

FEMUR/TIBIA CARTILAGE RESTORATION (MACI, OATS, OCA, MICROFRACTURE) PT PROTOCOL

| | BRACE INSTRUCTIONS AND RESTRICTIONS | RANGE OF MOTION GOALS | PT EXERCISES/NOTES |
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| PHASE 1 First 2 Weeks (0-2) 1-2 Sessions/week Begin after 5-7 days | -Hinge Knee brace x 6 weeks (may remove for shower/hygiene) -Brace locked in extension with ambulation and sleeping at 0 degrees -Unlock brace when seated for 0 to 90 degrees range of motion -Crutches for assisted ambulation -Touch down weight bearing | -Begin PROM/AAROM/AROM when seated 0 to 90 degrees -Consider CPM (Begin 0 to 30 degrees, progress as tolerated) 4 to 6 hours/day | -Begin patellar mobilization, pain/edema control, passive/active ROM exercises -Strengthening to include ankle pumps, quad sets, straight leg raise -Consider NMES as needed |
| PHASE 2 Next 4 Weeks (2-6) 2 Sessions/week | -Hinge Knee brace x 6 weeks (may remove for shower/hygiene) -Brace may be unlocked with ambulation -Crutches for assisted ambulation -May remove brace for sleeping at 4 weeks -Touch down weight bearing | -Progress PROM/AAROM/AROM when seated 0 to 120 degrees (Goal of 120 degrees knee flexion by 6 weeks) -Consider CPM (progress as tolerated) 4 to 6 hours/day | -Continue phase 1 exercises and add knee extension stretches, heel raises -Side lying hip/core strengthening -Consider NMES and add Blood Flow Restriction as needed |

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| <p>PHASE 3 Next 4 Weeks (6-10) 2 Sessions/week</p> | <ul style="list-style-type: none"> -Advance to full weight bearing as tolerated -Discontinue crutches as able at 7 to 8 weeks -Discontinue brace at 8 weeks | <ul style="list-style-type: none"> -Continue to advance PROM/AAROM/AROM to reach full ROM | <ul style="list-style-type: none"> -Continue phase 2 exercises and add closed chain exercises, hamstring work, lunges, seated leg press 0 to 90 degrees, proprioception exercises, balance/core/hip/glutes, -Daily stretching including prone quadriceps, hamstrings, and calf -Stationary bike to increase ROM at 8 weeks |
| <p>PHASE 4 Next 6 Weeks (10-16) 1-2 Sessions/week</p> | | <ul style="list-style-type: none"> -Continue to advance PROM/AAROM/AROM to reach full ROM | <ul style="list-style-type: none"> -Continue phase 3 exercises and add squat to chair, seated leg press ,step-up/step-down, single leg wall slides, single leg squat to chair -Progress proprioceptive activities -Begin walk-run program at 12 weeks -May begin plyometric exercises at 14 weeks (low intensity vertical and lateral hopping to begin – initially both feet, progress to one foot; advance volume as tolerated) -Begin use of conventional exercise equipment (start with light weight and high rep/sets, progress to short reps/sets and high weight) at 14 weeks -Consider ACE STRENGTH after 4 months |

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| <p>PHASE 5 16 Weeks+ Sessions weekly frequency to be determined</p> | | | <ul style="list-style-type: none"> -Continue phase 4 exercises -Advance sprinting, backward running, zig-zag running, figure-of-eight running, carioca running, shuttle run and sport specific drills provided 70% strength on Limb Symmetry Index - Consider ACE SPORT after 5+ months -Return to sport after 6 months per protocol pending functional test* and once clear by MD |
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FUNCTIONAL TEST/RETURN TO SPORT CLEARANCE CRITERIA:

- > 90% isometric quadricep strength
- > 90% comparable hop testing to contralateral side (single-leg, triple, cross-over, 6 meter timed hop test)
- > 90% quad index LSI with Biodex or HHD
- > 90% quad peak torque/weight on Biodex (if applicable)
- Good form on vertical jump, deceleration shuttle test, Y-balance test
- No functional complaints, effusion, ROM restriction
- Good confidence with sport specific agility drills, running, and jumping
- Acceptable ACL-RSI score

This protocol is intended for the purposes of guiding post-surgical or post-injury rehabilitation exercises and goals. These guidelines may be interpreted by a certified physical or occupation therapist and tailored to meet patient specific goals and expectations. Other specific modifications may be made by Dr. Butterfield depending on adjuvant surgical procedures, surgical findings, or rehabilitation progress.

Please fax initial physical therapy assessment and progress notes to Dr. Butterfield at 763-786-3320. You may direct questions regarding this protocol or patient progress to our office at 763-786-9543 or email at MatthewButterfield@tcomn.com