

**ACL**

**CO.RE**

A blue silhouette of a person in a dynamic, athletic pose, possibly a dancer or athlete, positioned behind the text 'CO.RE'. The figure is leaning forward with one leg extended back and the other bent, with arms reaching down, creating a sense of movement and balance.

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# THE BASICS

This program sets out the rehabilitation required to get an excellent result from your anterior cruciate ligament reconstruction with a safe but progressive exercise plan.

For those of you who are enthusiastic and have more time available, I have added advanced options where appropriate.

The mechanics of a joint do not get any simpler than the knee. It is a simple hinge joint. It bends and it straightens. The muscles that bend the knee are the hamstrings at the back of your thigh. The muscles that straighten the knee are the quadriceps at the front of your thigh.

When I talk to patients about rehabilitation, I tell them to think about it in two parts. Rehabilitation involves **stretching** and **strengthening**.

## **Stretching**

Stretching involves moving a joint using external forces. The early phases of rehabilitation are mostly about stretching. It must be done early before scar tissue forms, causing stiffness. So it is time critical – you cannot put it off until next week when you are feeling better. Stretches are a low load, long duration activity. The mantra is “stretch and hold”.

## **Strengthening**

Strengthening involves moving a joint using your own muscles. Early on a reconstruction cannot withstand substantial strength work. We will build in strength work as the reconstruction heals.

# THE FIRST WEEK

## **1. WOUND MANAGEMENT**

The dressings applied in hospital generally do not need to be changed. They are waterproof. Leave them in place until your postoperative wound check with the nurse at seven to ten days. Keep your wounds dry for the first week.

## **2. SWELLING**

Swelling control is an important part of the rehabilitation process. The basic principle is RICE: rest, ice, compression and elevation. You will have a Tubigrip compression bandage from the hospital and this should stay on for the first week at least, if not longer. It can be worn for as long as the swelling continues.

Some form of ice should be applied for fifteen to twenty minutes, three times a day. This can be as simple as a bag of frozen peas but there are newer devices such as the "Game Ready" which are excellent.

## **3. BRUISING**

It is normal to get bruising at the surgery site. Gravity may cause that bruising to come out at the back of the knee or commonly even down at the ankle. Some people get a bruise at the thigh from the tourniquet used in surgery. Ice and compression should settle things. The physiotherapist can help with ultrasound and massage for severe bruising.

## **4. CRUTCHES**

Crutches should be used for one week. The really critical point is that you should take some weight through your leg with every step, right from day one. Do not get into the habit of swinging the leg through the air. This causes the muscles to waste away very quickly. Weight bearing forces the muscles to contract and is a critical part of normal joint function. Remember, the reconstruction is not as fragile as you might think. It is capable of taking your full weight immediately.

## **5. KNEE BRACE**

Whether you have a knee brace will depend on what type of graft has been used. If you have had a hamstring graft, I recommend that you use a knee brace for three weeks, but only when ambulant. It is not necessary to wear the brace in bed, or when seated, Remove the brace to perform your exercises.

For patellar tendon and hybrid grafts, a brace is not usually required.

If you have had an extensive meniscal repair for a torn cartilage, you may need a brace for a longer period.

## **6. SLEEP**

Never sleep with a pillow under your knee. This leads to stiffness. You do not need to wear a brace when you are sleeping.

## **7. COMPRESSION STOCKINGS**

You will have been supplied with some short compression stockings in the hospital and it is advisable to wear these for a couple of weeks. They help prevent deep vein thrombosis and reduce swelling in the foot and ankle. They should be worn at all times and removed only for showering.

## **8. HOW HARD DO I PUSH?**

Work within your comfort zone, especially early on. Three simple rules:

- a) Gritting your teeth is okay, but tears in the eyes is not;
- b) You must be able to do tomorrow what you did today. If you wake up so sore you need a rest day – you did too much.
- c) A pain score of 3 out of 10 is ok, no more.

## **9. PHYSIOTHERAPY**

This program is meant to be conducted under the supervision of a physiotherapist where possible. Physio review every two weeks is advisable initially.

## **10. PAIN RELIEF**

See my brochure “Pain Relief After Surgery”.

# STAGE ONE

## WEEK ONE & TWO (DAYS 1 TO 14)

We are going to start with some stretching and then progress on with some gentle strength work. Remember, early on in the rehabilitation program, the big gains are made with stretching.

The rehabilitation program is meant to involve three 20 minute sessions per day. Stretch at every opportunity during the day.

I suggest you start each session with a stretching exercise we call “drop and dangle”. Before the session, you can take a couple of Panadol tablets, make a coffee, get yourself a magazine and spend the first five minutes doing this drill which involves sitting on a high bench or table and simply letting gravity bend the knee.

Follow this up with a more intensive bending exercise, usually a heel slide in the early weeks.

Once we have done some stretching to bend the knee, we move on to stretching it out straight. This is called a heel prop. A rolled up towel or pillow is put under the heel. Just like the drop and dangle, relax for five minutes and let gravity gradually straighten the knee.

Move on to the strength component, which involves static hamstring and quadriceps exercises (static meaning no movement, or “isometric”). Finish off with a solid block of straight leg raises.

