

KNEE REPLACEMENT REHAB

TOTAL KNEE ARTHROPLASTY (TKA) PHYSICAL THERAPY PROTOCOL

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Clinical Boundary & Scope Notice: This protocol outlines physical therapy exercise progressions, joint mobility benchmarks, and biomechanical guidelines designed to optimize physical function. All surgical matters, wound care, staple management, infection screening, and medication prescriptions are strictly governed by your attending orthopedic surgeon and medical team.

PHASE 1: EARLY PROTECTION & QUAD ACTIVATION (WEEKS 0–2)

The immediate post-operative period focuses on restoration of active knee extension, minimizing joint swelling, re-establishing quadriceps motor control, and achieving safe, independent transfers. Achieving complete knee extension (0°) early is the single highest priority in physical therapy to ensure a normal gait pattern and prevent permanent flexion contractures.

PHYSICAL THERAPY RANGE OF MOTION (ROM) TARGET TRAJECTORY



Core Physical Therapy Goals

- Full active knee extension (0° Terminal Extension).
- Knee flexion to at least 90° by end of Week 2.
- Independent Straight Leg Raise (SLR) without lag.
- Safe ambulation with walker or crutches.

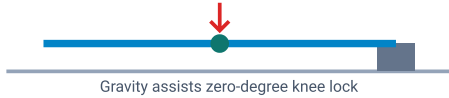
Phase 1 Daily Exercise Routine

- Ankle Pumps:** 20 reps every waking hour.
- Quad Sets:** Hold 5 sec, 10–15 reps, 3× daily.
- Heel Slides:** 10–15 reps, gentle end-range hold.
- Heel Prop (Extension Stretch):** 10 min, 3× daily.

PHASE 2: MOTION PROGRESSION & GAIT NORMALIZATION (WEEKS 2–6)

During Phase 2, physical therapy shifts toward consolidating motion gains, weaning from primary assistive devices, improving quad strength, and eliminating antalgic limp patterns. Swelling management remains essential, as persistent joint effusion mechanically inhibits quadriceps motor recruitment.

PASSIVE HEEL PROP (EXTENSION)



SEATED ASSISTED FLEXION SLIDE



Targeted Mobility Exercises

- **Seated Knee Bends:** Use non-operated leg to assist overpressure at end range. Hold 15–30 sec.
- **Stationary Bike Cycling:** Initiate with partial pendulum swings; progress to full backward and forward revolutions.
- **Prone Knee Hangs:** Lie stomach-down with kneecaps off bed edge for terminal extension stretch.

Closed-Chain Strength Progression

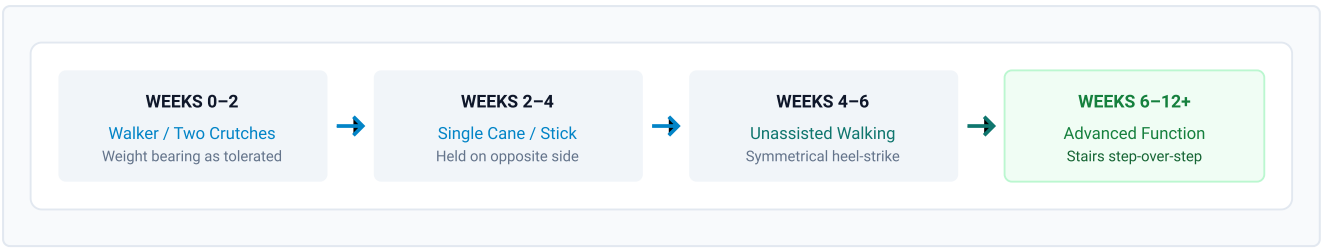
- **Terminal Knee Extensions (TKEs):** Band-resisted standing knee extension focusing on quad lock.
- **Mini-Squats:** 0° to 45° knee flexion, equal weight distribution on both legs.
- **Step-Ups (4-inch height):** Controlled concentric step-up with foot alignment over second toe.

Physical Therapy Swelling & Cryotherapy Guidelines

Elevate the operated leg so the knee and foot are positioned *above heart level* while lying flat. Never place pillows directly behind the knee joint; place support under the calf and heel to encourage full extension. Apply cold therapy for 15–20 minutes immediately following physical exercise sessions.

PHASE 3: STRENGTH, BALANCE & FUNCTIONAL INDEPENDENCE (WEEKS 6–12)

Phase 3 prioritizes functional strength, dynamic pelvic-hip stability, single-leg stance control, and stair navigation using a normal step-over-step pattern. Functional movement patterns are reinforced as joint pain and swelling continue to recede.



Exercise & Loading Progression Table

Exercise Module	Target Volume	Biomechanical Focus	Progression Benchmark
Step-Downs (Eccentric)	2–3 sets × 10 reps	Slow knee flexion control on stance leg	Increase step height from 2 to 6 inches
Single-Leg Stance Balance	3 sets × 30 sec hold	Proprioception & hip glute stability	Unstable surface / eyes-closed variations
Leg Press (45° or Horizontal)	3 sets × 12–15 reps	Bilateral to unilateral quad strengthening	Progress from 30% to 60% bodyweight
Stationary Biking (Endurance)	15–30 minutes daily	Low-impact joint aerobic conditioning	Add moderate magnetic resistance

PT Clinical Note: Differentiating Soreness vs. Overload

Mild muscle aching and localized tightness following physical therapy exercises are expected responses to tissue loading. However, sharp joint pain, sudden joint heat, or persistent swelling that lasts longer than 24 hours indicates excessive structural load. Reduce volume or resistance until symptoms settle.

PHASE 4: ADVANCED CONDITIONING & LONG-TERM JOINT LONGEVITY (MONTHS 3–12)

Beyond week 12, physical therapy transitions into maintenance of full range of motion, maximal muscular endurance, dynamic agility, and lifelong low-impact physical activity. Maintaining strong quadriceps and hamstrings reduces joint contact stress and prolongs implant longevity.

Activity & Sport Suitability Recommendations

Activity Category	Recommended Sports & Activities	Physical Therapy Rationale
HIGHLY RECOMMENDED	Walking, Stationary Cycling, Swimming, Aqua Aerobics, Golf, Doubles Tennis	Low joint impact with high cardiovascular and muscular benefits.
MODIFY WITH CAUTION	Hiking on uneven terrain, Low-impact rowing, Resistance weight training	Requires adequate quadriceps strength and single-leg balance.
NOT RECOMMENDED	Jogging/Running, Basketball, Football, High-impact aerobics, Downhill skiing	Repetitive impact forces accelerate prosthetic wear and loosening risks.

Long-Term Daily Physical Therapy Maintenance Program

- Range of Motion Check:** Maintain routine knee stretch holds (heel props and flexion slides) 2–3 times weekly.
- Strength Maintenance:** Continue closed-chain quad exercises (squats, step-ups, bridges) 3 days per week.
- Low-Impact Endurance:** Target at least 150 minutes per week of walking, cycling, or swimming.
- Kneeling Protocol:** From month 3 onward, practice kneeling on soft, padded surfaces, lowering onto the non-operated knee first.

Physical Therapist Attestation

Authored and compiled by **PT Ahmad Al Hariri**. Designed as a physical therapy movement and exercise guide following Total Knee Arthroplasty. Patients must consult their primary surgeon regarding all surgical clearances, wound checks, and medical restrictions.

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