

Timeline 12-16 weeks

Goals: Sport specific cardio fitness
Sport specific quad and hamstring strength
Sport specific proprioception training
Continue with flexibility and strength of lower extremity

Cardio: Treadmill jog-> run
Land jogging forward without cutting
Stationary jog against bungy cord resistance
Pool running
Bike standing with interval training
Mini tramp jumping 2->1 leg

Strength:

Quads/Hams: continue with CKC progressions - increasing weight, bungy cord eccentrics - reverse lunges with variable speed, shuttle kick backs, high steps, lunge walking fwd/bkwd, split squats, ham curls all with emphasis on endurance, progress to pool plyometrics deep water ->shallow water

Balance/Proprioception: mini-tramp jump and land, 2 ->1 leg balance with upper body or opposite leg skill i.e., throwing on rebounder, phantom kicking with bungy cord resistance, throwing/passing drills, single leg balance clock drill with mini pylons

Timeline 16-20 weeks

NB. Your physical therapist may decide to perform a Cybex test on you at week 16 or later to help define your specific strengths deficits i.e., strength, power, endurance in hamstrings and quads and the balance between the two muscle groups. This can redefine some specific goals for you to work on the next 8 weeks.

Goals: Progress sport specific lower extremity strengthening to plyometrics
Increasing strength, power and endurance of lower extremity muscles
Increase sport specific proprioception training
Increase specific cardio fitness

Strength:

Quads/Hams: if concentric/eccentric strength is adequate, gradually add on plyometrics on land, 2->1 foot progressions – diagonal lunges or running with bungy cord around waist incorporating upper or lower body skill i.e., kicking, jumping, catching, passing, shooting, 2 leg fwd/back/side hops, 4 square hops, 2 square diagonal hops -> progress to single leg, rebounder – jumping, jump & land, shuttle – ski hops (side to side), jumping 2-> alternating->1 leg, hopping, skipping,

bounding, cutting, box hops 2-4-6" side to side, front to back, jumpdown with fwd sprint, diagonal/lateral cone jumps.

Balance/Proprioception: Continue with sport specific drills as outlined above, cutting drills with quick stopping and maintaining balance

Cardio: Increase distance, duration or intensity with bike, stairmaster, treadmill, outdoor running or cycling depending on the demands of your particular sport. Add on tight turns and hills as tolerated.

Timeline 20-24 weeks

Goals: Back to sport practice for upper body skills
Functional testing in clinic to determine return to sport skills on own at practice
Continue with sport specific proprioception training
Continue with specific cardio fitness

Practice Drill Ideas:

Straight forward and backward running
Figure 8s gradually decreasing in size
Zig-Zag running
Cross over stepping
Backward with cutting
Stop and go drills

Functional Testing in Clinic:

Lunge walk with control both forward and backward
Forward hop and lateral hop with control with comparable distances L and R side
One foot hopping with control
Triple jump and landing with control with comparable distances L and R side
Sport specific demands with adequate skill, speed and control

Bracing: The use of braces is controversial. Dr Coolican will occasionally recommend a brace when other ligaments are involved but most isolated anterior cruciate reconstructions do not require bracing to return to sport. Please discuss this with our Physiotherapist and Dr Coolican.

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ACL Reconstruction Rehabilitation Protocol

CKC:	Closed Kinetic Chain; exercise with the foot in contact with a surface, ie: leg press, squats, lunge
Concentric:	the muscle is shortening while it is contracting ('positive contraction')
Cybex Test:	strength testing machine that can measure force, work, and power of muscle groups.
Eccentric:	the muscle is lengthening while it is contracting ('negative contraction')
Extension:	straightening
Flexion:	bending
FWB:	Full Weight Bearing
Hamstrings:	muscles in the back of the thigh
Isometrics:	tightening/contracting of a muscle without movement of the leg
OKC:	Open Kinetic Chain; exercise when the lower leg is moving freely ie: leg extension
Plyometrics:	exercises that enable a group of muscles to reach a maximum strength in as short a time as possible. It tries to bridge the gap between speed and strength training.
Prone:	lying on your stomach
Quadriceps:	muscles on the front of the thigh
ROM:	Range of Motion; amount of bending and straightening of the knee
Supine:	lying on your back

Timeline 0-2 weeks

After leaving hospital you will not have any formal physiotherapy visit until the 2 week mark. However, there are a number of goals and activities within this period.

