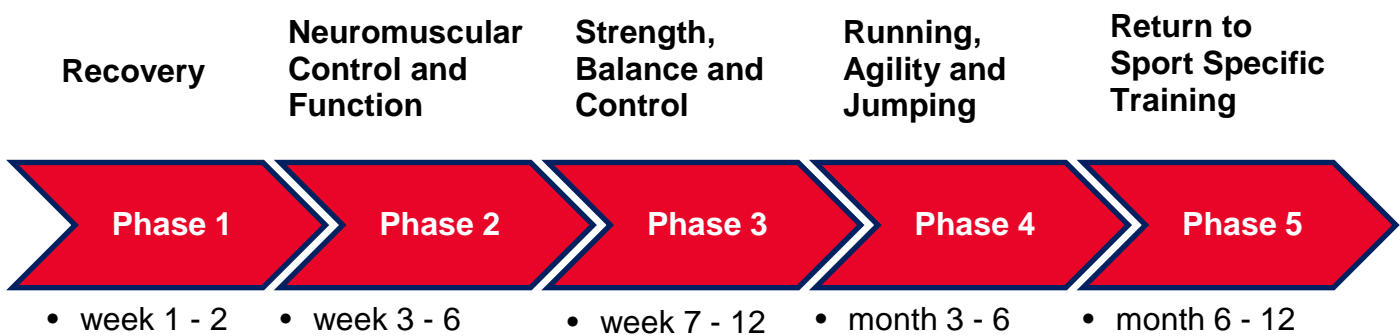


Anterior Cruciate Ligament (ACL) Reconstruction Protocol



- This document outlines rehabilitation goals, precautions and exercises following ACL reconstruction surgery.
- The phases are listed as time blocks; however progression should be guided by your treating physiotherapist. This may be earlier or later than listed, depending when the goals of the current phase are achieved.



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 when walking for **1 - 2 weeks** until you have adequate quadriceps muscle contraction as assessed by your physiotherapist
- The brace can be removed for exercises, hygiene and sleep

Bandages

- Remove the outer crepe bandage **48 hours** after surgery
- Leave the dressing underneath on and **keep it dry** until your outpatient appointment

Swelling Management

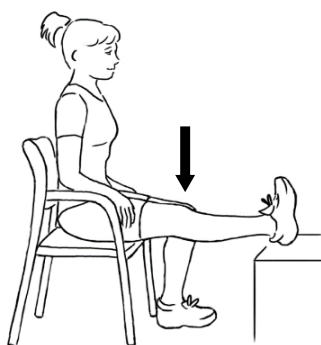
- Wear an elastic compression bandage (Tubigrip) once the crepe bandage has been removed (purchase from your local chemist). Remove it when you go to bed
- Elevate the leg and apply ice for **20 minutes, 3 - 4 times per day**

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 x 10



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

Repeat 3 x 10

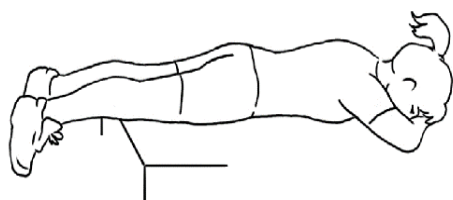


Add these exercises after 7 days

Prone Knee Hangs - **Only if full knee extension (straightening) is not achieved yet.** Lie on your tummy with your knees over the edge of the bed and let your legs hang.

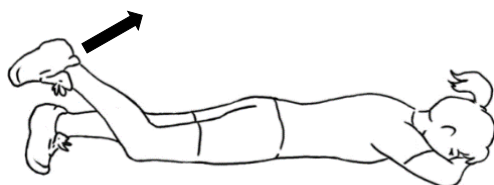
*** Note: It is normal to feel some numbness and tingling on the front of the shin from the surgical cut*

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



Hamstring Curl - Lie on your tummy, bend your knee up to 30 degrees, and then slowly lower down

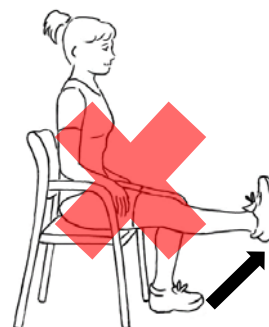
Repeat 3 x 10



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 you can 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 (where the foot is in contact with a surface), squats or lunges for example
 - 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 available.

