

This document follows the ACL Surgical Guidelines for Rehabilitation produced in November 2020 and can be used by patients in conjunction with telerehabilitation for their Anterior Cruciate Ligament repair following a physiotherapy assessment and a shared decision process. Whilst every attempt has been made to make this as appropriate and as evidence based as possible, the user must discuss this program before commencement with their physiotherapist and throughout their rehabilitation.

Anterior Cruciate Ligament Surgical Reconstruction (ACL-R)

Telerehabilitation Programme

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Telerehabilitation/Home Rehabilitation Programme Following Anterior Cruciate Ligament Surgical Reconstruction (ACL-R)

Introduction

The purpose of this document is to guide you through the different stages of telerehabilitation (telerehab) following Anterior Cruciate Ligament Surgical Reconstruction (ACL-R). This is instead of attending the physiotherapy department on a regular basis. However, protocols and processes are being developed to allow you to still have regular contact with your physiotherapist to guide you through the telerehab period. These included a blended approach to physiotherapist consultations using telephone, video calls (Near Me) and face-to-face appointments. Also being developed is an on-line platform for real-time discussions and consultations with your physiotherapist and peers in a “group” format who are also rehabilitating from ACL-R.

It is hoped that this information will keep you on track and prevent you from doing too much or too little. It is important to ensure that you do not overload the knee initially following your surgery. This will prevent any damage and enable you to return to the activities you want to do. You will have had surgery to reconstruct your ACL usually because there is a history of recurrent ‘giving way’ of the knee during twisting activities or activities that involve changes in direction and not for pain.

This programme is designed to guide you through the first nine to twelve months after surgical reconstruction for your ACL (ACL-R). It will prepare you for returning to your normal activities.

The information in this manual is based on the most up-to-date research on ACL-R rehabilitation, and contains links to videos embedded in the document of demonstrations of the various exercises at each stage of the telerehab process.

General Principles of Rehabilitation

The main principles when gradually rehabilitating your knee following ACL-R are:

- Control pain and swelling.
- Gradually restore full range of motion.
- Improve lower limb strength and joint stability.
- Improve your standing balance and co-ordination.
- Improve your general cardiovascular fitness.

There are up to five phases to rehabilitating your knee after ACL-R (Table 1).

Table 1: Phases in ACL knee rehabilitation post surgical reconstruction
(dependent on other knee injuries sustained at time e.g. bone bruising, medial ligament sprain etc)

Phase	Post-Surgery Time
Phase 1 Immediately post surgery	Approx 1 to 3 weeks
Phase 2 Increasing activity	Approx 4 to 6 weeks
Phase 3 Independence & maintenance	Approx 7 to 13 weeks
Phase 4 Commence low impact exercises	Approx 13 weeks to 9 months
Phase 5 Return to sport	9 months and beyond

These timescales are only a guide. They may vary between individuals. **Always seek advice from your physiotherapist or consultant if you have any concerns.**

You will be able to gradually increase your exercises as time goes by. Your rehabilitation should be at a steady pace. Progress will depend on the time which has passed from the surgery. It also depends on how your knee is reacting to exercise. Not everyone will respond at the same rate. Average time frames for return to normal activities are shown in Table 2.

Table 2: Average time frames for return to normal activities of daily living

Activity	Time (weeks/months from the surgery)
Driving	Up to 4 to 6 weeks depending on advice with your insurance company. Or as soon as full pain free knee motion with no locking
Return to Work	<ul style="list-style-type: none">•Sedentary/Desk based activities usually within 4 to 6 weeks. May be earlier if working from home.•Heavy duty work e.g. construction, usually 3 months.
Sports	<ul style="list-style-type: none">•Cycling/swimming usually after 8 weeks•Jogging/running usually after 3 months post surgery.•Golf usually after 3 to 4 months post surgery.•Jumping/hopping/cutting activities/changing direction usually after 12 weeks.

These timescales are only a guide and may vary between individuals. Always seek advice from your physiotherapist/consultant.

Early Phase: 0 to 3 weeks.

Aims:

- Protect the knee.
- Reduce pain and swelling.
- To be able to manage and mobilise with crutches.
- Improve muscle recruitment.

Advice

Put your leg up regularly throughout the day. Use ice packs for 10 minutes every couple of hours to help reduce the pain, swelling and any bruising, if present.

Application of ice can be repeated regularly, every 2 hours (while awake) in the first 24 hours. It must be done carefully. It is possible to get an ice burn.

Technique for the application of ice treatment at home

1. Use either a bag of frozen peas or a plastic bag with ice cubes.
2. Cover the area to be treated with a damp tea towel or damp cloth.
3. Place the ice pack over the area and hold in position with a towel or bandage.
4. Leave for 10 to 15 minutes on bony areas. 20 to 25 minutes over more fleshy or muscular areas.
5. Check the skin every 5 minutes and if painful or damaging the skin, **remove** the ice pack.

Mobilising and moving around

Move around with the help of your crutches, if need be. Keep your walking to short distances.

Exercise the knee gently at first.

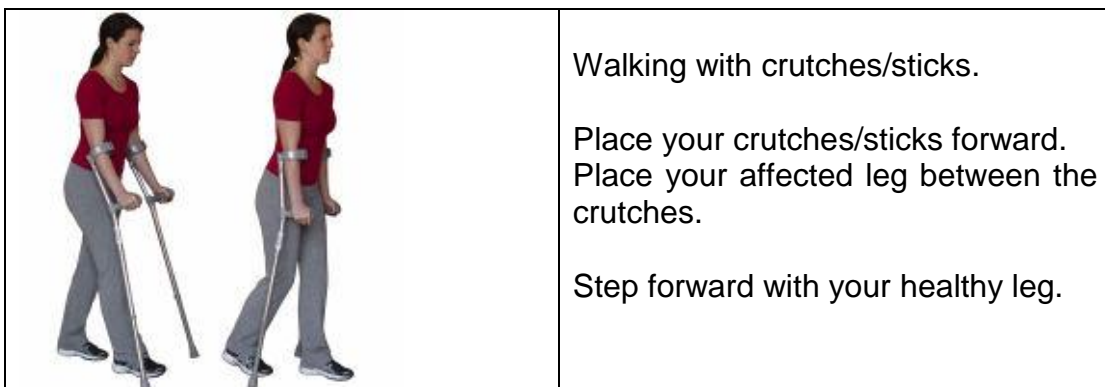
Walking

- With crutches for the first couple of weeks. Gradually try to use your crutches less as you increase in confidence and the leg feels strong enough to take your weight.
- You may still feel more confident using the crutches outdoors initially and over slightly longer distances.
- If you feel your knee is swelling, or there is greater pain these can be signs that you have overdone it. You need to rest more in this case.

Phase 1: Things to Avoid

- Do not sit and straighten the knee against resistance.
- Do not cross your legs.
- Do not run or jump.
- Avoid twisting and swivelling movements.

How do I walk with crutches?





Walking with crutches/sticks.

Place your crutches/sticks forward.
Place your affected leg between the crutches.

Step forward with your healthy leg.

How do I go up and down stairs with crutches?

	<p>Walking up stairs.</p> <p>Stand close to the stairs. Hold onto the handrail. First take a step up with your healthy leg.</p> <p>Then take a step up with your affected leg.</p> <p>Then bring your crutches up on the step.</p> <p>Always go one step at a time.</p>
	<p>Walking downstairs.</p> <p>First put your crutch one step down.</p> <p>Then take a step with your affected leg.</p> <p>Then take a step down with your healthy leg, onto the same step as your affected leg.</p> <p>Always go one step at a time.</p>

Phase 1 Rehabilitation Immediately Post Surgery: Up to 3 weeks approximately

Aims

- Reduce pain and swelling.
- Begin movement exercises, bending and straightening the knee.
- Begin muscle strengthening exercises.

