

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)

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

Phase II (10 days – 2 weeks)

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

Phase III (2-4 weeks)

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

Phase IV (4-6 weeks)

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

Phase V (6-8 weeks)

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

Phase VI (8-12 weeks)

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

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^{1/2} 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