



ACL Reconstruction

Post-Operative Rehabilitation Protocol

0-2 weeks

- WBAT with brace locked in extension
- Discontinue crutches when gait is non-antalgic
- ROM: 0-90° with emphasis on full extension
- Patella mobilization
- SLR supine with brace locked at 0 degrees
- Quad Sets with brace locked at 0 degrees
- Ankle Pumps
- Short crank (90mm) ergometry

2-6 weeks

- Can discontinue brace between 3-4 weeks once quad control is good
- ROM: 0-125 degrees (maintain full extension)
- Active knee extension from 40 degrees
- Standard (170 mm) ergometry (if ROM >115°)
- Leg press (80-0 degree arc)
- Mini squats/weight shifts
- Proprioception training
- Initiate Step Up program

6-14 weeks

- Progressive Squat program
- Initiate Step Down program
- Leg press, lunges
- Isotonic knee extensions (90-40 degrees, close chain preferred)
- Agility exercises (sport cord)
- Versa climber/Nordic track
- Retrograde treadmill ambulation

14-22 weeks

- Begin forward running (treadmill) program when 8" step down satisfactory
- Continue strengthening and flexibility program
- Advance sports-specific agility drills
- Start plyometric program

Weight Bearing Status

WBAT

Brace Settings

Locked straight x 2 weeks when ambulating or sleeping. Otherwise open brace once good quad control

ROM Restrictions

Full PROM beginning POD 1



>22 weeks

- Running progression
- Agility exercises
- Multidirectional motions
- Functional sports test



Exercise	Week														
	1	2	3	4	5	6	7	8	9	10	12	16	20	24	
Initial Exercises:															
ROM Goals	0-90°		0-125°			Progress to full									
Flexion/extension, heel slides	[Green bar from Day 1 to Day 12]														
Flexion/extension- seated	[Green bar from Day 7 to Day 14]														
Patella/Tendon mobilization	[Green bar from Day 1 to Day 9]														
Quad Series	[Green bar from Day 1 to Day 9]														
Hamstring Sets	[Green bar from Day 3 to Day 24]														
Sit and Reach for Hamstrings	[Green bar from Day 3 to Day 9]														
Ankle Pumps	[Green bar from Day 1 to Day 7]														
Crutch weaning	WBAT														
Heel prop knee extension stretch	[Green bar from Day 1 to Day 7]														
SLR (w/ brace until quad control restored)	[Green bar from Day 1 to Day 7]														
Toe Raises	[Green bar from Day 3 to Day 7]														
Weight-bearing Strength Exercises:															
Double Knee Bends	[Green bar from Day 3 to Day 24]														
Double Leg Bridges	[Green bar from Day 3 to Day 16]														
Reverse Lunge, static holds	[Green bar from Day 6 to Day 16]														
Beginning cord exercises	[Green bar from Day 8 to Day 18]														
Balance Squats	[Green bar from Day 6 to Day 24]														
Single Leg Dead Lift	[Green bar from Day 8 to Day 24]														
Leg Press (80-0° arc)	[Green bar from Day 3 to Day 18]														
Sports Test Exercises	[Green bar from Day 16 to Day 24]														
Cardiovascular Exercises:															
Bike with both legs-no resistance	[Green bar from Day 2 to Day 5]														
Bike with both legs- resistance	[Green bar from Day 3 to Day 24]														
Aqua jogging	[Green bar from Day 10 to Day 24]														
Treadmill-walking 7% incline	[Green bar from Day 8 to Day 24]														
Swimming with fins-light flutter kick	[Green bar from Day 8 to Day 24]														
Elliptical Trainer	[Green bar from Day 10 to Day 24]														
Rowing	[Green bar from Day 10 to Day 24]														
Stair stepper	[Green bar from Day 16 to Day 24]														
Agility Exercises:															
Running Progression	[Green bar from Day 16 to Day 24]														
Initial-Single Plane	[Green bar from Day 18 to Day 24]														
Advance-Multi Directional	[Green bar from Day 20 to Day 24]														
Functional Sports Test	[Green bar from Day 20 to Day 24]														
High Level Activities:															
Golf Progression	[Green bar from Day 20 to Day 24]														
Outdoor biking, hiking, running	[Green bar from Day 20 to Day 24]														
Return to Full Sport at 9 months post-op	[Green bar from Day 20 to Day 24]														

Adapted from post-operative protocol created by Howard Head Physical Therapy, Jill Monson, PT, OCS and Jon Schoenecker, PT, OCS, CSCS



Quad Series:

- Quad sets (5 sec hold) also quick contractions (NMES to supplement)
- Prone quad sets
- SLR with no extension leg
- Progression of Quad Strengthening (2-6 weeks)
 - LAQ in safe range -no added resistance to begin
 - Once weight bearing tandem stance TKE with 5 sec hold
 - Isometric wall sit
 - SLR with resistance
 - Step up progression
 - Squat progression
 - Leg press progression
 - Lunge progression

Hamstring Series:

- Hamstring stretching (supine/prone)
- Hamstring set (heel dig)- contract hamstring with knee flexed pressing heel into the floor (5 sec hold)
- Hamstring curls
- Progress to resisted hamstring curl

Sport test exercises:

- Goals: impact training and introduction of directional drills (initiate between 20-24 weeks)
- Double leg squat jumps
- Box jumps
- Speed skaters
- Double leg jumps for height and distance progress to single leg as tolerated
- Blaze pod change of direction drills

Further Clarifications and Considerations:

- Double Knee Bends: feet shoulder width apart, bend knees to 30°, keeping knees behind the toes.
- Cord exercises (resistance band/cord): resisted double knee bends, resisted hamstring curls
- May begin to implement BFR as early as 1 week into post-op period
- Functional Sports Test: Baseline completed around 7 months post-op with subsequent test at 9 months



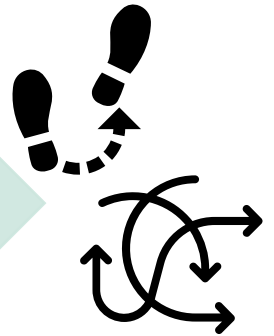
Return to Running Criteria

- Trace effusion, flexion within 5 degrees of contralateral side
- LSI on anterior reach Y balance test $\geq 90\%$
- LSI on quadriceps torque output on isometric measurement $\geq 75\%$
- 12" SL squat tolerance
- Able to walk > 1 mile with no limping or pain
- Able to "hop" with UE assist on operative leg 5 times without pain or compensation
- SL balance with eyes closed 30 seconds without loss of balance



Return to Agility/Change of Direction Criteria

- Return to running criteria listed above met
- No effusion
- Full ROM
- Quad LSI on isokinetic $\geq 85\%$
- Hamstring LSI on isokinetic $\geq 85\%$
- LSI on anterior reach Y-balance $\geq 95\%$
- SL hopping pain-free and effusion free



Return to Sport Criteria

- In order to test must demonstrate full AROM, no pain, no/trace effusion, 5/5 strength, negative lachman and pivot shift, LSI $\geq 95\%$ hamstring curl and leg press
- Quadricep strength $\geq 95\%$ of contralateral side (< 2 cm of atrophy)
- Able to perform single leg squat with correct form
- LSI SL hop $\geq 95\%$
- Y-Balance $\geq 95\%$ (mean of 3 trials in anterior, posterolateral, posteromedial /100)
- Vertical jump test, single leg hop distance, and timed single leg hop over 20 -feet $\geq 90\%$ of contralateral side

