



Stephen Brockmeier MD, David Diduch MD, Winston Gwathmey MD, Mark Miller MD, Brian Werner MD  
Claire Denny, PA-C, Jennifer Hart, PA-C, Michelle Post, PA-C, Brooke Martin, ATC, Blair Moore, ATC, Lizzie  
Leitch, ATC, Kaitlyn Shank, ATC

## ACL Reconstruction Post-operative Rehabilitation Protocol

### Phase 1: 0-4 weeks post-operatively

<b>Goals</b>	<ul style="list-style-type: none"> <li>• Protect graft</li> <li>• Minimize pain</li> <li>• Minimize swelling</li> <li>• Begin active range of motion of knee as tolerated</li> </ul>
<b>Brace/Crutch Use</b>	<ul style="list-style-type: none"> <li>• Wear knee immobilizer until nerve block wears off, then no immobilizer is needed</li> <li>• No brace needed</li> <li>• Weight bearing as tolerated using crutches</li> <li>• Wean from crutches as tolerated</li> </ul>
<b>Range of Motion</b>	<ul style="list-style-type: none"> <li>• Knee flexion 0-120° as tolerated</li> <li>• Work on restoring normal gait</li> </ul>
<b>Strengthening</b>	<ul style="list-style-type: none"> <li>• Ankle pumps</li> <li>• Work on quad control (quad sets, heel slides, straight leg raises)</li> <li>• For hamstring tendon autograft- delay hamstring strengthening for 12 weeks, heel slides to 90°</li> <li>• For patellar tendon autograft- hamstring curls adding weight as tolerated, Closed Kinetic Chain quadriceps strengthening as tolerated (wall sit, step ups, mini squats, leg press 90-30°)</li> </ul>
<b>Home Instructions</b>	<ul style="list-style-type: none"> <li>• Keep surgical dressings clear and dry</li> <li>• Change surgical bandages on 2nd day after surgery (keep covered until first clinic visit)</li> <li>• Can bathe on the 2nd day after surgery (do not scrub, soak, or submerge the incisions)</li> <li>• Sutures will be removed at first post-operative visit</li> <li>• Take Aspirin (or other DVT medication) twice daily for 2 weeks after surgery</li> </ul>

### Phase 2: 4-10 weeks post-op

<b>Goals</b>	<ul style="list-style-type: none"> <li>• Restore normal gait</li> <li>• Maintain full extension, progress to full flexion range of motion</li> <li>• Protect graft</li> <li>• Increase hip, quadriceps, hamstring and calf strength</li> <li>• Increase proprioception</li> </ul>
<b>Brace/Crutch Use</b>	<ul style="list-style-type: none"> <li>• Weight bearing as tolerated</li> </ul>
<b>Range of Motion</b>	<ul style="list-style-type: none"> <li>• Continue progressing in range of motion/flexibility to achieve full knee flexion</li> <li>• Work on restoring normal gait</li> <li>• Continue hamstring, gastroc/soleus stretches</li> </ul>

<b>Strengthening</b>	<ul style="list-style-type: none"> <li>• Closed kinetic chain strengthening <ul style="list-style-type: none"> <li>○ Patellar tendon autograft procedures: 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 90o-30o, lunges</li> </ul> </li> <li>• Stairmaster – begin with short steps, avoid hyperextension</li> <li>• Nordic Trac or 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-trampoline balance</li> <li>• Continue to progress hip, hamstring, and calf strengthening as tolerated</li> <li>• If available, begin running in pool (waist deep) or an unweighted treadmill at 8 weeks</li> </ul>
<b>Home Instructions</b>	<ul style="list-style-type: none"> <li>• Continue physical therapy and home exercises</li> <li>• Work on achieving full range of motion</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>• Improve strength, endurance, and proprioception of lower extremity</li> <li>• Protect patellofemoral joint</li> <li>• Normal running mechanics/gait</li> <li>• Strength approximately 70% of the uninjured lower extremity (using isokinetic evaluation if available)</li> </ul>
<b>Brace/Crutch Use</b>	<ul style="list-style-type: none"> <li>• Full weight bearing</li> </ul>
<b>Range of Motion</b>	<ul style="list-style-type: none"> <li>• Continue range of motion exercises to maintain full active ROM</li> </ul>
<b>Strengthening</b>	<ul style="list-style-type: none"> <li>• Initiate OKC knee extensions 90°-30°, progress to eccentrics</li> <li>• Begin swimming if desired</li> <li>• If available, isokinetics (with anti-shear device) – begin with mid-range speeds (120o/sec – 240o/sec)</li> <li>• Progress toward FWB running at 12 weeks for BTB autograft, 16 weeks for hamstring tendon autograft</li> <li>• Progressive hip, quadriceps, hamstring, and calf strengthening</li> <li>• Advance proprioceptive activities to initiate agility activities</li> <li>• Recommend isokinetic test with anti-shear device at 12 weeks for BTB autograft, 14-16 weeks for hamstring tendon autograft- used to guide continued strengthening</li> </ul>

