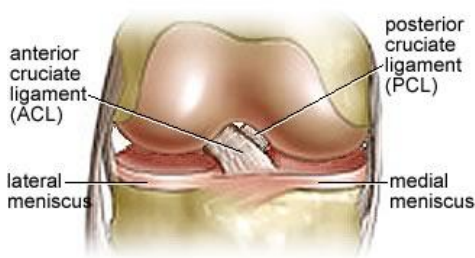
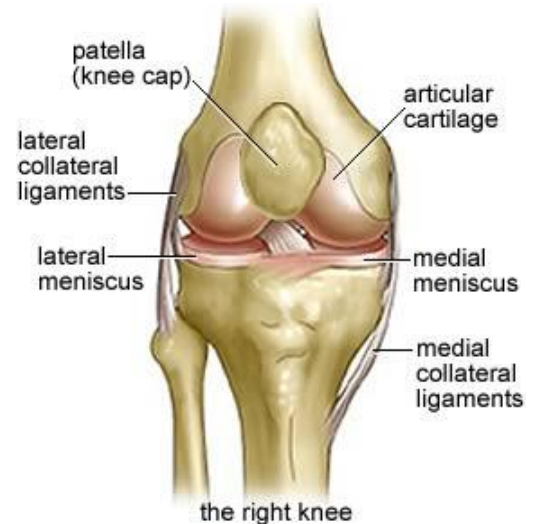


LMC Anterior Cruciate Ligament Reconstruction Rehabilitation Programme

Anterior Cruciate Ligament (ACL) tears are relatively common among sportspeople. They can occur in isolation or in combination with associated injuries particularly to the Meniscal and Articular cartilage and or the Medial Cruciate Ligament (MCL).

The Majority of ACL tears occur in a non-contact situation when the athlete is landing from a jump, pivoting or decelerating suddenly. Most ACL tears are extremely painful and accompanied with an audible 'pop' or 'crack' with a feeling of 'something going out and then going back in' and in most cases the athlete will be unable to continue their activity. **The best time to examine a suspected ACL tear is within 1hr of sustaining the injury** after this time swelling and intense pain will make thorough assessment very difficult for several days. The R.I.C.E. (see LMC acute injury advice) protocol will limit swelling and improve recovery prospects. If an ACL tear is suspected an X-ray should be sought to rule out secondary fractures.



Rehabilitation after an ACL Reconstruction

Rehabilitation must start from the time of the injury, not from the time of the surgery. Pre-operative treatment aims to reduce pain, swelling and inflammation within the joint to reduce the build up of scar tissue which will compromise future function. The athlete should immediately begin strengthening all the muscles associated

with the knee and hip as well as range of motion exercises. NB these exercises should be pain free, expert advice should be sought.

Weight bearing advice will be given by the surgeon based on the extent of associated injuries. Typically, in the case of an isolated ACL reconstruction, full weight bearing will be achieved within 2 weeks.

Reconstruction will generally be via a patellar tendon or hamstring tendon graft. The method chosen will slightly vary the rehabilitation programme to strengthen the area from where the graft has been taken. The LMC ACL rehabilitation programme is a generic programme which should only be completed with expert guidance. Each patient will respond differently, times are given as a guideline. Signs and symptoms around the knee should be monitored following each workout and cold compress applied if inflammation or swelling is present.

The timing of return to sport is variable. In most cases a six month target is given as an initial guideline. Functional agility tests should be used to assess readiness to return.

Phase	Goal of Phase	Time post Surgery	Treatment	Exercise programme	Functional Activity
Prehabilitation (preoperative)	Minimise swelling. Restore ROM (particularly extension). Maintain lower limb strength & muscle bulk.	N/A	Ice Massage. Compression. Manual Therapy. Exercise (modification & supervision)	Dependent on ability. Follow phase 1 and progress to phase 2 if appropriate.	Walking. Bike riding. Swimming (light kick no push off or breaststroke)
Phase 1	PWB – FWB Eliminate Swelling 0-100° ROM 70-80% Quadriceps strength. 80-90% Hamstring Strength.	0-2 Weeks	Ice Massage Compression Manual Therapy. Gait Re-education. Patient Education.	Gentle Flexion ROM. Extension ROM to 0° Quadricep setting. Supported (bilateral) calf raises. Hip abduction & extension. Hamstring pulleys/rubbers. Gait Drills.	Nil
Phase 2	No Swelling. Full knee hyperextension. Knee flexion to 130°+ Full Squat Good balance & control. Unrestricted walking.	2-12 Weeks	Ice Massage. Compression. Manual Therapy. Gait Re-education. Exercise (modification)	ROM drills Quadricep setting. Mini squats & lunges. Leg press (double then single) Hip abduction & extension. Single leg calf raises. Gait & balance drills	Walking Exercise bike

Phase	Goal of Phase	Time post Surgery	Treatment	Exercise programme	Functional Activity
Phase 3	Full ROM Full Strength & Power. Return to jogging, running, and agility.	3-6 Months	Manual Therapy Exercise (modification and supervision)	As above-increased difficulty, reps and weight as appropriate. Jump and land drills Agility Drills	Straight Line jogging. Swimming (light kick). Road Bike. Progressing to sport specific running (progressively sequenced eg Running forwards, sideways, backwards, Sprinting, jumping, hopping, changing directions, kicking)
Phase 4	Return to sport	6-12 Months	As above	High-level sport specific strengthening as required.	Progressive return to sport (eg restricted training, unrestricted training, match play, competitive match play)

Return to Sport

Functional Agility Tests

Standing Vertical Jump

Jump as high as possible. Take off and landing should be pain free and controlled with symmetrical movement.

Heiden Hop

Jump as far as possible from the uninjured leg, landing on the injured leg. The landing should be solid with no over step and good distance achieved.

Strength Tests

Quadricep strength should be at least 90% of the un-injured leg. Hamstring strength should be 100%.

Bracing

The use of a brace on return to sport is not necessary but may help confidence.

The use of a functional brace in the later stages of rehabilitation and return to sport has not been shown to be helpful.^{1,2}

There is some evidence that wearing a neoprene compression sleeve is beneficial after ACL reconstruction.³

¹ McDevitt ER, Taylor DC, Miller MD, et al. Functional bracing after anterior Cruciate ligament reconstruction: a prospective, randomised, multi-center study. *AM J Sports Med* 2004;32: 1887-1992

² Risberg MA, Holm I Steen H, et al. The affect of knee bracing after anterior Cruciate reconstruction: a prospective, randomised study with 2 years' follow up. *Am J Sports Med* 1999;27: 76-83

³ Kuster MS, Grob K, Kuster M et al The benefits of wearing a compression sleeve after ACL reconstruction. *Med Sci Sports Exerc* 1999; 31(3): 368-71