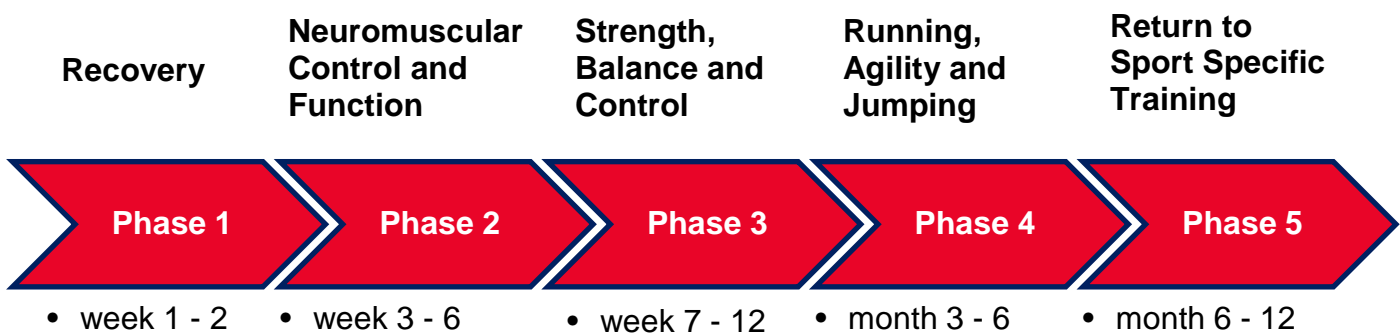


Anterior Cruciate Ligament (ACL) Reconstruction Protocol



- This document outlines rehabilitation goals, precautions and exercises following ACL reconstruction surgery.
- Although phases are listed in time blocks, your physiotherapist will progress exercises as goals are achieved. This may be earlier or later than listed.



Disclaimer:

This leaflet provides some exercises to assist with rehabilitation of your injury. While it contains the recommended exercises, it does not contain all the available exercises or information and does not take the place of talking to your orthopaedic surgeon or physiotherapist.

All exercises have risks and benefits. Your surgeon has weighed the risks of you undertaking these exercises against the expected benefits. If you have any concerns about any of these exercises, ask your surgeon or physiotherapist.

Do not continue the exercises if:

- You experience increasing pain (some discomfort is common)
- Your condition has deteriorated in any way since you last consulted your surgeon or physiotherapist
- You have a new injury or condition and have not consulted your treating doctor about continuing these exercises.

These exercises should only be undertaken by patients who are currently being treated by an orthopaedic surgeon at The Royal Melbourne Hospital.

If you do not understand how to perform an exercise then do not do it. Do not do more than the prescribed number of each exercise without first talking to your orthopaedic surgeon or physiotherapist.

Patients should be aware that the suggested exercises are not guaranteed to provide any improvement in your condition but may assist rehabilitation if undertaken in accordance with these instructions and your orthopaedic surgeon or physiotherapist's advice. Exercises are undertaken at your risk.

Keep this brochure as you may need to read it again.

Phase 1: Recovery (weeks 1 and 2)

Goals

- Protect the graft
- Control pain and swelling
- Achieve good quadriceps (thigh muscle) contraction
- Ensure full knee extension (that you are able to get your knee straight).

Precautions / Management

- You can **weight bear as tolerated** on the operated leg. Use crutches so you are not limping
- Slow your walking to ensure a normal heel-to-toe pattern
- You should not bend your knee beyond **30 degrees for the first 2 weeks**
- **Avoid** letting your operated leg dangle without support. Use your hands or other leg to assist the operated leg when getting in or out of bed.

Knee Brace

- Wear your brace while walking for **1 - 2 weeks**. Your physiotherapist will advise you to stop when you have adequate quadriceps muscle control
- Remove the brace for exercises, hygiene and sleep.

Bandages

- Remove the outer crêpe bandage **48 hours** after surgery
- Leave the dressing underneath. **Keep it dry** until your outpatient appointment.

Swelling Management

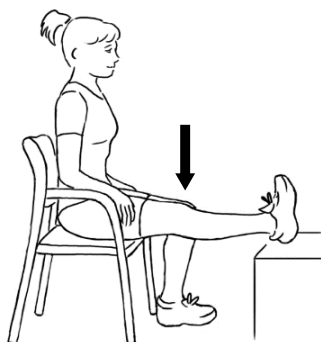
- Wear Tubigrip (an elastic compression bandage you can be purchase from the pharmacy) once the crêpe is removed. Take this off when you go to bed
- Elevate the leg and apply ice for **20 minutes, 3 - 4 times per day**.

