

Post-ACL Surgery Rehabilitation

Evidence-Based Physical Therapy Protocols & Recovery Roadmap

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Clinical Notice: This document serves as a supportive physical therapy educational guide following anterior cruciate ligament (ACL) reconstruction. It does not replace medical or surgical advice. Always adhere strictly to your orthopedic surgeon's postoperative precautions.

Phase 1: Protection & Early Mobilization (Weeks 0–2)

The immediate postoperative phase focuses on protecting the newly reconstructed graft, managing acute inflammatory swelling, and restoring foundational joint mobility—specifically full knee extension (straightness).

Key Phase 1 Goals

- Achieve 0° knee extension matching the uninjured leg.
- Control joint effusion and postoperative pain.
- Re-establish conscious quadriceps muscle activation.
- Weight-bearing as tolerated (WBAT) with crutches/brace.

Swelling & Ice Management

- Elevate the leg above heart level consistently.
- **Crucial:** Place pillows under your ankle, *never* directly under the knee, to prevent a fixed flexion contracture.
- Apply cold therapy packs for 15–20 minutes regularly.

Essential Early Range-of-Motion Exercises

Passive Knee Extension

Heel supported; gravity flattens knee



Passive Knee Extension: Rest with heel elevated; allow gravity to gently straighten the joint for 20 minutes daily.

Heel Slides (Flexion)

Smoothly slide heel toward body



Heel Slides: Gently bend the knee while keeping the foot in contact with the supporting surface.

Phase 1 & 2: Muscle Activation & Early Strengthening

Re-educating the quadriceps muscle without placing excessive strain on the healing graft is paramount during the first few weeks.

Quadriceps Set ("Quad Set")

Tighten thigh, press knee flat into surface



Quad Sets: Tighten front thigh muscles and press the back of the knee flat. Hold for 6 seconds; repeat frequently.

Ankle Pumps

Pump ankles up and down hourly for circulation



Ankle Pumps: Move ankles up and down like pressing a gas pedal to enhance lower extremity blood flow.

Phase 2: Progressive Restoration (Weeks 2–6)

As pain subsides and swelling normalizes, therapy transitions into active strengthening, gait normalization, and balance training under clinical supervision.

Timeline	Mobility & Strength Milestones	Key Precautions
Weeks 2–4	Knee flexion reaching 110°–120°. Stationary cycling (zero resistance) introduced. Mini-squats and wall sits.	Avoid high-impact twisting, pivoting, or heavy open-chain extension loads.
Weeks 4–6	Approaching full flexion (130°+). Crutch-free normalized gait. Controlled leg press and step-ups.	Monitor for patellofemoral irritation or localized swelling flare-ups.

Phase 3 & 4: Functional Training & Return to Activity (Months 2–6+)

The later stages of rehabilitation focus on neuromuscular control, dynamic stability, sport-specific movement patterns, and symmetrical lower-limb strength testing.

Month 2–3 Milestones

- Progressive quadriceps and hamstring resistance training.
- Single-leg balance tasks and perturbation training on unstable surfaces (e.g., balance pads).
- Single-leg squats and controlled Bulgarian split squats.
- Cardiovascular conditioning via elliptical, swimming, and stationary bike.

Month 4–6+ & Return Criteria

- Advanced agility drills, ladder drills, and controlled deceleration mechanics.
- Surgical leg strength symmetry > 85–90% compared to the uninjured limb.
- Formal isokinetic testing and clearance from both your orthopedic surgeon and physical therapist.

Clinical Safety Guidelines & Red Flags

Patient adherence and mindful monitoring during home exercise programs ensure long-term graft integrity and joint longevity.

Contact Your Medical Team Immediately If You Experience:

- Sudden, severe increase in knee pain or calf tenderness/swelling (signs of DVT).
- Fever, chills, or spreading redness/warmth around surgical incision sites.
- Sudden mechanical locking, giving way, or inability to bear weight.

Document Reference & Author Information:

Content synthesized from evidence-based ACL rehabilitation frameworks. Authored and supervised by **PT Ahmad Al Hariri**. For personalized clinical assessments, consult your attending physical therapist or orthopedic specialist.