**ACL REHABILITATION PROTOCOL**

**General Precautions:**

-Weight bearing as tolerated immediately post-op with crutches, wean from crutches by 2 weeks as patient demonstrates normal gait mechanics and good quadriceps control

-Wean from brace between 2 and 4 weeks based on quadriceps control

-Focus on protection of graft during primary revascularization (8 weeks) and graft fixation (8-12 weeks)

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| **Phase** | **Goals/Progression Criteria** | **Precautions** | **Suggested treatments** |
| **1:**  **0-4 weeks post-op** | 1. Protect graft and graft fixation  2. Control inflammation/swelling  3. Educate patient on rehab progression | -Avoid hyperextension greater than 10 degrees  -Flexion to 120 degrees to protect graft fixation  -Delay hamstring strengthening 12 weeks for hamstring autograft  -Avoid SLR until able to perform without extension lag | 0-4 weeks:  -Patellar mobilization, scar mobilization  -Heel slides (limit 90 degrees for hamstring autograft)  -Quad sets (consider NMES)  -Gastroc/Soleus stretching  -SLR all planes (add weight as tolerated for abduction, adduction and extension)  -Deep water jogging for ROM/swelling  -(not for hamstring autograft) Hamstring curls, closed chain quad (wall sit, step up, mini squat, leg press 90-30), quad isometrics 60 and 90degrees  -Aquatics for gait, weight bearing and strength  -Balance/proprioception  -Stationary bike: initially for ROM progress with resistance as tolerated |
| **2.**  **4-10 weeks post-op** | 1. No patellofemoral pain  2. Minimum 120 degrees flexion  3. Sufficient strength and proprioception to begin treadmill running  4. Minimal swelling/inflammation | - Protect graft and graft fixation  -Delay hamstring strengthening until week 12 for hamstring autograft  -Avoid hyperextension with functional movements | 4-10 weeks:  - Continue ROM and flexibility as needed  - Continue closed chain strengthening including single leg squats, leg press, step ups, partial lunges, wall sits, lunge walks  - Stairmaster (begin with short steps)  - Nordic trac or elliptical for conditioning  - Stationary bike: increase resistance and time  - Progress proprioceptive activities: ball toss, balance beam, mini-tramp balance  - Continue hamstring, gastroc/soleus stretches  - Continue to progress hip, hamstring, and calf strengthening as tolerated  - If available begin running in pool (waist deep) or unweighted treadmill at 8 weeks |
| **3.**  **10-16 weeks post-op** | 1. no swelling/inflammation  2. Full pain-free ROM  3. no patellofemoral joint irritation  4. Strength approximately 70% of the uninvolved leg  5. Sufficient strength and proprioception to initiate agility drills  6. Normal running gait | - Avoid overstressing the graft, for hamstring tendon autograft progressively increase resistance of hamstring strengthening  - Protect patellofemoral joint | - Continue flexibility  - Initiate OKC knee extension 90-30 degrees and progress to eccentrics  - If available, isokinetics (with anti-shear device) –begin with mid-range speeds (120°/sec-240°/sec)  - Progress toward full weight bearing treadmill running at 12 weeks for BTB autograft (16 weeks for hamstring tendon autograft procedures).  -Begin swimming if desired  - Recommend isokinetic test with anti-shear device at 12 weeks (14- 16 weeks for hamstring tendon autograft procedures) to guide continued strengthening.  -Progressive hip, quadriceps, hamstring, calf strengthening  -Cardiovascular/endurance training via stairmaster, elliptical, bike  -Advance proprioceptive activities |
| **4.**  **4-6 months post-op** | 1. No patellofemoral or soft tissue complaint  2. Normal joint ROM, strength, endurance and proprioception to safely return to work/athletics  3. Symmetric performance of basic and sport specific agility drills  3. Single leg hop and 3 hop test 85% of uninvolved leg  4. Quadriceps and hamstring strength at least 85% of uninvolved leg |  | - Continue and progress flexibility and strengthening program based on individual needs/deficits  - Initiate plyometric program as appropriate for athletic goals  -Agility progression including but not limited to:  -Side steps, crossovers, figure 8 running, shuttle running, one and two leg jumping, cutting, acceleration/deceleration sprints, agility ladder drills, progression of treadmill running distance based on patient needs, initiate sport-specific drills as appropriate, assessment of running on treadmill |
| **5.**  **6 months plus** | 1. Clearance for athletics/work in PT. Likely return to sport around 12 months for allograft reconstructions  2. Maintenance of strength, endurance, proprioception  3. Patient education regarding any possible limitations |  |  |