MACI Tibiofemoral Joint

Weeks One to Three	Weeks Four to Six
Evaluate	**Evaluate**
➢ Range of motion ➢ Joint hemarthrosis ➢ Ability to contract quad/vmo ➢ Gait: PWB with 2 crutches ➢ Patella Mobility ➢ Inspect for infection/signs of DVT ➢ Assess RTW and sport expectations	➢ Range of Motion ➢ Ability to contract quad/vmo ➢ Signs of infection or DVT ➢ Patella mobility ➢ Evaluate/discuss footwear to optimize foot and ankle biomechanics
Patient Education	**Patient Education**
➢ Support Physician prescribed meds ➢ **Brace:** unlocked to 0-30° week 1-2, 0-45° Week 3, and 2 crutches ➢ **CPM:** 0-30° week 1, progress to 0-90° by end of week 3 (at least 1 hour per day) ➢ **ROM:** PROM 0-30° week 1, Progress to AROM 0-90° by end of week 3 ➢ **WB Status:** <20% WB weeks 1-2, 30% WB week 3, unless directed otherwise by physician **PRECAUTIONS** ➢ **Week 1: No active knee extension thru ROM, no more than 30° of knee flexion** ➢ **Brace use 24 hours per day for first 3 weeks** ➢ Discuss frequency and duration of treatment (2-3x/wk is expected for 12 weeks, intermittent after 12)	➢ **Brace:** 0-60° week 4, progress to fully unlocked by end of week 6 ➢ Can wean to 1 crutch once 50% WB with pain-free gait ➢ **CPM:** Maximum comfortable ROM ➢ **AROM**: 0-110° week 4, progress to 0-125° by end of week 6 ➢ **WB Status:** 40% WB week 4, progress to 60% WB by week 6 ➢ **Reinforce precautions regarding brace use, crutch use, and WB status.** ➢ Continue cryotherapy as needed, 20 min, 3x or more per day
Therapeutic Exercise	**Therapeutic Exercise**
➢ Week 1: Isometrics (quad, glute, HS), ankle pumps, PROM knee flex/ext to 30° ➢ Week 2-3: PROM/AROM heel slides, quad sets with NMES, supine or sitting hangs/heel prop, 4-way leg raises, HS/Calf stretching Initiate aquatics at 3-4 weeks post-op ➢ Deep water walking (Fwd, Bwd, Sws), deep water calf raises, 4-way leg raises, Passive knee flexion, stretch HS/Calf *Focus on duration of each exercise versus repetitions (30-45 seconds, progress to 60-90 seconds)	➢ Initiate bicycle week 5-6 (do not force flexion >90°) ➢ Progress 4-way leg raises with weights/bands ➢ Initiate clamshells ➢ Initiate heel raises once 50% WB ➢ Initiate core stabilization exercises Advance aquatics at 4 weeks post-op ➢ Shallow water walking (Fwd, Bwd, Sws), Initiate partial squats, shallow water heel raises, and standing HS curls ➢ Open Chain aquatics: Initiate gentle bicycle, jumping jacks and cross-country skiers *Focus on duration of each exercise versus repetitions (30-45 seconds, progress to 60-90 seconds)
Manual Techniques	**Manual Techniques**
➢ Patella mobilization as needed ➢ PROM within precautions as tolerated (focus on extension) ➢ Incision mobilization/edema STM week 2	➢ Patella mobilization as needed ➢ PROM as needed within precautions ➢ Posterior capsule mobilization (if needed) ➢ Incision mobilization
Modalities	**Modalities**
➢ NMES / Interferential/Biofeedback ➢ Ice	➢ Modalities may be used as needed
Goals	**Goals**
➢ Gain full knee extension/restore quad contraction ➢ Control pain ➢ Reduce joint hemarthrosis ➢ Independence with post-op precautions ➢ 0-90° ROM by end of week 3	➢ Pain-free gait using 1-2 crutches, 60% WB with brace fully unlocked ➢ Pain-free knee flexion to 125° ➢ SLR without quad lag ➢ Proficiency with HEP

Weeks Seven to Twelve	Weeks Twelve to Discharge
Evaluate	**Evaluate**
➢ Gait ➢ ROM ➢ Balance	➢ Any excessive joint laxity ➢ Address any deficits that may limit return to work or sport. ➢ HEP compliance
Patient Education	**Patient Education**
➢ **Brace:** Fully unlocked ➢ **CPM:** To maximum comfortable range as required ➢ **AROM:** Progress to full knee AROM by week 8 ➢ **WB Status:** Progress from 80% WB week 7 to FWB by week 10 ➢ **Crutch use:** Starting week 8, no crutches indoors, one crutch when ambulating outdoors/unfamiliar areas	➢ No impact, deep squats, squats with lifting, crossed legged sitting until 4 months post op.
Therapeutic Exercise	**Therapeutic Exercise**
➢ Progress closed chain and isotonic exercises to include multiple planes and single leg activity week 10 ➢ Progress HS strengthening ➢ Single leg dynamic balance activity and unstable surfaces week 12 ➢ May begin CFA at 10 weeks with physician approval ➢ May initiate cardiovascular training at 12 weeks (Bike, Swim, and elliptical) ➢ Closed chain aquatics: Advance step up and lunge activity ➢ Open Chain aquatics: Initiate stretching of quads and hip flexors as indicated. (Use of floatation cuffs or stair lunges. Balance: SLS, kickboard balance. Eyes open, eyes closed *Progress exercises using resistance fin(s) or hydrocuff(s)	➢ Continue strength and conditioning ➢ Encourage participation in CFA ➢ May initiate light/straight plane running activity with full motion, strength, and physician approval at 16 weeks (No cutting, pivoting, or jumping) ➢ Agility and plyometrics at 20 weeks given good tolerance of straight plane running and pre-running activity
Manual Techniques	**Manual Techniques**
➢ Patella mobilization as needed ➢ PROM and posterior capsule stretch as indicated	➢ Any as indicated
Modalities	**Modalities**
➢ Any as indicated	➢ Any as indicated
Goals	**Goals**
➢ 4+/5 strength with manual testing by week 10 ➢ Good stability at the hip and knee joints particularly with single leg balance and control of terminal knee extension ➢ May complete independent HEP and intermittent appointments when above criteria is met	➢ Minimal to no pain ➢ 5/5 muscle strength ➢ Discharge to full work or sport

References

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