So we have stretched the knee to bend, we have stretched the knee out straight, and then we have done some work on the bending muscles (hamstrings), and the straightening muscles (quadriceps). It is as simple as that. Do some calf raises if you have time. Finish off with fifteen minutes of ice and you are done.

### **Objectives by the end of this stage**

By the end of week two, you should have achieved the following:

- The knee should be almost straight
- The knee should be able to bend almost to 90 degrees
- You should be walking without crutches

# WEEK ONE & TWO (DAYS 1 TO 14)

## STRETCH



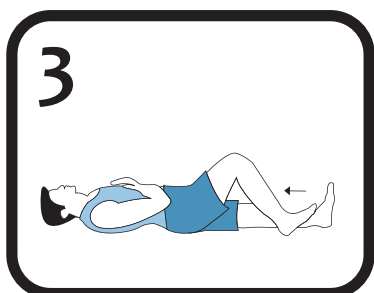
### 1. Drop and dangle

Sit on a high bench or table with your leg dangling over the edge. Get a coffee or magazine and take some Panadol. For five minutes, let gravity bend your knee.



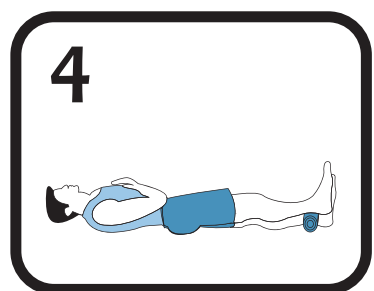
### 2. Calf stretch

Stand facing a wall with your hands on the wall. Place the leg back, keeping the knee straight. Heels on the ground. Lean forward feeling the stretch in the back of your calf. Hold for 10 seconds. Repeat x3.



### 3. Heel slides - lying

While lying flat, slide the heel towards your bottom as far as you can. Hold for ten seconds and then relax out straight again. Repeat x3.

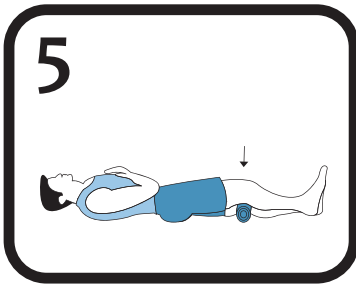


### 4. Heel prop

This is an extension stretch. Place a rolled up towel under your ankle while lying flat. Relax for five minutes and let gravity straighten the leg.

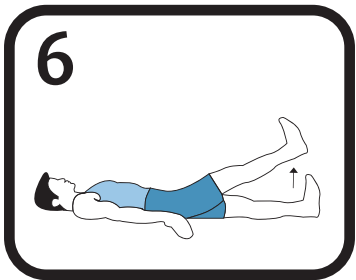
# STRENGTHEN

## 5. Quads setting



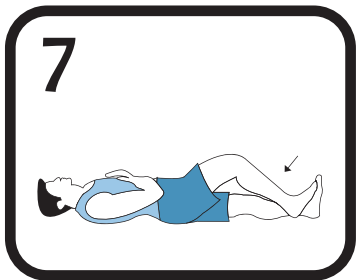
Use the rolled up towel under your knee. Turn the foot outwards slightly. Push the back of the knee into the towel. Feel the quadriceps muscles at the front of your thigh tighten. Hold for five seconds and relax. Repeat 3 sets of 10.

## 6. Straight leg raises



Lie flat with your leg straight. Turn the toes out. Lift the heel twenty centimeters off the floor. Hold for one second and lower. Three sets of 10 is a minimum, aim to be doing at least 200 per day. Progression: Hold for 3 to 5 seconds.

## 7. Static hamstring - lying



Bend the knee to approximately 30 degrees and push the heel down into the floor. Hold for 5 seconds and relax. Repeat 3 sets of 10.

## 8. Double leg heel raise



Stand feet together with one hand on a wall or table for balance. Raise up on your toes lifting both heels as far off the ground as possible. Hold for a second and lower. Repeat 3 sets of 10 or until calf fatigues.

# ICE



# STAGE TWO -

## WEEKS THREE & FOUR (DAY 15 TO 28)

In the second phase we are going to stretch a bit harder bringing in some prone hangs and assisted flexion but also increase the strengthening work with some gentle quarter squats and quarter lunges. Continue 3 sessions a day preferably, 2 at a minimum.

### Closed chain and open chain

Most of the intensive strengthening exercises in the rehabilitation program are done with your foot on the floor. This is what we call a “Closed Kinetic Chain” (CKC) exercise. It is thought that this puts less strain on the anterior cruciate ligament. With “Open Kinetic Chain” (OKC) exercises, the foot is not fixed to anything, and there are higher shear forces on the ACL.

### Objectives by the end of this stage

By the end of week four, you should have achieved the following:

- Close to full straightening (less than five degrees)
- Bending comfortably to ninety degrees or more
- Walking without a limp

## WEEK THREE & FOUR EXERCISES (DAY 15 TO 18)

### STRETCH



#### 1. Drop and dangle - Assisted

Continue this stretching at the start of each session until such time as you can comfortably bend to ninety degrees and then it can be omitted.