Goals: Gradually restore a normal gait, reduce swelling with ice, achieve flexion to 90° and avoid open kinetic chair activities. Maintain flexibility of lower extremity with activities of daily living, including walking around your home and outside as pain and swelling allow. Continue with quadriceps and hamstring, hip and calf strengthening exercises that you have been taught in hospital.

Gait: You may weight-bear as tolerated and dispense with both the brace and crutches as confidence allows. Generally speaking, you should be able to walk normally, without a limp before dispensing with crutches.

ROM: Heel slides
Prone leg hangs
Ankle pumping

Modalities: Ice
No heat

Flexibility: Calf stretches seated with towel
Seated hamstring stretches
Supine hip flexor stretches

Balance/Proprioception: 1 foot standing 30-60 seconds with eyes open progressing to closed.

Timeline 3-6 weeks

Goals: Achieve near or full flexion and extension
Continue flexibility exercises
Normal FWB gait
Maintain cardiovascular fitness
Continue strengthening hams, quads, hip, calves
Add on balance/proprioception

ROM: Continue as outlined
Pool - walking, squats, knee flexion, step-ups & downs

Flexibility: Continue as outlined

Gait: Normalize to full weight bearing

Cardio: Bike, Stairmaster, Pool: swim/jog (no whip kick)

Strength:

Quads: step ups 4-6-8" step fwd/lateral, ½ wall squats, shuttle leg press 2->1 leg, bungee lunge, squats with pulleys

Hams: seated chair walking, standing knee flexion with weight/pulleys, seated knee flexion with bungee cord, seated ham curls, reverse stairmaster

Hip: standing abduction/adduction/extension with pulleys/tubing

Calves: heel drops, shuttle drops, mini-tramp bouncing, single heel raises

Balance/Proprioception: standing 1 foot eyes closed -> balance board, wobble board

Timeline 6-9 weeks

NB: Graft is at the weakest point now.
Avoid OKC exercises

Reasons why open kinetic chain (OKC) exercises (ie: leg extensions especially with weight) are contraindicated after ACL reconstruction:

- When the quadricep muscle contracts with the above exercises, the lower leg (tibia) is pulled forward (shears) in relation to the upper leg (femur).
- This shear directly stresses the reconstructed ACL graft.
- It is believed that these shearing forces may lead to stretching of the ACL graft that may result in increased laxity.
- Shearing is minimized if the force is maintained down the whole leg during muscle contraction (i.e., foot is fixed), and therefore CKC exercises are recommended.

Goals: Full pain free ROM Increase cardio fitness
Continue to strengthen hip and calves
Intermediate proprioception
Functional quads strength
Concentric-eccentric hams strength

Cardio: Bike, fitter, stairmaster, swim (flutter kick only), pool, jogging, treadmill power walking

Strength:

Quads: stairmaster fwd/bkwd, bungee lunge in different directions, clock face lunges, squats with pulleys increasing weight

Hams: backward walking, ham curls progress concentric - eccentric

Hip: increase weight standing abduction/ adduction/ extension with pulleys/tubing, tubing kick backs, fitter

Calves: as above with an increase in weight

Balance/Proprioception: balance board progressions, wobble board progressions, trampoline balance

Timeline 9-12 weeks

Goals: Progress quad and hamstring strength
Progress proprioception
Sport specific cardio fitness

Cardio: Add treadmill quick walk +/- gradient ->slow jog
Stationary jog against bungee cord resistance
Pool running
Bike and stairmaster interval training

Strength:

Quads: continue with CKC progressions, lunge walking forward/backward aggressive pool exercises, bungee cord eccentrics - reverse lunges

Hams: increase weight with pulley ham curls prone and standing – emphasis on full range(90-130)- focus on eccentric component – strength (high load, low rep) and endurance (low load, high rep), shuttle –

kneeling hip/knee extension, Hydrifitness – hamstrings only

Hip: slider, skating machine, fitter, pulleys/tubing with increased weight,

Calves: eccentric heel drops 2->1 leg, eccentric toe press 2->1 leg

Balance/Proprioception: mini-tramp balance -> eyes open->closed