

## REHABILITATION GUIDELINES: BEAR IMPLANT FOR ACL REPAIR

### PHASE I (0-4 WEEKS)

DATES:

Appointments	<ul style="list-style-type: none"> <li>Physical therapy 2-3x/week, beginning 2-5 days post-op</li> </ul>
Rehabilitation Goals	<ul style="list-style-type: none"> <li>Edema control (Ice/elevate)</li> <li>Slow progression of knee ROM</li> <li>Quad re-education (BFR and NMES)</li> <li>Protect repair</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>Gait: PWB 50% with crutches and brace on and locked to 0 degrees x 4 weeks</li> <li>ROM Progression: 0-45 degrees at 0-2 weeks, 0-90 degrees at 2-4 weeks</li> <li>Sleep with brace on and locked at 0 degrees x 6 weeks</li> <li>No Scar massage until 6 weeks post-op</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>Passive knee extension stretching towel under ankle (no prone extension hang until 4 weeks post-op)</li> <li>Supine, seated heel slides for knee ROM within protocol limitations</li> <li>Quad set, SAQ once 0-45 degrees has been optioned is ok, SLR, avoid open chain ex's with any resistance, BFR and NMES ex's encouraged</li> <li>Patellar mobility</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>Seated UBE arm bike</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>4 weeks post op</li> </ul>

### PHASE II (4-7 WEEKS)

DATES:

Appointments	Continue physical therapy 2x/week
Rehabilitation Goals	<ul style="list-style-type: none"> <li>Full knee extension</li> </ul>

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	<ul style="list-style-type: none"> <li>• Good quad contraction</li> <li>• Flexion ROM &gt;90</li> <li>• Minimize pain and swelling</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• Wear brace except for sleeping, exercises</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• Prone knee extension stretch can be added to extension stretching</li> <li>• Continue with patellar mobility all planes</li> <li>• Continue with quad strength/activation (quad sets, add SLR if no extension lag present, LAQ 0-90)</li> <li>• Initiate closed kinetic chain ex's with step-ups, stair reciprocal training, mini-squats, as allowed per protocol with ROM and brace use.</li> <li>• Gait training progressing to normal heel-to-toe with brace unlocked 0-90</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>• Seated UBE arm-bike</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>• 7 weeks post op</li> <li>• 0-90 ROM</li> </ul>

### PHASE III (7 WEEKS – 12 WEEKS)

DATES:

Appointments	Continue physical therapy 2x/week as indicated
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Minimize pain and swelling</li> <li>• Full knee extension ROM</li> <li>• Good quad control (able to do 20 SLR with no extension lag)</li> <li>• Normal gait pattern</li> </ul>
(Phase III continued) Precautions	<ul style="list-style-type: none"> <li>• 0-110 degrees AROM by week 7, then ROM to full</li> <li>• Change from Hinged knee brace to ACL brace when ROM &gt; 110 degrees.</li> <li>• ACL brace worn during walking and all weight bearing/CKC ex's x 12 weeks</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• SLR with no extension lag</li> <li>• Bilateral squats</li> <li>• HS curls</li> <li>• Open/closed chain proximal hip strength ex's</li> <li>• Calf raises</li> <li>• Reciprocal stair training (step up/down)</li> <li>• Water jogging ok in pool starting at 8 weeks post-op</li> </ul>

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Cardiovascular Exercises	<ul style="list-style-type: none"> <li>• Bike (no resistance) ROM</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>• Ability to do 20 SLR with no extension lag</li> <li>• Normal gait</li> <li>• Full extension and at least 90 degrees knee flexion ROM</li> <li>• Quad index 60-80%</li> <li>• Minimum of 12 weeks post op</li> </ul>

### PHASE IV (12 TO 20 WEEKS)

DATES:

Appointments	Continue physical Therapy 2x per week
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Full ROM</li> <li>• Strength progression</li> <li>• Progress proprioception and Balance</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• Return to running may start at week 18 if ok by surgeon</li> <li>• No pivot/cutting motions</li> <li>• No plyometrics until 20 weeks post-op</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• Closed Kinetic Chain strength as focus progressing from bilateral to single leg (squats, lunges, step up/down)</li> <li>• Single leg strength progression including single leg balance</li> <li>• Leg press</li> <li>• Proximal hip/core strength progressing from double leg to single leg</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>• Bike</li> <li>• Swimming with flutter kick only can start at 12 weeks</li> <li>• Walk/hiking</li> <li>• Running may start at 18 weeks if cleared by surgeon</li> <li>• Transition to straight line running on treadmill (zero gravity or standard treadmill) or in a protected environment after clearance by operating surgeon and quad QI ≥80%, zero eusion and full ROM, otherwise, hold o on straight line running until Phase 5</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>• Full ROM</li> <li>• Functional strength and control in daily activities (QI &gt; 80% LSI)</li> <li>• Minimum of 20 weeks post op</li> </ul>