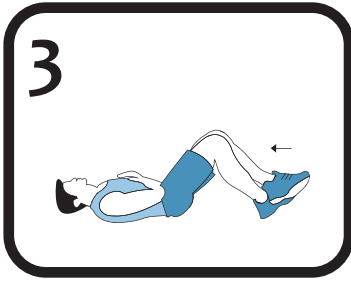
Progression: Use your good leg over the top to push for further bending, hold for 10 seconds then release.



#### 2. Calf Stretch

Stand facing a wall with your hands on the wall. Place the leg back, keeping the knee straight. Heels on the ground. Lean forward feeling the stretch in the back of your calf. Hold for 10 seconds. Repeat x3.

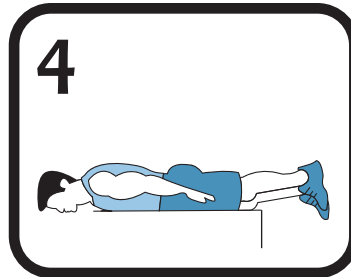
### 3. Lying heel slides – Assisted



While lying flat, slide your heel towards your bottom. Use the good leg over the top to actively push the bending further. Hold for 10 seconds. Repeat x3.

Progression: Sit up and use your hands to pull into a deeper bend.

### 4. Prone hang

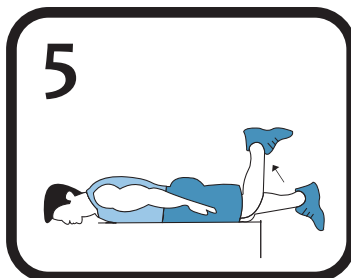


Lying on your stomach with your knees hanging over the edge of a bed or bench, relax and let gravity straighten the knee. Hold for 5 minutes (if you find this uncomfortable, continue with heel props).

Progression: Put a bag of rice on the back of your ankle.

## STRENGTHEN

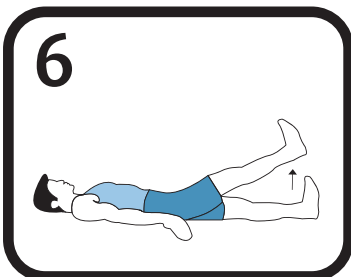
### 5. Prone hamstring curls



Lying on your stomach, pull your heel up to the buttock, hold and then lower. Repeat for 3 sets of 10.

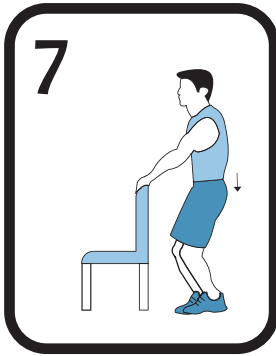
Progression: This exercise can be done in a standing position.

### 6. Straight leg raises



Continue this quadriceps exercise in this phase. Repeat for 3 sets of 30.

Progression: Hold for longer, do more reps.



### 7. One quarter squats with a chair

Standing feet shoulder width apart, foot slightly turned out with your hands on the back of a chair, bend the knees slightly, hold then straighten. Repeat for 3 sets of 10.

Progression: Go deeper.



### 8. One quarter lunges with a chair

Stand with the operated leg in front and the foot turned slightly outwards. Support yourself with two hands on the back of a chair. Slowly take your weight forward, bending your front knee until it is over the toes. The rear knee will be halfway to the floor. Hold briefly then straighten. Repeat for 3 sets of 10. Change legs.

Progression: Take the rear knee closer to the floor.



### 9. Heel raises - Single leg

Stand on one leg. Use a hand on a wall for balance. Rise up on your toes, lifting the heel as far off the ground as possible. Pause and lower. Repeat for 3 sets of 10 or until the calf fatigues.

Progression: Hold at the top of the lift for longer.

**ICE**

# **STAGE THREE -**

## **WEEKS FIVE & SIX (DAYS 29 TO 42)**

At this stage you might find your range of motion is coming along very well and you can spend less time on the stretches and more time on the strengthening exercises. However, if stiffness is an issue, then the stretches need to be pushed outside your comfort zone – start to grit the teeth.

Aim for two 30 minute sessions a day. You can start walking for exercise now. We also start preparing for some cycling in this phase.

### **Objectives by the end of this stage**

At the end of week 6, you should have achieved the following:

- A knee which is fully straight, flat on the bed when lying
- Bending to one hundred and ten degrees, enough to do a full revolution on an exercise bike
- Be able to walk comfortably for exercise

## **WEEK FIVE & SIX EXERCISES (DAY 29 TO 42)**

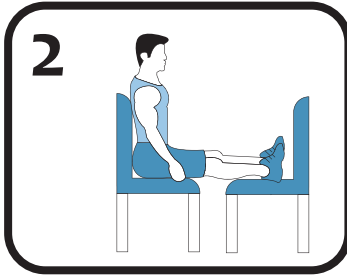
### **STRETCH**



#### **1. Seated assisted knee flexion**

In a seated position, put your good heel over your operated leg and use it to forcefully bend the knee beyond 90 degrees. Hold for ten seconds and then relax. Repeat x10.

