

Prehabilitation Programme for an Anterior Cruciate Ligament (ACL) Injury

Patient Information leaflet

Introduction

This booklet is designed to provide information, advice and guidance for your initial rehabilitation following injury to an Anterior Cruciate Ligament (ACL) or prior to an ACL reconstruction.

The exercises should be followed with guidance from a Physiotherapist. It is your responsibility to ensure you are dedicating time to gaining full range of movement and building strength. Pace yourself; if you progress **too early**, you could experience more pain, swelling or reduction in function.

What are the benefits of rehabilitation before surgery?

Your knee will recover better and quicker if you partake in rehabilitation. Rehabilitation will also reduce your knee pain and swelling and increase function, making your day to day life easier.

What are the goals of rehabilitation before surgery?

- To reduce pain and swelling of the knee
- To gain full movement of the knee
- To gain full strength and stability around your knee, hip and ankle
- To improve proprioception (awareness of your joint position in space) and balance
- To walk without a limp.

If it is too painful to walk without a limp, crutches are recommended. Please contact RUH physiotherapy if you need these. This [link](#) gives advice on how to use crutches. If you are viewing this on a printed document and cannot access the link, please use the web address on the final page of this leaflet.

Exercise programme

Before starting the strengthening exercises, you need to have achieved full movement of your knee. If you do not have full movement, you should complete range of movement exercises 4-5 times per day.

1) Exercises to regain movement

Full knee movement is vital for your recovery. The exercises to increase your knee movement may cause some discomfort.

Repeat 10 times, 2-3 times daily, or as pain allows.

Knee Straightening (extension)



With your ankle resting on a rolled up towel/ similar, pull your ankle towards you and push your knees against the bed or floor tensing your thigh muscles. Hold for 5 seconds before relaxing.

Knee Bend (flexion)



Resting on the floor or on a bed, bend the affected leg as far as possible, holding for 5 seconds and relax. To further increase the movement, use your hand to assist it back.



Use your opposite leg to ensure you are bending both knees equally.

2) Strengthening exercises

It is important that you strengthen your main muscle groups (quadriceps, hamstrings, gluteals, calves). Ideally, both of your legs should have the same muscle power.

Be aware of pain: soreness during the exercise is quite normal but you **should not have increased pain the next day**. If this is the case, **reduce the amount of exercise you do**.

Aim for 3 sets x 8-12 reps or until the muscle is exercised to light fatigue.

Complete 2-3 times weekly

Quadriceps strengthening – Stage 1

Inner Range Quads [\(video link\)](#)

Lying on your back, place a firm cushion or rolled up towel under your affected leg. Lift the lower part of your leg so that your heel lifts off the bed. Hold for 5 seconds before relaxing. Complete the exercise until the thigh muscle lightly fatigues.



Straight Leg Raise [\(video link\)](#)

Lying on your back, straighten your affected leg and pull your toes towards you and lift your leg to about 15cm above the bed, hold for a second then relax. Complete the exercise until the thigh muscle fatigues.

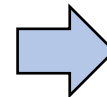


Quadriceps strengthening – Stage 2

Lunge progressing to Split

Lunge [\(Video link\)](#)

Stand with legs shoulder width apart. Take a large step forward keeping your trailing leg straight. Bend forward knee to 90 degrees, then step back in one movement to start position.



During the exercise **keep your knee aligned over your second toe**. To progress from the same starting position lunge forward and bend both legs to 90 degrees, keeping weight equally distributed. To progress, use hand held weights. During the exercise **keep your knee aligned over your second toe**.

Quadriceps strengthening – Stage 3

Single Leg Sit to Stand

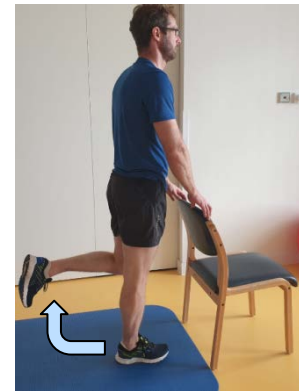
Sitting in a tall chair, have your affected leg bent to 90 degrees and your unaffected leg straight in front of you. Place all your weight through the affected leg as you do a sit to stand. From standing, slowly lower yourself down into the chair. During the exercise **keep your knee aligned over your second toe**. To increase the difficulty further use a lower chair or hold weights (aim for 20 reps).



Hamstring strengthening – Stage 1

Standing Hamstring Curls [\(Video link\)](#)

Stand holding onto a support, keep your knees together. Bend your affected knee towards your buttocks as far as it will go and hold for 5 seconds. Add in an ankle weight or resistance band to increase the difficulty.



