



## Purpose:

This guideline 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 with 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.

## Precautions:

- Monitor patellofemoral irritation and arthrofibrotic knee
- Avoid open chain quadriceps strengthening from 40° 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 weight bearing precautions if indicated
- Avoid isolated hamstring strengthening for 6 weeks post-op with posterior horn meniscus repair and hamstring grafts
- If a patient has a concomitant injury/repair (such as meniscus repair), treatment may vary - consult with physician
  - May need to follow more conservative protocol in regard to ROM, weight bearing and rehab progression
- If autograft used for repair, treatment may vary - consult with physician

PHASE	SUGGESTED INTERVENTIONS	MILESTONES FOR PROGRESSION
<b>Phase I</b> Weeks 0-2	<b>WB Status:</b> <ul style="list-style-type: none"> <li>• FWB as tolerated (unless otherwise instructed by MD) with brace locked in extension</li> <li>• Use assistive devices as needed</li> </ul> <b>Brace:</b> <ul style="list-style-type: none"> <li>• Locked at 0° of extension while weight-bearing</li> <li>• 0-90° for knee flexion                             <ul style="list-style-type: none"> <li>— Gradually unlock further as flexion increases</li> </ul> </li> </ul> <b>Therapy:</b> <ul style="list-style-type: none"> <li>• Ice 4-6 times per day for 15-30 minutes</li> <li>• Patellar glides/tilts</li> <li>• ROM:</li> </ul>	<b>Goals:</b> <ul style="list-style-type: none"> <li>• Obtain full knee extension and 90° of knee flexion</li> </ul>



	<ul style="list-style-type: none"> <li>Flexion: knee bends, wall slides and heel slides to patient tolerance</li> <li>Extension: passive knee extension using prone hangs &amp; towel roll</li> <li>Strengthening: <ul style="list-style-type: none"> <li>Quad sets with knee support</li> <li>Hamstring digs with knee support</li> <li>Begin ankle strengthening exercises <ul style="list-style-type: none"> <li>⇒ Plantar flexion/dorsiflexion, inversion/eversion</li> </ul> </li> </ul> </li> </ul>	
<b>Phase II</b> Weeks 2-6	<p><b>Brace:</b></p> <ul style="list-style-type: none"> <li>Continue knee rehab brace at full extension <ul style="list-style-type: none"> <li>May ambulate without knee brace (with crutches) once quadriceps are able to fire well to support operative knee</li> </ul> </li> <li>Unlock brace when quad control is adequate for knee support</li> <li>Discontinue knee rehab brace when able to control knee</li> <li>Fit with functional knee brace</li> </ul> <p><b>Therapy:</b></p> <ul style="list-style-type: none"> <li>Flexion: <ul style="list-style-type: none"> <li>Active assisted knee flexion <ul style="list-style-type: none"> <li>⇒ Goal is 130°</li> <li>⇒ Try to increase 10° per week</li> </ul> </li> <li>Heel slides</li> <li>Wall slides</li> <li>Biking as tolerated to 30 minutes <ul style="list-style-type: none"> <li>⇒ Zero to low resistance; increase progressively</li> </ul> </li> <li>First 2 weeks of exercise bike backwards <ul style="list-style-type: none"> <li>⇒ No resistance</li> </ul> </li> </ul> </li> <li>Extension: <ul style="list-style-type: none"> <li>Prone hangs</li> <li>Passive terminal knee extension with overpressure to tolerance</li> <li>Opposite leg active assist leg extension</li> </ul> </li> <li>Progressive Resistance: <ul style="list-style-type: none"> <li>30-50 repetitions, 0-5 pounds, 3 times/day</li> <li>SLR (maintain full extension)</li> <li>Hamstring curls</li> <li>Hip flexion, extension, abduction, adduction</li> <li>Heel raises</li> </ul> </li> </ul>	<p><b>Goals:</b></p> <ul style="list-style-type: none"> <li>Top priority - obtain full (0°) knee extension</li> <li>Increase knee flexion</li> <li>Increase quadriceps strength in preparation for progression to ambulation without use of crutches</li> </ul>



