

MACI Cartilage Restoration — Femoral Condyle Rehabilitation Protocol

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Patient: _____ **DOS:** _____

Surgeon Parameters

Graft site: ☐ Medial condyle ☐ Lateral condyle	Full weight bearing at _____ wks (default 8)	Concomitant procedure: ☐
Other Precautions:		

Parameters above are patient-specific and supersede the general timeframes below. **Compressive loading of the graft is the rate-limiting factor: weight bearing advances on a fixed schedule, while knee flexion (which does not load a condylar graft) advances early.** Assumes an isolated defect; a concomitant osteotomy, meniscal, or ligament procedure overrides this schedule. Therapist to use clinical judgment to individualize exercise selection and pace within each phase.

Phase	Goals	Precautions	Treatment Focus
Phase 1 Weeks 0–6	Goals - Protect the graft; control pain/effusion - Full passive extension from day 1 - Flexion 90° by wk 3, 110–125° by wk 6 - Quad activation; SLR without lag	Precautions - Weight bearing with 2 crutches: ≤20% body weight wks 0–2 → 30% wk 3 → 40% wk 4 → 50% wk 5 → 60% wk 6 - Hinged brace for ambulation: 0–30° wks 0–2 → 0–45° wk 3 → 0–60° wk 4 → 0–110° wk 6 - No resisted open-chain knee extension - No twisting or pivoting on the operative leg; no impact	Treatment Focus - CPM from day 1–2: start 0–30/40°, to 90° by wks 3–4 and 120° by wk 6 - Quad/hamstring/glute isometrics, ankle pumps, SLR - Heel slides and patellar mobilization - Pool therapy once wounds are healed - Recumbent bike without resistance, wks 5–6 - Ice/modalities PRN pain-swelling
► Advance to Phase 2 when: wound healed, minimal effusion, full extension, flexion ≥110°, SLR without lag, 60% body weight tolerated pain-free.			
Phase 2 Weeks 6–12	Goals - Full weight bearing by ≈8 wks (per parameters above) - Full active ROM from wk 7 - Normal gait off crutches and brace by ≈10 wks - Restore balance/proprioception	Precautions - Weight bearing: 80% body weight wk 7 → full wk 8 as tolerated; 1 crutch until gait is normal - Brace open to full flexion at wk 7; wean wks 8–10 - Closed-chain work light and in a shallow range; back off for pain or effusion - No running, jumping, or twisting	Treatment Focus - Gait training; crutch and brace weaning - Balance/proprioception, bilateral → single leg - Light closed-chain: weight shifts, mini-squats, bridges, calf raises - Upright bike, walking program, pool - Hip/core strengthening; hamstring curls
► Advance to Phase 3 when: full weight bearing with normal gait, full ROM, no or trace effusion, brace and crutches discontinued.			
Phase 3 Months 3–6	Goals - Build quad/hip strength and endurance - Unrestricted daily activity - Low-impact recreation (cycling, swimming) from ≈3 months	Precautions - No running, jumping, or pivoting - Progress load and squat depth gradually; open-chain knee extension light and in a pain-free arc - Pain or effusion after a session → reduce load	Treatment Focus - Upright/outdoor cycling, rowing, elliptical - Leg press; squat and lunge variations - Single-leg balance; hip/core strengthening
► Advance to Phase 4 when: no effusion with strengthening, daily activities pain-free, single-leg squat to ≈60° with good control.			
Phase 4 Months 6–9	Goals - Single-limb strength and control - Begin jogging progression once cleared by surgeon	Precautions - No cutting, pivoting, or contact sport - Jogging only with surgeon clearance and no effusion	Treatment Focus - Single-limb work: step-ups/downs, single-leg squat and press - Mini-trampoline jogging → walk-jog progression on level ground
► Advance to Phase 5 when: jogging pain-free without effusion, quad/hamstring strength ≥80% of contralateral.			

Phase	Goals	Precautions	Treatment Focus
Phase 5 <i>Months 9–12</i>	Goals - Running, agility, and sport-specific conditioning - Strength and hop testing $\geq 90\%$ of contralateral	Precautions - Impact, pivoting, and contact sport not before 12 months (12–18 months in some series) - Clearance is criteria-based once the time minimum is met	Treatment Focus - Running progression; agility and sport-specific drills - Plyometrics, double $\rightarrow$ single leg - Strength and hop testing vs. contralateral
► Full Release (typically 12–18 months): full pain-free ROM, no effusion, quad/hamstring strength and hop tests $\geq 90\%$ of contralateral, sport-specific progression completed, cleared by physician.			

Special Considerations

- Time frames are minimums set by graft maturation (ongoing for 1–2 years); the knee usually feels ready before the graft is. Criteria govern progression beyond each minimum, never ahead of it
- Persistent or recurrent effusion, catching/locking, or new sharp joint-line pain — stop and contact the surgeon

Thank you for taking care of our patient.

This protocol serves as a general guideline and outline only. Our team defers to the clinical judgment and expertise of the treating physical therapist to make appropriate adjustments and modifications based on the individual patient's presentation, progress, and response to treatment. For any questions regarding this protocol, please contact Dr. Wollenman directly at (561) 215 – 0184.