

## Meniscal Root Repair Protocol

### General Considerations:

- It is important to recognize that all times are approximate and that progression should be based on careful monitoring of the patient's pain and functional status.
- Patients are STRICTLY non weight-bearing for the initial 4-6 weeks (**per MD**) with use of the knee immobilizer/knee brace locked into 0 degrees of extension
  - o TDWB may be allowed per MD instruction
- Knee immobilizer may be discontinued at 4 weeks if patient demonstrates good quadriceps control
- CKC exercises can be initiated at 6 weeks in full extension or between 20-70 degrees of knee flexion, and this is maintained until 4 months post-operatively. Should be limited to 90 degrees until 20 weeks, thereafter as tolerated.
- Overall, repetitive CKC movements involving deep knee flexion should be limited for the first 6 months post-operatively
- Active hamstring exercises should not be initiated until week 6, and not with resistance until weeks 8-10
- Return to sport will be based on the outcomes of a functional examination, and per MD evaluation

### Phase I (0 - 6 weeks post-op):

#### Goals:

- Protect the surgical repair
- Manage swelling, soft tissue
- Initiate protective PROM, restore full ROM (0-120 degrees by week 6)

#### Weight-bearing:

- Strictly non weight-bearing to touch-down weight-bearing if allowed per MD instruction
- TDWB should be performed in full extension only
- Discontinue immobilizer at 4 weeks per MD, and if demonstrates good quadriceps control

#### ROM:

- 0-90° PROM only for the first 2 weeks, then after as tolerated
- No isolated hamstring activation

#### Suggested Interventions:

- Swelling and soft tissue management, tendon mobilizations
- Patellar mobilizations
- Quadriceps activation interventions, NMES/Russian Stimulation
- Quadriceps, gastroc/soleus stretching
- Heel/wall slides
- Hip and core strengthening
- Gait training
- Well-leg stationary cycling, upper body training

### Phase II (7-9 weeks post-op):

#### Goals:

- Achieve full WB, normalize gait mechanics (tolerate 20-25 min standing/walking by week 9)
- Restore full ROM

- Continue to manage swelling/soft tissue restrictions

**Weight-Bearing:**

- WBAT to full WB, wean from brace/immobilizer and any assistive device
- Minimize walking on uneven surfaces

**ROM:**

- No restrictions for P/AROM
- CKC Strengthening interventions should be performed in full extension or between 20-70° of knee flexion to avoid excessive stress on the repair.

**Suggested Interventions:**

- Gait training, focusing on normalizing walking mechanics and weaning from AD
- Balance training consistent with WB status
- Initiate WB CKC activities in full extension (heel raises, SLS activities) or between 20-70° of knee flexion (leg press, DL squats)
- Stationary cycling without resistance (until week 12, avoid loading knee with resistance past 90°)
- May begin hamstring curls at week 8

**Phase III (10-15 weeks post-op):**

**Goals:**

- Progress strength and endurance training

**Weight-Bearing:**

- Patients should be FWB with normal gait mechanics before beginning phase III

**ROM:**

- Continue CKC ROM restrictions of <70° knee flexion through phase III

**Suggested Interventions:**

- DL squats, focusing on normalizing firing patterns and weight-bearing between limbs, building endurance
- Static to dynamic lunges
- More advanced tandem and single-leg static balance drills
- Can introduce lateral exercises (side stepping), maintaining CKC ROM restrictions
- Avoid pivoting/twisting motions of the knee
- Stationary bike with increasing resistance
- Overall interventions should focus on building muscle endurance, focusing on 3-4 sets in the 15-20 repetition range
- At this stage, ensure patients receive adequate rest days for muscle recovery. HEP/activity should be 3-4 days per week, with rest days built in.

**Criteria for Progression to Phase IV:**

- Able to perform a 90s single-leg squat held at 45 degrees of knee flexion
- Post activity soreness should resolve within 24 hours

**Phase IV (16-20 weeks post-op):**

**Goals:**

- Progress strength and endurance training
- Progress to dynamic single-leg strength and stability interventions

**ROM:**

- Continued CKC ROM restrictions to 90° until week 20

- Repetitive CKC activities in deep knee flexion should still be limited as a therapeutic exercise

#### Suggested Interventions:

- Double-leg to single-leg squats
- Single-leg RDLs
- Dynamic single-leg stability exercises, including training on uneven surfaces
- Multi-planar lunges
- Stationary bike with resistance, elliptical, treadmill walking
- Begin plyometric exercise progressions as able to demonstrate good neuromuscular control of the hip, core/pelvic stability
  - o No jumping/hopping if patient cannot control knee valgus collapse

#### Criteria for Progression:

- Individuals/athletes should perform a comprehensive functional assessment to assess for readiness to progress to phase V, or before performing progressive plyometric training
  - o *Reference Vail Sport Test, Y-balance test, agility T-test, limb symmetry index, as examples*
- Involved quadriceps strength should be at least 80% of the uninvolved limb via dynamometry

#### Phase V (week 20+):

##### Goals:

- Progress return-to-sport training
- Initiate a return to running program
- Discharge to independent HEP if not returning to sport, high-level activities

##### ROM:

- No CKC ROM restrictions, but continue to limit/avoid repetitive CKC activities in deep knee flexion

#### Suggested Interventions:

- Return to running program, see separate protocol
- Progress towards more dynamic plyometric training: DL/SL box jumps, hopping drills
- Sport-specific training programs
- Deep squatting (past parallel) should be avoided until 6 months

#### Criteria for Progression:

- Quadriceps strength should be at least 90% of uninvolved side via dynamometry
- Return to sport transition can begin at 6 months if able to pass functional evaluation without pain
  - o *Reference Vail Sport Test, Hop Testing Battery (single-leg hop, triple-hop, crossover hop), limb symmetry index, agility T-test, Y-balance test as examples*

#### References:

1. Meuller, BT, et al.. Rehabilitation Following Meniscal Root Repair: A Clinical Commentary. JOSPT, 46(2); 104-113, 2016.
2. Garrison, JC et al.. The Reliability of the Vail Sport Test as a Measure of Physical Performance Following Anterior Cruciate Ligament Reconstruction. Int J Sports Phys Ther, 7; 20-20; 2012.
3. Spand III, RC, et al.. Rehabilitation Following Meniscal Repair: A Systematic Review. BMJ Open Sport Exerc Med, 4(1); 2018