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## REHABILITATION GUIDELINES FOR ACL WITH QUAD TENDON AUTOGRAFT

**PHASE I (0-3 WEEKS)**

**DATES:**

Appointments	<ul style="list-style-type: none"> <li>Physical therapy 2-3x/week, beginning 2-5 days post-op</li> </ul>
Rehabilitation Goals	<ul style="list-style-type: none"> <li>Full extension symmetrical to contralateral knee before the first post-op visit at 2 weeks</li> <li>Flexion to 120°</li> <li>20° SLR without quad lag</li> <li>Off of crutches</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>WB:</li> <li>WBAT with crutches</li> <li>Brace:</li> <li>Brace locked in extension until first PT visit, then unlocked at all times. May remove brace for sleep and exercises after 1 week</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>Prolonged extension- prone hang, supine with roll under ankle</li> <li>Heel slides, wall slides, prone knee flexion</li> <li>Isometric quad set, then SLR</li> <li>Hamstring isometrics</li> <li>4-way hip and ankle exercises including calf pumps</li> <li>Initiate proprioceptive/balance exercises to include single leg stance, weight shifts forward, retro, lateral</li> <li>Patellar mobilizations (especially cranially)</li> <li>Ice 5x/day, 20 min each time, especially after exercises</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>Stationary bike- no resistance</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>DC crutches when quad control returns, full extension achieved, stable with low fall risk.</li> <li>May be weaned to 1 crutch with full extension if steady in gait</li> </ul>



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**PHASE II (3-6 WEEKS)**

**DATES:**

Appointments	Continue physical therapy 2-3x/week
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Full ROM</li> <li>• Advanced strengthening</li> <li>• Consider early neuromuscular retraining</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• Wear brace except for sleeping, exercises</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• AVOID OPEN CHAIN RESISTIVE ESPECIALLY WITH WEIGHTS (resistance bands OK for hamstring/quad)</li> <li>• Quad: Mini squats/wall squats, step ups</li> <li>• Hamstring: bridge, standing hamstring eccentrics</li> <li>• Calf: heel raises, calf press</li> <li>• Hip: extension, ABD, ADD</li> <li>• Consider balance board/wobble board for early NM retraining</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>• Stationary bike: as soon as motion (0-115 degrees) allows</li> <li>• Elliptical</li> <li>• Stairmaster</li> <li>• Pool: walking, aqua-jogging, NO KICKING (begin 4-6 weeks)</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>• Full ROM</li> <li>• Minimal Effusion</li> <li>• Functional control for ADLs achieved</li> <li>• DC brace: with adequate quad control for gait on level surfaces, inside. 6 weeks post-op.</li> </ul>

**PHASE III (6 WEEKS – 3 MONTHS)**

**DATES:**



Appointments	Continue physical therapy 1-2x/week as indicated
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Maintain full ROM (should be full extension to 135° flexion)</li> <li>• Progress neuromuscular retraining program</li> <li>• Core integration</li> </ul>
(Phase III continued) Precautions	<ul style="list-style-type: none"> <li>• No downhill walking/running, downhill skiing, downhill biking until 4.5 months</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• HEP 5x per week</li> <li>• Progress neuromuscular proprioceptive/balance exercises including single leg balance progression- varying surfaces</li> <li>• Pool: begin 4 way hip, lateral movement, deep water jogging in place (no freestyle or frog/breaststroke kick)</li> <li>• Strengthening: lunges, sport cord, wall squats, step up/down</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>• May begin road biking outdoor on flat roads only</li> <li>• May begin treadmill walking</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>• Neuromuscular exercises without difficulty</li> </ul>

**PHASE IV (3 TO 5 MONTHS)**

**DATES:**

Appointments	Continue physical Therapy 1-2x per week
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Running: Light running/hopping without pain or swelling (12 weeks), progress to running patterns at 75% speed</li> <li>• Good jumping mechanics- NO DYNAMIC VALGUS</li> <li>• Hop drills without difficulty</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• No downhill walking/running, downhill skiing, downhill biking until 4.5 months</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• HEP 5x per week</li> <li>• Agility drills: shuffling, hopping, running patterns (Ex: figure 8)</li> </ul>



	<ul style="list-style-type: none"> <li>Some sport specific: closed-chain exercises including leg press (0-60°), step ups, mini squats (0-60°), short arc quad (30-90°), hamstring curls with light weight/high repetition</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>Begin endurance closed-chain exercises 3-4x/week                     <ul style="list-style-type: none"> <li>Stairmaster, stationary bike, elliptical, NordicTrack (short stride).</li> <li>Focus on increasing endurance.</li> </ul> </li> <li>Gait training: progress jogging on treadmill or even ground to running patterns at 75%</li> <li>Pool: may start freestyle swimming (avoid frog/breaststroke kick), progress to shallow water jogging</li> </ul>
(Phase IV continued) Progression Criteria	<ul style="list-style-type: none"> <li>Running without knee effusion</li> <li>Hopping/agility drills without knee pain or effusion</li> </ul>

PHASE V (5 TO 8 MONTHS)

DATES:

Appointments	Continue physical therapy 2 visits per month to review HEP
Rehabilitation Goals	<ul style="list-style-type: none"> <li>Able to complete a running program</li> <li>May begin plyometric program: jump rope exercises</li> <li>Hamstring and quadriceps strength 90 % of normal leg</li> <li>Return to sport testing at 9 months post-op, prior to MD visit</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>Earliest return to full sports = 9 months.</li> </ul>
(Phase IV continued) Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>HEP 4-5x per week</li> <li>Agility drills: shuffling, hopping, running patterns (Ex: figure 8)</li> <li>Sport Specific: plyometric program, fast straight running, backward running, cutting, cross-overs, carioca, etc. in controlled environment</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>Pool available: may advance swimming (avoid frog/breaststroke kick)</li> </ul>
Progression Criteria (Return to Sport)	<ul style="list-style-type: none"> <li>quadriceps and hamstring strength at least 90% of opposite leg</li> <li>Single leg hop test and vertical jump at least 90% of opposite leg</li> <li>Jog, full speed run, shuttle run, and figure of 8 running without a limp</li> <li>Full controlled acceleration and deceleration</li> <li>Squat and rise from a full squat</li> <li>No effusion or quadriceps atrophy</li> </ul>

PT Protocol: ACL Reconstruction with  
Quad Graft



Matt Fournier MD