Hamstring strengthening – Stage 2

Double / Single Leg Bridge [\(video link\)](#)

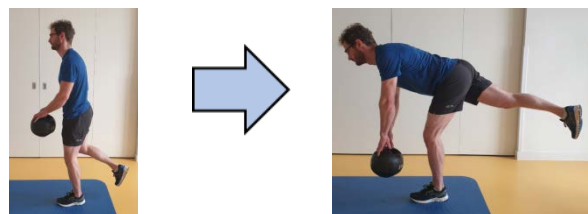


Lying on your back with feet flat on the floor and knees bent. Gently squeeze your stomach and buttock muscles and push through your heels to lift your bottom off the floor. Ensure your hips are level and return to starting position. To make this harder, straighten your affected leg and lift in the air, in line with the other knee, keeping pelvis in line.

Hamstring strengthening – Stage 3

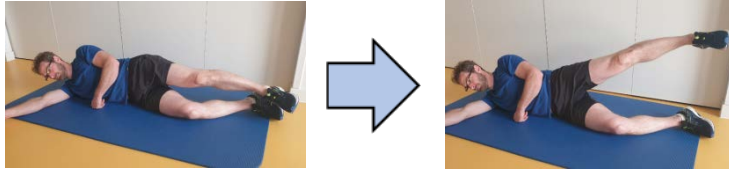
Single Leg Romanian Deadlifts

[\(Video link\)](#)



Stand on the affected leg, holding a weight at hip level in both hands. Straighten the unaffected leg and gently move it behind you until it is in line with your spine, as you bend forwards so the weight is just above the floor. Gently squeeze your bottom muscles and return to the upright position.

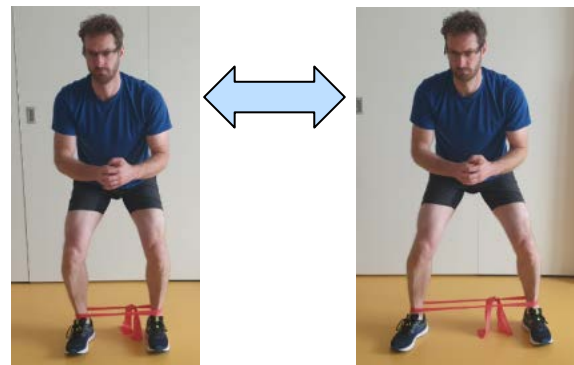
Gluteal strengthening – Stage 1
Side Lie Hip Abductions ([video link](#))



Lie on your unaffected side, bend slightly forward at the hips. Roll slightly forward. With your top leg straight, lift and hold leg to level with the hip for 5 seconds without rotating your pelvis. Slowly lower back down and then repeat. Progression: Add a resistance band between legs/ use ankle weight.

Gluteal strengthening – Stage 2
Crab Walks ([video link](#))

In a mini squat position with feet shoulder width apart, walk sideways 5metres whilst maintaining the mini squat. Maintain the shoulder width distance between your feet. When you have done 5metres in one direction, go in the other direction and repeat to fatigue.



Progression: Increase step length, add a resistance band to your ankles, making sure you keep the resistance on the band as you walk sideways.

Gluteal strengthening – Stage 3
Forward Step Ups ([Video link](#))

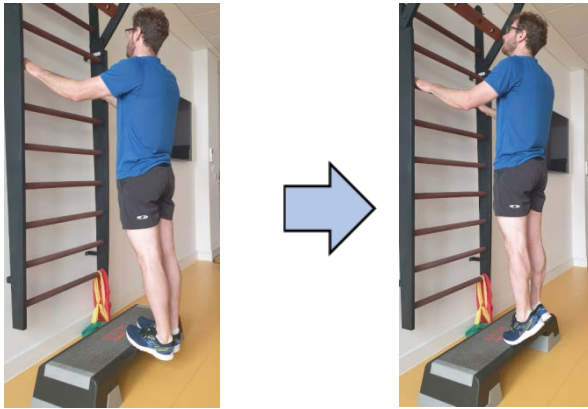
Start with the foot of your affected leg on a step and step up onto the step by extending the knee and hip. Bring your unaffected leg up to 90 degrees. Hold for 5 seconds at the top and then step back down with your unaffected leg, lowering through your affected knee.



During the exercise **keep your knee aligned over your second toe**. Progression: Increase the height of the step or use hand weights.

Calf strengthening

Gastrocnemius Calf Raises [\(video link\)](#)



Hold on to something for support whilst standing with the balls of your feet on a step and your knees straight. Slowly go up onto your toes and then return to the start position of heels off the edge. **Aim:** 20 reps or to fatigue.

Progression: Double leg to single leg. Add weight to your back e.g. rucksack of books

Soleus Calf Raises [\(video link\)](#)



Hold on to something for support whilst standing with the balls of your feet on a step and your knees bent (45 degrees). Slowly go up onto your toes and then return to the start position of heels off the edge.

Aim: 20 reps or to fatigue

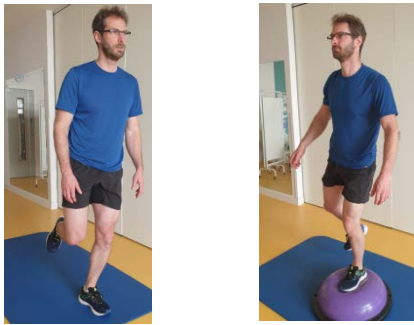
Progression: Double to single leg. Add weight to your back.

