

**ACLR Protocol Hamstring Autograft**

Name \_\_\_\_\_ Date \_\_\_\_\_

Procedure \_\_\_\_\_

Procedure Date \_\_\_\_\_

Frequency 1 2 3 4 5 times/week Duration 1 2 3 4 5 6 weeks

\*\*\*Range of motion is an important progression of therapy, but limiting swelling is important.  
Respecting swelling will decrease pain and improve motion.\*\*\*

Time	Goals /Milestones	Activities/Exercises
Week 1	Full extension (0 degrees)  At least 90 degrees flexion  Active Quadriceps contraction  Controlled Straight leg raise in all planes (brace on)  Walk weight bearing as tolerated with crutches  Minimal swelling (less than 5% comparative girth measurements)  <b>WOUND CARE:</b> Therapist will change 1st dressing. If dressing is sealed, it should stay in place until MD appointment. Home dressing change should be made following universal precautions. Wound should not be wet. Showering normally allowed after 3 <sup>rd</sup> day, however, wound should be covered with Press-N-Seal.	CPM machine 2 hours 3-5x per day Start 0-45 degrees, increase 10 degrees everyday  Heel slide on the wall Assisted by other leg. Hold 10 seconds; repeat 10 to 20 times 3 times a day.  Heel Prop or Prone Hang (5 to 10 minutes 3-5 times per day) May combine with ankle pumps 20 times 3-5 sets  Quad Sets (5 sets of 20; 3-5 times per day)  Face up SLR; Start day 3 and use brace if necessary 5 sets of 10 reps 3-5 times per day
Week 2	Full Knee Extension  Quadriceps control while single leg standing (able to stand up in one leg with good control)	<b>Continue with previous exercises at home, especially extension exercises</b> Straight leg raises 4 ways. Attempt without brace. 3 sets of 10 reps

	<p>Knee flexion 110 degrees or more</p> <p>Walking without crutches and full extension, minimal or no limp.</p> <p>Able to go around on a stationary bicycle.</p> <p>Reciprocal Stair Climbing</p>	<p>Patellar Mobilizations (start earlier if swelling is down). Hold 5 to 10 seconds. 10 reps Also could be performed by oscillating up and down or side to side as instructed by Therapist</p> <p>Stationary Bicycle 10 to 20 minutes a day</p> <p>Single leg stand weight shifting, progressing to Step climbing. Single leg step up. Start with 2 inches and move 2 inches every other day until reaching 12" step.</p> <p>Calf raises (10 reps x 3 sets) followed by calf stretches (hold 10 seconds per 3 times)</p> <p>Terminal knee extension with T-band (above knee and protecting donor site with a towel). Progress to ¼ bilateral squats or mini squats (20 reps x 3 sets).</p>
Time	Goals /Milestones	Activities/Exercises
Week 3 to 5	<p>Flexion within 10 degrees of contra lateral</p> <p>Normal gait pattern</p> <p>Quadriceps strength 60%</p> <p>Increased cardiovascular endurance</p> <p>Hamstrings Strengthening and Flexibility. Until now, The harvested tendon had to be protected. While light stretching could be initiated along with Knee extension in the first 2 weeks, aggressive stretching, and Soft tissue mobilization, and Strengthening should wait until week 4 or 5.</p>	<p><b>Continue with previous activities, adding resistance to SLR exercises.</b></p> <p>Stairmaster, Stationary Bike, Elliptical short stride (20 to 30 minutes of Cardio 3 times per week).</p> <p>Leg press. Bilateral and unilateral with low resistance. Progress resistance according to Therapist instructions.</p> <p>Goal is to obtain at least 100% of body weight bilaterally and 50% of body weight Unilaterally by week 8 if preoperative testing was not performed.</p> <p>Quadriceps sets in short arch and 90-45 degrees quad sets</p> <p>Introduce Hamstrings Strengthening and Stretching.</p> <p>Hamstrings strengthening progression: heel slides with ball or roll, Stool scoots, Hamstring curls</p> <p>Hamstring stretching progression: Face up SLR; sitting reaching toes and standing reaching toes on a step or to</p>

		<p>the floor.</p> <p>Perturbation training exercises Level 1 (bilateral rocker board, Mini trampoline, BOSU or Pillow) Even and tandem add ball toss when balance is good. Advance to single leg stand</p>
<b>Time</b>	<b>Goals/Milestones</b>	<b>Activities/Exercises</b>
Week 6 to 8	<p>Full Range of Motion</p> <p>Controlled step up and down on 6 inch step</p> <p>Controlled Lunges</p> <p>Controlled squat up to 60 degrees</p> <p>Quadriceps strength 70%</p> <p>1<sup>st</sup> Functional Test performed at the end of week 8(only straight ahead tests, no lateral test). See Functional Testing Scoring Sheet. If scores are below 60% or FMS below 14 delay functional exercises and concentrate on deficits.</p>	<p><b>Continue with previous cardiovascular activities, Leg press quadriceps and Hamstring strengthening. Increase loads as tolerated</b></p> <p>Step up and down 20 reps x 3. Progressing to resistive step ups/downs.</p> <p>General Flexibility Exercises as Instructed by Physical Therapist</p> <p>Perturbation training exercises Level 2 (Single leg on rocker board, Mini trampoline, BOSU or Pillow adding ball toss when balance is good)</p> <p>Week 8 Mini-trampoline marching and fast walking in short bouts (20-30 secs)</p> <p>Lunges straight ahead. Advance to resistive lunges and lunges into a step</p> <p>Resistive lateral walking</p>

