swelling manageable with cryotherapy and elevation
- ☐ Independent, safe transfers (supine-to-sit, sit-to-stand)
- ☐ Walks safely with a rolling walker on level surfaces; non-reciprocal stairs with a device
- ☐ Independent with the home exercise program

Exercises

Exercise	How
Quad sets	Isometric, knee straight: 3 × 15 every 1–2 hours while awake
Ankle pumps	3 × 20 every hour (DVT prophylaxis)
Heel slides	Supine, gravity-assisted: 3 × 10; no forcing
Straight-leg raise	When quad control is present and the lag is <10°: 3 × 10
Seated knee flexion · extension	Active, in a chair: 3 × 10
Transfer training	Supine-to-sit, sit-to-stand (chair and toilet height)
Gait training	Rolling walker on level surfaces; progress as tolerated
Stair training	Non-reciprocal (step-to pattern) with the assistive device
Cryotherapy	20 min on, 20 min off while awake; mandatory throughout Phase 1
NMES	To the quadriceps at PT, if available (no home unit): 20-min sessions for AMI

Precautions

- Do not place a pillow under the knee; calf only. A flexion contracture established in week 1 is far harder to correct at 6 weeks
- Cryotherapy is not optional: 20 min on, 20 min off while awake. Skipping it perpetuates swelling, AMI, pain, and stiffness
- Avoid prolonged sitting, standing, or walking. Short, frequent activity bouts with elevation between them are preferred
- Do not force motion in week 1; forcing it before swelling is controlled increases pain, synovial inflammation, and quad inhibition
- Do not start CPM unless specifically ordered by Dr. Merritt

Why: Aggressive early TKA rehab drives a vicious cycle: excessive early movement → synovial inflammation → effusion → AMI → quad shutdown → pain → guarding → stiffness. The Quiet Knee approach interrupts it by prioritizing effusion control in the first 10 days. Cryotherapy (20 min on, 20 min off) produces vasoconstriction and lowers inflammatory cytokines in the joint. Extension must be established from day 1: a 5° flexion contracture at 6 weeks is much harder to correct than to prevent.

PHASE

2

Motion and Strength

Weeks 2–6

For the patient: what to expect

Swelling should be under better control now, so it is time to build motion and strength. **Keep icing after every PT session.** You'll work toward full straightening, bending past 110°, and walking normally. Going up and down stairs step over step is the goal by the end of this phase. Let pain guide your effort: soreness is normal, but sharp or severe pain means back off.

WEIGHT BEARING	Full. Advance walker → cane as quad control and gait quality improve. Goal: no device on level surfaces by weeks 4–6
BRACE	None

Goals

- Active flexion >110° and full extension (0°) with no quad lag
- No assistive device on level surfaces; normal gait
- Reciprocal stairs
- Independent with all ADLs (sit-to-stand, car transfers, tub or shower)
- Start the step-up and step-down progression; normal quad activation

Move on when

- ☐ Active flexion >110°; active extension 0° with no lag
- ☐ Normal gait on level ground without an assistive device
- ☐ Ascends a 6-inch step with good control
- ☐ Sit-to-stand without pushing off with the arms
- ☐ Independent with all ADLs
- ☐ Swelling and pain controlled; minimal effusion after activity

Exercises

Exercise	How
Quad sets · ankle pumps	Continue, reduced to 2–3× a day; stay consistent
Motion	PROM and AROM flexion and extension: heel slides, wall slides, supine PROM
Extension stretching	Prone hang or seated with the heel propped; prioritize 0°
Straight-leg raise	All planes (flexion, abduction, adduction, extension) once the quad lag has resolved
Stretching	Standing quad stretch, supine hamstring stretch
Step-ups · step-downs	Start at 2–4 inches; advance with strength
Patellar mobilization	Superior-inferior and medial-lateral, once the incision is stable
Stationary bike	Short crank if flexion <90°; full crank once >110°; 10–20 min
NMES · EMG biofeedback	At PT, for quad re-education; continue until the lag resolves
Mini squats	With continued quad sets and SLR
Gait training	Heel strike, knee extension at loading response, reciprocal arm swing
ADL training	Sit-to-stand, car transfers, tub or shower entry

Precautions

- Continue cryotherapy after every PT session; swelling management remains a priority through week 6
- If motion plateaus with a hard or painful end feel, we will start a more aggressive protocol after 6 weeks
- Avoid prolonged sitting or walking; short activity bouts, then elevation and icing
- Do not progress to reciprocal stairs until gait on level ground is non-antalgic
- Do not rush device weaning; gait quality and safety come before speed

Why: Phase 2 is the critical window for motion. Scar tissue matures between weeks 3 and 6, and the motion gained in this window largely determines the long-term result. Mobilize a quiet knee, not an angry one. NMES strengthens the quad with minimal joint loading, addressing AMI without more synovial irritation. Extension gains must be kept: passive extension stretching continues daily.

PHASE

3

Strength and Return to Activity

Weeks 6–12+

For the patient: what to expect

Many people stop formal physical therapy at 6 weeks, but you can keep building strength and getting back to your activities. You'll move on to the leg press, squats, the treadmill, and balance work. **Most people reach their activity goals by about 3 months.** Sticking with your home program after PT ends decides your long-term result. The work you do at home matters as much as formal PT.

WEIGHT BEARING	Full, no restrictions
BRACE	None
Goals - Active flexion >120° with full extension maintained - Symmetrical lower-extremity strength: quad, hip, hamstring - Reciprocal stairs on an 8-inch step without pain or significant deviation - Return to community-level activities - Discharge to an independent home program Move on when ☐ Active flexion >120°; extension 0° maintained ☐ Lower-extremity strength ≥4+/5 (MMT); symmetrical quad function ☐ Descends an 8-inch step without pain or trunk deviation ☐ TUG ≤12 sec (community ambulation standard) ☐ Five-times sit-to-stand ≤12 sec ☐ Independent with the full home program ☐ No significant increase in swelling or pain with community-level activity	

Exercises

Exercise	How
Leg press	Bilateral → unilateral → eccentric; advance load as tolerated
Step-ups · step-downs	Advance to 6–8 inches
Squats	Wall, ball, or functional squats: 3 × 12–15
Treadmill · elliptical	Retro treadmill → forward treadmill → elliptical; 20–30 min conditioning
Stationary bike	Full crank, progressive resistance; 20–30 min
Eccentric strengthening	Hamstring and quad
Balance	Single-leg stance, foam surface, dynamic challenges
Pool	Once the wound has healed: aquatic walking, mini squats
Single-leg work	Unilateral leg press, short-arc quads
Kinetic chain	Hip, hamstring, and calf as needed

Precautions

- High-impact activity (running, jumping, plyometrics) is not appropriate after TKA and should not be started
- Watch for persistent effusion after activity; more swelling calls for less load
- Regression is not failure: if gait deviation or pain returns with more load, reduce it and rebuild

Why: TKA patients do not return to high-impact sport, but most return to walking, cycling, swimming, hiking, golf, and low-impact recreation. Activity guidance is individualized by the surgeon based on implant design, polyethylene bearing, age, and fitness. High-impact activity substantially increases polyethylene wear and the risk of early revision.

Return to Activity

Discharge to an independent home program once the Phase 3 milestones are met.

RECOMMENDED	Walking, cycling, swimming, elliptical, hiking, golf (walking), pickleball and tennis, and low-impact recreation
NOT RECOMMENDED	Running, jumping, contact sports, and high-impact aerobics

Questions about PT progress? Patients can call our office or bring them to their next appointment. We are always glad to coordinate with the therapist.