ANDREW L. MERRITT, MD — PROLIANCE ORTHOPEDIC ASSOCIATES

YOUR KNEE REPLACEMENT RECOVERY
A GUIDE TO PHYSICAL THERAPY

THE ROLE OF PHYSICAL THERAPY IN YOUR RECOVERY

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 much you bend your knee. It is how well you control the swelling. Swelling is what shuts down your quad muscle, and your quad is what makes everything else possible.

Important: You advance through phases when your knee is ready — not simply because a certain number of weeks have passed. Full straightening comes before bending. Getting your quad firing comes before everything else.

YOUR RECOVERY TIMELINE

PHASE	TIMEFRAME	PT VISITS	WHAT YOU'RE WORKING ON
1	Days 1–14	2–3× per week	• Control swelling — ice 20 min every hour while awake • Full straightening is the #1 priority from Day 1 • Quad sets and ankle pumps begin immediately • Safe walking with a walker; bed and chair transfers
2	Weeks 2–6	2–3× per week	• Bend past 110° and reach full straightening (0°) • Walk without a limp — wean off cane as strength allows • Stairs with a normal step-over-step pattern • Build quad strength with step-ups, bike, and leg exercises
3	Weeks 7–12	1–2× per week + home program	• Leg press, functional squats, treadmill, elliptical • Bend past 120°; single-leg balance and stability • Return to walking, cycling, golf, pickleball, hiking • Most patients reach their activity goals by 3 months

Activities after knee replacement: Walking, cycling, swimming, elliptical, hiking, golf, and pickleball are all great goals. Running, jumping, and contact sports are not recommended after a knee replacement.

Questions about your PT progress? Call our office or bring them to your next appointment. We are always glad to coordinate with your therapist.

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"PROLIANCE PROGRESSIVE RECOVERY" TOTAL KNEE ARTHROPLASTY — PHYSICAL THERAPY PROTOCOL

Patient Name: _____ **Surgeon:** Andrew L. Merritt, MD
Date of Surgery: _____ **PT Start Date:** _____

Overview & General Principles

- THE QUIET KNEE PRINCIPLE — In the first 14 days, 'less is more.' Avoid intensive PT immediately post-op. Aggressive cryotherapy (20 minutes every 2 hours while awake) is mandatory, or more. Controlling effusion is the prerequisite for everything else that follows.
- NEVER place a pillow under the knee — this promotes a flexion contracture. Elevate the leg straight with a pillow under the calf/heel. Full extension is the #1 priority from Day 1.
- QUAD ACTIVATION PRECEDES AGGRESSIVE ROM — quad sets and ankle pumps begin Day 1 to combat AMI. NMES (neuromuscular electrical stimulation) and BFR are approved and encouraged throughout for quad reeducation.
- CRITERION-BASED PROGRESSION — advance phases when milestones are met, not by calendar alone. Swelling and pain must be controlled at each phase transition.
- WBAT from Day 1 with walker. Progress 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.

PHASE (Days 1–14)

INFORMATION FOR THE PATIENT — What to Expect This Phase

The first 14 days are the most important. Ice aggressively — 20 minutes every hour while awake. Be careful with ice packs crossing frostbite, but if you have an ice machine, you can keep it on continuously. Keep your leg elevated 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 progresses later.

Goals:

- Control post-operative inflammation and swelling through aggressive cryotherapy and leg elevation
- Establish active quad contraction (quad sets) and ankle pump from Day 1
- Achieve safe functional mobility: transfers, household ambulation with rolling walker
- Non-reciprocal stair training sufficient for home discharge
- Target active knee flexion ~80° and extension with <10° lag for discharge readiness

Weight-Bearing Status:

WBAT from Day 1 with walker. Progress to cane/crutch as quad control and pain permit. Most patients are on a cane by Week 2-3.

Bracing:

None required. Pillow under calf/heel only — NOT under the knee. you want to encourage the leg going straight and NOT keeping the knee with a slight bend.