Phase 1 Exercises (Remove the knee brace for these exercises)

Start these exercises the day after surgery. Perform 3 - 5 times per day.

Knee Extension - Place your foot on a chair with the knee unsupported. Tighten the thigh muscle and straighten the knee. Avoid pushing beyond straight (hyper-extension). Hold for 5 seconds then relax.

Repeat 3 × 10



Knee Flexion - Slide your heel towards your bottom **stopping at 30 degrees**. Return to a straight knee position.

Repeat 3 x 10

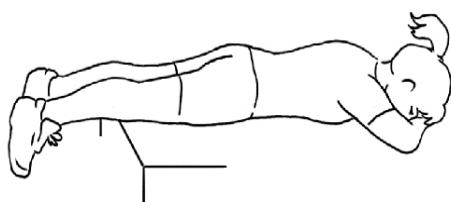


Add these exercises after 7 days

Prone Knee Hangs - **Only if you haven't achieved full knee extension (straightening)**. Lie on your front with your knees over the edge of the bed. Let your legs hang.

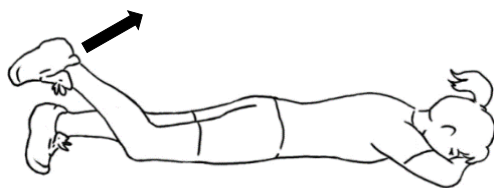
*** Note: It is normal to feel some numbness or tingling on the front of the shin from the surgical cut*

Repeat 1 x 2 - 5 minute hold (or longer if tolerated)



Hamstring Curl - Lie on your front. Bend your knee to 30 degrees, then lower slowly.

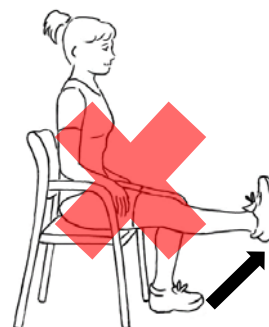
Repeat 3 x 10



Phase 2: Neuromuscular Control and Function (week 3 - 6)

Goals

- Protect the graft
- Control pain and swelling
- Maintain full knee extension
- Achieve knee **bend 100+ degrees**
- Regain knee strength with functional activities
- Wean off crutches.



Precautions / Management

- Continue swelling management as required
- Once you have adequate knee strength, stop supporting the leg when getting in / out of bed
- **No “open chain” exercises** (that is, kicking your leg straight against resistance) **until 8 weeks**
- Focus on “closed chain” strength like squats or lunges, where your foot is in contact with a surface
- Commence hydrotherapy or swimming with a ‘pull buoy’ between your legs (**no kicking**).

Phase 2 Exercises

Aim to spend 20 - 30 minutes on exercises each day. Rotate through different combinations depending on how much time you have.

Knee Flexion - Slide your heel towards your bottom bending the knee. Stop when you feel a stretch or mild discomfort.

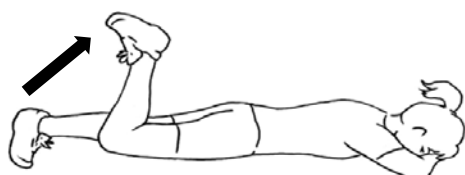
Repeat 3 × 10



Hamstring Curl - Lie on your front. Bend the heel of your operated leg towards your bottom.

Repeat 3 × 10

To increase the challenge add an ankle weight or light theraband



Hamstring Stretch - Sit with your operated leg out straight. Lean your body forward until you feel a gentle stretch in the back of your thigh (hamstring). **Don't push into pain.**

Hold for 30 seconds. Repeat 3 times.



Squat - Stand holding something for support. Bend your knees to squat then stand up.

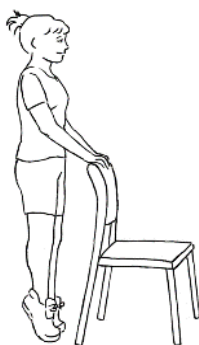
Repeat 3 x 10



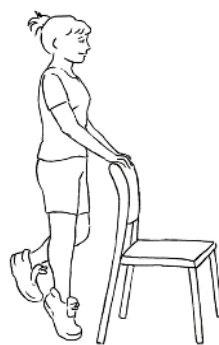
Calf Raises - Stand holding something for support. Rise up onto your tip toes then lower.