3) Balance and proprioception exercises

It is important that we train balance and proprioception (awareness of joint position in space) after ACL injury to reduce re-injury risk.

Balance and proprioception – Stage 1

Single Leg Stand [\(video link\)](#)



Starting position: Stand on your affected leg and hold, keeping shoulders and pelvis in line.

Aim: 3 x 30-60 seconds

Progress: Close your eyes, turn your head whilst maintaining standing, stand on an unstable surface (e.g. gym mat, wobble board).

Balance and proprioception – Stage 2

Clock Face Mini Squat [\(video link\)](#)

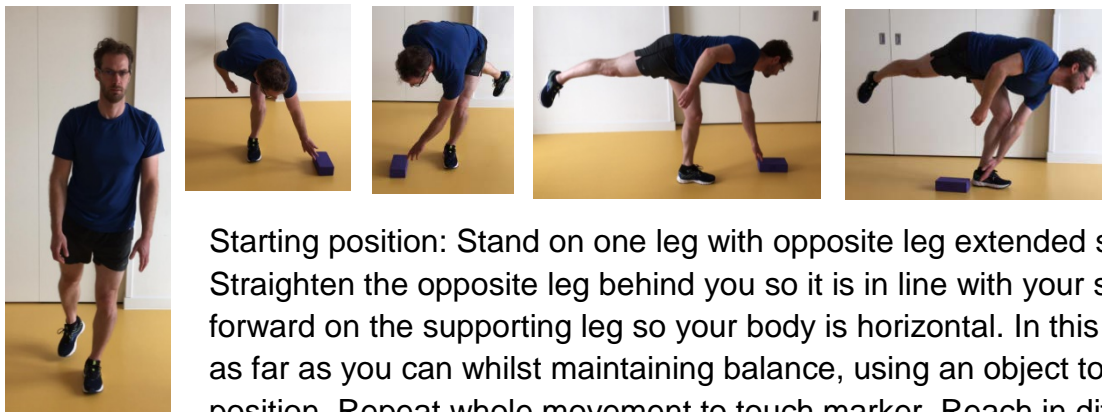


Starting position: Stand on your affected leg with your knee slightly bent as if you are in the middle of a clock. Whilst standing on this leg, extend your unaffected leg out in the direction of numbers on a clock (ultimately doing mini single leg squats on your affected leg).

Aim: Go around the clock 3 x clockwise and 3 x anti-clockwise

Balance and proprioception – Stage 3

Arabesque Clock [\(video link\)](#)



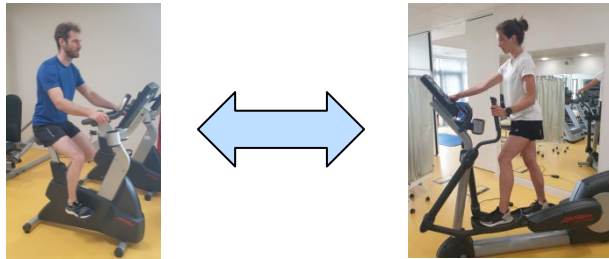
Starting position: Stand on one leg with opposite leg extended slightly behind. Straighten the opposite leg behind you so it is in line with your spine. Bend forward on the supporting leg so your body is horizontal. In this position reach as far as you can whilst maintaining balance, using an object to mark this position. Repeat whole movement to touch marker. Reach in different directions around an imagined floor clock 12, 3, 6 and 9.

Aim: 10 reps in each direction.

4) Aerobic exercise

It is important to maintain general cardiovascular fitness levels. Completing low impact exercise is safe and can be effective for relieving knee pain.

Work at a moderate intensity for up to 30 minutes using a static bike or cross trainer.



5) Plyometric (agility) exercises [\(video link\)](#)

When the strength and control of you knee is returning, it is important to gradually increase the demand on the knee to be able to withstand jumping and rebounding exercises.

Two Legged Jump

Jump up vertically. Land softly; **keep your knees over your second toe** and pushing your bottom out in to a squat position.

Aim: 20 repetitions



Single Legged Hop

Hop vertically up. Land softly on one leg, **keep your knees over your second toe** and push your bottom out in to a squat position.

Aim: 20 repetitions



These exercises should be followed with guidance from a Physiotherapist. It is your responsibility to ensure you are dedicating time to gaining full range of movement and building strength. Pace yourself, if you have pain or swelling, make your exercises easier. Use these symptoms as signs of needing to reduce intensity by reducing the number of sets/reps of the exercise.

If you have any queries, please do not hesitate to call Physiotherapy reception on (01225) 821241. They will be able to direct you to your Physiotherapist.

Alternatively, you can email ruh-tr.therapiesoutpatientadmin@nhs.net
To access video links and further support, please visit the Physiotherapy webpage: www.ruh.nhs.uk/knee



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