### PHASE V (20 TO 30 WEEKS MONTHS)

DATES:

Appointments	Continue physical therapy 1-2 visits per week
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Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Able to maintain full ROM</li> <li>• Able to complete a running program</li> <li>• Return to pain free running</li> <li>• Plyometric training without pain or instability</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• No cutting or pivot motions</li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• Continue with double leg and single leg closed kinetic chain strength</li> <li>• Begin double leg progressing to single leg plyometrics</li> <li>• Continue with proprioception and balance progressing to single leg</li> <li>• Double leg jumping progression to hopping as tolerated</li> </ul>
Cardiovascular Exercises	<ul style="list-style-type: none"> <li>• <b>Running (no cutting or pivot) and biking</b></li> <li>• <b>Begin or continue running progression on treadmill or in protected environment after clearance by operating surgeon and QI = 80%, to trace eusion and full ROM</b></li> <li>• <b>NO cutting or pivoting</b></li> <li>• <b>All other cardiopulmonary equipment</b></li> </ul>
Progression Criteria (Return to Sport)	<ul style="list-style-type: none"> <li>• Running without pain or swelling</li> <li>• Able to hold single leg balance for at least 1 minute</li> <li>• 50% hop height on operated leg compared to non-operated leg (hop test in brace)</li> <li>• QI &gt; 80% LSI</li> <li>• Minimum of 30 weeks post op</li> </ul>

### PHASE VI (30 TO 36 WEEKS)

DATES:

Appointments	Continue physical therapy 1 visit per week
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• Running patterns (Figure-8, pivot drills, etc.) at 75% speed without difficulty</li> <li>• Jumping without difficulty</li> <li>• Hop tests at 85% contralateral values (Cincinnati hop tests: single-leg hop for distance, triple-hop for distance, crossover hop for distance, 6-meter timed hop)</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• <b>Return to sport given before cleared by surgeon for cutting sports</b></li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• Continue single leg closed kinetic chain strength</li> <li>• Continue with single leg plyometrics</li> <li>• Agility training with change of direction, cutting, and pivot training</li> <li>• Sport specific training</li> </ul>

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Agility Drills	<ul style="list-style-type: none"> <li>• Shuffling</li> <li>• Hopping</li> <li>• Cariocas</li> <li>• Vertical jumps</li> <li>• Running patterns at 50 to 75% speed</li> <li>• Initial sports specific drill patterns at 50 to 75% effort</li> </ul>
Progression Criteria	<ul style="list-style-type: none"> <li>• Maximum vertical jump without pain or instability</li> <li>• 85% of contralateral on hop tests</li> <li>• Run at 85% speed without difficulty</li> <li>• IKDC Question #10 (Global Rating of Knee Function) score of <math>\geq 8</math></li> <li>• Completion of functional hop testing showing 85% function and clearance by operating surgeon</li> <li>• QI 85% LSI</li> </ul>

### PHASE VII (36 TO 52 WEEKS)

DATES:

Appointments	Continue physical therapy 1-2 visits per week
Rehabilitation Goals	<ul style="list-style-type: none"> <li>• 90% contralateral quad strength</li> <li>• 90% contralateral on hop tests</li> <li>• Sport specific training without pain, swelling or difficulty</li> </ul>
Precautions	<ul style="list-style-type: none"> <li>• <b>Return to sport given before cleared by surgeon for cutting sports</b></li> </ul>
Suggested Therapeutic Exercises	<ul style="list-style-type: none"> <li>• Continue with double leg and single leg closed kinetic chain strength</li> <li>• Begin double leg progressing to single leg plyometrics</li> <li>• Continue with proprioception and balance progression</li> </ul>
Sport Specific Activities	<ul style="list-style-type: none"> <li>• Interval training programs</li> <li>• Running patterns in football</li> <li>• Sprinting</li> <li>• Change of direction</li> <li>• Pivot and drive-in basketball • Kicking in soccer</li> <li>• Spiking in volleyball</li> <li>• Skill/biomechanical analysis with coaches and sports medicine team</li> </ul>
Return to Sport Evaluation Recommendations	<ul style="list-style-type: none"> <li>• Balance test: Single leg balance for 60 seconds without touchdown for each leg</li> <li>• Single leg squat: Get to 60° of flexion, able to do without IR at the hip or valgus at the knee</li> <li>• Hop tests (single leg hop for distance) to be 95% of contralateral side</li> <li>• QI <math>\geq 90\%</math></li> </ul>

## REHABILITATION GUIDELINES FOR ACL WITH QUAD TENDON AUTOGRAFT

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