

Rehabilitation Protocol: Anterior Cruciate Ligament (ACL) Reconstruction

Date of Surgery: _____

Graft: ☐ BTB Autograft ☐ BTB Allograft ☐ Hamstring Autograft ☐ Quadriceps Tendon Autograft

Concomitant: Meniscus repair – use the ACL + Meniscus Repair protocol. Cartilage procedure – refer to the cartilage protocol.

Graft modifications: Hamstring autograft: no hamstring stretching until 4 weeks; no isolated hamstring loading (heel slides against resistance, curls) until 6 weeks. **Quadriceps tendon autograft:** partial weightbearing weeks 0–4, then WBAT.

Progression is criteria-based. Outcome measures: LEFS, IKDC, NPRS, ACL-RSI. Return-to-sport assessments at 3, 6, and 9 months. Please contact our office with any questions or concerns.

☐ Phase I – Protection (Weeks 0–2)

- **Weightbearing:** As tolerated with crutches
- **Hinged Knee Brace: Week 0–1:** locked in full extension at all times except PT/exercise. **Weeks 1–4:** unlocked for ambulation and removed for sleep once able to perform SLR without lag
- **Precautions: No active knee extension 40–0° until 12 weeks;** avoid advancing activity too quickly
- **Range of Motion** – AAROM to AROM as tolerated; **emphasize full extension** (prevent flexion contracture). **Goal 0–90° by 2 weeks**
- **Therapeutic Exercises**
 - Quad sets with NMES (quad stim); hamstring sets; heel slides; patellar mobilization
 - Active extension/pushdowns; prevention of arthrogenic muscle inhibition (AMI) – education video: journals.sagepub.com/doi/10.1177/26350254221086295
 - SLR in brace locked in extension until no lag; multi-plane SLR
 - Non-weightbearing gastroc/soleus stretch; ankle pumps
 - Short crank bike once >85° flexion; bilateral leg press 80–5° once >90° flexion
- **Criteria to Progress:** Full passive extension; 0–90°; SLR without lag; effusion controlled

☐ Phase II – Early Strengthening (Weeks 2–6)

- **Weightbearing:** As tolerated; **discontinue crutches by weeks 4–6** with normal gait
- **Hinged Knee Brace: Discontinue once full extension with no extension lag** (typically weeks 4–6)
- **Range of Motion** – Maintain full extension; progress flexion. **Goal 0–130° by 6 weeks;** standard bike once 115°
- **Therapeutic Exercises**
 - Closed chain extension: weight-bearing TKEs, mini squats 0–60° (hip-initiated), leg press bilateral to single-leg eccentric
 - Hamstring curls (hamstring autograft: from 6 weeks); toe raises; weight-bearing gastroc/soleus stretch
 - Balance: bilateral to single leg on stable, then unstable surfaces
 - Hip/core strengthening; RDLs toward end of phase
- **Criteria to Progress:** Non-antalgic gait without brace or crutches; 0–130°; minimal effusion

☐ Phase III – Strengthening (Weeks 7–12)

- **Precautions:** Still **no active knee extension 40–0° until 12 weeks**
- **Therapeutic Exercises**
 - Isometric knee extension at 60°, progressing to varied angles
 - Squats to 0–90°; single-leg squat progression; step-ups/step-downs

- Progress hamstring strengthening (isolation exercises); hip, gluteal, calf PREs
- Stairmaster, elliptical; proprioception progression
- **Week 12:** Quadriceps isometric strength testing (dynamometry at 60°)
- **Criteria to Progress:** Full symmetric ROM; symmetric squat to parallel; quad isometric strength $\geq 70\%$ of contralateral limb

☐ **Phase IV – Running and Plyometrics (Weeks 13–26)**

- **Open Chain Knee Extension: Week 12:** PRE in 90–40° arc, progressing to 90–30°, then 90–0°
- **Therapeutic Exercises**
 - **Straight-ahead running from ~12 weeks** once cleared – interval walk/run progression on non-consecutive days
 - Plyometric progression (double to single leg); agility and controlled sport-specific movements
 - Single-leg squat variations; continue quad strength symmetry focus
 - **3- and 6-month return-to-sport assessments**
- **Criteria to Progress:** Strength, hop, and functional testing $\geq 85\%$ of contralateral limb; psychological readiness reassessed

☐ **Phase V – Return to Sport (Week 27+)**

- **Therapeutic Exercises**
 - Cutting and sport-specific drills; gradual return to practice and competition
 - Maintenance strength and neuromuscular program
- **Return to Sport: 9-month return-to-sport assessment** – quad strength (isokinetic or isometric) and hop testing $\geq 90\%$ of contralateral limb, good movement quality, psychological readiness; physician clearance. Avoid premature return