## 2. Seated heel prop



Sitting in a chair, put your ankle up onto a facing chair. If the knee does not straighten fully then push with modest force to point of mild discomfort and hold for ten seconds and then relax. Repeat for a set of ten.

Progression: If the knee is not coming out straight, sit in this position in front of television for extended periods of time each night.

## 3. Calf stretch



Stand facing a wall with your hands on the wall. Place the leg back, keeping the knee straight. Heels on the ground. Lean forward feeling the stretch in the back of your calf. Hold for 10 seconds. Repeat x3.

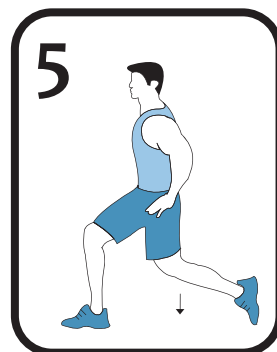
# STRENGTHEN

## 4. One quarter wall squat

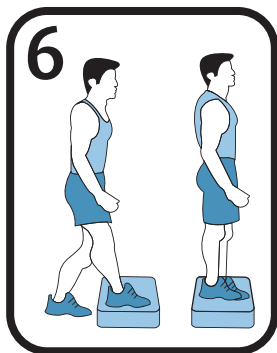


Stand with your back against the wall or use a fit ball between back and wall. Feet shoulder width apart, toes turned slightly out. Squat slowly down to approximately 45 degrees, pause and straighten. Repeat 3 sets of 10. Progression: Go deeper.

## 5. One quarter lunge



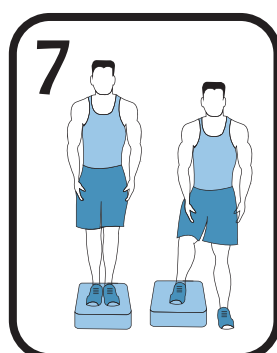
Stand with both feet together, hands on hips. Take a comfortable long step forward with the injured leg, putting the foot to the ground with the toes turned slightly outwards. Slowly take your weight forward bending your front knee until it is over the toes. The rear knee will be halfway to the floor. Pause and then step back again, feet together and straighten. Repeat 3 sets of 10. Change legs. Progression: Go deeper.



## 6. Step ups

Stand facing a small step. Start with a height of approximately 5cms. The foot of the leg to be exercised remains on top of the step throughout. The back foot is brought from the ground up onto the step until weight is evenly distributed between both feet. Pause and take the same foot back to the ground again, completely unweighting the foot on the step and taking your full weight on the back leg on the floor. Repeat 3 sets of 10. Change legs.

Progression: Increase height of step to 20cms over time.



## 7. Side steps

Start standing two feet on top of a small step, 5cms initially. The leg to be strengthened stays on the step. The opposite leg is lifted off the side of the step and put on the ground taking full weight to that leg. Then lift this leg back up on the step to stand two feet, weight evenly distributed. Repeat 3 sets of 10. Change legs.

Progression: Increase height of step to 20cm over time.



## 8. Standing hamstring curls

Stand with hands on hips or supported with a table or chair. Pull the heel of the injured leg up as far as possible towards your buttock.

Hold for a count of 3 then lower. Repeat 3 sets of 10.

Progression: Bridges (see stage 3).



## 9. Single leg stance

Balancing on the operated leg only, bend the knee slightly, hands on hips. Start with a ten second balance. Repeat x3.

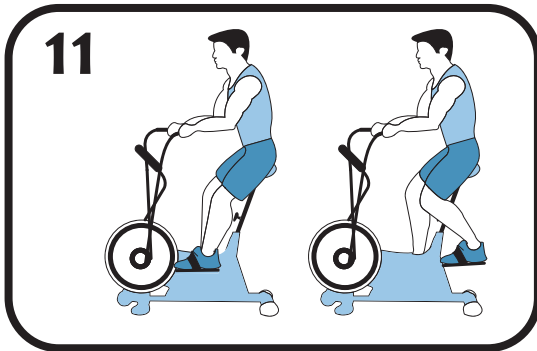
Progression: Hold for longer. Close eyes.



## 10. Single leg heel raise on a step

Stand on one leg on a step with your hand on the wall for balance. Rise up on the ball of your foot as high as you can. Pause and then slowly lower the heel to come down below the level of the step.

Repeat 3 sets of 10 or until the calf fatigues.



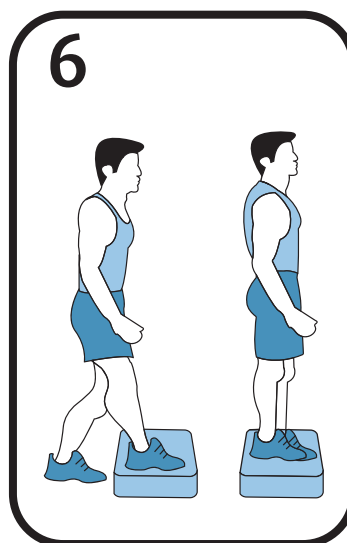
## 11. Exercise bike – rock for range

This exercise is a stretching drill in preparation for cycling which usually starts in the next phase. On the exercise bike, rock the operated leg across the bottom of the cycle, front to back until you have sufficient bend to undertake a full revolution. You can put the seat height up a bit to make it easier.

