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ACL Reconstruction Postop Protocol

Phase 1: Immediate Postoperative (0–2 weeks)

Goals: Protect graft, control pain/swelling, restore full knee extension, initiate quadriceps activation.

- **Weight Bearing:**
 - WBAT with crutches.
 - Partial weight bearing (PWB) if combined with meniscus/root repair.
- **Brace:** Hinged brace locked in extension for ambulation; unlock for exercises as quad control improves.
- **ROM:**
 - Full extension (0°) immediately.
 - Flexion to 90° by end of week 2.
- **Exercises:**
 - Quadriceps sets, straight leg raises (in brace), heel slides ($\leq 90^\circ$), ankle pumps, patellar mobilization.
- **Precautions:** Avoid active open-chain knee extension 0–45° for first 6 weeks to protect graft fixation

Phase 2: Early Rehabilitation (2–6 weeks)

Goals: Achieve full extension, gradual flexion to $\geq 125^\circ$, normalize gait.

- **Weight Bearing:** Progress to full weight bearing without crutches by week 3–4.
- **Brace:** Unlock as quadriceps control allows; discontinue when walking without limp.
- **ROM:**
 - Increase flexion 10–15° per week.
 - Target $\geq 125^\circ$ by week 6.
- **Exercises:**
 - Closed-chain strengthening (0–60° flexion).
 - Stationary bike (low resistance).
 - Hip and core strengthening.
 - Balance and proprioception drills.
- **Precautions:** No pivoting/twisting. Avoid resisted open-chain knee extension.

Phase 3: Intermediate Rehabilitation (6–12 weeks)

Goals: Restore muscular strength, endurance, and neuromuscular control.

- **Weight Bearing:** Full without restrictions.

- **Brace:** Discontinue if good control.
 - **ROM:** Full, pain-free motion.
 - **Exercises:**
 - Leg press $\leq 70^\circ$ flexion.
 - Step-downs, glute bridges, lateral walks with resistance band.
 - Proprioception and single-leg balance training.
 - Low-impact cardio: elliptical, swimming.
 - **Precautions:** No running or jumping until cleared.
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Phase 4: Advanced Strengthening & Running (3–5 months)

Goals: Achieve $\geq 90\%$ strength symmetry, reintroduce plyometrics and running.

- **Exercises:**
 - Progressive return-to-run program (track or treadmill).
 - Agility ladder drills.
 - Box jumps and landing mechanics training.
 - Sport-specific cutting drills introduced late in phase.
 - **Criteria to Progress:**
 - Isokinetic strength testing $\geq 90\%$ of contralateral limb.
 - Hop test $\geq 90\%$ symmetry.
 - No swelling or pain after running.
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Phase 5: Return to Sport (6–9+ months)

Goals: Full competitive readiness with minimal re-injury risk.

- **Criteria for Return:**
 - Strength and functional testing $\geq 95\%$ symmetry.
 - No knee effusion or instability.
 - Psychological readiness (ACL-RSI score acceptable).
 - Surgeon clearance.
 - **Exercises:** Full sport-specific training and unrestricted competition.
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Key Evidence Notes:

- Quadriceps tendon grafts have strong stability outcomes and low retear rates, but quadriceps weakness can persist longer — emphasize targeted quad strengthening (Hurley et al., 2023).
- Achieving full extension early prevents cyclops lesion formation (Shelbourne et al., 2022).
- Delaying return to sport until ≥ 9 months significantly reduces risk of re-injury (Grindem et al., 2016).