Time	Goals/Milestones	Activities/Exercises
Weeks 9 to 12	<p>Maintaining or Gaining quadriceps strength (&gt; 80%)</p> <p>Single leg hop test, supported (&gt;50%)</p> <p>Knee Outcome Survey &gt; 70% (IKDC)</p> <p>Controlled running pattern in treadmill starting at week 12</p> <p>Single leg balance and reach tests in Anterior, Posterior medial and posterior lateral within 75%.</p> <p>2nd Functional test performed at week 12 and includes some lateral testing (see Functional testing sheet)</p> <p>If scores are below 75% or FMS below 14 delay functional exercises and concentrate on deficits.</p>	<p><b>Continue with previous cardiovascular activities, leg press quadriceps and hamstring strengthening, increase loads as tolerated.</b></p> <p>Weight Room activities (Could be performed independently at a health club o school gym, but a strength and conditioning specialist or athletic trainer is highly recommended)</p> <p><b>Running Progression</b></p> <p>-Depending on patient’s progress in previous stages, body mass, strength, first functional evaluation results and any other applicable factors, patient could initiate a gradual running progression around week 12. The following guidelines are an example of such progression:</p> <p>-Week 11 Mini-Trampoline running 30-second bouts of <b>light stationary jogging</b> followed by 30 seconds of stationary walking.</p> <p>-Week 12 initiate treadmill running program at clinic (week 1-2 of running/Level 1) 0.1 miles jog followed by 0.1 miles walk. Complete 5 times and gradually increase up to 10 times. Do NOT run back-to-back days.</p> <p><b>Perturbation Techniques level 3</b> (Single leg stand eyes closed on non compliant surface) Also add ball toss on mini-trampoline or “kicking” a soccer ball. Introduce a sport gesture without twisting. Add rolling board.</p> <p>Initiate lateral lunges and single leg balance and reach activities in all planes</p> <p>Initiate backward walking with resistance. Advance to light running at week 12.</p>

Weeks 13-15	<p>Increase running progression</p> <p>Able to tolerate lateral and diagonal movements without difficulty</p> <p>Able to perform higher balance activities without difficulty</p>	<p><b>Initiate early agility drills</b> (floor ladder) Walking, then light jog</p> <p><b>Running</b>  Week 3 of running (Level 2) Alternate 0.1 miles walk and 0.2 miles jog (2 miles total)  Week 4 of running (Level 3) Alternate 0.1 miles walk and 0.3 miles jog (2 miles total)  Week 5 of running (Level 4) Alternate 0.1 miles walk and 0.4 miles jog (2 miles total)  Perturbation techniques with sport gestures (board, BOSU plus batting, dribbling a basket, pushing a ball held at different heights) . Use all movement planes (diagonal, rotation)  Initiate crossover step ups or BOSU/ dynadisc crossovers</p> <p><b>Initiate figure 8 walking</b> progress to light jogging</p> <p><b>Mini trampoline hops</b> and Total Gym bilateral “jumps”.</p>
<b>Time</b>	<b>Goals/Milestones</b>	<b>Activities/Exercises</b>
Weeks 16 to 20	<p>3<sup>rd</sup> Functional Test performed at week 16.</p> <p><b>80-90 % on Following tests:</b></p> <ol style="list-style-type: none"> <li>1. Comparative 10 rep max for Quad, Hamstring and Leg press</li> <li>2. IKDC or KOS</li> <li>3. Single leg hop for distance</li> <li>4. Single leg crossover for distance</li> <li>5. Double leg Jump and tuck in test</li> <li>6. Modified Agility T-run Test</li> <li>7. Isokinetic test (90/180)</li> <li>8. Any other functional test (step down, Functional movement screening)</li> </ol> <p>If scores are below 90% or FMS below 14 delay Plyometric exercises and concentrate on deficits.</p>	<p><b>Increase Intensity and duration of all previous exercises.</b></p> <p><b>Running.</b>  Week 6 of running level 5-6 (jog 2 full miles) <b>Track or Treadmill</b>, Do not run 2 days in a row. Progress to level 6 (jog 2.5 miles)  Week 7 of running level 7 (Increase workout to 3 miles)  Week 8 of running level 8 (alternate between running and jogging every 0.25 miles). On a track increase speed straight ahead and jog curves (one level a week)  Week 9 and up full run.</p> <p><b>Advanced Neuromuscular Training</b>  Dynamic warm up: Straight leg march, forward, backward lunge, leg cradle, hand walks, “spider-man” crawl; “Frankenstein” walk (kicking hands at shoulder height). Dog and bush walk.  Agility drills: Floor ladder full speed, add complex patterns and crossing legs. Add resistance. Skipping, Lateral shuffle, Backward running, T run jogging.  <b>Initiate Plyometric Work with a safe sequence:</b></p>

