



Meridian
CLINIC

ACL Reconstruction Rehabilitation Program

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1. Introduction to Rehabilitation
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1. INTRODUCTION TO YOUR REHABILITATION

If you want to achieve your best outcome, adhering to your rehabilitation program is essential after this surgery. It will take perseverance and hard work. There are no short cuts to success.

Key Functional Goal

Your surgeon and physiotherapist will work with you to select a realistic goal. This becomes a focus for your rehabilitation, especially in the later stages which are usually sport specific.

My Goal:

My Physiotherapist's contact information:

2. THE KEYS TO SUCCESSFUL REHABILITATION

Your condition before surgery

The way you present at surgery is essential to a good outcome. Research and clinical experience strongly emphasizes the following pre-operative requirements:

- Full knee extension (the same as the opposite side)
- No swelling
- Strong quadriceps and hamstring muscles (thigh muscles)

Work with your physiotherapist to achieve these goals prior to surgery.

Management after Surgery

Early after surgery, the key objectives are to decrease swelling, obtain a full range of movement (especially knee extension), and regain active control of your knee joint.

In the next stage, it is important to improve your walking ability and to start increasing strength and balance.

In the middle stages, it is a time of consolidation where there is a focus on strength, endurance and coordination.

In the final stage, the focus is on sport and work specific activities and improving your ability to do the physical tasks required of you in these endeavors. Things that prevent you from achieving your best result are called barriers to recovery and include:

- Working too hard when pain and swelling are present.
- Not having immediate and long term goals to aim for.
- Not following a staged rehabilitation program.
- Failure to obtain good movement, especially knee extension.
- Not appreciating that you do need to focus on your knee joint and work at improving its function.

Overall confidence, perseverance and sticking to the plan are the keys to success.

3. STAGES OF REHABILITATION AFTER ACL RECONSTRUCTION

STAGE ONE: To the End of the Week One

Immediate goals:

- A. Reduce swelling
- B. Obtaining full passive knee extension
- C. Obtaining 90 degrees of knee flexion

Swelling Control:

- R** = Resting the knee between sessions of regulated exercise (lying down with the knee up).
- I** = Icing the knee at regular intervals during the first week (20 minutes on/20 minutes off).
- C** = Compression - Leave the knee bandaged for at least 48 hours and continue with good quality compression bandage after that time.
- E** = Elevate your knee to allow swelling to flow toward your trunk.

Range of Motion

Extension

- To obtain full extension (ie: a straight knee), sit on a flat surface (floor, bed or lounge chair) with a cushion or pillow under your heel. Relax your leg and let gravity slowly straighten your knee. Hold your knee in this position for at least one minute each time. Longer is better. This exercise can be performed hourly.
- Your therapist can show you other similar exercises.

Flexion

- Sit on a table or chair with your knee bent comfortably. Cross your legs and use your non operated leg to assist in increasing your flexion (knee bend). Aim for 110 degrees of bend by the end of week 1 after your operation.
- Lie on your back and slide the heel of your operated knee towards your bottom. Do this exercise in sets of 30, three times per day.
- Sit on a chair and place your heel on a skateboard. Then move your heel up towards your trunk bending your knee as fast as you can and then straighten your knee as far as it can go. Repeat up to 50 times, at least 3 times per day (notice this exercise can replace the one above).

Knee Cap

- With your knee in a straightened position, and your muscles and joint in a relaxed state, check that your knee cap moves freely by moving it from side to side gently with your hands for one minute. Do this exercise once daily, do more if it is stiff as it prevents the knee from gaining full movement.

Strength

- While lying, every hour tighten your quadriceps muscles and hold them tight for 5 seconds. Do 5 reps every hour. Try to gain a maximal contraction.
- While sitting, from a bent knee position, straighten your knee contracting your quadriceps muscles with extra effort at the end of the range. Do 3 sets of 15 repetitions three times per day.

Function

Walking

- Walk regularly with crutches for the first few days. By the end of week 1 try walking without crutches for short periods (10 minutes).

