

This rehabilitation program is designed to return the individual to their full activities as quickly and safely as possible following an ACL reconstruction. Modifications to this guideline may be necessary dependent on physician specific instruction or other procedures performed. This evidence-based ACL reconstruction guideline is criterion-based; time frames and visits in each phase will vary depending on many factors. The therapist may modify the program appropriately depending on the individual's goals for activity following ACL reconstruction.

This guideline is intended to provide the treating clinician a frame of reference for rehabilitation. It is not intended to substitute clinical judgment regarding the patient's post-operative care based on exam/treatment findings, individual progress, and/or the presence of concomitant procedures or post-operative complications. If the clinician should have questions regarding post-operative progression, they should contact the referring physician.

**General Guidelines/Precautions:**

- Monitor of patellofemoral irritation and arthrofibrotic knee
- Avoid open chain quadriceps strengthening from 40 degrees to terminal extension until 10-12 weeks for B-T-B grafts and 14-16 weeks for hamstring grafts.
- Follow delayed protocol progression for meniscus repair guidelines with ROM and wt bearing precautions if indicated.
- Avoid isolated hamstring strengthening for 6 weeks post-op with posterior horn meniscus repair and hamstring grafts.
- Dr. Volk: Wear immobilizer at all times for first 2 weeks.
- If patient has a concomitant injury/repair (such as meniscus repair) treatment may vary-consult with physician. (may need to follow more conservative protocol in regards to ROM, weight bearing, and rehab progression)
- If autograft used for repair treatment may vary-consult with physician.

Delayed Protocol for ACL with meniscal repair or otherwise specified:

- ROM:
  - 0-90 degrees at week 4
  - 0-120 degrees at week 6
  - 0-135 degrees at week 8
- WB:
  - Dr. Volk: WBAT
  - Dr. Dean:
    - TT to ¼ WB to 2 weeks
    - ½ WB to 4 weeks
    - Full WB at 6 weeks
    - If meniscal repair TTWB 4-6 weeks

Additions to protocol for ACL with MCL repair:

- TTWB with brace locked in extension for 2 weeks
- After 2 weeks, progress to full WB with hinged brace worn during exercise to avoid medial joint stress
- Delay hip adductor strengthening for 4 weeks
- Continue with ACL protocol unless physician specifies otherwise

Phase	Suggested Interventions	Goals/Milestones for Progression
<p><b>Phase I</b></p> <p>Week 0-1</p>	<p><i>Therapy:</i></p> <ul style="list-style-type: none"> <li>• Begin supine exercises including: Ankle pumps, quad sets, heel slides, 4-way SLR</li> <li>• Teach crutches for gait and stairs as needed</li> <li>• Pain and edema control, modalities PRN</li> <li>• <b>Patient Education:</b> keep your knee straight and elevated when sitting or lying down. Do not rest with towel placed under knee. Do not pivot on surgical side. Do not actively kick your knee out straight; support you surgical side with transfers</li> </ul>	<p><i>Goals of Phase:</i></p> <ol style="list-style-type: none"> <li>1. Skin healing</li> <li>2. 70 degrees PROM</li> </ol>
<p><b>Phase II</b></p> <p>Weeks 1-4</p>	<p><i>WB Status:</i></p> <ul style="list-style-type: none"> <li>• B-T-B graft: 50% for first 3 weeks, progress to full</li> </ul> <p><i>Therapy:</i></p> <ul style="list-style-type: none"> <li>• Begin extension stretching with prone hangs and heel props, standing/seated gastroc and soleus stretches</li> <li>• Aquatic therapy as appropriate</li> <li>• Stationary bike, sweeps to full circles.</li> <li>• Patellar mobilizations (highly emphasized in the early post-op phase following patellar tendon autograft)</li> <li>• Gait training</li> <li>• B mini squats 0-60 degrees; wall slides, ball squats</li> <li>• B calf raises</li> <li>• 4-way hip strengthening, except no extension for hamstring grafts</li> <li>• Clam, fire hydrant</li> <li>• B leg press, 70-10 degrees</li> <li>• Multi-angle isometrics at 90 and 60 deg. knee extension</li> </ul>	<p><i>Goals of Phase:</i></p> <ol style="list-style-type: none"> <li>1. Healing</li> <li>2. Pain and edema control, modalities PRN</li> <li>3. Full wt bearing by 4 weeks</li> <li>4. ROM at 2 weeks: from 10-90 degrees</li> <li>5. ROM at 4 weeks: full extension</li> <li>6. No restriction on flexion with</li> <li>7. Ambulation without assistive device when quad control is achieved and gait normalized</li> <li>8. No Quad lag with SLR</li> <li>9. Quad contraction with superior patella glide and full active extension</li> </ol> <p><i>Criteria to Advance to Next Phase:</i></p>