	<ul style="list-style-type: none"> <li>— Leg press with minimal resistance (flexion up to 90°)</li> <li>• Proprioception Exercises</li> <li>• Trunk Stabilization Exercises</li> <li>• Manual interventions: <ul style="list-style-type: none"> <li>— Patellar mobilizations as needed</li> <li>— Tibiofemoral mobilization into extension</li> <li>— Soft tissue as indicated</li> </ul> </li> </ul> <p><i>If any of these exercises seem to aggravate the knee (swelling, pain, or tenderness), then that specific exercise which causes difficulty should be postponed until you have discussed the effects of the exercise with Dr. Keene.</i></p>	
<b>Phase III</b> Weeks 7-12	<p><b>WB Status:</b></p> <ul style="list-style-type: none"> <li>• WBAT <ul style="list-style-type: none"> <li>— WB status and gait progression determined by physician and based on radiographic evidence of implant incorporation</li> </ul> </li> </ul> <p><b>Therapy:</b></p> <ul style="list-style-type: none"> <li>• Quadriceps: <ul style="list-style-type: none"> <li>— SLR <ul style="list-style-type: none"> <li>⇒ 10 sets of 30 repetitions each</li> </ul> </li> <li>— Quads setting <ul style="list-style-type: none"> <li>⇒ 10 sets of 30 repetitions each</li> </ul> </li> <li>— Short arc quadriceps extension</li> </ul> </li> <li>• Hips: <ul style="list-style-type: none"> <li>— May progress by adding weights above the knee</li> <li>— Hip abductors, flexors, adductors and extensors <ul style="list-style-type: none"> <li>⇒ 10 repetitions, 4 sets daily</li> </ul> </li> <li>— Isometric variation can be performed by pushing down on the hip being worked on and sustaining a contraction for 10 seconds</li> </ul> </li> <li>• Hamstrings curls - may add weights around the ankle <ul style="list-style-type: none"> <li>— 10 repetitions, 4 times daily</li> </ul> </li> <li>• Calf raises – fast and slow sets <ul style="list-style-type: none"> <li>— 3 sets, 10 repetitions each</li> </ul> </li> <li>• Swimming – gentle flutter kick only <ul style="list-style-type: none"> <li>— No whip kick</li> </ul> </li> <li>• May begin outdoor biking program - avoid hills</li> </ul>	<p><b>Goals:</b></p> <ul style="list-style-type: none"> <li>• Achieve full extension to near full flexion</li> <li>• Improve quadriceps tone (return of VMO definition)</li> </ul>



	<ul style="list-style-type: none"> <li>— A good rule of thumb for those interested in returning to athletics is that you need 3 min of biking to substitute for 1 min of running</li> <li>• Accelerated program – start with sand bags on tibial tubercle             <ul style="list-style-type: none"> <li>— Perform straight leg raises                 <ul style="list-style-type: none"> <li>⇒ 10 sets, 10 repetitions each</li> <li>⇒ Progress fulcrum distally one inch per week</li> </ul> </li> </ul> </li> <li>• Walking (level ground)             <ul style="list-style-type: none"> <li>— Build up pace gradually</li> <li>— Feel big toe of affected foot push off as you walk to ensure normal gait pattern</li> <li>— Start off at one mile at a brisk pace, increase to three miles</li> <li>— No limping allowed</li> </ul> </li> <li>• Sissy Squats:             <ul style="list-style-type: none"> <li>— Stand facing the edge of a door and place hands on the doorknobs on each side of the door</li> <li>— Feet should be shoulder width apart</li> <li>— Perform a half squat and slowly rise to starting position</li> <li>— Build up to 100 repetitions per day</li> </ul> </li> </ul>	
<b>Phase IV</b> Weeks 12-16	<b>Therapy:</b> <ul style="list-style-type: none"> <li>• Continue with Phase III exercises</li> <li>• Leg Press             <ul style="list-style-type: none"> <li>— Press body weight as many times as possible on nonsurgical side (to fatigue)</li> <li>— Follow same sequence on surgical side</li> </ul> </li> <li>• Squat Rack             <ul style="list-style-type: none"> <li>— Half squats (not past 70°) at one-half body weight, 10 repetitions</li> <li>— Progress to full body weight as tolerated</li> </ul> </li> <li>• Continue biking and/or swimming on a daily basis             <ul style="list-style-type: none"> <li>— No whip kicks</li> </ul> </li> <li>• Agility:             <ul style="list-style-type: none"> <li>— Balance on teeter-totter board/bobble board</li> <li>— Figure 8's (20-30 yard diameter circles)</li> </ul> </li> </ul>	<b>Goals:</b> <ul style="list-style-type: none"> <li>• Full knee range of motion             <ul style="list-style-type: none"> <li>— Refer back to surgeon for extension restriction of 5° or if less than 110° of flexion</li> </ul> </li> <li>• Normal gait pattern</li> <li>• Progressively increasing functional strengthening program</li> </ul>
<b>Phase V</b> Months 4-6	<b>Therapy:</b> <ul style="list-style-type: none"> <li>• Backward jog</li> <li>• Jogging - (level surfaces only)             <ul style="list-style-type: none"> <li>— 15 minutes at 8-10 minutes/mile pace</li> </ul> </li> </ul>	<b>Goals:</b> <ul style="list-style-type: none"> <li>• Improve quadriceps strength/function</li> <li>• Improve endurance</li> <li>• Improve coordination/proprioception</li> </ul>