Balance and Coordination

Standing exercises will help control at the knee joint and also maintain strength in other muscles in our leg (e.g. hip and ankle muscles). Do the following:

- Single leg standing: hold onto a table and stand on the injured leg for 30 seconds
- Weight Shifting: tighten your thigh muscles and shift weight from left to right leg.
- One Leg Calf Raise: standing on either leg (do both) and use your calf muscles to lift your heel off the ground. Do this 10 times.
- Side Steps: try 2 steps left and 2 steps right. Do this 5 times.
- Double Leg Squat: holding onto a table, in the standing position gently bend your knee (knee cap over 2nd toe) to about 40 degrees or as comfortable. Do this 5 times, then rest for 2 minutes. Do at least 2 sets twice per day.

After all the exercise sessions and specific walking activities, ice your knee joint and rest with the knee elevated. In the first 2 weeks, this is very important.

With a swollen joint, you will not be able to proceed to the next stage.

You should report to the physiotherapist 1-2 weeks after surgery. Your surgeon may recommend alternatives to this. You should have full terminal extension, flexion to 90 degrees, minimal swelling and normal walking.

STAGE TWO: To the End of the Week 2

Immediate goals:

- A. Reducing swelling further.
- B. Obtaining/Maintaining full passive knee extension.
- C. Obtaining 110 degrees of knee flexion.
- D. Walking normally, and increasing walking ability to 2x10 minutes per day.
- E. Increasing balance to standing comfortably on one leg.
- F. Cycling on a stationary bike for 10 minutes.

To achieve these goals:

Continue to control swelling using RICE as before but only if swelling is a problem or it increases after exercise.

Range of MotionExtension

- To obtain full extension (knee straight) same as week 1 except you can place a very gentle amount of overpressure with your hands above and below the knee cap to further straighten your knee. Your physiotherapist will show you how much force to apply.
- Try lying on your stomach hanging your knee off the end of a table or bed. Make sure your knee cap is not under direct pressure (you can place a towel in front of it). Hold this for some time (1-10 minutes), gradually letting the knee straighten.

Flexion

- Same as week 1 except more force can be applied. Aim for 130 degrees of bending.
- Sit on a stationary cycle and gently move the knee back and forth to increase the ROM. It is unlikely you will be able to complete the peddle stroke but it is good to work towards this. Do this for 5-10 minutes.

Knee Cap

- Same as week 1; you should be aiming for a knee cap that moves freely. If it is stiff your physiotherapist can assist you with progressions.

Strength

Same as week 1, but now add:

- Single Leg Squat: in the single leg standing position gently bend your knee (knee cap over 2nd toe) to about 40-60 degrees or as comfortable. Repeat 5 times, and repeat during the day up to 2 hourly.
- Sitting leg extension off the table. In the sitting position straighten your knee to the fully extended position. Repeat 10-15 times and the 2 hourly.
- Hamstrings can be strengthened by lying on your stomach and bending your knee to 90 degrees (do 3x15 reps), and rest.

FunctionWalking

- Should now be with a regular normal gait pattern. More time can be spent off the crutches until weaned entirely. You should now try going for 2x10 minute walks as a minimum.
- Use crutches for uneven ground, or when in crowded places.
- Walking sideways, in a good floor space, 10-20 steps, 3 times per day.
- Walking backwards 10-20 steps, 3 times per day.
- Walking heel to toe, walking with a high knee lift and in front of a mirror should also be practiced.

Cycling

- You can start endurance training on the stationary cycle when you have 90 degrees of flexion. Keep the pressure low, turning the legs rather than loading them (10 minutes at about level 2)

Balance and Coordination

- Improve time standing on one leg and if confident start to close eyes for short periods.
- Standing and locking your knee back is good for control and ROM. Repeat 10 times every 2 hours.
- Single leg heel raises (2x10 reps). Try to straighten your knee and lift your heel off the floor.
- Some limb matching exercises (your physiotherapist will describe these to you).

Other Exercises

After all exercise sessions and walking activities, ice your knee joint as described above and rest with the knee elevated. This is very important. With a swollen joint, you will not be able to proceed to the next stage.

If full range of motion (ROM) and other goals have been met, then that strengthening may progress.