	<ul style="list-style-type: none"> <li>• When full wt bearing, progress step-ups starting @ 2"</li> <li>• Lunges on step, progressing to level ground</li> <li>• Treadmill both forward and backwards, no incline</li> <li>• Balance and proprioception: wt shifting, single leg stance</li> <li>• Standing hamstring curl (after 6 weeks with hamstring graft)</li> <li>• Lumbopelvic strengthening: bridge variations, hip hikes</li> </ul>	<ol style="list-style-type: none"> <li>1. Healing appropriate for stage to move on.</li> </ol>
<p><b>Phase III</b></p> <p>Weeks 4-8</p>	<p><i>WB Status:</i> WBAT* *WB status and gait progression determined by physician and based on radiographic evidence of implant incorporation.</p> <p><i>Therapy additions:</i></p> <ul style="list-style-type: none"> <li>• SFMA to identify movement limitations and physical risk factors</li> <li>• Continue closed chain exercises</li> <li>• Single leg squats to 45 degrees</li> <li>• Lateral step downs and lateral lunges</li> <li>• Single leg press, 70-10 degrees</li> <li>• Retro ambulation up to 10% incline</li> <li>• Sport cord resisted retro ambulation and lateral movements.</li> <li>• Core strengthening</li> <li>• Baps</li> <li>• Balance: foam roller, single leg stance(knee slightly flexed) with reaches, static progressed to dynamic, level progressed to unsteady surface; lateral step overs</li> <li>• Lumbar locked bridging</li> <li>• Address/Improve mobility and motor control deficits: ankle DF, hip flexion, hip extension</li> <li>• Prone and standing quad stretch</li> <li>• 8 weeks: elliptical, stair climber, flutter kick swimming, pool jogging</li> <li>• Joint position retraining</li> </ul>	<p><i>Goals of Phase:</i></p> <ol style="list-style-type: none"> <li>1. Swelling reduction</li> <li>2. Full ROM</li> <li>3. Climb stairs reciprocally</li> <li>4. DC brace if patient demonstrates good quad control</li> </ol> <p><i>Criteria to Advance to Next Phase:</i></p> <ol style="list-style-type: none"> <li>1. Normal Gait pattern</li> <li>2. Pain control</li> <li>3. Edema managed</li> <li>4. Full knee extension</li> <li>5. Symmetrical joint position sense (&lt;5 degree margin of error)</li> </ol>