Do this drill for three minutes.

Progression: You can do very light resistance cycling on an exercise bike in this phase.

**ICE**



## ***STAGE FOUR* - WEEKS SEVEN TO TWELVE (DAYS 43 TO 84)**

By the end of six weeks, we are finally at the stage where we can start some general exercises - walking, swimming and cycling.

If you were to do only one thing in this period, it would be EXERCISE BIKE. It is a complete rehabilitation program in one activity. It strengthens quads, hamstrings, calf muscles and all done in a low impact and cardio manner. Start the bike easy and build up to moderate resistance, but not stand up cycling. Start at five minutes and build up gradually. Aim to be able to do thirty to sixty minutes of moderate resistance cycling by the end of week twelve.

Pool work can also start now. During a pool session, I recommend that you do half swimming and half pool walking. Swimming is good cardio exercise but does not build a lot of lower limb strength. In the first couple of weeks, you should be swimming with a gentle flutter kick. The lane walking will assist in lower limb strengthening.

Longer walks for fitness. Walk mostly on the flat. You should be walking briskly for some cardiovascular effort. It does not matter if it is grass or hard surface – just safe, not uneven.

Other low impact gym equipment such as a cross trainer, elliptical, stepper, or rowing ergo can be brought in later in this phase (approximately week ten). With the rowing machine, do not bend past ninety degrees.

Remember if you have not achieved full extension or cannot bend enough to sit on an exercise bike, then the stretches need to be moderately forceful at this stage. There also needs to be clear evidence of improving range of motion on a weekly basis. If not, schedule a review.

It is not necessary to do gym based exercises and in general I would not recommend using gym equipment until the three-month mark.



If you have had a hamstring graft, continue with only light standing hamstring curls or similar at this stage. It is not uncommon to experience a small hamstring tear in this phase. This is not a serious complication.

For the advanced program, add in some theraband hip exercises and progress to single leg calf raises on a step.

In summary, your daily routine at this stage should be:

- 1) A general exercise session (on the exercise bike preferably, or walking, swimming, rowing ergo, or cross trainer).
- 2) The specific Stage 4 exercise session once a day.

But if you are really time crunched, just stick with the exercise bike.

### **Weaker before it is stronger**

In the second six weeks block, the ACL graft actually gets a bit weaker as your body is “growing into it”, substituting new tissue for old. Do not let this concern you greatly other than to say, “stick with the program”. No matter how good you feel, there are still sensible limits to what you can do at this stage. No running yet.

### **Objectives by the end of the this stage**

- Exercise bike – moderate resistance for minimum of 30 minutes
- Walking briskly 30 minutes comfortably
- Knee straightening Left=Right

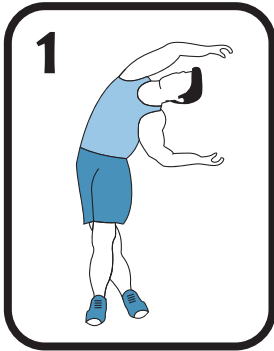
## ***GENERAL EXERCISE – STAGE FOUR***

Week 7:    Exercise Bike  
              Power Walk  
              Pool Walking  
              Swim (flutter kick)

Week 10:   Cross Trainer/Elliptical  
               Stepper  
               Rowing Ergo  
               Swim (normal kick)

# WEEK SEVEN TO TWELVE EXERCISES

## STRETCH



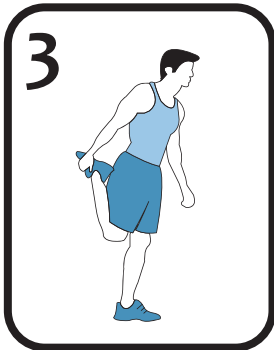
### 1. ITB doorway stretch

This exercise can be done standing or in a doorway if you find it difficult to balance. The leg to be stretched goes behind the good leg. Both feet are facing forward. Bend sideways as far as possible to feel the stretch on the outer thigh and running all the way down to the knee. Hold for 10 seconds. Repeat x3.



### 2. Calf stretch

Stand facing a wall with your hands on the wall. Place the leg back, keeping the knee straight. Heels on the ground. Lean forward feeling the stretch in the back of your calf. Hold for 10 seconds. Repeat x3.



### 3. Quadriceps stretch

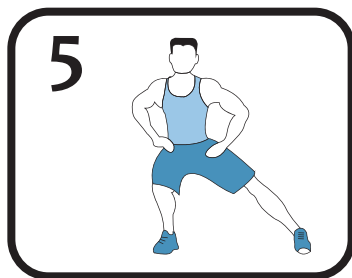
Reach back to grab the ankle of your injured leg and pull your heel to the buttock. Use the opposite arm to balance against a wall if necessary. Make sure that your knee points directly towards the ground and that your hips are pushed forward. Bending at the waist or letting the knee come out to the side will negate the stretch. Hold for 10 seconds. Repeat x3.