STAGE THREE: To the End of the Week 4

Immediate goals:

- A. Formal strengthening with supervision can commence.
- B. Continue to increase ROM. Flexion should now be 130 or more and extension full.
- C. Increase walking to 30 minutes, and be able to change directions and walk sideways and backwards without difficulty.
- D. Improve balance and knee joint awareness.
- E. Increasing endurance.

To achieve these goals:

Strength

Same as week 2, now add:

- Step down from a small step or wedge, single leg (3x15 reps, 90 second rest in between).
- Leg press (3x15 reps, 90 second rest in between).
- Calf raiser with knee straight and bent (3x15 reps, 90 second rest in between).
- Hip abduction, flexion and extension (1-2x15 reps, 90 second rest in between).

Note: Some of these are gym based exercises but good alternatives can be found for a home program. It is best to start with both legs but quickly progress to all single leg strengthening exercises.

Function

Walking

- Can be progressed including changes in direction, speed, and endurance. Should now be able to do 30 minutes constant walking.

Cycling

- Daily if possible, moderate to low resistance up to 20 minutes. Once this is achieved progress to other interval type training.

Stepper

- And/or cross trainer can be introduced.

Swimming

- Can be used to supplement training. Avoid any frog like kicking, keeping to freestyle and backstroke. Your physio can make special recommendations.

Balance and Coordination

- Improve time standing on one leg to at least 30 seconds and if confident start to close eyes for longer periods.
- Standing on the wobble board or bosu ball (see your physio as these exercises should be supervised).
- Limb matching exercises (see your physio).

Other Exercises

There are other exercises you could do at this stage. These can be supervised by your physiotherapist, and include upper body and core strengthening.

STAGE FOUR: To the End of the Week 10

****NOTE: THIS IS THE PERIOD WHERE YOUR GRAFT IS AT IT'S WEAKEST AND EXTRA CARE SHOULD BE TAKEN. TRY TO AVOID SITUATIONS WHERE YOU CAN UNEXPECTEDLY TWIST OR PIVOT ON YOUR KNEE****

Immediate goals:

- A. Progress and consolidate the strengthening, endurance and coordination
- B. Increase walking to 45 minutes and be able to change direction, stop and start quickly and go up and down stairs with good gait.
- C. ***AVOID DAMAGE TO THE GRAFT AS THIS IS WHEN IT'S AT IT'S WEAKEST***
- D. Improve strength of quadriceps to around 70% of the other leg.

To achieve these goals:

Strength

Over these weeks, repetitions are lowered and the load is increased progressing slowly toward 3x8-10 reps with rest intervals of 2-3 minutes in between.

- Step down from a small step or wedge, single leg (3-4x8-10 reps, 2-3 minute rest in between). You can add a small weight to the opposite side to increase resistance and hip control.
- Leg curls (3-4x8-10 reps, 2-3 minute rest in between). If you have had a hamstring graft, then take a little longer building this exercise as the hamstring is still in process of healing.
- Leg press (3-4x8-10 reps, 2-3 minute rest in between).

- Lunges or split squats can be added as an alternative to leg presses.
- Calf raiser with knee straight and bent (3-4x8-10 reps, 2-3 minute rest in between).
- Hip abduction, flexion and extension (1-2x15 reps, 90 second rest in between).

Function

Walking

- Progress to include hills, uneven ground, steps and stairs (30-40 minutes), increase speed and backward walking pace. Add figure 8s, squares, swerves, stops and starts, as described by your physio.

Cycling (For Endurance)

- Add load with the aim to be cycling for 30 minutes at an intensity that leaves you sweating mildly and slightly out of breath (65-80% of your max heart rate).

Stepper and/or Cross Trainer

- Regimes should focus on endurance (10-20 minutes at 65-80% of your max heart rate).

Running

- Can start week 8 with straight line jogging only, and with supervision of running style. Include walk to jog progressing, no speed or direction changes. It is important your physio observe and coach your running style to reduce load through your knees.

Balance and Coordination

- Improve time standing on one leg and if confident start to close eyes for longer periods. Progress to moving the upper limbs to create more challenge to the balance system. This can be further progressed by holding a small weight in your arms as you move them around.
- Stand on a wobble board or bosu ball, using limb movements and arm weights for progressions. Also you can try some easy jumping exercises. Jump off the bosu ball landing on your midfoot with knees slightly bent, absorbing shock through the limb. You can also jump from the floor to the ball. Repeat 10 times.
- Agility exercise can be progressed in terms of their intensity. These include figure eights, cutting and turning, carioca, running backwards, and high knee running drills.