<p><b>Phase IV</b></p> <p>Weeks 8-12</p>	<p><i>WB Status:</i> Full; patient should exhibit normalized gait</p> <p><i>Exercise additions:</i></p> <ul style="list-style-type: none"> <li>• Open chain knee ext with proximal pad placement from 90°-40° (avoid anterior knee pain)</li> <li>• Treadmill, forward and backwards, on incline of 20% grade</li> <li>• Step-ups progressed to 8 inch as tolerated: forward, lateral and backwards</li> <li>• Slowly progress hamstring strength for hamstring grafts</li> <li>• Shock absorption activities</li> <li>• Deep squat with Reactive Neuromuscular training bands &amp; lunge with Reactive Neuromuscular training bands</li> <li>• Testing @ 8 weeks post op: FMS, Y-balance</li> <li>• Begin sub max sport specific training in the sagittal plane</li> <li>• Bilateral partial weight bearing plyometrics progressed to FWB plyometrics</li> </ul>	<p><i>Goals of Phase:</i></p> <ol style="list-style-type: none"> <li>1. Full ROM</li> <li>2. Full wt bearing</li> <li>3. Ability to do 10 controlled single leg squats to 45 degrees</li> </ol> <p><i>Criteria to Advance to Next Phase:</i></p> <ol style="list-style-type: none"> <li>1. Patient to be instructed in appropriate home exercise program</li> <li>2. No episodes of instability</li> </ol>
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<p><b>Phase V</b></p> <p>Weeks 12-16</p>	<p>Exercise additions:</p> <ul style="list-style-type: none"> <li>• Nordic hamstring curl</li> <li>• Reverse hamstring curl</li> <li>• Front/back squat</li> <li>• Progress single leg squat</li> <li>• Progress weight with previous exercises</li> <li>• Leg extensions 90-0</li> <li>• Initiate functional movement progressions</li> <li>• B leg jumps on leg press or total gym, progress to single leg as tolerated to learn controlled land</li> </ul> <p>If patients strength within 70% of uninvolved leg, and or successful completion of basic functional assessment add:</p> <ul style="list-style-type: none"> <li>• Side lunges</li> <li>• Lateral shuffles</li> <li>• Jumping rope</li> <li>• Light jogging</li> <li>• B plyometrics: up to 6 inches, on leg press</li> <li>• Landing/stabilization exercises</li> </ul> <p>Interval running program If goals 6-10 are met. Plyometric and agility program.</p> <p><b>Provider refer to isokinetic testing.</b></p>	<p>Goals of Phase:</p> <ol style="list-style-type: none"> <li>1. Restore strength.</li> <li>2. Normal 8" step down.</li> <li>3. Half speed running</li> <li>4. Controlled landing from 12 in box bilaterally and 6 in box unilaterally</li> <li>5. Controlled rotational jumps and landings</li> <li>6. 25 single leg squats to 45°</li> <li>7. Controlled landing for jumps up to 6 inches</li> <li>8. Less than 30% difference with single leg press or isotonic testing</li> <li>9. Less than 25% difference with functional assessment</li> <li>10. Less than 30% difference with kinetic testing</li> </ol> <p><i>Criteria to Advance to Next Phase:</i></p> <ol style="list-style-type: none"> <li>1. Patient to be instructed in appropriate home exercise program</li> <li>2. If achieve goals 6-10 above, may begin straight line running</li> </ol>
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<p><b>Phase VI</b></p> <p>Weeks 16-20</p>	<p>Exercise additions:</p> <ul style="list-style-type: none"> <li>• Twisting jumps</li> <li>• Backwards running up to 20-30% incline</li> <li>• Lateral hops over cones, blocks, etc.</li> <li>• Single leg jumps up to 6 inch box</li> <li>• Figure 8 running</li> <li>• Zigzag cutting (45 degree angles)</li> <li>• Lateral shuffles with resistance</li> <li>• Jump down activities beginning 6" progressing to 12"</li> <li>• <b>Deceleration training exercises</b></li> </ul>	<p>Goals of Phase:</p> <ol style="list-style-type: none"> <li>1. Half speed running forward and backward</li> <li>2. Normal hip strategy to control LE</li> <li>3. Adequate shock absorption strategies</li> </ol> <p><i>Criteria to Advance to Next Phase:</i></p> <ol style="list-style-type: none"> <li>1. Discharge to independent exercise program once goals are achieved</li> <li>2. Patient to be instructed in appropriate home exercise program</li> </ol>
<p><b>Phase VII</b></p> <p>Weeks 20-24</p>	<p>Exercise additions:</p> <ul style="list-style-type: none"> <li>• Single leg plyometrics</li> <li>• Resisted running</li> <li>• Sport specific training including full speed running, cutting, and stopping.</li> <li>• May require additional bracing before returning to full sports play. Physician to determine</li> <li>• <b>Return to play testing if returning to sport</b></li> <li>• Completion of single leg hop test and triple hop test</li> <li>• Drop down jump test</li> <li>• <b>Non-contact practice → full practice → full play (~9mo)</b></li> </ul>	<p>Goals of Phase:</p> <ol style="list-style-type: none"> <li>1. Return to prior level of function.</li> </ol> <p><i>Criteria to Return to Play</i></p> <ol style="list-style-type: none"> <li>1. Pass return to play testing             <ol style="list-style-type: none"> <li>a. Physician Approval</li> <li>b. Full ROM</li> <li>c. No pain or swelling</li> <li>d. Normal running</li> <li>e. Adequate drop jump mechanics</li> <li>f. Adequate lateral shuffle mechanics</li> <li>g. Adequate cutting mechanics</li> </ol> </li> </ol>