Exercises:

- Quad sets (isometric quad contraction with knee straight): 3 × 15 reps every 1–2 hours while awake
- Ankle pumps (dorsiflexion/plantar flexion): 3 × 20 reps every hour — DVT prophylaxis
- Heel slides (supine, gravity-assisted): 3 × 10 reps — no forcing
- SLR: when quad control present and lag <10° — 3 × 10 reps
- Seated active knee flexion/extension in chair: 3 × 10 reps
- Transfer training: supine-to-sit, sit-to-stand (chair, toilet height)
- Gait training with rolling walker: level surfaces, progress as tolerated
- Non-reciprocal stair training with assistive device (step-to pattern)
- Cryotherapy: 20 minutes every 2 hours while awake — mandatory throughout Phase 1
- NMES to quadriceps (if available): 20-minute sessions 2–3×/day for AMI

Progression Milestones:

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

PRECAUTIONS — Phase 1: The Quiet Knee Rules

- DO NOT place a pillow under the knee — pillow under the calf only. A flexion contracture established in Week 1 is far more difficult to correct at 6 weeks.
- Aggressive cryotherapy is not optional — ice 20 minutes every hour while awake. Skipping icing perpetuates swelling → AMI → pain → stiffness.
- Avoid prolonged sitting, standing, or walking. Short, frequent activity bouts are preferred over sustained effort — rest with elevation between sessions.
- Do NOT force ROM in Week 1 — forcing ROM before swelling is controlled increases pain, synovial inflammation, and quad inhibition.
- Do not initiate CPM unless specifically ordered by Dr. Merritt.

Rationale: The fundamental problem with traditional aggressive early TKA rehabilitation is a vicious cycle: excessive early movement → increased synovial inflammation → effusion → AMI → quad shutdown → pain → guarding → stiffness. The Quiet Knee approach interrupts this cycle by prioritizing effusion control in the first 10 days. Cryotherapy applied 20 minutes every 2 hours achieves vasoconstriction and reduces inflammatory cytokine concentration in the joint. Extension must be established from Day 1 — a 5° flexion contracture at 6 weeks is substantially more difficult to correct than preventing it.

PHASE (Weeks 2–6)

INFORMATION FOR THE PATIENT — What to Expect This Phase

Swelling should be under better control now — time to build motion and strength. Keep icing after every PT session. You'll work toward full straightening, bending past 110°, and normalizing your walking pattern. Reciprocal stairs are the goal by end of this phase. Pain should guide effort — soreness is normal; sharp or severe pain means back off.

Goals:

- Achieve active knee flexion >110° and full extension (0°) with no quad lag

- Eliminate assistive device on level surfaces; normalize gait pattern
- Progress to reciprocal stair negotiation
- Independent with all ADL (sit-to-stand, car transfers, tub/shower)
- Initiate step-up/down progression; normalize quad activation

Weight-Bearing Status:
Full weight-bearing. Advance walker → cane as quad control and gait quality improve. Goal: no device on level surfaces by Week 4–6.

Bracing:
None.

Exercises:
- Continue quad sets and ankle pumps (reduce to 2–3×/day; maintain consistency)
- PROM/AROM knee flexion and extension: heel slides, wall slides, supine PROM
- Passive extension stretching: prone hang or seated with heel elevated — prioritize 0°
- SLR all planes (flexion, abduction, adduction, extension) when quad lag is resolved
- Hamstring and quad stretching: standing quad stretch, supine hamstring stretch
- Step-up/step-down progression: begin 2–4 inches, advance with strength
- Patella mobilization (superior-inferior, medial-lateral) once incision is stable
- Cycle ergometry: short crank if flexion <90°; full crank once >110° — 10–20 min
- NMES or EMG biofeedback for quad reeducation — continue until lag resolved
- BFR training: quad sets, SLR, mini-squats with limb occlusion cuff
- Gait training: heel strike, knee extension at loading response, reciprocal arm swing
- ADL training: sit-to-stand, car transfers, tub/shower entry