Other Exercises

At this stage your therapist can progress your core and upper body regime. However, this should be very basic as total time in the gym should not be much more than 50 minutes. Some work or sport specific exercises may be appropriate if your physiotherapist advises you.

STAGE FIVE: To the End of the Week 16

At this stage intensity increases in all areas of strengthening, walking and balance. Add speed and direction changes to running. Start some sports and work specific training under supervision if possible. Jumping exercises can be included. Training should focus on improving function and reducing re-injury.

Immediate goals:

- A. Quads should be 80-90% of the opposite limb.
- B. Running should be normal gait.
- C. Sports and work specific drills need to be commenced.
- D. Endurance increased.

To achieve these goals:

Strength

Over these weeks, repetitions are lowered again in some exercises and the load is increased, progressing slowly toward 4x6-8 reps with rest intervals of 2-3 minutes inbetween. It is important at this stage to strengthen the lower limb using single leg exercises.

- Leg Extensions (4x6-8 reps, 2-3 minute rest in between).
- Leg Curls (4x6-8 reps, 2-3 minute rest in between).
- Leg Press (4x6-8 reps, 2-3 minute rest in between). Squats or dead lifts can be added with supervision. (4x6-8 reps, 2-3 minute rest in between).
- Calf raises with knee straight and bent (3-4x8-10 reps, 2-3 minute rest in between).
- Hip abduction, flexion and extension (1-2x15 reps, 90 second rest in between).

Function

Walking

- Walking exercises for agility/control should be progressed in terms of intensity and pace.

Cycling (For Endurance)

- Same as previous, trying to increase intensity. No limitations on duration.

Stepper and/or Cross Trainer

- Same as previous, trying to increase intensity. No limitations on duration.

Running

- Direction changes should be incorporated. Depending on your sport this may also include some light interval training. Your physiotherapist will assist you with this.

Balance and Coordination

- All previous exercises regimes continued and progressed. (Your physiotherapist will help).
- It is good to add a formal jumping regime such as the PEP program. (Santa Monica Orthopedic and Sports Medicine Research Foundation: Prevent Injury and Enhance Performance).
- Jumping exercises include, single hop for distance, 6 meter timed hop, triple hop for distance, and cross over hop for distance.

Other Exercises

At this stage your physiotherapist can progress your core and upper body regime. However, this should be very basic as total time in the gym should not be much more than 50 minutes.

STAGE SIX: To the End of the Week 26

Progress adding in alternatives to previous exercises, using more free weights and starting power work. Make sure your work is now specific toward your goals. This is a good time to use an advanced rehab program or a trainer focusing on performance. At the end of this stage you should be getting ready to return to sport with approval from your surgeon.

Immediate goals:

- A. Quads should be 90-100% of the opposite limb.
- B. Running should be normal gait.
- C. Sports and work specific drills should be focused on return to sport, with return to sport possible at 6 months.
- D. Familiarity with warm up drills, and commencement of a preventative regime such as the PEP program for neuromuscular retraining.

To achieve these goals:

Strength

Over these weeks, repetitions are lowered again in some exercises and the load is increased, progressing slowly toward 4x4-6 reps with rest intervals of 2-3 minutes inbetween, some of these can include speed or power.

- Leg extension (3x15 reps, 90 seconds rest in between). The shin pad should be placed higher than normal towards the knee to avoid any chance of stress at the ACL graft. Load should be small.
- Leg Curls (4x6-8 reps, 2-3 minute rest in between).
- Leg Press (5x4-6 reps, 2-3 minute rest in between).
- Squats or dead lifts can be progressed with supervision (2x6 reps, 2-3 minute rests in between). Power development can be included by increasing speed on the up movement.

Function

All exercises progress in intensity and duration. A sport or work specific regime needs to be implemented, aiming at return to function at around 6 months.

Balance and Coordination

All previous exercises regimes continued and progressed. (Your physiotherapist will help).



You can always contact our
office with any questions or
concerns you may have about
your ACL Reconstruction.

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