

# ACL RECONSTRUCTION REHABILITATION PROTOCOL

## General Considerations:

- Pre-surgical phase to explain the protocol, condition non-injured extremities and to become acquainted with PT
- Full weight bearing as soon as tolerated
- Regular attention should be paid to incisions to decrease fibrosis and scarring, with particular emphasis to the anterior medial portal and patellar tendon incision
- Any activity that is in a straight plane, within the limits of the brace and tolerable is okay for the first 4 weeks
- Keep nose in line with toes when moving to prevent stress on the graft; **NO TWISTING for Meniscal repair!**
- No shower or bath until incisions are healed (about 2 weeks)
- Exercises and manual treatments should also focus on proper patellar tracking
- PROM between 0-90 degrees at 4 weeks meniscal repair and full PROM without repair
- The least stress on both bands of the ACL is from 30-60 degrees flexion (PLB most taut 0-20, AMB most taut 70 to full flexion)
- Early emphasis on achieving full hyperextension equal to the opposite side
- Patients are given a functional assessment/sports ready test 4 months post-op
- Knee class is encouraged at 3 months for ACL; 4 months for ACL with meniscal repair

## Phase I (1-10 days)

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| <p><b>ROM:</b></p> <ul style="list-style-type: none"> <li>• 0-120 flexion AROM as tolerated first 4 weeks; 0-90 for meniscal repair with/without MCL pathology</li> <li>• Prone lying on top step/table top, prone hangs for extension</li> <li>• CPM; heel slides, assisted with belt as needed</li> <li>• Start early ROM 5 times per day</li> </ul>   | <p><b>BRACE:</b></p> <ul style="list-style-type: none"> <li>• Doctor visit 3-5 days post-op and again at 8-10 days</li> <li>• Knee brace locked at zero (aggressive measures must be taken to regain extension)</li> <li>• Sleep in brace for 3 weeks</li> <li>• OK to remove brace for exercises and periodically during day</li> <li>• Check brace for full extension in brace; keep brace snug on leg</li> </ul> |
| <p><b>STRENGTH:</b></p> <ul style="list-style-type: none"> <li>• SLR for quads (multiangle, not past 45), isometrics</li> <li>• Balance</li> <li>• Soft tissue treatment-gentle patellar mobs and incisions</li> <li>• Knee dips with adductor squeeze (bilateral 1/3 squat)</li> <li>• Hamstrings: ham sets, slides, resisted exercise with well leg</li> <li>• Hip: adduction, abduction</li> <li>• Calf: toe pointing</li> <li>• Weight shifting</li> </ul> | <p><b>GAIT:</b></p> <ul style="list-style-type: none"> <li>• Ambulation with bilateral axillary crutches</li> </ul> <p><b>OTHER:</b></p> <ul style="list-style-type: none"> <li>• Ice, elevation, modalities for swelling control</li> <li>• Consult MD for NSAID and pain med use</li> </ul>   |

## Phase II (10 days – 2 weeks)

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| <p><b>ROM:</b></p> <ul style="list-style-type: none"> <li>• Patellar mobilization</li> </ul>   | <p><b>BRACE:</b></p> <ul style="list-style-type: none"> <li>• Open brace per quad function</li> <li>• Still locked in extension for sleep</li> </ul>  |
| <p><b>STRENGTH:</b></p> <ul style="list-style-type: none"> <li>• Quad/Hamstring/Adductor/Glut sets, SLR in 2 positions, theraband hamstring flexion, theraband TKE</li> <li>• Pool workout after incisions have healed</li> <li>• VMO with biofeedback if necessary</li> <li>• Balance and proprioceptive exercises</li> <li>• Bicycle ½ to full revolution, short crank on op-side</li> <li>• PNF-Ankle, hip</li> <li>• Begin leg/toe press, physioball wall exercises</li> </ul> | <p><b>GAIT:</b></p> <ul style="list-style-type: none"> <li>• Progress to single crutch ambulation in knee brace</li> <li>• WBAT</li> </ul> <p><b>OTHER:</b></p> <ul style="list-style-type: none"> <li>• Steri-strip removal, incision/portal inspection</li> <li>• Ice, elevate as much as possible</li> <li>• Discontinue TED hose if swelling decreased</li> </ul> |

## Phase III (2-4 weeks)

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| <p><b>ROM:</b></p> <ul style="list-style-type: none"> <li>• PROM full extension to flexion</li> <li>• Well leg or belt assisting flexion; weighted assistance for full extension or hyperextension</li> <li>• Patellar mobilization prn</li> <li>• LE and back stretching</li> </ul>  | <p><b>BRACE:</b></p> <ul style="list-style-type: none"> <li>• Continue to use brace until 3-4 weeks as determined by quad strength and extension</li> </ul>  |
| <p><b>STRENGTH:</b></p> <ul style="list-style-type: none"> <li>• Aerobic exercises as ROM allows (Stairmaster, Versaclimber, UBE, Stationary Bike, Treadmill)</li> <li>• Standing LE closed chain WB activity-partial squats, side steps, step activity, lateral step ups</li> <li>• Active hamstring curls – concentric and eccentric</li> <li>• Sportcord activity</li> </ul> | <p><b>GAIT:</b></p> <ul style="list-style-type: none"> <li>• Brace, no crutch if possible</li> </ul> <p><b>OTHER:</b></p> <ul style="list-style-type: none"> <li>• Continue pain control, ROM, gait training, STM, balance and proprioceptive exercises, functional exercises</li> </ul> |