### **Phase 4: 4-6 months 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 uninjured lower extremity (STEP and LEAP testing will need to be scheduled 4 months and 6 months after surgery – information will be given at follow-ups appointments in the Sports Medicine clinic)</li> <li>• Quadriceps and hamstring strength at least 85% of uninjured lower extremity per isokinetic strength test</li> </ul>
<b>Brace/Crutch Use</b>	<ul style="list-style-type: none"> <li>• Full weight bearing</li> </ul>

<b>Range of Motion</b>	<ul style="list-style-type: none"> <li>Maintain full knee range of motion</li> </ul>
<b>Strengthening</b>	<ul style="list-style-type: none"> <li>Continue and progress flexibility and strengthening program based on individual needs and deficits</li> <li>Initiate plyometric program as appropriate for patient's goals</li> <li>Agility progression including, but not limited to: <ul style="list-style-type: none"> <li>Side steps, crossovers, figure 8 running, shuttle running, one leg &amp; two leg jumping, cutting, acceleration/deceleration sprints, agility ladder drills, sport-specific drills as appropriate for patient</li> </ul> </li> <li>Assessment of running on treadmill for proper running mechanics</li> <li>Continue progression of running distance based on patient needs</li> </ul>

### **Phase 5: 6 months post-op and beyond**

<b>Goals</b>	<ul style="list-style-type: none"> <li>Safe return to athletics/work</li> <li>Maintenance of strength, endurance, proprioception</li> <li>Educate patient with regards to any possible limitations</li> </ul>
<b>Brace/Crutch Use</b>	<ul style="list-style-type: none"> <li>Full weight bearing</li> </ul>
<b>Range of Motion</b>	<ul style="list-style-type: none"> <li>Maintain full knee range of motion</li> </ul>
<b>Strengthening</b>	<ul style="list-style-type: none"> <li>Maintenance program for strength and endurance with a gradual return to sports participation/work</li> </ul>

**All patients should consult with their operating surgeon on specific return to work/ return to play release.**

For any questions about operative details or rehabilitation guidelines, please contact the respective surgeon's Athletic Trainer:

#### **Surgeon**

Stephen Brockmeier, MD  
David Diduch, MD  
Winston Gwathmey, MD  
Mark Miller, MD  
Brian Werner, MD

#### **ATC Name**

Kaitlyn Shank, ATC  
Blair Moore, ATC  
Brooke Martin, ATC  
Blair Moore, ATC  
Lizzie Leitch, ATC

#### **ATC Contact Information**

[Kcg4hf@hscmail.mcc.virginia.edu](mailto:Kcg4hf@hscmail.mcc.virginia.edu)  
[Jbp5c@hscmail.mcc.virginia.edu](mailto:Jbp5c@hscmail.mcc.virginia.edu)  
[Bnm3h@hscmail.mcc.virginia.edu](mailto:Bnm3h@hscmail.mcc.virginia.edu)  
[Jbp5c@hscmail.mcc.virginia.edu](mailto:Jbp5c@hscmail.mcc.virginia.edu)  
[Ebl7nu@hscmail.mcc.virginia.edu](mailto:Ebl7nu@hscmail.mcc.virginia.edu)