Repeat 3 x 10

To increase the challenge, try one leg at a time (as in picture b.)



a) Double Leg



b) Single Leg

Lunges - Step forward with the operated leg. Bend both knees, lowering down.

Repeat 3 × 10

To increase the challenge step to the side or back, or add hand weights



Step Ups - Step onto a step or small box leading with the operated leg. Use a rail or wall for support if needed.

Repeat 3 × 10

To increase the challenge try step downs, side steps or increase the height of your step



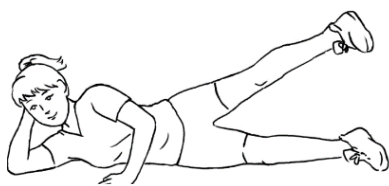
Hip Strengthening

a) Hip Abduction - Lie on your side, lift the top leg up and down

b) Bridge - Lie on your back with knees bent up. Lift your bottom off the bed then lower down

Repeat 3 × 10 each

To increase the challenge add an ankle weight / theraband, or perform a single leg bridge



a) Hip Abduction



b) Bridge

Balance Exercises

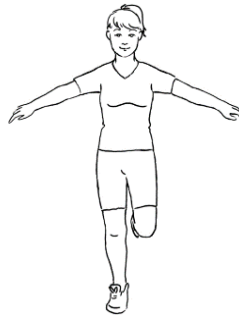
- a) Tandem Stance - Stand heel to toe with the (operated leg at back)
- b) Single Leg Balance - Stand on your operated leg
- c) Toe Taps - Balance on your operated leg while using your other foot to tap each marker

Repeat 3 x 30 seconds each

To increase the challenge add a pillow under your foot or close your eyes



a) Tandem Stance



b) Single Leg Stance



c) Toe Taps

Phase 3: Strength, Balance and Control (week 7 - 12)

Goals

- Minimal or no swelling
- Full knee movement
- Leg press strength at **85%** of the unaffected leg or better
- Able to single leg squat with good alignment and control
- Single leg balance equal to the unaffected leg
- Start a gym program (2 - 4 sessions per week). Focus on knee alignment, control, strength (including core), balance and general fitness.

Precautions / Management

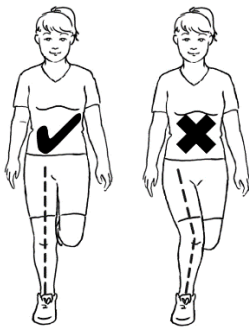
- Commence “open chain” exercises at **8 weeks**
- Swimming can progress to **gentle kicking** at **8 weeks**
- *If progressing well your physiotherapist may start phase 4 exercises earlier than 12 weeks*

Phase 3 Exercises

Aim to spend 20 - 30 minutes on exercises each day. Rotate through different combinations depending on how much time you have.

Single Leg Squat - Stand on the operated leg. Squat keeping the knee in good alignment. If this is too difficult, hold a chair or wall on your non-operated side, or try a Bulgarian squat (with the back leg supported on a chair).

Repeat 3 × 10



Advanced Balance Exercises - Balance on a wobble board / Bosu ball / dura disc.

Repeat 3 x 30 - 60 seconds

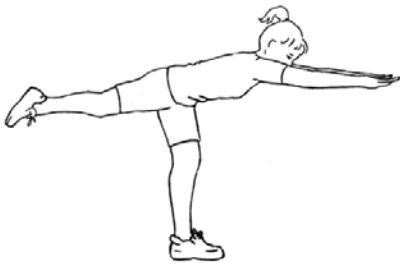
To increase the challenge add upper body movements e.g. catch and throw a ball



Eccentric Hamstring Strength / Arabesque - Stand on the operated leg. Lean forward and lift your back leg off the floor. Your chest should be parallel with the floor.

Repeat 3 x 10

To increase the challenge hold a small weight



Single Leg Balance with Resistance - Stand with the operated leg in a slight squat. With a Theraband around the opposite ankle, extend backward at the hip.