## Phase IV (4-6 weeks)

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| <p><b>ROM:</b></p> <ul style="list-style-type: none"> <li>• Push full PROM</li> <li>• Increase lower extremity and back stretching</li> </ul>   | <p><b>BRACE:</b></p> <ul style="list-style-type: none"> <li>• Discontinue brace</li> </ul>                                   |
| <p><b>STRENGTH:</b></p> <ul style="list-style-type: none"> <li>• Stationary cycle as tolerated</li> <li>• Step exercises (4-8 weeks), continued stair training</li> <li>• Knee dips with adductor squeeze (1-6 weeks)</li> <li>• Pool program - deep water running for cardiovascular</li> <li>• Double leg sport cord, ¼ squats, knee dips</li> <li>• PNF exercises</li> <li>• NordicTrac, Body Trec, Stairmaster, Versaclimber</li> <li>• Forward and backward (10% grade retro or reverse stairmaster) low impact power walk, jogging, prancing</li> </ul> | <p><b>OTHER:</b></p> <ul style="list-style-type: none"> <li>• Doctor visit at 4 weeks</li> <li>• Begin eccentrics</li> </ul> |

## Phase V (6-8 weeks)

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| <p><b>ROM:</b></p> <ul style="list-style-type: none"> <li>• Patellar mobilization prn</li> <li>• Advanced LE stretches</li> </ul>  | <p><b>GAIT:</b></p> <ul style="list-style-type: none"> <li>• Form walking, gait evaluation on treadmill</li> </ul>  |
| <p><b>STRENGTH:</b></p> <ul style="list-style-type: none"> <li>• Add lateral training exercises</li> <li>• Begin to incorporate sport-specific training</li> <li>• Step up/down, leg press, partial squats, progress to single leg squat, wall sits</li> <li>• Progressive quad exercise: stairmaster, squat machine, leg press</li> <li>• All previous hamstring exercises</li> <li>• Deep water running with aqua jogger vest</li> <li>• Box drills in all directions</li> </ul> | <p><b>OTHER:</b></p> <ul style="list-style-type: none"> <li>• Emphasize closed chain for co-contraction but don't forget to incorporate some open chain to prevent compensation by other LE musculature</li> <li>• Continue increasing intensity of exercise</li> </ul> |

## Phase VI (8-12 weeks)

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| <p><b>ROM:</b></p> <ul style="list-style-type: none"> <li>• Full active and passive ROM</li> </ul>   | <p><b>GAIT:</b></p> <ul style="list-style-type: none"> <li>• No limp</li> <li>• No pain for 30 min walk</li> <li>• Walk 5 min, jog 5 min</li> <li>• Walk 5 min, jog 10 min</li> <li>• Walk 5 min, jog 15 min</li> <li>• And so on...</li> </ul> |
| <p><b>STRENGTH:</b></p> <ul style="list-style-type: none"> <li>• Weaning to HEP with emphasis on particular sport/activity</li> <li>• Wall sits of increased duration</li> <li>• Lunges</li> <li>• Swimming: crawl and backstroke ONLY until 12-16 weeks</li> <li>• Grid/Hexagon drills in all directions</li> <li>• Crossover walking-agility drills</li> <li>• Jogging week 9-12 depending upon individual progress - treadmill only</li> <li>• Balance board</li> </ul> | <p><b>OTHER:</b></p> <ul style="list-style-type: none"> <li>• Doctor visit not until 3-4 months post-op</li> <li>• <b>If ROM not 100% report restriction to MD</b></li> </ul>   |

## Phase VII (3-4 months; 6 months if meniscal repair)

### **STRENGTH:**

- ½ squats, jump and hop drills, jump rope
- Running straight line, continue box and agility drills
- Home/gym program for various cardio equipment
- For return to sports 6 months post-op, strength should be 90-95% of opposite leg and ROM must be WNL
- This is individual for each patient and each sport has a specific protocol:

**Soccer:** Athlete starts on field progression early on in conjunction with the box; to be done with and w/o ball

**Basketball:** It is very therapeutic to start walking around the court, shooting foul shots and shagging balls; begin progression early to improve muscular timing and dynamic control

**Skiing:** When the athlete is about 80% recovered, the experienced skier may, after clinic progressions, start on the mountain progressions. This is not full activity, but limited to the "blue" for only 1-1<sup>1/2</sup> hours per day and then progressively increasing duration and intensity

**Tennis:** The athlete begins to hit balls against the wall by themselves. This early step is important to reacquaint eye-hand-body coordination. The progression will continue in a gradual, systemic manner

**Volleyball:** The athlete will begin by gently hitting, with progression to continue

### **OTHER:**

- 6-12 months post-op – full release and return to competitive sports involving directional change sports based on strength, agility, aerobic and anaerobic fitness, joint stability, speed, vertical leap, quad muscle bulk, and other sports-specific issues

- For THERMAL SHRINKAGE:

#### Week 0-1:

- Brace locked at 0 degrees
- No heel slides or CPM
- Quad isometrics
- WB w/2 crutches
- Ice/elevation – edema control

#### Week 1-3:

- Begin ROM – heel slides 0-30 x 1 week, 30-60 x 1 week
- Continue isometrics, add SLR
- Progress WBAT
- Out of brace for exercises only
- Brace at 0 degrees

#### Week 3-6:

- ROM 0-90 by week 4, 0-120 by week 6
- Begin PT at week 3 – PNF (ankle/hip), QS, HS, Hip, Calf
- Progress to FWB and open brace per quad function
- Brace x 4-6 weeks

#### Week 6-12:

- Full ROM
- Derotational brace starting at 1-3 months
- Quad/HS/Calf strength
- Balance
- Linear activity only

#### > 12 weeks:

- Increase functional activity