Advice:

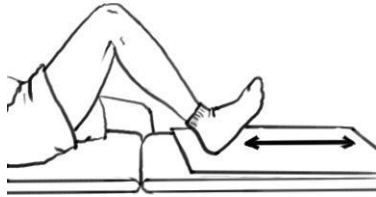
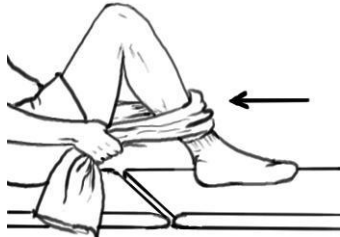
Use ice as outlined in the previous section (page 5) and elevate the leg regularly. See advice on walking with crutches on pages 6 and 7, along with things to avoid during this phase.

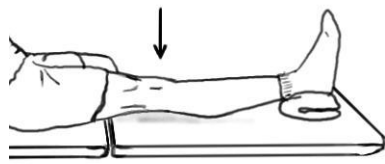
Guidance for return to normal activities of daily living

- The aim of phase 1 is to get the best start to the rehabilitation process. Many of your normal day to day activities will gradually increase as the pain and swelling settles down and you continue to recover. Your physiotherapist will be able to answer any questions you may have about your progress.
- **Link to ACL-R Telerehabilitation Phase 1 Exercises below:**

Exercises: [ACL-R PHASE 1 TELEREHAB VERSION 2 Exs 1a\) - 10b\)](#)
[PLAYLIST NHS FIFE YOUTUBE](#)

Exercises:

<p>Range of Motion</p>  <p>1a) Knee Flexion (bending)</p>	<p>Bending the Knee (Flexion) Technique: Sitting with the legs straight or with the non injured leg over the edge of a bed. Bend your injured knee by sliding the heel up and down along the floor. Ideally you would want to do this on a smooth floor or surface such as a tray.</p> <p>Repetitions: 10 times. Sets: 3 sets at a time. Daily: Repeat every 1 to 2 hours during the daytime.</p>
 <p>1b) Knee Flexion (bending) With Overpressure</p>	<p>Technique: If comfortable to do so, wrap a towel or scarf around the ankle of the injured leg. Pull on the towel to increase the amount of bend in the knee.</p> <p>Repetitions: Hold the stretch for up to 20 seconds on each occasion. Repeat 3-4 times. Sets: 1 set at a time. Daily: Repeat every 1 to 2 hours during the daytime.</p>



**1c) Knee Extension
(straightening)**

Straightening the Knee (Extension)

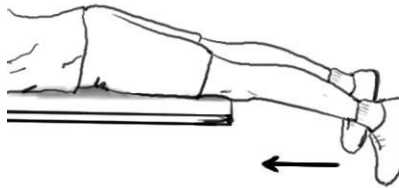

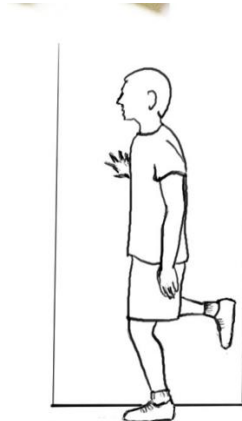
Technique: Sit with the legs straight out in front and place a towel or wedge under the ankle so the back of the knee is unsupported.

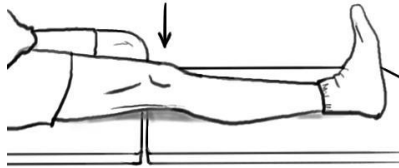
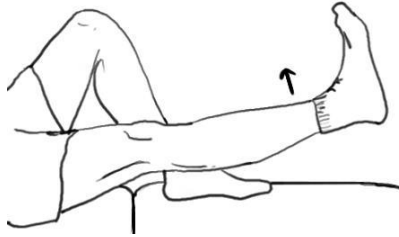
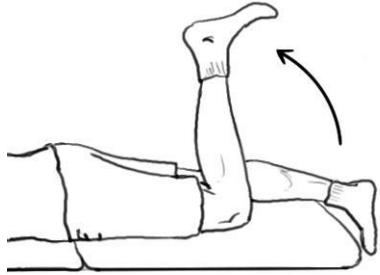

Tighten the muscles at the front of the knee to straighten the knee into the gap underneath.

Repetitions: Hold the stretch for up to 20 seconds on each occasion. Release and repeat 3-4 times.

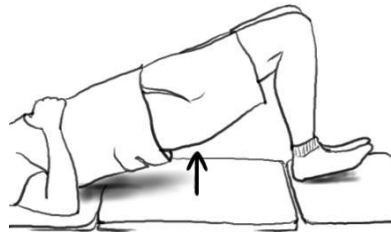
Sets: 1 set at a time.

Daily: Repeat every 1 to 2 hours during the daytime.

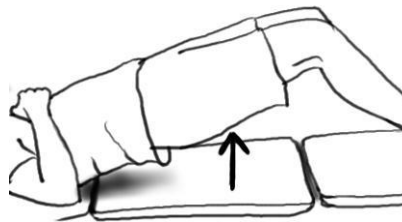
 <p>2) Knee Extension <i>N.B. Achieving full range of motion in the first few weeks after the injury is important. This speeds progress and return to sports. There is evidence that it could prevent arthritis in the knee later in life.</i></p>	<p>Knee Extension Stretch (Straightening of Knee) Technique: Lying on your front. Have your knees at the edge of the bed and your feet hanging off the bed. Tighten the muscles at the front of the knee and hold for up to 20 seconds. Repetitions: Hold the stretch for up to 20 seconds on each occasion. Sets: 3-4 sets at a time. Daily: Repeat 3 times during the daytime. Progression: You can cross your unaffected leg over the affected leg to apply gentle pressure to help straighten the affected knee (see Video).</p>
<p>3) Kneecap (Patella) Mobilisation</p> 	<p>Kneecap (Patella) Mobilisations Technique: Use the fingers to gently move the kneecap from side to side when the leg is at rest and knee straight. Repetitions: Move the kneecap up to 30 times to each side. Sets: Up to 3 sets at a time. Daily: Repeat 3 times during the daytime.</p>
<p>4) Single Leg Balance Exercise</p> 	<p>Single Leg Balance Exercise Technique: Stand on one leg. Slightly bend the knee of your standing leg. Use one hand or finger against the wall for support, if required. Repetitions: Balance for up to 1 minute at a time. Sets: Up to 5 sets at a time. Daily: Repeat 3 times during the daytime.</p>

<p>5) Strength Exercises - Front of Thigh (Quadriceps)</p>  <p>5a) Static Quadriceps</p>	<p>Thigh (Quadriceps) Strengthening Technique: Sitting on the floor or on a bed with the injured leg straight out in front of you and supported. Push the back of your knee down into the floor or bed.</p> <p>Repetitions: 10 times holding the tight thigh contraction for 10 seconds hold each time. Sets: 3 sets at a time. Daily: Repeat 3 times during the daytime.</p>
 <p>5b) Straight Leg Raise</p>	<p>Technique: Sitting or lying down on the floor or on your bed. Keep your leg as straight as you can and lift the leg up in the air.</p> <p>Repetitions: 10 times holding the straight leg up for a 10 seconds hold each time. Slowly lower. Sets: 3 sets at a time. Daily: Repeat 3 times during the daytime.</p>
<p>6) Strength Exercises - Back of Thigh (Hamstrings)</p> 	<p>Prone Hamstring Curl Technique: Lying on your front. Bend your knee up to 90 degrees (a right angle). Slowly lower back down.</p> <p>Repetitions: 10 times. Sets: 3 sets at a time. Daily: Repeat 3 times during the daytime.</p>
<p>7) Strength Exercises- Side Hip Muscles</p> 	<p>'Clam' for Gluteus Medius & Minimus Technique: Lying on your side with your feet and knees together, and knees bent. Keep the feet next to each other as you lift the top knee outwards to strengthen the muscles on the outside of the uppermost hip. Tighten your tummy muscles. Try not to roll the trunk back as you do this exercise. Make sure the muscles at the side of your hip, towards the back, contract to move the leg.</p> <p>Repetitions: 10 times. Sets: 3 sets at a time. Daily: Repeat 3 times during the daytime.</p>

8) Strength Exercises – Core, Back, Hip & Thigh Muscles

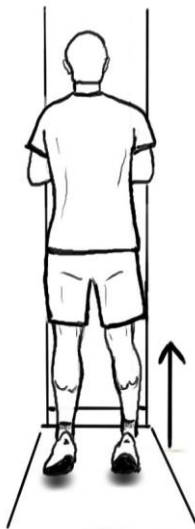


8a) Double Leg Bridge



8b) Extended Bridge

9) Strength Exercises – Back of Leg (Calf Muscles)



Double Leg Bridging

Technique: Lying on your back with both knees bent and heels on the floor. Tighten your tummy muscles. Lift your bottom up off the floor and hold for approximately 10 seconds. Then slowly lower back down. Relax your tummy muscles. Try to keep the movement slow and controlled. Make the exercise more difficult: move your hands to your hips, or shoulders.