		<ol style="list-style-type: none"> <li>1. Hoping (bouncing up and down on toes)</li> <li>2. Vertical Jumps (hip and knee flexion acceleration)</li> <li>3. Lateral jumps (side to side)</li> <li>4. Diagonal Jumps (Direction of feet land at an angle)</li> <li>5. Broad Jumps (Distance jumps)</li> <li>6. Scissors jump (split landing alternating legs)</li> <li>7. Single leg hopping</li> <li>8. Single leg vertical Jump</li> <li>9. Single leg lateral jump</li> <li>10. Single leg diagonal jump</li> <li>11. Bounding</li> </ol> <p><b>Field Therapy session/Controlled practice:</b>  Schedule a conference involving parent/athlete/coach /athletic trainer/ strength and conditioning specialist /physical therapist. Discuss the possibility of uneventful and modified practices.  Level II sports that have lateral movements, less jumping and pivoting than level I (baseball, softball, tennis), may initiate training under controlled environments and skill training/technique should be the focus of training.</p>
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Time	Goals/Milestones	Activities/Exercises
Weeks 20 +	<p>4<sup>th</sup> Functional Test performed at week 20. 5<sup>th</sup> at weeks 24</p> <p>Return to Sport Training. Controlled contact practices Follow Return to sport criteria:  <b>90-100 % on Following tests:</b></p> <ol style="list-style-type: none"> <li>1. Comparative 10 rep max for Quad, Hamstring and Leg press</li> <li>2. IKDC or KOS</li> <li>3. Single leg hop for distance</li> <li>4. Single leg crossover for distance</li> <li>5. Double leg Jump and tuck in test</li> <li>6. Modified Agility T-run Test</li> <li>7. Isokinetic test (90/180)</li> <li>8. Any other functional test (step down, Functional movement screening)</li> <li>9. Vertical Drop Test</li> </ol> <p>If scores are below 90% or FMS below 14 delay return to sport exercises and concentrate on deficits.</p>	<p><b>Advanced Plyometrics allowed:</b></p> <ol style="list-style-type: none"> <li>1. Barrier Jump forward-back</li> <li>2. Barrier Jump side to side</li> <li>3. 180 jump bilaterally</li> <li>4. Barrier hop or single leg jump front and back</li> <li>5. Barrier hop or single leg jump side to side</li> <li>6. Scissors jump</li> <li>7. Single leg hop diagonally</li> <li>8. Single leg jump and turn 90 degrees, 180 degrees.</li> </ol> <p><b>Field Therapy session/Controlled practice:</b>  Schedule a conference involving Parent/Athlete /coach /Athletic trainer/ Strength and conditioning specialist /Physical Therapist With Surgeons approval, return to sport activities need to be tailored and have a multidisciplinary approach. Cutting, figure 8 and Contact should only be introduced if testing reveals &gt;90% of strength in all tests.</p> <p>Physical Therapy Evaluation/testing 20 and 24 and 28 if necessary. Surgeon will consider testing results for release as well as type of sports played.</p> <p>Level II sports that have lateral movements, less jumping and pivoting than level I (Baseball, Softball, tennis), may return to sport under controlled environments.</p> <p>Level I sports with Jumping, Cutting, Pivoting (e.g. Basketball, Soccer, Football) can initiate practice in a controlled environment, but with the surface and equipment that the athlete normally wears, It would be ideal to perform a therapy session involving all movements natural to the sport, including skill training at low speeds. PT, ATC or Certified Strength and conditioning specialist along with coach could tailored a program to involve the athlete in practice without contact, However, Cutting and Pivoting are restricted until surgeons release.</p> <p>Uneventful practices for about 4 weeks, followed by contact/full speed practices for 4 weeks recommended before competition.</p>

**Comments:**

FCE \_\_\_\_\_ Work Conditioning/Work Hardening \_\_\_\_\_ Teach HEP \_\_\_\_\_

**Every patient's therapy progression will vary to a degree depending on many factors. Please use your best clinical judgment on advancing a patient. If other ideas are considered to improve patient's outcome do not hesitate to call.**

**Patient's recovery is a team approach: Patient, family/friend support, therapist, and surgeon. Every team member plays an important role in recovery.**

**Signature** \_\_\_\_\_ **Date** \_\_\_\_\_