### 4. Hamstring stretch

Stand on 1 leg. Other leg straight out on chair or bench. Lean forward into the stretch. Hold for 10 seconds. Repeat x3.

## 5. Hip adductor stretch



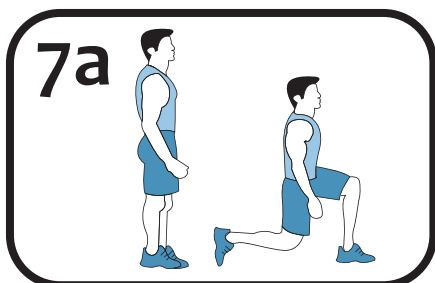
Stand with a very wide stance, hands on hips. Move your weight over one foot, feeling the stretch in the opposite groin. Hold for 10 seconds. Repeat x3.



## 6. Hip flexor stretch

Assume a full lunge position with both hands on top of your front thigh on the ground. Injured leg back, good leg forward. Lean forward with your hips keeping your body upright until you feel a stretch along the front of the thigh. It is very important to push the pelvis forward and keep the body upright or the stretch is lost. Hold for 10 seconds. Repeat x3.

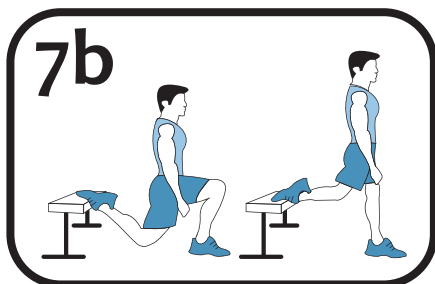
# STRENGTHEN



## 7a. Lunges - Walking lunges (Wk 7, 8, 9)

Lunge forward with the right leg and drop the left knee down to lightly touch the ground. Keep the hip, knee and ankle aligned, the front knee should come out over the top of your toes. Push forward coming onto the left leg and dropping the right knee to the ground. Repeat this full cycle for ten reps. Do 2 or 3 sets.

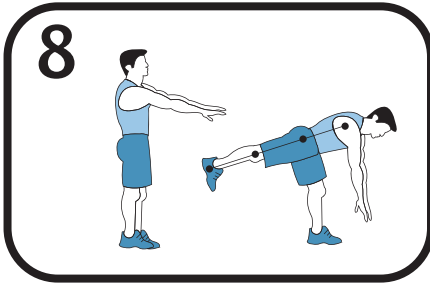
Progression: Bulgarian split squats.



## 7b. Lunges - Bulgarian Split Squats (Wk 10, 11, 12)

Stand in front of a box or chair. Place rear leg on chair. Bend front knee over toes. Lower the rear knee as close as possible to floor. Pause and come back up. Repeat ten reps. Do 2 or 3 sets each leg.

## 8. Single leg Romanian deadlift



This is one of my all time favourite rehabilitation exercises. It builds strength in hamstrings and gluteals, at the same time promoting balance and core stability.

Stand on one leg, hinge at the waist. Both arms go forward, back and rear leg remain aligned. Hold for 10 seconds then change to other leg. Ten reps. Do 2 or 3 sets each leg.

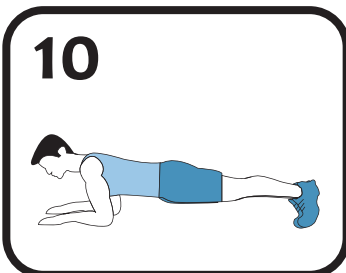
Progression: Add dumbbells.



## 9. Single leg heel raise on a step

Stand on one leg on a step with your hand on the wall for balance. Rise up on the ball of your foot as high as you can. Pause and then slowly lower the heel to come down below the level of the step. Repeat 3 sets of 10 or until the calf fatigues.

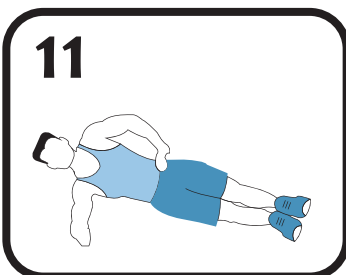
## 10. Bench



Lying on your front, support your weight on your forearms and toes. Your body forms a straight line from head to foot. Hold for 30 seconds. Do 2 or 3 reps.

Progression: bench with leg lift.

## 11. Side plank



Lay on your side with both legs straight. Support your weight on the outer side of your foot and your forearm. Hold for 30 seconds. Do 2 or 3 reps each side

Progression: side plank with leg lift.

# **STAGE FIVE - MONTHS FOUR TO NINE**

## **1. Continue Stage Four exercises**

## **2. Gym exercise**

From three months onwards it is safe to undertake gym based exercise training. Exercises should all be low weight and high rep (three sets of 12 to 15). Do not undertake any rotational weight bearing exercises. Leg press, squats, calf raises and hamstring curls are all appropriate exercises at this stage. Avoid the leg extension machine (open kinetic chain exercise).

## **2. General Cardio exercise**

This is the mainstay of your rehabilitation for now. Walk, swim, cycle or cardio gym equipment. Twisting, turning and change of direction activities should be avoided. Cycling is still your best overall exercise. Cycling on the road is okay now.

## **3. Jogging**

A jogging program is safe to commence from approximately 14 weeks onwards. A simple program starts with some one hundred metre intervals and then progresses to two hundred metre intervals, four hundred metre intervals etc. on a graduated basis. It is best to be done on an oval or predictable safe path. It does not matter if it is grass or a paved surface. No cross country running. Make sure you have a good pair of running shoes (replace every 800km). I would suggest jogging only twice a week. Jogging is high impact and may provoke some pain in the knee and swelling.

If you are not a keen jogger, then it is certainly not a compulsory part of the recovery program.

## **4. Return to manual occupations**

Most people return to manual occupations three months post op. Avoid twisting load bearing duties. Use of ladders and scaffolding or working on roofs should be delayed until four months post op.

# ***STAGE SIX* - MONTHS TEN AND ELEVEN**

A safe return to competitive and impact sport can occur eleven months post reconstructive surgery. In order to reduce the risk of early reinjury, a two month return to sport program should be undertaken. This program focuses on strength, agility and co-ordination.

Read my CO.RE Return to Sport program.

Once this program is completed, the athlete moves onto sport specific activities. At this stage, your therapist can undertake functional testing to confirm that you are fit to return to sport.

## ***SPORT-SPECIFIC DRILLS***

### **1. Football/Rugby**

Dodging drills, running and kicking drills (all directions), defense tackling drills.

### **2. Soccer**

Dribble around cones, shooting drills, defense drills, lateral shuttle runs while kicking ball off wall, tackling drills.

### **3. Basketball/Netball**

Lay-up drills, lateral shuttle runs while throwing/catching ball off wall, run-pivot-vertical jump, dodging drills, defense drills (running/jumping backwards).

# ***POSTOPERATIVE PROBLEMS***

## **1. Deep vein thrombosis**

A small deep vein thrombosis in the calf veins is not that uncommon following cruciate ligament reconstruction and may often go unrecognised. Larger clots cause quite tight painful swelling in the calf and require investigation and treatment. Generally speaking, deep vein thrombosis is an inconvenience but if treated, does not have any long term implications for the result of your cruciate reconstruction. If you experience excessive calf pain and swelling, you should come back for review and an ultrasound scan will be organised.

## **2. Hamstring tear**

If you have had a hamstring graft used as part of your reconstruction, then it is not uncommon to experience a small hamstring tear sometime in the first few months after surgery. This is not a true hamstring tear in the traditional sense, rather it is a tearing or stretching of the scar tissue in the region of the graft harvesting. The pain is usually experienced in the back of the mid-thigh.

We are generally fairly cautious with hamstring exercises in the first three months after surgery because of the possibility of this injury.

Treatment is along the usual lines with rest, ice, compression, and elevation. Your physiotherapist can help with ultrasound and stretching. Symptoms are generally short lived and do not need to interrupt the rehabilitation substantially.

## **3. Knee stiffness**

Knee stiffness is rarely a problem if you are diligent with your stretching program. My rehabilitation program outlines the expected targets. Full straightening is more important than the bending. If you are starting to fall behind schedule, you should push the stretches harder and spend longer doing them. Remember – “stretch and hold”.

A small number of people get scar tissue forming in a lump at the front of the reconstruction. This is called a Cyclops lesion. Sometimes keyhole surgery is required to remove this nodule of scar tissue.

A rare and serious complication of knee surgery is called arthrofibrosis. In this condition, excessive scar tissue forms. Further surgery may be required to treat that complication.

#### **4. Recurrent swelling**

Some swelling in the knee is to be expected in the first six to twelve weeks. Intermittent episodes of swelling can continue in the first year of recovery.

Ongoing swelling may be a reflection of the severity of the injury. Some people who tear their cruciate ligament also damage the meniscus or the joint articular surface.

Swelling can be provoked by a synthetic ligament (LARS graft) if it has been used.

Expect to experience increased swelling when you return to work, particularly if you are on your feet all day. Swelling is also associated with an increase in your rehabilitation effort such as when you return to running.

Swelling is treated with compression, ice, elevation and anti-inflammatories.

#### **5. Clicking in the knee**

Clicking in the knee after cruciate ligament reconstruction is very common and is almost always caused by the knee cap. After injury and subsequent surgery, there is significant wasting of the quadriceps muscles. The knee cap is not held as firmly into the groove at the front of the knee (trochlea) and can make an audible click when it re-centres under load.

Clicking generally resolves once quadriceps strength returns. It is safe to ignore painless clicking.

#### **6. Knee cap pain/patellofemoral pain/anterior knee pain**

In a similar manner to knee cap clicking, knee cap pain can occur in the recovery period, as a result of quadriceps weakness. Many of the rehabilitation exercises are tailored towards restoring strength in the quadriceps, particularly the inner quadriceps (VMO or Vastus Medialis Oblique). Doing your exercises with your foot turned out helps strengthen the inner quadriceps.

If you are struggling with knee cap pain, you may benefit from knee cap taping or a brace and possibly supportive orthotics.



# ***FREQUENTLY ASKED QUESTIONS***

## **1. How soon can I have surgery?**

Often the best time to have reconstructive surgery is immediately after the injury. This is before muscle wasting and knee stiffness has occurred. This will result in the fastest recovery.

However if there has been a delay in the diagnosis then sometimes the knee has become stiff and this is not the right time to proceed with surgery. It may take several weeks of rehabilitation to restore movement before surgery can proceed safely.

A few weeks of “pre-hab” can take months off the recovery time if stiffness is an issue.

## **2. Can I delay surgery?**

In general terms, reconstructive surgery is not urgent and can be delayed to fit around work and personal schedules. During this time, sport and change of direction activities should be avoided. It is important to continue some “straight line” fitness activities and cycling is ideal.

If there are other injuries such as a meniscal tear which might be suitable for repair, then you may be advised to have surgery sooner rather than later.

## **3. Can an anterior cruciate ligament tear heal?**

In the great majority of cases, anterior cruciate ligament tears are complete tears of the ligament and healing capacity is very limited. One of the reasons for this is that the tear occurs in a fluid environment. The knee joint contains articular fluid which bathes the torn area and prevents healing.

Sometimes limited healing will occur and can provide an adequate level of stability. Alternatively, the ligament may heal but is longer than it should be and this can still allow for the knee joint to be unstable.

Partial tears are much less common. Even with a partial tear, the knee joint may be adequately stable and reconstruction may not be required.

#### **4. What happens if I don't have an ACL reconstruction?**

The anterior cruciate ligament provides stability to the knee particularly with twisting, turning and change of direction activities. Immediately after the injury, your knee will be sore but the pain will settle provided there are no other injuries. The end result of the cruciate ligament tear is an unstable knee, not a painful knee. Most people with an anterior cruciate ligament tear are unable to return to competitive sporting activities without reconstruction. Straight line activities such as walking, swimming and cycling are still possible. Cruciate ligament reconstruction surgery is undertaken to restore stability to the knee joint to improve quality of life and allow sporting activities.

It is also generally accepted that an unstable knee with a torn cruciate ligament is more likely to develop arthritis in the longer term. The risk of arthritis is increased but that does not mean that it occurs in all patients.

#### **5. What type of graft should I have for my ACL reconstruction?**

There are many options for graft tissue but the commonest in use today is hamstring tendon tissue. Although much attention is paid to graft choice, it is not the most important factor in the success of surgery. Read my article on ACL graft choice.

#### **6. Will I need crutches?**

Most patients use crutches for one week but take weight on the leg (partial weight bearing) immediately. You should be full weight bearing without crutches after one week if possible.

#### **7. Will I need a brace?**

I advise that a brace should be worn for three weeks following a hamstring reconstruction but I do not generally use a brace for other graft types.

#### **8. What rehabilitation and physical therapy will I require?**

It is desirable to have a physiotherapist supervise your recovery. Their job is to instruct you on the exercises to perform. You then undertake those exercises for twenty to thirty minutes, three times a day in the first six weeks. I would advise that you see a physiotherapist every two weeks for the first six weeks, and then reducing frequency thereafter.

## **9. How soon can I drive after surgery?**

You are not fit to drive until six weeks, with the exception that if you had a left knee ACL reconstruction, you can drive an automatic car after three weeks. You need to be able to stand on 1 leg for 1 minute to be fit to drive.

## **10. When can I go back to work?**

It is safe to allow at least one week before you resume office duties. Light physical duties can resume at six weeks post surgery and a manual occupation is usually deferred until twelve weeks post surgery.

If your occupation involves ladders, scaffolding or roofs, then these duties should be held off until four months post surgery.

## **11. When can I play sport after ACL reconstruction?**

Swimming and exercise bike will start six weeks post surgery. Jogging starts approximately twelve to fourteen weeks post surgery.

A return to competitive sports and twisting and turning activities is at eleven months post surgery.

# KNEE TERMINOLOGY

<b>ACTIVE</b>	A movement initiated by your own muscles. This movement will build strength.
<b>ANTERIOR</b>	Front.
<b>CLOSED KINETIC CHAIN (CKC)</b>	Exercise where the foot is fixed or planted.
<b>CONCENTRIC</b>	Contracting and shortening a muscle (the usual form of exercise).
<b>GRAFT</b>	Tissue used to make the new ACL.
<b>EXCENTRIC</b>	Contraction while lengthening a muscle (a controlled release).
<b>EXTENSION</b>	The action of straightening your knee.
<b>FEMUR</b>	Thigh bone
<b>FLEXION</b>	The action of bending your knee.
<b>ISOMETRIC</b>	Contracting a muscle without shortening it (ie. no movement of the joint) – also called static.
<b>OPEN KINETIC CHAIN (OKC)</b>	Exercise where the foot is free, not fixed
<b>PASSIVE</b>	A movement initiated by external forces, a stretching exercise.
<b>PATELLA</b>	Kneecap.
<b>POSTERIOR</b>	Back.
<b>PRONE</b>	Lying on your abdomen.
<b>RANGE OF MOTION (ROM)</b>	How far you can move a joint in any one direction (measured in degrees).
<b>STATIC</b>	See “Isometric”.
<b>SUPINE</b>	Lying on your back.
<b>TIBIA</b>	Shin bone.