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

Repeat 3 x 10



Hamstring Curl - Lie on your tummy and bend the heel of the operated leg towards your bottom

Repeat 3 x 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 into a squat then slowly stand up straight again

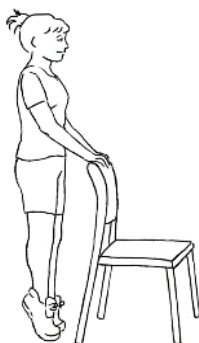
Repeat 3 x 10



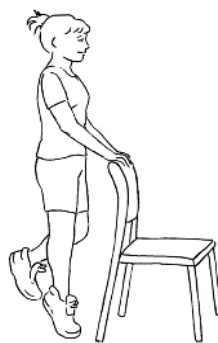
Calf Raises - Stand holding something for support. Rise up onto your tip toes then slowly lower

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 the operated leg forward, and bend both knees, lowering down

Repeat 3 x 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 x 10

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



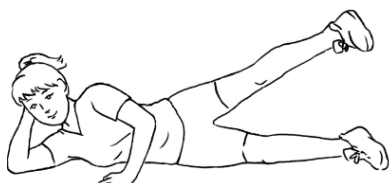
Hip Strengthening

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

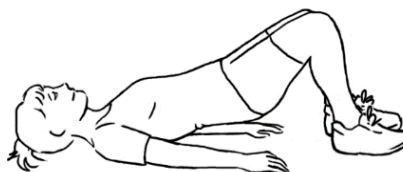
b) Bridge - Lie on your back with knees bent up, lift your bottom off the bed then slowly lower down

Repeat 3 x 10 each

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



a) Hip Abduction



b) Bridge

Balance Exercises

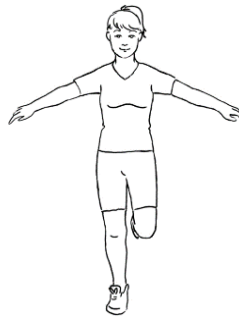
- a) Tandem Stance - Stand heel to toe with the (operated leg at back)
- b) Single Leg Balance - Stand on your operated leg
- c) Toe Taps - Stand and balance on your operated leg while using your other foot to tap each marker

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 range
- 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

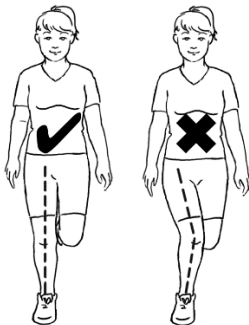
- Commence “open chain” exercises at **8 weeks**
- Swimming can progress to **gentle kicking** at **8 weeks**
- *If progressing well your physiotherapist may start phase 4 exercises earlier than 12 weeks*

Phase 3 Exercises

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

Single Leg Squat - Stand on the operated leg, squat down while keeping the knee in good alignment. Hold a chair on the opposite side if needed initially or complete a Bulgarian squat

Repeat 3 x 10



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

Repeat 3 x 30 - 60 seconds

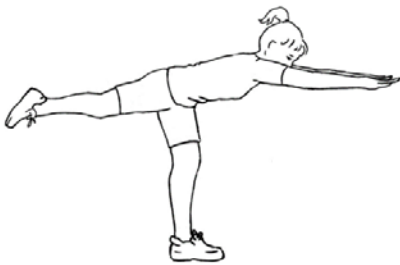
To increase the challenge add upper body movements e.g. catch and throw a ball



Eccentric Hamstring Strengthening / Arabesque - Stand on the operated leg and lean forward lifting your back leg off the floor. Aim for the trunk to be parallel with the floor

Repeat 3 x 10

To increase the challenge hold a small weight in your hands



Single Leg Balance with Resistance - Stand on the affected leg in a slight squat position. Extend the unaffected leg backwards while maintaining balance

Repeat 3 x 10

To increase the challenge increase the resistance of the theraband or perform in multiple directions



Crab Walk - Stand in a slight squat position with theraband around your knees, side step 10 steps to the right then 10 steps to the left

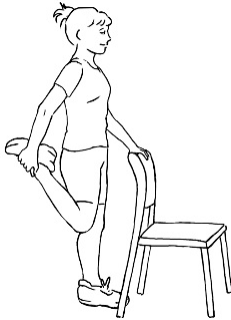
Repeat 5 times

To increase the challenge increase the resistance of the theraband or move it to ankles



Quadriceps Stretch - Hold a chair for balance. Bring your heel to your bottom 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. 3sets of 15 - 20repetitions. As you gradually increase the load / weight, reduce the repetitions as guided by your physiotherapist

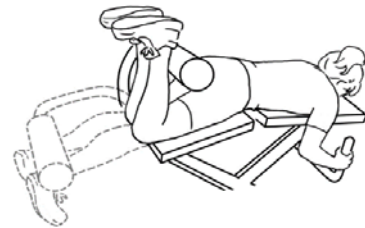
- a) Exercise bike
- b) Leg Press - double leg, then progress to single leg with a lighter weight
- c) Hamstring Curls - double leg, then progress to single leg with a lighter weight
- d) Calf Raise Machine - double leg, then progress to single leg with a lighter weight
- e) Core Exercises e.g. with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