Repetitions: 10 times.

Sets: 3 sets at a time.

Daily: Repeat 3 times during the daytime.

Repeat the previous exercise, but with less bend in your knees.

Repetitions: 10 times.

Sets: 3 sets at a time

Daily: Repeat 3 times during the daytime.

Double Leg Calf Raises (Gastrocnemius & Soleus).

Technique: Standing near a wall or kitchen worktop for support if required.

Push up onto your toes on both feet as far as is comfortable.

Then let your heels drop down slowly to the ground. Once on the ground lift the front of your feet up, rocking back slightly on your heels.

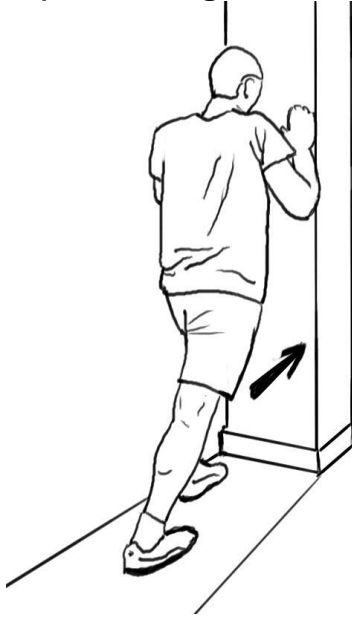
You can repeat this exercise keeping your knees slightly bent as you lift and lower your heels off the ground. This will be more difficult and targets the soleus muscle more.

Repetitions: 10 times.

Sets: 3 sets at a time.

Daily: Repeat 3 times during the daytime.

10) Stretching Exercises



10a) Calf Stretch

Calf Stretch

Technique: Stand facing a support (either the wall or kitchen worktop for support).

Take a step back with the foot you want to stretch. Ensure that this knee is straight, and the foot is pointing straight forward.

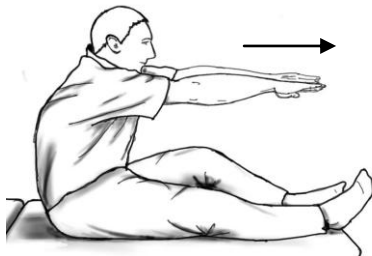
Then, lean forward towards the wall and keep your heel on the floor. Let your front knee bend. You should feel a gentle stretch in the middle of the calf muscle of the back leg (for gastrocnemius and soleus muscles).

The exercise can be repeated with the stretch emphasised to the front foot, increasing the bend in the front knee to feel a stretch low down near the ankle of the front foot (targeting soleus muscle).

Repetitions: Hold the stretch for 20 seconds on each occasion.

Sets: 3 sets at a time.

Daily: Repeat 3 times during the daytime on both sides.



10b) Hamstring Stretch

Hamstring Stretch

Technique: In standing, with your hands on your thigh not being stretched, move the other heel forward onto the ground, with the knee straight. Lean forward at the hips until you feel a stretch on the back of the thigh of the forward leg.

To make the exercise more difficult, repeat but with your front heel elevated on a low box or a step.

Alternative Technique: Sit on a floor with legs out in front. Keep the affected leg straight and bend the unaffected leg slightly. Then sit as tall as you can and slowly reach forward with both hands out in front, to create a stretch in the muscles of the back of the thigh.

Repetitions: Hold the stretch for 20 seconds on each occasion.

Sets: 3 sets at a time.

Daily: Repeat 3 times during the daytime on both sides.

**Phase 2 Rehabilitation Increasing Activity:
4 to 6 weeks approximately (Continue with: Phase 1 Range of Motion Exercises 1a) to 1c); 2) & 3) as guided by your physiotherapist).**

Criteria for Progression onto Phase 2:

- Minimal or no pain
- Minimal or no swelling
- Good range of movement.

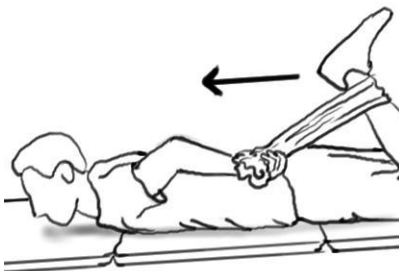

Aims

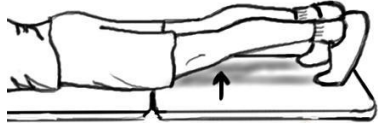
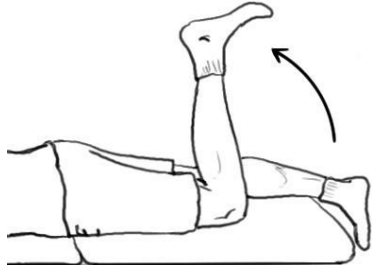
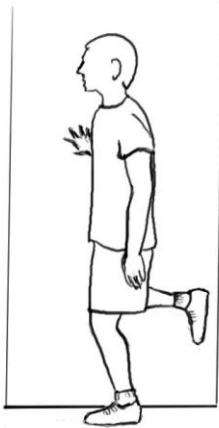
- Reduce pain and swelling
- Restore full range of motion
- Mobilise independently

Guidance for return to normal activities of daily living

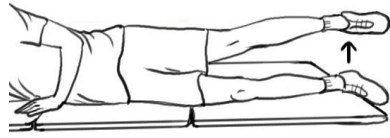
- Sedentary/desk based activities usually within 4 to 6 weeks, earlier if working from home.
- Heavy duty work e.g. construction not usually until 3 months.
- Driving can be commenced at 4 to 6 weeks under consultation with your insurance company.

**Exercises: [ACL-R PHASE 2 TELEREHAB VERSION 2 EXERCISES 1– 5b\)](#)
[NHS FIFE YOUTUBE PLAYLIST](#)**

<p>Range of Motion</p>  <p>1) Quadriceps Stretch</p>	<p>Thigh (Quadriceps) Stretching</p> <p>Technique: Lying on your front or your side. Have your knee bent and draw the foot slightly closer to the bottom with the use of a towel until you feel a stretch in the front of your thigh. Try to keep your thigh in line with the rest of your body.</p> <p>Repetitions: Hold the stretch for up to 30 seconds on each occasion.</p> <p>Sets: 3 sets at a time.</p> <p>Daily: Repeat 3 times during the daytime.</p>
<p>2) Single Leg Balance Exercise</p> 	<p>Single Leg Balance Exercise (Progression from Phase 1: Exs 4 Single Leg Balance Exercise).</p> <p>Technique: Stand on a cushion or a towel. These are surfaces which will challenge your balance and co-ordination more than standing on a flat floor.</p> <p>Repetitions: Balance for up to 1 minute at a time.</p> <p>Sets: 3 sets at a time.</p> <p>Daily: Repeat 3 times during the daytime.</p>

<p>3) Strength Exercises – Front of Thigh (Quadriceps)</p>  <p>3) Isometric Quadriceps Prone</p>	<p>Thigh (Quadriceps) Strengthening: Technique: Lying on your front with your toes on contact with the floor.</p> <p>Repetitions: 10 times holding the tight thigh contraction for 10 seconds hold each time. Sets: 3 sets at a time. Daily: Repeat 3 times during the daytime.</p>
<p>4) Strength Exercises - Back of Thigh (Hamstrings)</p>  <p>4a) Prone Hamstring Curls</p>	<p>As in Phase 1: exercise 6, repeat the exercises labelled strengthening for the back of the thigh (hamstrings).</p> <p>Prone Hamstring Curl Technique: Lying on your front. Bend your knee up to 90 degrees (a right angle). Slowly lower back down.</p> <p>Repetitions: 10 times. Sets: 3 sets at a time. Daily: Repeat 3 times during the daytime.</p> <p><i>As <u>guided by your physiotherapist</u>, progress the exercise by adding an ankle weight to your ankle. Be <u>guided by your physiotherapist</u> regarding the weight, number of sets, repetitions & frequency per week for the exercise.</i></p> <p><i><u>Progress to Phase 2: Exercise 4b) as guided by your physiotherapist.</u></i></p>
 <p>4b) Standing Hamstring Curls</p>	<p>Standing Hamstring Curls Technique: In standing place the fingers against the wall to provide some support.</p> <p>Bend the injured knee, bringing your heel up towards your bottom.</p> <p>Repetitions: 10 times. Sets: 3 sets at a time. Daily: Repeat 3 times during the daytime.</p> <p><i>As <u>guided by your physiotherapist</u>, progress the exercise by adding an ankle weight to your ankle & the sets, repetitions & frequency per week for the exercise.</i></p>

5) Strengthening Exercises – Side Hip Muscles



5a) & 5b) Hip Abduction Long Lever With & Without Ankle

Hip Abduction Long Lever – With & Without Weight

Technique: Lying on your side with your body in a straight line. Keep your pelvis level. Press with your thumb to help activate your gluteal muscles at the side and towards the back of your hip, to initiate the movement. Slowly lower back to start.

If it is difficult to keep your pelvis level, bend the lower leg at the knee behind you, or reach the lower arm out in front of you, for support.

Repetitions: Hold the leg in air for up to 10 seconds, then relax and slowly lower, repeat 10 times.


Sets: 3 sets at a time.

Daily: Repeat 3 times during the daytime.

As guided by your physiotherapist, progress the exercise by adding an ankle weight to your ankle.

Be guided by your physiotherapist regarding the weight, number of sets, repetitions & frequency per week for the exercise.

Cardiovascular (CV) Fitness

Walking	Technique: You should normally be managing without your crutches at this point. You can gradually start to build up your walking distance. Be careful not to overdo it. Your knee can still swell up easily and this can slow down your progress.
<p style="text-align: center;">Phase 2: Things to Avoid</p> <ul style="list-style-type: none">• No thigh (quadriceps) knee extension exercises.• Do not cross your legs.• Do not run or jump.• Avoid twisting and swivelling movements. <div style="text-align: right;"><p>No thigh (Quadriceps) knee extension exercises.</p></div>	

Phase 3 Rehabilitation Independence and Maintenance: 7 to 13 weeks approximately (Continue With: Range of Motion & Stretching exercises as in Phase 1 and Phase 2 as guide by your physiotherapist).

Criteria for progression to Phase 3:

Must be able to:

- Fully straighten (extend) the injured knee.

Preferably be able to:

- Fully bend (flex) the injured knee.
- Have minimal pain/swelling


Aims of the phase

- To regain full range of movement, if not already achieved.
- To build up leg strength.
- To improve balance and coordination.

Guidance for return to normal activities of daily living

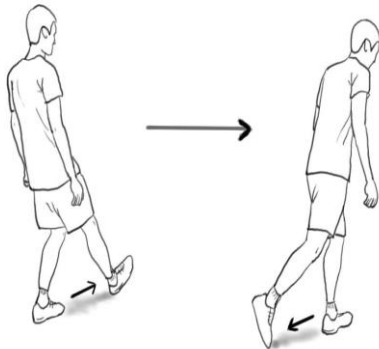
- Return to moderate manual work as agreed with consultant.
- Cycling/Swimming usually after 6 to 8 weeks post surgery.
- Return to swimming (*avoid breaststroke leg kick*).

Exercises: [ACL-R PHASE 3 STAGE 1 TELEREHAB VERSION 2 EXERCISES 1\) to 8\) and MAINTENANCE & PROGRESSION Exs PHASE 1 NHS FIFE YOUTUBE PLAYLIST](#)

<p>1) Positional Awareness/ Balance Exercises</p>  <p>Single Leg Dynamic Balance</p>	<p>1) Positional Awareness/Balance Single Leg Balance Exercise (Progression from Phase 2: Exs 2 Single Leg Balance Exercise).</p> <p>Technique: Stand on one leg facing a wall. Throw a tennis ball with two hands at the wall level with your head/chest and catch. Do 3-4 of these. Then throw the ball so it is level with your belly button. Again do 3-4 throws & catches. Finally, with two hands, throw the ball so it is at knee level, do 3-4 throws & catches.</p> <p>Repeat throwing & catching the ball with your right hand, 3-4 times each, at head height; belly height & knee height. Then repeat with your left hand. Finally, do this exercise throwing & catching the ball with different hands, 3-4 times each, at head, belly & knee height.</p> <p>Repetitions: Do for up to 1 minute at a time. Sets: 3 sets at a time. Daily: Repeat 3 times during the daytime. Be guided by your physiotherapist regarding the number of sets, repetitions & frequency per week for the exercise.</p>
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2) Positional Awareness/Balance Exercises

Single Leg Dynamic Balance



Progression to: Star Excursion Balance Test (SEBT)

2) Single Leg Dynamic Balance: Progression to Star Excursion Balance Test, (SEBT)

Technique: Stand on your affected leg. Reach forward with the non-stance foot to tap the floor directly in front of you (12 “o” clock position). Return to start, do 3-4 of these. Repeat by tapping non-stance foot directly behind you (6 “o” clock position).

As you progress you may be able to tap the non-stance foot at different positions: you could try: 1 “o” clock; 7 “o” clock; 11 “o” clock; 5 “o” clock; 3 “o” clock & 9 “o” clock positions.



Repetitions: up to 10 times.

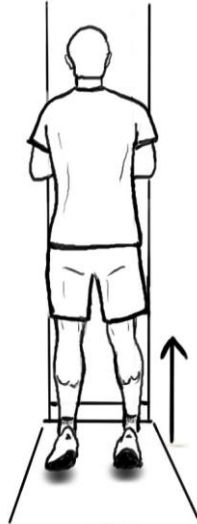
Sets: 3 sets at a time.

Daily: Repeat 3 times daily.

Exercise progression: As guided by your physiotherapist: hold light weights in each hand, or stand on an unstable surface.

Be guided by your physiotherapist regarding the progression of this exercise & number of sets, repetitions & frequency per week for the exercise.

 <p data-bbox="236 568 376 607">3a) & 3b)</p>	<p data-bbox="671 197 1110 230">3a) & 3b) Double Leg Squats</p> <p data-bbox="671 232 1342 450">Technique: Stand with your feet shoulder width apart, toes pointing outwards slightly. Bend equally to approximately 90 degrees at both the hips and knees. Maintain a neutral back with bottom tucked in throughout. Return to start position.</p> <p data-bbox="671 488 999 521">Repetitions: 10 times.</p> <p data-bbox="671 524 987 557">Sets: 3 sets at a time.</p> <p data-bbox="671 560 1078 593">Daily: Repeat 3 times daily.</p> <p data-bbox="671 631 1310 741">Exercise progression: As <u>guided by your physiotherapist</u>: hold light weights in each hand.</p> <p data-bbox="671 779 1294 920">Be guided by your physiotherapist regarding the weight, number of sets, repetitions & frequency per week for the exercise.</p>
 <p data-bbox="336 1352 639 1462">4a) & 4b) Dead Lifts With & Without Dumbbells</p>	<p data-bbox="671 927 1158 960">4a) & 4b) Double Leg Dead Lifts</p> <p data-bbox="671 963 1286 1039">Technique: Stand with your feet shoulder width apart, toes pointing outwards slightly.</p> <p data-bbox="671 1077 1334 1218">Unlock/soften the knees and bend forward at the hips until a stretch is felt behind the thighs. Maintain a straight back position throughout. Return to start position.</p> <p data-bbox="671 1256 999 1290">Repetitions: 10 times.</p> <p data-bbox="671 1292 987 1326">Sets: 3 sets at a time.</p> <p data-bbox="671 1328 1078 1361">Daily: Repeat 3 times daily.</p> <p data-bbox="671 1400 1302 1509">Exercise progression: As <u>guided by your physiotherapist</u>: hold light weights in each hand.</p> <p data-bbox="671 1547 1294 1688">Be guided by your physiotherapist regarding the weight, number of sets, repetitions & frequency per week for the exercise.</p>
<p data-bbox="236 1704 608 1738">INTENTIONALLY BLANK</p>	<p data-bbox="671 1704 1043 1738">INTENTIONALLY BLANK</p>



**5a) & 5b) Calf Raises
With & Without
Dumbbells**

**5a) & 5b) Double Leg Calf Raises
(Progression from Phase 1 Exercise 9)**

Technique: Standing, without support, push up onto your toes and then slowly lower. You can repeat this exercise with the knees slightly bent too, this will be more difficult

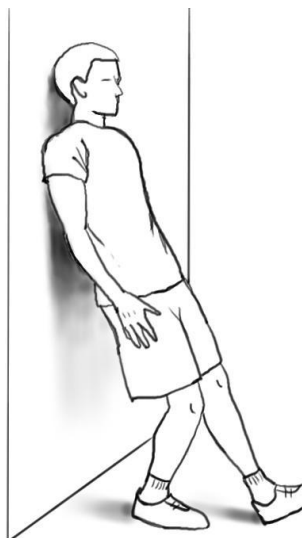
Repetitions: 10 times.

Sets: 3 sets at a time.

Daily: Repeat 3 times daily.

Exercise progression: As guided by your physiotherapist: hold light weights in each hand.

Be guided by your physiotherapist regarding the weight, number of sets, repetitions & frequency per week for the exercise.



6) Single Leg Supported Squat (Mini Dips)

As in the picture, stand with your feet away from the wall and your shoulders against the wall. Keep your body in a straight line.

Then, lift your unaffected leg out in front of you and bend your standing knee.

Bend the standing knee until the unaffected legs heel touches the floor. Then straighten the knee.




Repetitions: 10 times.


Sets: 3 sets at a time.

Daily: Repeat 3 times daily.

Exercise progression: As guided by your physiotherapist: hold light weights in each hand.

Be guided by your physiotherapist regarding the weight, number of sets, repetitions & frequency per week for the exercise.

 <p style="text-align: right;">7a) Step Ups</p>	<p>7a) Step Ups Technique: Stand in front of a 20 - 40 cm step. Place the foot of the affected leg on a step. Step the other foot up to join it, and then take the foot of the affected leg back down to the floor, & follow with affected leg. Repetitions: 10 times. Sets: 3 sets at a time. Daily: Repeat 3 times daily.</p> <p>Exercise progression: Increase sets or hold light weights in each hand. Be guided by your physiotherapist regarding the weight, number of sets, repetitions & frequency per week for the exercise.</p>
 <p style="text-align: right;">7b) Step Downs</p> <p>Downs</p>	<p>7b) Step Downs Technique: Stand on the affected leg on a step facing down. Slowly lower your-self by bending your knee to approx 30° or until your other foot brushes the floor. Return to starting position. Try to stand tall throughout the movement Repetitions: 10 times. Sets: 3 sets at a time. Daily: Repeat 3 times daily.</p> <p>Exercise progression: Increase sets or hold light weights in each hand. Be guided by your physiotherapist regarding the weight, number of sets, repetitions & frequency per week for the exercise. <i>(See videos for variations: check with your physiotherapist how to progress Exs 7a & 7b).</i></p>
 <p>Progression of clams as advised by your physiotherapist add theraband for resistance (ensure no allergies to the material of the band).</p>	<p>Hip Abduction: See Phase 1 Exs 7 & Phase 2 Exs 5a) & 5b) Technique: As in Phase 1 Exercise 7 (Clams) & Phase 2 Exercises 5a) & 5b) (Hip Abduction Long Lever).</p> <p>Hip strengthening 'clam' exercise: As <u>guided by your physiotherapist</u> use theraband for resistance. Exercise progression: As <u>guided by your physiotherapist:</u> use theraband for clam exercise or ankle weights for hip abduction long lever exercise. Be <u>guided by your physiotherapist</u> regarding the resistance of band or weight, number of sets, repetitions & frequency per week for the exercise.</p>

 <p>8a) & 8b) Hip Adduction With & Without Ankle Weight</p>	<p>8) Hip Adduction Technique: Lying on your side with top leg bent in front of lower leg and the foot on the floor. Roll top hip slightly forwards, use top arm to support you in front. Lift lower leg 20 cm from the floor keeping toes pointed forwards. Return to starting position.</p> <p>Repetitions: 10 times. Sets: 3 sets at a time. Daily: Repeat 3 times daily.</p> <p>Exercise progression: As <u>guided by your physiotherapist</u>: attach ankle weights to the exercised leg.</p> <p>Be guided by your physiotherapist regarding the resistance of band or weight, number of sets, repetitions & frequency per week for the exercise.</p>
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Cardiovascular Fitness

Be guided by your physiotherapist regarding the progression of each of the exercises below, and how, and when to introduce them to your rehabilitation:

Walking

5 times weekly for 20 to 30 minutes

Try to find places to walk. These should be over even ground, but with hills to vary the challenge to the legs.

Exercise progression: add a backpack with weights/books to your back.

Steps

Climb and descend a set of 10 to 15 steps (stairs).

Repetitions: 10 to 20 times.

Sets: 3 sets at a time.

Weekly: 3 times a week.

Exercise progression: add a backpack with weights/books to your back.

If you have access to a gym then using a treadmill, stationary bike, rowing machine, cross trainer and step machine are all appropriate. **Avoid any equipment that involves a twisting motion of the knees.**

In a Swimming Pool:

Swimming

Duration: 10 to 30 minutes.

Weekly: 2 to 3 times a week.

Front or back crawl only – **Breaststroke only if no pain or joint reaction.**

Exercise progression: use a float to increase leg workout.

Aqua Jogging:

Use either an 'aqua jogger belt' or other floatation device in the deep end of the pool. Your feet should not hit the bottom. Mimic the jogging motion with your legs (and arms, if not needed for floatation).

Duration: 10 to 20 minutes.

Weekly: 2 to 3 times a week.

This program is a rough guide on how you can gradually build up your cardiovascular fitness without using gym equipment.

Light jogging: can be commenced from weeks 12 to 13 approximately provided no pain or swelling following previous exercises and no limp when walking fast.

Stretching See diagrams in Phases 1, 2 and 3.	Continue stretching exercises for the calf, back of thigh (hamstrings) and front of thigh (quadriceps) as in the previous phases outlined.
Strengthening Continue the strengthening exercises already described in the previous Phases: See diagrams in Phases 1, 2 and 3.	Double Leg Squats: See previous Phase 3 Exercise 3. Single Leg Squat (Supported): See previous Phase 3 Exercise 6. Step ups: See previous Phase 3 Exercise 7a). Step downs: See previous Phase 3 Exercise 7b).

GYM BASED EXERCISES

ACL-R PHASE 3 STAGE 2 TELEREHAB VERSION 2 EXERCISES 9) to 13)

[**ACL-R PHASE 3 STAGE 2 TELEREHAB VERSION 2 EXERCISES 9\) to 13\)**](#) [**NHS FIFE YOUTUBE PLAYLIST**](#)

As guided by your physiotherapist, commence the ACL-R Phase 3 Stage 2 Exercises [Exs 9) to 13)]. These are more demanding than the exercises in Phase 3 Stage 1, and some will require gym equipment.

Patients with a hamstring graft should note the restrictions placed on the range of movement allowed at the knee. In particular, knee movement from 90 degrees flexion (bend) to 45 degrees flexion (bend) with weight is possible from week 7 post surgery ***if advised by your physiotherapist***. Knee movement WITHOUT weight is possible from 90 degrees flexion (bend) to 0 degrees (fully straight) from week 7 post surgery ***if advised by your physiotherapist***.

For hamstring graft patients, knee movement from 90 degrees flexion (bend) to 0 degrees (fully straight) with weight is possible from week 12 post surgery ***if advised by your physiotherapist***.

FOLLOW THE ADVICE OF YOUR PHYSIOTHERAPIST REGARDING RANGE OF MOVEMENT AND WHETHER EXERCISES 9) Double Leg Knee Extension & 10) Double Leg Hamstring Curl, BELOW SHOULD BE CONDUCTED WITHOUT OR WITH WEIGHT ADDED.



9) Double Leg Quadriceps Extension in the Gym

9) Double Leg Quadriceps Extension Strengthening in the Gym

Be guided by your physiotherapist regarding when to start this exercise.

***Technique:** In sitting slowly straighten the knees to *fully straight then bend the knees to approximately *90 degrees knee bend.

Repetitions: 10 times.

Sets: 3 sets at a time.

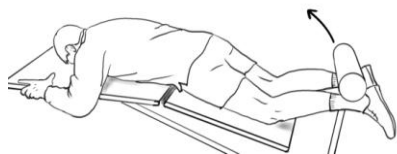
Weekly: Repeat 3 times weekly.

Be guided by your physiotherapist regarding when to start this exercise, the weight, number of sets, repetitions & frequency per week for the exercise.

****NOTE 1): HAMSTRING Graft patients Open Kinetic Chain Quadriceps Extensions with Resistance from Week 7 @ 90° to 45°.
0° to 90° Active Range Of Movement Knee Extension WITHOUT resistance should be safe.***

****NOTE 2): HAMSTRING Graft patients Full Active Range Of Movement Open Kinetic Chain Quadriceps Extension with Resistance from Week 12 is safe.***

10) Double Leg Hamstring Curl Strengthening in the Gym



10) Double Leg Hamstring Curl in the Gym

Be guided by your physiotherapist regarding when to start this exercise.

***Technique:** In front lying slowly bend the knees to *90 degrees and then *fully straighten.

Repetitions: 10 times.

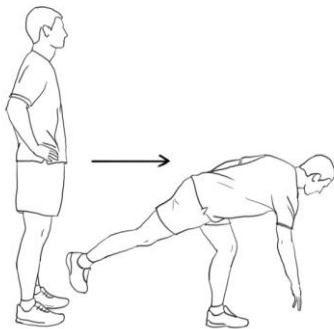
Sets: 3 sets at a time.

Weekly: Repeat 3 times weekly.

Be guided by your physiotherapist regarding when to start this exercise, the weight, number of sets, repetitions & frequency per week for the exercise.

***See Notes Above for Phase 3 Exercise 10) Double Leg Quadriceps Extension Strengthening in Gym.**

Balance and Coordination



11) Single Leg Dead Lift With Reach in the Gym

11) Single leg Dead Lift With Reach in the Gym

Technique: Balance on your injured leg with your knee slightly bent and keep this knee angle throughout the exercise.

Bend forward at the waist and swing the non-injured leg back. Your shoulder and ankle should move as one to form a straight line.

Aim to bend as far forward as you can as if you are trying to touch the floor. Slowly return to standing.

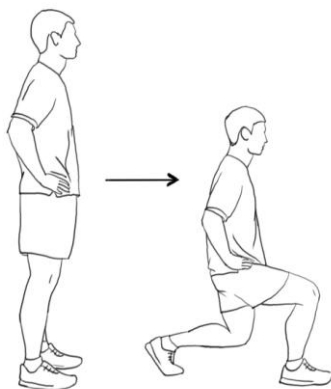
Repetitions: 10 times.

Sets: 3 sets at a time.

Weekly: Repeat 3 times weekly.

Exercise Progression: dumbbells in hands as you try to touch the floor.

Be guided by your physiotherapist regarding when to start this exercise, the weight, number of sets, repetitions & frequency per week for the exercise.



12) Forward Lunges in the Gym

12) Forward lunges in the Gym

Technique: Stand with your feet shoulder with apart. Take a large step forward with your left leg and slowly lower your right knee down towards the floor as far as you feel comfortable. Push back up into a standing position. Repeat with the right leg. ***Make sure the knee of the front leg stays in line with your big/second toe and does not bend more than 90 degrees.***

Repetitions: 10 times.

Sets: 3 sets at a time.

Weekly: Repeat 3 times weekly.

Exercise Progression: Gradually increase repetitions or hold dumbbells each hand as you carry out the exercise. Your physiotherapist may progress you onto lunging onto an unstable surface.

Be guided by your physiotherapist regarding when to start this exercise, the weight, number of sets, repetitions & frequency per week for the exercise.



13) Mini-trampette Jogging in the Gym

13) Mini-trampette Jogging in the Gym:

If you have access to a trampoline, you can practice gentle jogging on the spot.

As ***guided by your physiotherapist*** you can begin gentle jogging on a mini-trampoline at the latter part of Phase 3 Rehabilitation period. Normally at 3 months (12-13 weeks) post surgery at earliest. Keep knee lift low & gentle jog.

Be guided by your physiotherapist regarding when to start this exercise, the time to jog, number of sets, repetitions & frequency per week for the exercise.

Duration: 5 minutes.

Sets: 1 set at a time.

Weekly: Repeat 3 times weekly.

General Cardiovascular exercise program:

You can speed up or slow down your progress through the program **as guided by your physiotherapist**. If running is not something you need to return to then you do not need to carry out this part of Phase 3.

If you are able to perform 30 minutes of running without pain, you can try the following speed drills. Once again, if your lifestyle does not require sprinting then you do not need to perform these drills.

Sprint 20 metres, rest for a minute then repeat 5 times, (slow acceleration and slow stop).

Sprint 20 metres, rest for a minute then repeat 5 times, (slow acceleration and fast stop).

Sprint 20 metres, rest for a minute then repeat 5 times, (fast acceleration and fast stop).

Phase 4 Rehabilitation Low Impact Exercises: 13 weeks to 9 months approximately

Criteria for progression to Phase 4:

- Proficient technique for all Phase 3 exercises
- No pain or swelling

Aims of the phase

- To commence low intensity exercises with proficient technique with forward and backward movements and with side-to-side movements no earlier than week 12.
- Return to jogging/running usually not before weeks 12/13-16.
- If no adverse reaction to running and hopping drills add diagonal movements; generally around week 20.

Guidance for return to normal activities of daily living

- Return to moderate manual work as agreed with consultant.
- Cycling/Swimming usually after 6 to 8 weeks post injury.
- Return to swimming (avoid breaststroke leg kick).
- Golf 4 months post surgery.

Phase 4 Rehabilitation exercise involving plyometric exercises, as guided by your physiotherapist, are the mainstay of this part of the rehabilitation programme following ACL-R surgery. You will be commenced on these exercises within this phase once you can pass certain performance based criteria including, but not limited to the following:

- Appropriate scores in Knee Osteoarthritis and Outcome Score (KOOS)
[KOOS Form](#)
- Appropriate lower limb symmetry on testing Single Leg Hop for Distance (SHD); Triple Leg Hop for Distance (THD); Crossover Hop Test.
- 5 repetition Maximum (5 RM) Single Leg Press.
- Some Sport Specific Agility Tests such as T-Test.

Your physiotherapist will discuss the progression onto and through Phase 4.

PHASE 4 PLYOMETRIC EXERCISES

[ACL-R PHASE 4 PLYOMETRICS OVERVIEW & INTRODUCTION and STAGE 1 EXERCISES NHS FIFE YOUTUBE](#)

Only progress onto these exercises when advised by your physiotherapist. Plyometric exercises are demanding and normally you should have at least one day of rest between sessions. As you progress the plyometric exercises might be conducted two to four times per week as guided by your physiotherapist.

Plyometric exercises develop the ability to rapidly produce large forces; power (generation of large forces at high speeds) and improve function of particular explosive sporting characteristics such as acceleration/deceleration; jumping height & straight line speed or rapid changes of direction.

There are specific criteria which must be met before moving through each of the four stages of plyometric exercises.

Phase 4 Plyometric Exercises

Criteria for progression to Phase 4 Stage 1 Plyometric Exercises:

- Proficient technique for ALL Phase 3 Exercises.
- No pain or swelling.

Must be able to:

- Fully straighten (extend) the injured knee.
- Fully bend (flex) the injured knee.
- Demonstrate good technique with double leg squat with weight (less than 20% asymmetry in loading between feet).
- Demonstrate knee extension (straightening) strength greater than 70% of unaffected side.

Aims of the Phase 4 Stage 1 Plyometric Exercises:

- To regain full range of movement, if not already achieved.
- To restore strength of affected side to within 20% of unaffected side.
- To recover basic motor patterns and running gait.
- To avoid physical de-conditioning.

Phase 4 Stage 1 Plyometric Exercises are low intensity, involve large ground contact times and mostly double leg exercises. Load is monitored via the number of foot contacts per day. For this stage a maximum of 50 foot contacts per day is suggested, be guided by your physiotherapist.

Phase 4 Stage 1 Plyometric Exercises: Link to playlist below:

[ACL-R PHASE 4 PLYOMETRICS OVERVIEW & INTRODUCTION and STAGE 1 EXERCISES NHS FIFE YOUTUBE](#)

Phase 4 Stage 1 Plyometric Exercises:

[ACL-R PHASE 4 PLYOMETRICS OVERVIEW & INTRODUCTION and STAGE 1 EXERCISES NHS FIFE YOUTUBE](#)

Ex 1) Double Leg Submaximal Box Jump

Jump with both feet onto a box. Squat down slightly before take-off. Land softly. Ensure good hip & knee alignment on landing; approximately 90 degrees each. Landing on the box will allow you to land from a lower height, & reduce the force of landing.

Ex 2) Lunge Push Back

Feet together, step forward with affected leg. Control the deceleration, with good knee control, to push back to start.

Ex 3) Step Up Jumps

Ex 3a) Same Leg

Stand with the foot of the affected leg on a box or step. Jump up & land at start position. Land softly, with good trunk, hip & knee control. At all times quality movement takes priority over the number of sets or repetitions.

Ex 3b) Alternating Legs

Exercise 3a) can be made more difficult by alternating legs in the air when you jump, so that the foot positions on landing are reversed from the start (take-off) position.

Phase 4 Stage 2 Plyometric Exercises:

[ACL-R PHASE 4 STAGE 2 PLYOMETRICS TELEREHAB NHS FIFE YOUTUBE](#)

Criteria for progression to Phase 4 Stage 2 Plyometric Exercises:

- Ability to run on a treadmill at 8 km/h (5 mph) for 10 minutes.
- Good double leg landing technique (double leg submaximal box jump).
- Good single leg squat technique.
- Able to perform 8 single leg repetitions on leg press machine with weight greater than 1.25 times body weight.
- Knee extension (straightening) and flexion (bending) strength greater than 80% of unaffected side.

Aims of the Phase 4 Stage 2 Plyometric Exercises:

- To develop functional strength.
- To develop eccentric (muscle contraction whilst lengthening) strength with feet in contact with a surface, e.g. floor (closed kinetic chain).
- To develop power in both lower limbs.
- To continue to develop single leg eccentric control.
- To continue to restore lower limb muscle imbalances.

Phase 4 Stage 2 Plyometric Exercises are moderate intensity, involve medium ground contact times and are a mix of double and single leg exercises. Load is monitored via the number of foot contacts per day. For this stage a maximum of 100 foot contacts per day is suggested, be guided by your physiotherapist.

Phase 4 Stage 2 Plyometric Exercises: Link to playlist below:

[ACL-R PHASE 4 STAGE 2 PLYOMETRICS TELEREHAB NHS FIFE YOUTUBE](#)

Phase 4 Stage 2 Plyometric Exercises:

[ACL-R PHASE 4 STAGE 2 PLYOMETRICS TELEREHAB NHS FIFE YOUTUBE](#)

Ex 1) Maximal Vertical Squat Jump

From two feet jump vertically as high as you can & land softly on two feet. Ensure good trunk, hip & knee alignment. Landing from a greater height than the Double Leg Submaximal Box Jump in Stage 1 will increase the landing forces.

To make the exercise more challenging add a 90 degrees rotation in the air before landing. Complete a full circle with 4 jumps, clockwise & then anti-clockwise.

Ex 2) Forward Step & Land

The Lunge Push Back from Stage 1 is progressed to: Forward Step & Land. Ensure good trunk, hip & knee control. Soft Landings & quick step back. Control the deceleration.

Ex 3) Lateral (Side) Push Back Progressed to Lateral (Side) Step & Land

Feet together, step sideways onto the foot of affected leg. Control the deceleration, with good knee control, to push back to start. This can be progressed to Lateral (Side) Step & Land. This can be done holding a ball for extra difficulty.

Ex 4) Split Squat Jumps

4a) Same Leg

Progression of Step Up Jumps from Stage 1 to Split Squat Jumps in Stage 2. Start with same leg, then progress to alternating legs. The greater landing height will result in greater landing force. Maintain good landing mechanics & control with soft landings.

4b) Alternating Legs

As exercise 4a) but, whilst in the air swap legs so when you land the foot position is reversed compared to the starting (take-off) position.

Ex 5) Double Leg Drop Jump

This is a criteria for progression to Stage 3 Plyometrics, and therefore will most likely be attempted in latter parts of Stage 2 Plyometrics. Start with a low height & gradually increase as guided by your physiotherapist to approximately 30 cm. This greater landing height will again increase landing forces. Both feet on box, step affected leg off box & drop to land on both feet. Immediately on landing jump up.

Phase 4 Stage 3 Plyometric Exercises:

[ACL-R PHASE 4 STAGE 3 PLYOMETRICS TELEREHAB NHS FIFE YOUTUBE PLAYLIST](#)

Criteria for progression to Phase 4 Stage 3 Plyometric Exercises:

- Good double leg landing technique (double leg drop jump).
- Good single leg landing control.
- Able to perform 8 single leg repetitions on leg press machine with weight greater than 1.5 times body weight.
- Knee extension (straightening) and flexion (bending) strength greater than 80% of unaffected side.

Aims of the Phase 4 Stage 3 Plyometric Exercises:

- To restore neuromuscular function (motor control) of affected side to within 10% of unaffected side.
- To restore high load movement quality.
- To build strength, power and rate of force development with double leg exercises.
- To build power, motor control and acceleration with single leg exercises.
- To restore aerobic, cardiovascular (CV), fitness.

Phase 4 Stage 3 Plyometric Exercises are higher intensity, involve shorter ground contact times compared to Stage 2 exercises and are a mix of double and single leg exercises. Load is monitored via the number of foot contacts per day. For this stage a maximum of 150 foot contacts per day is suggested, be guided by your physiotherapist.

Phase 4 Stage 3 Plyometric Exercises: Link to playlist below:

[ACL-R PHASE 4 STAGE 3 PLYOMETRICS TELEREHAB NHS FIFE YOUTUBE PLAYLIST](#)

Phase 4 Stage 3 Plyometric Exercises:

[ACL-R PHASE 4 STAGE 3 PLYOMETRICS TELEREHAB NHS FIFE YOUTUBE PLAYLIST](#)

Ex 1) Tuck Jump

From Phase 4 Stage 2 Maximal Vertical Squat Jump with medium landing forces is progressed in Stage 3 to, Tuck Jump to increase landing forces further.

From two feet jump vertically as high as you can & tuck your knees to your chest in order to land from a greater height; land softly on two feet. Ensure good trunk, hip & knee alignment.

Ex 2) Lateral (Side) Jump Back - Continuous

The Lateral (side) Push Back and Step & Land Exercises from Stage 2 can be progressed to a Lateral (side) Jump Back – continuously.

Try & land softly, maintain good trunk, hip & knee alignment – move in a smooth continuous manner.

Ex 3) Single Leg Squat Jumps

Ensure good single leg squat technique before commencing this exercise. Keep knee aligned over big/second toe, & do not let knee move inwards.

3a) Single Leg Squat Jumps to Double Leg Landing (Floor)

Split Squat Jumps from Stage 2 can be progressed to Single Leg Squat Jumps. Start with a single leg squat jump from floor vertically upwards & land on two feet. Then progress to:

3b) Single Leg Box Jump

Landing on a higher box will reduce landing forces. Progress the box height as advised by your physiotherapist.

& finally progress onto:

3c) Single Leg Squat Jump Landing on Same Leg (Floor)

Progression from Exercises 3a) & 3b): single leg squat on floor to vertically jump upwards and land on same leg.

ACL-R PHASE 4 STAGE 3 PLYOMETRICS TELEREHAB NHS FIFE YOUTUBE PLAYLIST

Ex 4) Single Leg Drop Jump

The Double Leg Drop Jump from Stage 2 can be progressed to a Single Leg Drop Jump.

Start with a low height & gradually increase as guided by your physiotherapist to approximately 30 cm. This greater landing height will again increase landing forces. Both feet on box, step affected leg off box & drop to land on affected leg. Immediately on landing jump up.

This can be progressed by dropping off of one elevated surface & hopping up onto a second elevated surface.

Ex 5) Hopping

Ensure good single leg squat technique before commencing these exercises. Keep knee aligned over big/second toe, & do not let knee move inwards.

Also ensure proficiency with exercises 3a) Single Leg Squat Jumps to Double Leg Landing (Floor) and 3c) Single Leg Squat Jump Landing on Same Leg (Floor) before commencing these hopping exercises.

5a) Hopping On the Spot

Aim for soft quiet landings & short ground contact times, quick movements.

5b) Hopping Forward

Do NOT try & travel too far with each hop, move rapidly.
Aim for soft quiet landings & short ground contact times, quick movements.

5c) Hopping Lateral (Sideways)

Do NOT try & travel too far with each hop, move rapidly.
Aim for soft quiet landings & short ground contact times, quick movements.

Do this exercise hopping in each direction on the affected leg.

Phase 4 Stage 4 Plyometric Exercises:

[ACL-R PHASE 4 STAGE 4 PLYOMETRIC EXERCISES TELEREHAB NHS FIFE YOUTUBE PLAYLIST](#)

Criteria for progression to Phase 4 Stage 4 Plyometric Exercises:

- Good pre-planned movement quality: single leg landing; single leg deceleration; double leg and single leg drop jumps and during change of directions.
- Able to perform 8 single leg repetitions on leg press machine with weight greater than 1.5 times body weight.
- Knee extension (straightening) and flexion (bending) strength, through full range of movement, greater than 90% of unaffected side.

Aims of the Phase 4 Stage 4 Plyometric Exercises:

- Restore sport specific movement quality, fitness, skill and build high load movement quality.
- To build strength, power, rate of force development and acceleration/deceleration with single leg exercises.
- To build aerobic, cardiovascular (CV), fitness.

Phase 4 Stage 4 Plyometric Exercises are very high intensity, involve shorter ground contact times compared to Stage 3 exercises and are a mix of double and single leg exercises. The aim is to progress to reactive movements in order to prepare for Phase 5 Return to Sport where sport specific training will commence. Load is monitored via the number of foot contacts per day. For this stage a maximum of 200 foot contacts per day is suggested, be guided by your physiotherapist.

Phase 4 Stage 4 Plyometric Exercises: Link to playlist below:

[ACL-R PHASE 4 STAGE 4 PLYOMETRIC EXERCISES TELEREHAB NHS FIFE YOUTUBE PLAYLIST](#)

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Phase 4 Stage 4 Plyometric Exercises:

[ACL-R PHASE 4 STAGE 4 PLYOMETRIC EXERCISES TELEREHAB NHS FIFE YOUTUBE PLAYLIST](#)

Ex 1) Double Leg Weighted Squat Jump

The Maximal Vertical Squat Jump from Stage 2 can be progressed to Double Leg Weighted Squat Jump.

As guided by your physiotherapist hold some weights (dumbbells) in your hands. From two feet jump vertically as high as you can & land softly on two feet. Ensure good trunk, hip & knee alignment. Landing with weight will increase the landing forces.

Ex 2) Single Leg Drop Jump Progressions from Stage 3

The Single Leg Drop Jump from Stage 3 can be progressed to a Single Leg Drop Jump with increased height of either the height of first surface dropping from and/or height of surface hopping up too as advised by your physiotherapist.

Dropping from a higher height increases landing forces, and hopping to a higher second surface increases the power required.

Start with a low height & gradually increase as guided by your physiotherapist to approximately 30 cm. This greater landing height will again increase landing forces. Both feet on box, step affected leg off box & drop to land on affected leg. Immediately on landing jump up.

This can be progressed by dropping off of one elevated surface & hopping up onto a second elevated surface.

Ex 3) Single Leg Lateral (Side) Drop Jump

The Lateral (Side) Jump Back – Continuous from Stage 3 can be progressed to a Single Leg Lateral (Side) Drop Jump with progressions in a similar manner to Exercise 2 Single Leg Drop Jump (see above). Single Leg Lateral (Side) Drop Jump with increased height of either, the height of first surface dropping from and/or height of surface hopping up to as advised by your physiotherapist.

Dropping from a higher height increases landing forces, and hopping to a higher second surface increases the power required.

Start with a low height & gradually increase as guided by your physiotherapist to approximately 30 cm. This greater landing height will again increase landing forces. Both feet on box, step affected leg TO THE SIDE off box & drop to land on affected leg. Immediately on landing jump up. This can be progressed by dropping off of one elevated surface & hopping up onto a second elevated surface.

Ex 4) Step and Cut

[ACL-R PHASE 4 STAGE 4 PLYOMETRIC EXERCISES TELEREHAB NHS FIFE YOUTUBE PLAYLIST](#)

Step onto the affected leg, and accelerate off at different angles: for example 30 degrees; 45 degrees; 60 degrees and 90 degrees.

Phase 5 Return to Sport

Criteria for progression to Phase 5:

- Not before 9 months
- No pain or swelling
- Proficient technique for all Phase 4 exercises
- Completion of a progressive program of sub-maximal running, supervised agility and low intensity plyometric exercises with proficient technique, landing mechanics and quality of movement.
- Successfully pass functional testing.

Aims of the phase

Return to Sport.

Many patients with an AC-R will be able to return to sports, especially those sports that do not involve twisting, turning and changing direction. Practising jumping, hopping and turning exercises before returning can help. However, these exercises have risks and benefits. You may need more specific exercises to help you return to your sport safely. Only you can decide if you want to get back to your sport. The more demanding your sport, the more specific training you will need to do. Building up the level of exercise will help you return to your sport.

Return to sport is a continuum comprising: return to participation, return to sport and return to performance. In consultation with your physiotherapist, and if appropriate coaches, it may be advisable to look at the Strategic Assessment of Risk and Risk Tolerance (StAART) [StAART Framework](#) framework to guide your return to sport decision making.

Some patients on attempting to return to their sport feel the knee still feels unstable or 'gives way'.

Notes:
