

Orthopaedic Department

Posterior Cruciate Ligament Reconstruction (PCL)

This information sheet is written as a guide to help with your recovery after PCL reconstruction surgery.

Purpose and description of the procedure

The PCL is the largest ligament in the knee and stops the shin bone (tibia) from moving too far backwards. It is commonly injured by a blow to the front of the upper shin, such as falling onto a bent knee. Hyperextension (over straightening) and hyperflexion (over bending) of the knee can also tear the PCL and it is often torn in high energy injuries, such as falling from a height or in road accidents, that can dislocate the knee.

Not everyone who has a PCL injury will require surgery as milder or partial isolated tears (no other ligaments involved) can heal just with the aid of an appropriate brace and rehabilitation.

Some people experience problems of giving way or a feeling of 'looseness' in the knee after PCL injury and the knee can become painful.

A functional brace can help improve these symptoms and can also help predict if surgery is likely to be helpful. The brace holds the tibia forwards and improves stability. The knee can tolerate some looseness following an injured PCL but symptoms may depend on activity levels (eg sports + occupation) and how well the ligament has healed.

The operation

The operation takes approximately 1½ hours and is mainly an arthroscopic (keyhole) procedure, with some additional small incisions.

Various 'grafts' are used to replace the ligament. There are several options including; your own hamstring tendons that are taken through a small incision just below the joint line; part of your quadriceps

tendon (the tendon just above the knee cap); or donor tendons from a tissue bank.

The new graft is passed through tunnels drilled in the knee and is fixed securely into position, matching the original position of the ruptured ligament.

The wounds are normally closed with stitches or small metal staples that will need to be removed, and the leg is initially covered with a wool and crepe bandage. A special supportive knee brace is applied at the end of the procedure to hold the leg straight. This helps to protect the graft in the early weeks of recovery.

Occasionally reconstruction of the ligaments on the side of the knee is required as well if there is a combined ligament injury.

Expectations and results following surgery.

The success rate for PCL surgery is around 7-8 out of 10 - i.e. achieving good functional stability and return to activity and sport. 2-3 in 10 may still have problems with the knee not feeling tight enough or problems of pain if the joint surfaces are damaged.

Recovery back to playing sport is around 9-12 months and post op rehabilitation physiotherapy is the key.

During the Hospital stay

Surgery involves an overnight stay with discharge home the following afternoon. Immediately after the operation the knee is supported in a splint and the bandages are removed the following morning.

Outpatient physiotherapy

This should start within the first 1 - 2 weeks following surgery and a referral will be made upon discharge. Basic exercises are given to do for this period between discharge and your out-patient physiotherapy appointment.

Post-operative care

Rehabilitation is a slow process as the ligament heals in place. In principle the first phase is regaining movement and reducing swelling,

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the second phase is building strength and this is followed by the functional phase as you get back to activity. We cannot progress from one stage to the next until certain goals are reached and the knee is ready.

Gravity unfortunately works against the ligament and the tibia (shin bone) is always falling backwards, stretching the new ligament. The knee is therefore supported in a special dynamic brace that allows movement whilst actively holding the tibia forward - reducing load on the healing graft. Currently we use the MediUK PCL Dynamic Brace. www.mediuk.co.uk or the Ossur Rebound brace



We follow the detailed rehabilitation program as published by Dr Laprade and his team in Vail USA. (Posterior cruciate ligament tears: functional and postoperative rehabilitation KSSTA journal 2012). Copies of this program are available on request.

In brief the principles are:

- **Weight Bearing:** Partial weight bearing for 6 weeks then build to full weight bearing by 8 weeks.

- **Knee brace:** Initial temporary knee splint brace is replaced by the dynamic PCL brace as soon as the swelling around the knee allows. The brace is worn day and night for 12 weeks and then just during the day for a further 12 weeks. Although the brace is maybe uncomfortable at times to wear for the full 24 week program, the longer the brace is worn the better the outcome will be.
- **Clinic review with surgical team:** Clinic appointments are usually at 2, 6 and 12 weeks, and then at 6 and 9 months, tailored to requirements. Physiotherapy appointments are arranged individually.
- **Further Rehabilitation and progression to sport:** The exact time for return to contact sport must be discussed with the surgeon and is dependent on the type of surgery and the sport.

