ANTERIOR CRUCIATE LIGAMENT ALLO/AUTOGRAFT RECONSTRUCTION (Criteria Based)

This protocol is designed to progress through phases based on meeting certain criteria and not strictly on time. Approximate time frames are included with each phase but are not absolute. It is designed for allografts and autograft patellar tendon and hamstring grafts. It does not change if there is a concomitant meniscal repair. There are a few time-based exceptions:

- No full range open chain knee extensions until 10 weeks post-op
- No land running until >10 weeks for autograft patellar tendon and >12 weeks for hamstring/allograft
- No agilities until at least 16 weeks post-operative and after successful completion of 4 – 6 week straight plane running program
- No hamstring curls for 6 weeks with a concomitant posterior horn medial meniscal repair
- Weight-bearing may be restricted initially with concomitant articular pick or drilling and will be determined by physician based on size of lesion

Phase I – Protective Phase (~Day 1 – 7)
Gait: WBAT with immobilizer and 2 crutches
ROM: PROM/AAROM to tolerance for flexion/extension
   - Prone hangs/heel props (10 min) for extension ROM
   - PROM for flexion at end of bed using opposite leg
Strength: Quadricep sets emphasizing VM (use E-stim if necessary)
   - SLR’s X 4 planes (in immobilizer if significant quadricep lag)
Proprioception: Weight shifts without immobilizer
Progress Criteria: >90° flexion; extension within 5° of opposite leg
   - Fair/Good quad set (VL solid and some recruitment of VM)
   - SLR with < 5° quadricep lag
Phase II – Early Mobility (~Day 8 – 20)

Gait: First wean from immobilizer when good quad control and no lag
Then wean off crutches when no limp or increase in pain/effusion

ROM: Progress to heel slides for flexion ROM
Continue prone hangs/heel props (add weight if necessary)
Begin stationary cycle when >110° flexion
Initiate HS/ITB/Calf stretching
Initiate 1 leg retrograde walking on treadmill for extension ROM
Patellar mobilizations/scar massage/massage to ITB and quads

Strength: Continue quad sets and SLR’s (no resistance)
Initiate closed chain TKE’s in standing with theraband
Initiate bilateral calf raises on floor

Proprioception: Continue weight shifts
Initiate single leg stance (SLS) on floor

Progress Criteria: >110° flexion and extension within 5° of opposite side
Good quadricep set (solid VM/VL recruitment)
SLR without a quad lag
Independent gait without assistive device and without a limp
< 1+ effusion

Phase III - Controlled Mobility (~Week 3 – 6)

Gait: Client should be independent without limp/quad avoidance gait

ROM: Continue heel slides and prone hangs until equal to opp. side
Add quadricep stretch when appropriate

Strength: D/C quad sets and SLR’s in clinic
Calf raises (2 leg floor→2leg step→1 leg floor→1 leg step)
Initiate: Shuttle/leg press (high reps/low resistance for endurance)
     Mini-squats (0 - 45°) and progress with dumbbells
     Forward/lateral step-ups (6”→8”→10”→12”)
     Hamstring curls (light resistance if HS graft)
     T-band resisted sidestepping for hip abductors
**Proprioception:** Begin and progress through proprioception progression

Slide board

**Progress Criteria:** ROM (within 10 -15° flex and full ext. equal to opposite side)

< Trace effusion

No or very mild patello-femoral symptoms

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**Phase IV - Advanced Strengthening/Proprioception (~Week 7 – 10)**

**Gait:** Initiate water running if > 8 weeks

**ROM:** Continue ROM and flexibility as necessary

**Strength:** Continue to progress previous exercises

Initiate leg press (<90° flexion)

Initiate open chain knee extension with the last 40° of ext. blocked

Isokinetic (high speed/high reps)

Isotonic (light weights/high pad on tibia)

**Proprioception:** Continue to progress through program increasing challenges

**Progress Criteria:** ROM WFL (within 5° flexion and full ext. equal to opposite side)

No effusion

Progressing without PF symptoms in strength/proprioception

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**Phase V - Plyometric/Running (~Week 11 – 12)**

**Gait:** Water running → treadmill as outlined initially

**ROM:** Continue flexibility as necessary

**Strength:** Continue all strengthening progressing to full range knee ext.

**Proprioception:** Continue to increase challenges

**Plyometrics:** Bounding on shuttle (2 legs→ 1 leg working on landing form)

10 – 12” step jumps both forward and lateral progressing from 2 leg landing to 1 leg landing concentrating on proper technique

**Testing at 12 wks:** KT 2000 (15, 20, 30 lbs and manual max)

Isokinetic strength test (full ROM at 60 and 180°/sec)

**Progress Criteria:** Stable KT ( < 3 mm side to side difference)

Biodex deficit of < 40% in quadriceps and hamstrings
No effusion
No PF symptoms

Phase VI - Independent Running/Agility (~Week 12 – 6 months)
Gait: Initiate independent straight running program for 4 – 6 wks
ROM: Counsel on appropriate stretching for warm-up/cool-down
Strength: Counsel on appropriate strengthening program at gym based on biodex results
Agility: Initiate independent 4 – 6 week agility/sport specific program after successful completion of straight running program

Criteria for Return to Play (~5 – 6 months post-op)
1. Physician release
2. Stable KT (< 3mm side to side difference with firm end point)
3. Full ROM
4. No effusion
5. Satisfactory strength (> 85% compared to opposite leg)
6. Successful completion of proprioception/running/agility programs