Repeat 3 x 10

To increase the challenge increase the resistance of the Theraband, or move in multiple directions



Crab Walk - Stand in a slight squat with Theraband around your knees. Side-step 10 steps to the right, then 10 steps to the left.

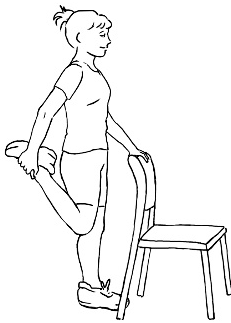
Repeat 5 times

To increase the challenge increase the resistance of the Theraband or move it to you ankles



Quadriceps Stretch - Hold a chair for balance. Bring your heel to your bottom and hold to feel a stretch in the front of your thigh (quadriceps).

Repeat 3 x 30 seconds



Gym Exercise Ideas - Start with low load and high repetition (e.g. 3 sets of 15 – 20 repetitions).
As you increase the load / weight, reduce the repetitions.

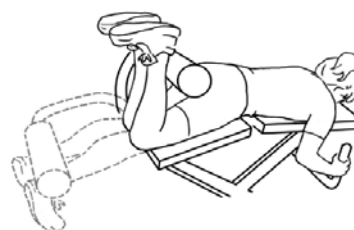
- a) Exercise bike
- b) Leg Press - double leg, then progress to single leg with a lighter weight
- c) Hamstring Curls - double leg, then progress to single leg with a lighter weight
- d) Calf Raise Machine - double leg, then progress to single leg with a lighter weight
- e) Core Exercises e.g. Swiss ball



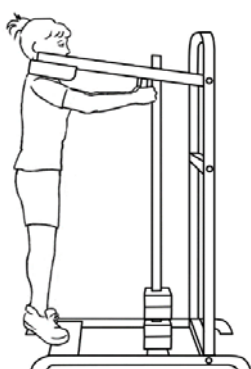
a) *Exercise Bike*



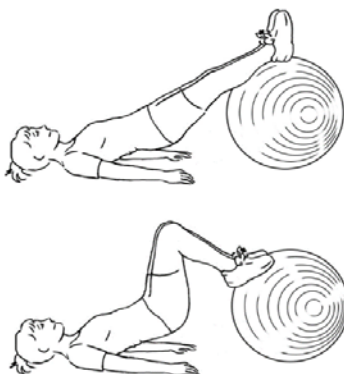
b) *Leg Press*



c) *Hamstring Curl*



d) *Calf Raise Machine*



e) *Core Exercises*

Phase 4: Running, Agility and Jumping (3 - 6 months)

Goals

- Full squat
- Single leg press strength **95%** of the other leg or better
- Single leg hop test AND triple crossover hop test scores **90%** of the other leg or better
- Star excursion balance test score equal to the other leg
- Return to running

Management

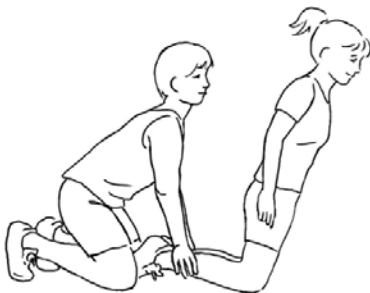
- Progression of strength / balance / gym programs
- Plyometric training with focus on control and good alignment
- Speed drills e.g. floor ladder drills forward, backward, sideways
- Skipping or mini trampoline exercises
- Outdoor cycling
- Swimming with full power kicking
- Graduated return to running program
- Start basic sport specific drills e.g. ball skills, kicking, catching etc.

Phase 4 Exercises

Continue your gym program 2 - 4 times per week. Speak with your physiotherapist about which exercises to focus on.

Nordic Eccentric Hamstring Exercise - Hook your feet under a secure object or ask a friend to hold you. Lean forward from the knees. When you can no longer hold, drop into a push-up position on your hands.

Repeat 3 × 10, **twice per week only**



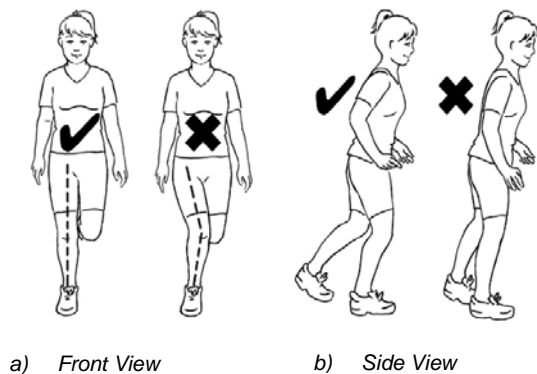
Gym Program - Add seated knee extension to your program. Start with **low resistance** and increase.