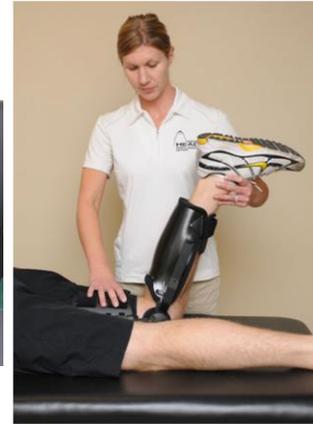
PHASE I (week 0-6)

- Control of swelling and pain with ice treatment and painkillers. Leg elevation when resting.
- Initial knee splint (Medi PTS) applied in theatre – to stay on day and night for two weeks. Splint can be removed for initial movement exercises and washing.
- At two weeks the PTS splint is changed to the dynamic Medi PCL brace. (seen in appliance or out-patient clinic)
- Weight bearing: Partial Weight Bearing while in PTS brace two weeks, Partial Weight Bearing until 6 weeks and aim to be fully weight bearing by 8 weeks with Dynamic Medi PCL brace.
- Dynamic PCL Knee brace worn day and night until 12 weeks (then day time up to 6 months)
- Quadriceps activation exercises with static quads as much as possible
- Flexion (bending) exercises in the first 2 weeks:

Flexion is best achieved by 'side lying assisted passive flexion' (lying on your side and using your hands to help bend your knee) as shown below

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Other options are passive knee flexion while prone lying (on your front) and sitting assisted flexion (again using your hands or other leg to help bend your knee) also shown below.



- Passive knee flexion while prone lying – only with physiotherapist during 2-3 weeks post operatively until dynamic brace applied. Allowed to sit with knee bent to 90, no active hamstring exercises until 6 weeks. Once dynamic brace applied passive flexion as tolerated by patient in sitting (as taught by physiotherapist).
- Range of movement:
 - Weeks 0-2 bend knee as pain allows 2-4 times per day
 - Weeks 2-6 aim to achieve 90 degrees of flexion by 6 weeks. Week 7 onward build to full flexion
- Avoid hyperextension for 12 weeks (i.e. no straightening leg beyond a flat position)
- Maintenance of knee cap movement

PHASE 2 (week 7-12)

- Gradually increase to full weight bearing by week 8
- **Dynamic PCL brace wear day time when walking until 6 months post op. Essential to wear every day and night until 3 months as a minimum, to protect graft. Could be removed after 3 months if absolutely not tolerated but the longer it is worn the better.**

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- Gait education to restore normal walking pattern, wean off crutches as able
- Be able to perform Straight Leg Raise without lag
- Use of electrical stimulation for quadriceps activation as appropriate
- Achieve full range of movement in prone and supine *Important not to be over-aggressive in pushing flexion to protect graft*
- Avoid isolated hamstring exercises until week 12, and then not past 60 degrees of bend
- Static bike with no / low resistance – ensure saddle is high

PHASE 3 (week 13-18)

- Full weight bearing for all activities
- Full passive range of movement
- Proprioception (balance) exercises using balance board and BOSU
- Progress stationary bike with resistance and duration
- Progress muscular strength, power and endurance with open and closed kinetic chain exercises. Focus should be on quadriceps strength

PHASE 4 (week 19 onwards)

- Continue to build strength and single leg endurance – important to emphasize power of calf, thigh and gluteal muscles
- Initiate sports specific drills as appropriate
- Start treadmill work and progress to light jogging
- Able to start swimming but no breast stroke

Preparation for return to sport can be considered at 6 months, pivoting sports such as rugby, basketball, football and skiing may require longer. It is advised 3 months of training is completed prior to return to competitive games, in order to increase confidence and skill.

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Document History

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