Progression Milestones:
- Active flexion >110°; active extension = 0° with no lag
- Ambulates on level surface with normal gait pattern without assistive device
- Ascends 6-inch step with good control
- Sit-to-stand without compensatory upper extremity push-off
- Independent with all ADL
- Swelling and pain controlled — minimal effusion after activity

PRECAUTIONS — Phase 2
- Continue cryotherapy after every PT session — swelling management remains a priority through Week 6.
- If ROM plateaus with a hard or painful end feel — we will initiate a more aggressive protocol after 6 weeks.
- Avoid prolonged sitting or walking — short activity bouts with elevation and icing after.
- Do not progress to reciprocal stairs until non-antalgic gait is demonstrated on level surfaces.
- Do not rush device weaning — prioritize gait quality and safety over speed of advancement.

Rationale: Phase 2 is the critical window for ROM establishment. Scar tissue matures between Weeks 3–6, and ROM achieved in this window largely determines long-term outcome. The key principle: mobilize a quiet knee, not an angry one. NMES and BFR allow quad strengthening with minimal joint loading, addressing AMI without driving further synovial irritation. Extension gains must be maintained — passive extension stretching must continue daily.

PHASE (Weeks 7–12+)

INFORMATION FOR THE PATIENT — What to Expect This Phase

Many patients stop physical therapy at six weeks, but you can continue to build strength and return to your activities. You'll progress to leg press, functional squats, treadmill, and balance work. Most patients reach their activity goals by 3 months. Consistency with your home program after discharge determines your long-term result — the work you do at home matters as much as formal PT.

Goals:

- Achieve active flexion >120° and maintain full extension
- Restore symmetrical lower extremity strength: quad, hip, hamstring
- Reciprocal stair negotiation 8-inch step without pain or significant deviation
- Return to community-level functional activities
- Discharge to independent HEP

Weight-Bearing Status:

Full weight-bearing. No restrictions.

Bracing:

None.

Exercises:

- Leg press progression: bilateral → unilateral → eccentric loading; advance load as tolerated
- Step-up/step-down progression: advance to 6–8 inches
- Wall/ball/functional squats: 3 × 12–15 reps
- Retro treadmill → forward treadmill → elliptical: 20–30 min cardiovascular conditioning
- Cycle ergometry: full crank, increase resistance progressively — 20–30 min
- Eccentric hamstring and quad strengthening
- Balance and proprioception: single-leg stance, foam surface, dynamic challenges
- Hydrotherapy (once wound healed): aquatic walking, mini-squats
- BFR continuation: unilateral leg press, short-arc quad extensions
- Kinetic chain exercises: address hip, hamstring, and calf as needed

Progression Milestones:

- Active flexion >120°; extension = 0° maintained
- Lower extremity strength ≥4+/5 on MMT; symmetrical quad function
- Descends 8-inch step without pain or trunk deviation
- TUG ≤12 seconds (community ambulation standard)
- 5× sit-to-stand in ≤12 seconds
- Independent with full HEP
- No significant increase in swelling or pain with community-level activity

PRECAUTIONS — Phase 3

- High-impact activities (running, jumping, plyometrics) are not appropriate after TKA and should not be initiated.
- Monitor for persistent effusion after activity — increased swelling warrants load reduction
- Regression is not failure — if gait deviation or pain recurs with increased load, reduce and rebuild.

Rationale: TKA patients do not return to high-impact sport, but most return to walking, cycling, swimming, hiking, golf, and low-impact recreational activities. Activity guidance should be individualized by surgeon based on implant design, polyethylene bearing, patient age, and fitness level. High-impact activities substantially increase polyethylene wear and risk early implant revision.

DISCHARGE & RETURN TO ACTIVITY CRITERIA

Clinical Note

- Recommended activities after TKA: walking, cycling, swimming, elliptical, hiking, golf (walking), pickleball and tennis, and low-impact recreational activities. Activities generally not recommended: running, contact sports, and high-impact aerobics.

Surgeon Notes / Special Instructions: