



### Post-operative Rehabilitation Protocol

#### ACL Reconstruction with Meniscus Repair or Microfracture

#### Phase 1 (0-6 weeks post op):

<b>Goals</b>	<ul style="list-style-type: none"> <li>• Protect graft and graft fixation</li> <li>• Minimize effects of immobilization</li> <li>• Control inflammation/swelling</li> </ul>
<b>Brace/Precautions/ Crutch Use</b>	<ul style="list-style-type: none"> <li>• Weight bearing: <ul style="list-style-type: none"> <li>○ 0-2 weeks: toe-touch (25%) weight-bearing</li> <li>○ 2-6 weeks: 50% weight-bearing</li> </ul> </li> <li>• Brace: 0-6 weeks: 0-90 degrees <ul style="list-style-type: none"> <li>○ Leave brace unlocked at all times following resolve of nerve block</li> <li>○ Brace may be removed for hygiene and therapy</li> </ul> </li> </ul>
<b>Range of Motion</b>	<ul style="list-style-type: none"> <li>• Weeks 0-6: 0-90 degrees – no forced flexion</li> </ul>
<b>Strengthening</b>	<ul style="list-style-type: none"> <li>• Restore quadriceps recruitment through strengthening exercises</li> <li>• Quadriceps, hamstring, and gluteal strengthening exercises <ul style="list-style-type: none"> <li>○ Delay HS strengthening for 12 weeks (for HS tendon autograft procedure)</li> </ul> </li> <li>• Exercises to reduce swelling/ effusion (modalities as needed)</li> <li>• Quadriceps NMES</li> </ul>
<b>Home Instructions</b>	<ul style="list-style-type: none"> <li>• Keep surgical dressings clean and dry</li> <li>• Change surgical bandages on the 2<sup>nd</sup> day after surgery (keep covered until first clinic visit)</li> <li>• Avoid getting sutures wet until at least 5 days after surgery (do not scrub, soak, or submerge the incisions)</li> <li>• Note DVT (blood clot) prophylaxis medications provided by your surgeon to take following surgery – follow those instructions carefully.</li> </ul>
<b>Suggested Exercises</b>	<ul style="list-style-type: none"> <li>• Patellar Mobilizations</li> <li>• Ankle pumps</li> <li>• Quad sets (consider NMES for poor quad sets)</li> <li>• Hamstring Curls – add weight as tolerated (patellar tendon procedure only)</li> <li>• Heel slides (to 90° only for hamstring tendon autograft procedure only)</li> <li>• Gastroc/Soleus Stretching</li> <li>• SLR, all planes, with brace in full extension until quadriceps strength is sufficient to prevent extension lag – add weight as tolerated to hip abduction, adduction and extension.</li> <li>• Gasroc/Soleus stretching</li> <li>• Hamstring stretches (very gentle for hamstring tendon autograft procedure)</li> <li>• <b>For patellar tendon autograft procedures only:</b></li> <li>• Closed Kinetic Chain Quadriceps strengthening activities as tolerated (wall sit, mini squats, leg press 90-30 degrees)</li> <li>• Quadriceps isometrics at 60° and 90°</li> <li>• Balance/Proprioception</li> <li>• Stationary Bike – initially for promotion of ROM – progress light resistance as tolerated</li> </ul>

<b>Criteria to Advance</b>	<ul style="list-style-type: none"> <li>• Full PROM flexion/extension</li> <li>• Good quad set, SLR without extension lag</li> <li>• Minimal swelling/inflammation</li> <li>• Normal gait on level surface</li> </ul>
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### **Phase 2 (6-10 weeks post op):**

<b>Goals</b>	<ul style="list-style-type: none"> <li>• Restore normal gait with stair climbing after brace is discontinued at 6 weeks</li> <li>• Maintain full extension, progress toward full range of motion at 6+ weeks</li> <li>• Protect graft and graft fixation</li> <li>• Increase hip, quadriceps, hamstring and calf strength</li> <li>• Increase proprioception</li> </ul>
<b>Brace/Precautions/ Crutch Use</b>	<ul style="list-style-type: none"> <li>• Discontinue brace if capable of SLR without extensor lag</li> <li>• Discontinue crutches and progress to full weight bearing</li> </ul>
<b>Range of Motion</b>	<ul style="list-style-type: none"> <li>• Restore full, pain-free active ROM</li> </ul>
<b>Strengthening</b>	<ul style="list-style-type: none"> <li>• Increase hip, quadriceps, hamstring and calf strength</li> </ul>
<b>Home Instructions</b>	<ul style="list-style-type: none"> <li>• Restore normal activities of daily living (within weight-bearing restrictions)</li> </ul>
<b>Suggested Exercises</b>	<ul style="list-style-type: none"> <li>• Continue with range of motion/flexibility exercises as appropriate for the patient</li> <li>• Continue closed kinetic chain strengthening as above for patellar tendon autograft procedures, progressing as tolerated – can include one-leg squats, leg press, step ups at increased height, partial lunges, deeper wall sits, lunge walks.</li> <li>• Initiate CKC quad strengthening and progress as tolerated for hamstring tendon autograft procedures (wall sits, step-ups, mini-squats, Leg Press, lunge at 90° -30°)</li> <li>• Stairmaster (begin with short steps, avoid hyperextension)</li> <li>• Elliptical machine for conditioning.</li> <li>• Stationary bike - progress time and resistance as tolerated</li> <li>• Continue to progress proprioceptive activities for patellar tendon autograft procedures, initiate for hamstring tendon autograft procedures – ball toss, balance beam, mini-tramp balance</li> <li>• Continue hamstring, gastroc/soleus stretches</li> <li>• If available, begin running in the pool (waist deep) or on an unweighted treadmill at 8 weeks.</li> </ul>
<b>Criteria for advancement</b>	<ul style="list-style-type: none"> <li>• No patellofemoral pain</li> <li>• Minimum of 120 degrees of flexion</li> <li>• Sufficient strength and proprioception to initiate running</li> <li>• Minimal swelling/inflammation</li> </ul>

### **Phase 3 (10-16 weeks post-op):**

<b>Goals</b>	<ul style="list-style-type: none"> <li>• Full range of motion</li> <li>• Protect the patellofemoral joint</li> <li>• Normal running mechanics</li> <li>• Strength approximately 70% of the uninvolved lower extremity per isokinetic evaluation (if available)</li> </ul>
<b>Brace/Precautions/ Crutch Use</b>	<ul style="list-style-type: none"> <li>• Avoid overstressing the graft, for hamstring tendon autograft progressively increase resistance of hamstring strengthening.</li> </ul>

<b>Range of Motion</b>	<ul style="list-style-type: none"> <li>Maintain full ROM</li> </ul>
<b>Strengthening</b>	<ul style="list-style-type: none"> <li>Progress hip, quadriceps, hamstring, calf strengthening</li> <li>Improve strength of lower extremity to prepare for sport activities</li> </ul>
<b>Home Instructions</b>	<ul style="list-style-type: none"> <li>Maintain normal activities of daily living</li> </ul>
<b>Suggested Exercises</b>	<ul style="list-style-type: none"> <li>Continue and progress flexibility and ROM exercises as appropriate for patient</li> <li>Initiate OKC Knee extensions 90°-30°, progress to eccentrics</li> <li>If available, isokinetics (with anti-shear device) – begin with mid-range speeds (120o/sec- 240o/sec)</li> <li><b><u>Progress toward full weight bearing running at 12 weeks for BTB autograft (16 weeks for hamstring tendon autograft procedures).</u></b></li> <li>Begin swimming if desired</li> <li>Recommend STEP test at 4 months to guide continued strengthening</li> <li>Cardiovascular/endurance training via stairmaster, elliptical, bike</li> <li>Advance proprioceptive activities</li> </ul>
<b>Criteria for advancement</b>	<ul style="list-style-type: none"> <li>No significant swelling/inflammation.</li> <li>Full, pain-free ROM</li> <li>No evidence of patellofemoral joint irritation</li> <li>Strength approximately 70% of uninvolved lower extremity per isokinetic evaluation</li> <li>Sufficient strength and proprioception to initiate agility activities</li> <li>Normal running gait</li> </ul>

#### **Phase 4 (4-6 month post-op):**

<b>Goals</b>	<ul style="list-style-type: none"> <li>Symmetric performance of basic and sport specific agility drills</li> <li>Single hop and 3 hop tests 85% of uninvolved lower extremity</li> <li>Quadriceps and hamstring strength at least 85% of uninvolved lower extremity per isokinetic strength test</li> </ul>
<b>Precautions/ Crutch Use</b>	<ul style="list-style-type: none"> <li>None</li> </ul>
<b>Range of Motion</b>	<ul style="list-style-type: none"> <li>Maintain full ROM</li> </ul>
<b>Strengthening</b>	<ul style="list-style-type: none"> <li>Continue and progress strengthening based on individual needs and deficits</li> </ul>
<b>Home Instructions</b>	<ul style="list-style-type: none"> <li>Maintain normal activities of daily living</li> </ul>
<b>Suggested Exercises</b>	<ul style="list-style-type: none"> <li>Progress flexibility and strengthening program</li> <li>Initiate plyometric program as appropriate for patient's athletic goals</li> <li>Agility progression including, but not limited to: <ul style="list-style-type: none"> <li>Side steps</li> <li>Crossovers</li> <li>Figure 8 running</li> <li>Shuttle running</li> <li>One leg and two leg jumping</li> <li>Cutting</li> <li>Acceleration/deceleration/sprints</li> <li>Agility ladder drills</li> <li>Continue progression of running distance based on patient needs.</li> <li>Initiate sport-specific drills as appropriate for patient</li> </ul> </li> <li>Assessment of running on treadmill</li> </ul>

<b>Criteria for Advancement</b>	<ul style="list-style-type: none"> <li>• No patellofemoral or soft tissue complaint</li> <li>• Necessary joint ROM, strength, endurance, and proprioception to safely return to work or athletics</li> </ul>
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**Phase 5 (6+ month post-op):**

<b>Goals</b>	<ul style="list-style-type: none"> <li>• Safe return to athletics/work</li> <li>• Maintenance of strength, endurance, proprioception</li> </ul>
<b>Precautions/ Crutch Use</b>	<ul style="list-style-type: none"> <li>• None</li> </ul>
<b>Range of Motion</b>	<ul style="list-style-type: none"> <li>• Maintain full ROM</li> </ul>
<b>Strengthening</b>	<ul style="list-style-type: none"> <li>• Maintenance and progression of strength pending activity level goals</li> </ul>
<b>Home Instructions</b>	<ul style="list-style-type: none"> <li>• Maintain normal activities of daily living</li> </ul>
<b>Suggested Exercises</b>	<ul style="list-style-type: none"> <li>• Gradual return to sports participation</li> <li>• Recommend LEAP test at 6+ months to guide return to sport/activity</li> </ul>

For any questions about operative details or rehabilitation guidelines, please contact the respective surgeon's Athletic Trainer at the contact information found at this link: <https://med.virginia.edu/orthopaedic-surgery/orthopaedic-divisions/sports-medicine/protocols/>