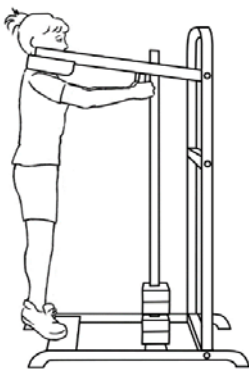
a) Exercise Bike



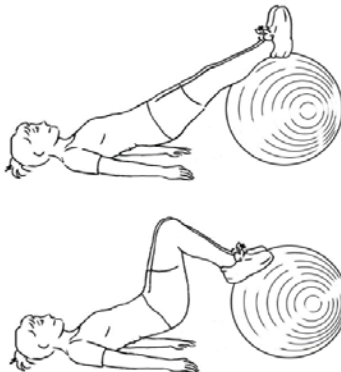
b) Leg Press



c) Hamstring Curl



d) Calf Raise



e) Core Exercises

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

Goals

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

Management

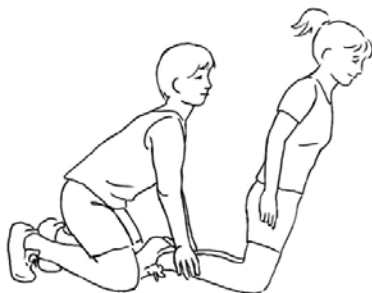
- Progression of strengthening / balance / gym programs
- Plyometric training with focus on control and good alignment
- Speed drills e.g. floor ladder drills forward, backwards, sideways
- Skipping or mini trampoline exercises
- Outdoor cycling
- Swimming with full power kicking
- Graduated return to 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. Slowly lean your trunk forward as far as possible, when you can no longer hold, drop into a push-up position on your hands

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



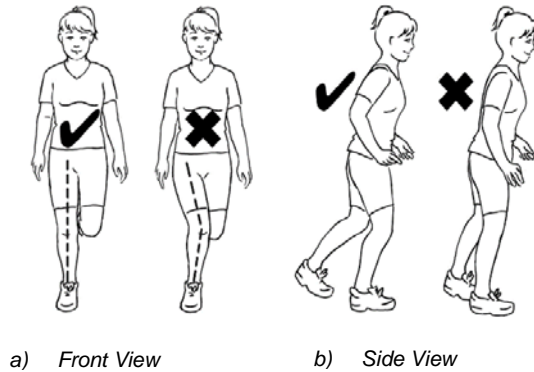
Gym Program - Add seated knee extension to your program. Start with **low resistance** and increase gradually

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



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

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

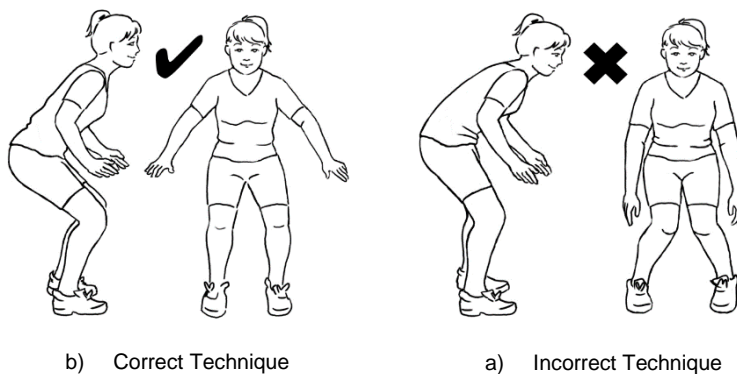


To increase the challenge:

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

Jumping (Plyometric) Exercises - Squat down keeping 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
- Zig Zag – double leg or single leg

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

Goals

- Leg press strength **95% to 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

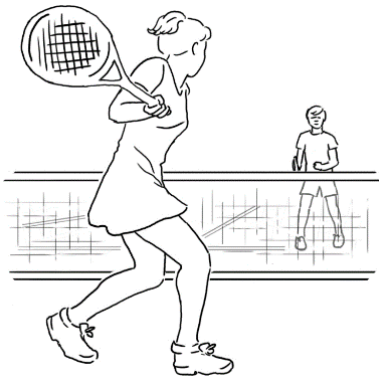
- Return to sport specific training and sport as guided by your physiotherapist or coach

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 work) around **4 - 6 weeks** when comfortable.
- Manual labour jobs (e.g. construction worker) around **8 - 12 weeks** once you can complete work specific activities with no increase in pain or swelling.

Return to driving?

- Automatic car:
 - Left leg surgery: After **2 weeks** once adequate knee bend.
 - 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