	<ul style="list-style-type: none"> <li>— Add 5 minutes per week</li> <li>— Perform daily</li> <li>• Biking: <ul style="list-style-type: none"> <li>— By now the amount of set resistance should be increasing</li> <li>— Perform daily at 20 minutes/day</li> <li>— Legs should feel drained once off the bike</li> </ul> </li> <li>• Step-ups: <ul style="list-style-type: none"> <li>— Face the step</li> <li>— Put the foot of the operative knee on the step and step up</li> <li>— Repeat with gradual build up in repetitions until doing 100 step-ups/day</li> <li>— Try to lower from the step twice as long as it takes to rise up on the step</li> </ul> </li> <li>• Agility: <ul style="list-style-type: none"> <li>— Figure 8's – daily <ul style="list-style-type: none"> <li>⇒ 5 minutes ½ speed, tighten circle size</li> </ul> </li> <li>— Shuttle runs – daily <ul style="list-style-type: none"> <li>⇒ 5 minutes ½ speed, repeat 10-12 repetitions</li> </ul> </li> <li>— Zig-zag running <ul style="list-style-type: none"> <li>⇒ Angle across a distance of 10-15 yards</li> <li>⇒ Then angle back across field to another boundary 10-15 yards apart</li> <li>⇒ Continue for 100 yards</li> <li>⇒ Tighten up as strength/endurance permits</li> </ul> </li> </ul> </li> <li>• Educate patient as to use of a functional brace</li> <li>• Sports on own: <ul style="list-style-type: none"> <li>— Basketball: <ul style="list-style-type: none"> <li>⇒ Shooting baskets only</li> </ul> </li> <li>— Rollerblades <ul style="list-style-type: none"> <li>⇒ Level surfaces</li> <li>⇒ No hills, quick stops, cutting or operative leg crossovers</li> </ul> </li> <li>— Golf <ul style="list-style-type: none"> <li>⇒ 9 holes</li> <li>⇒ Avoid fatigue</li> </ul> </li> </ul> </li> <li>• Provider refer to isokinetic testing</li> </ul>	
<b>Phase VI</b> Full Rehabilitation	<b>Therapy:</b> <ul style="list-style-type: none"> <li>• No competitive or pivot sports until cleared by surgeon</li> </ul>	<b>Goals:</b> <ul style="list-style-type: none"> <li>• Return to prior level of function</li> </ul>



	<ul style="list-style-type: none"> <li>— When cleared, patient is to use functional brace for 6 months</li> <li>• Full and painless AROM</li> <li>• No patellofemoral joint pain</li> <li>• Gross manual muscle testing strength 90-100% of contralateral side</li> <li>• Pass single leg hop test for distance, single leg squat test and figure eight hop test</li> <li>• Quadriceps/thigh circumference should be within 1 cm of non-operative (if normal) side</li> <li>• Weekly strengthening program — independently (2-3 times/week) <ul style="list-style-type: none"> <li>— Full speed jog/run <ul style="list-style-type: none"> <li>⇒ 20-30 minutes at 6-7 minute/mile or best pace</li> </ul> </li> <li>— Exercise stationary bike <ul style="list-style-type: none"> <li>⇒ Increasing resistance</li> <li>⇒ Set bike so low leg is flexed no more than 10-15° for 20 minutes</li> </ul> </li> <li>— Continue quad sets, SLR's (300 repetitions/day)</li> <li>— Hills/stairs <ul style="list-style-type: none"> <li>⇒ Running up hills and stairs can be utilized to help build muscle mass and strength</li> <li>⇒ Care should be taken running downhill and down steps <ul style="list-style-type: none"> <li>(1) This can irritate the knee and should be one of the last exercises added to the workout program</li> </ul> </li> </ul> </li> </ul> </li> <li>• Return to play testing if returning to sport: <ul style="list-style-type: none"> <li>— Completion of single leg hop test and triple hop test</li> <li>— Drop down jump test</li> <li>— Non-contact practice → full practice → full play</li> </ul> </li> </ul>	<p><b>Return to Sport:</b></p> <ul style="list-style-type: none"> <li>• Pass return to play testing: <ul style="list-style-type: none"> <li>— Physician approval</li> <li>— Full ROM</li> <li>— No pain or swelling</li> <li>— Normal running</li> <li>— Adequate drop jump mechanics</li> <li>— Adequate lateral shuffle mechanics</li> <li>— Adequate cutting mechanics</li> </ul> </li> </ul>
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