To increase the challenge, progress to single leg or increase the resistance



Running Drills (avoid treadmills) - Jog or run in a straight line on flat ground. Focus on knee control.

Start with 5 - 10 minutes, 2 - 3 times per week. Increase time / distance as tolerated

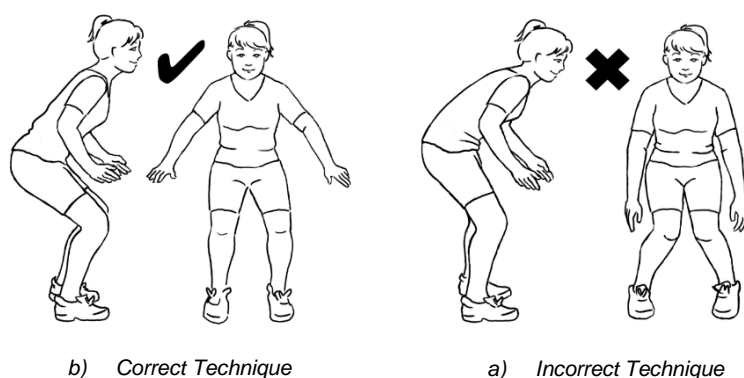


To increase the challenge:

- Increase speed and/or distance
- Add incline/decline hill work
- Move in a different direction: forwards, backward, sideways
- Add bounding or change speed
- Leaping
- Running with quick change in direction e.g. plant and cut

Jumping (Plyometric) Exercises - Squat keeping your hips, knees and ankles in good alignment. Hold for 1 second then jump straight up. Focus on landing softly with good hip and knee control

Repeat 3 x 30 seconds, 2 - 3 times per week



To increase the challenge:

- Side jumps
- Box jumps with increasing height
- Jump with rotation – 90° and 180°
- Double leg jump landing on single leg
- Lunge jumps
- Hopping
- Triple jump

- Zigzag – double leg or single leg

Phase 5: Return to Sport Specific Training (6 - 12 months)

Goals

- Leg press strength **95 - 100%** of the unaffected leg
- Single leg hop test, triple crossover hop test, single leg squat endurance **equal** to that of the unaffected leg
- Feel comfortable, confident and ready to return to play

Management

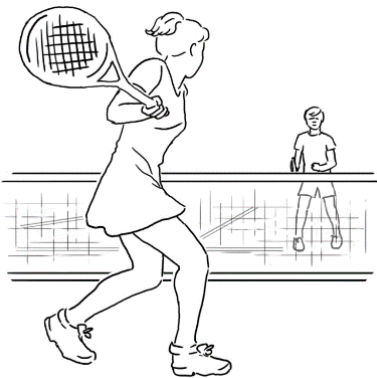
- Return to sport specific training and sport as guided by your physiotherapist or coach

Useful Links – injury prevention and rehabilitation:

<https://kneesurgerysydney.com.au/preventing-acl-injuries-with-the-fifa-11-program/>

<http://www.fittoplay.org/body-parts/knee/knee/>

<http://knee.netball.com.au/>



When can I ...

Return to work?

- Sedentary employment (e.g. desk job): **when comfortable**.
- Work that involves standing on your feet most of the day (e.g. retail): after **4 - 6 weeks** when comfortable.
- Manual labour jobs (e.g. construction worker): after **8 - 12 weeks** once you can complete work specific activities without an increase in pain or swelling.

Return to driving?

- Automatic car:
 - Left leg surgery: After **2 weeks**, once you have adequate knee bend to sit in the driver's seat.
 - Right leg surgery: After **4 - 6 weeks**, once adequate knee bend and strength is achieved.
- Manual car:
 - After **4 - 6 weeks**, once adequate knee bend and strength is achieved.

Return to jogging?

- After **3 - 6 months** as guided by your physiotherapist.

Return to sports?

- After **9 - 12 months** as guided by your physiotherapist and surgeon.

Contact:

Department of Physiotherapy
Allied Health
(03) 9342 7440

