

ACL Reconstruction: A Guide to Recovery After Surgery

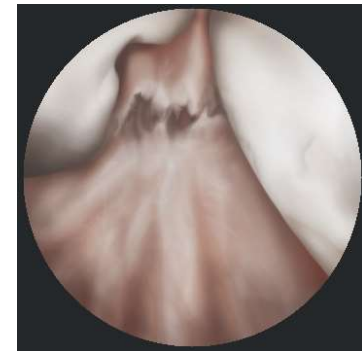
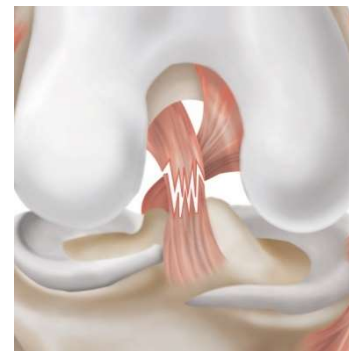
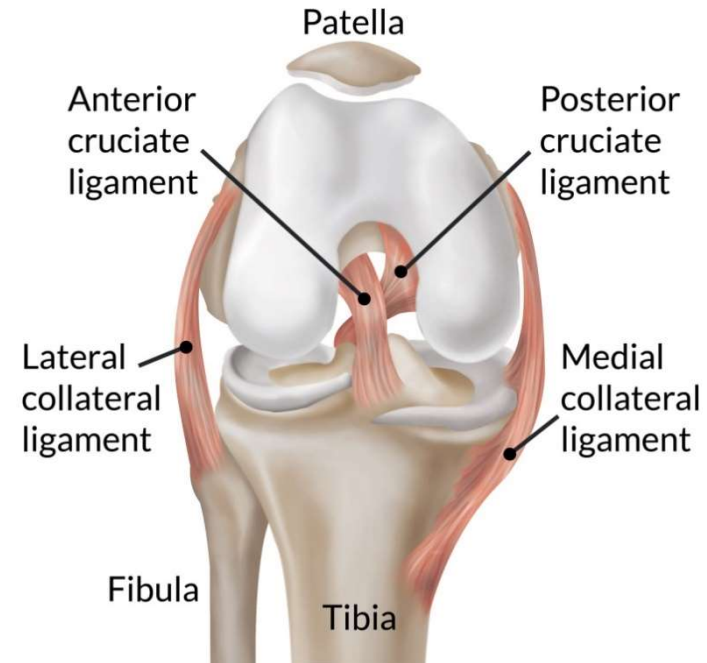
General Information about the ACL & ACL Tears

What is the ACL?

The Anterior Cruciate Ligament or ACL is a large ligament deep in the knee joint. The ACL is like a thick rope that helps keep the thigh bone, 'femur', connected to the shin bone, 'tibia'. The ACL can be torn in different ways, most commonly during a sudden change in direction or awkward landing that puts the ACL under too much stress. Many patients hurt other parts of their knee, like the cartilage or meniscus (cartilage cushion) when they tear their ACL.

How do you treat a torn ACL?

A completely torn ACL cannot repair itself. Your surgeon may recommend reconstructing your ACL if you have symptoms like the knee buckling or feeling like you can't trust the knee.



ACL Reconstruction: A Guide to Recovery After Surgery

What happens during ACL reconstructive surgery?

During the surgery, a lighted telescopic lens called an arthroscope is inserted directly into the knee joint to confirm that the ACL is torn and look for other injuries to the joint. Several small incisions or cuts are made in the skin. These cuts are used to insert the arthroscope and surgical instruments into the knee. If there is damage to other parts of the knee like the meniscus (the cartilage bumper), your surgeon will treat that at the same time.

Most ACL reconstructions are done by using a graft or 'donor' tendon from your body. A new ACL will then grow along the graft. Most commonly, two of the hamstring tendons from the back of the thigh are used as a graft. The hamstring tendons are harvested or removed from a small cut around the knee. Other graft options include the patellar tendon or an allograft - a tendon donated by another person. Your surgeon will discuss with you what type of graft is recommended.

ACL reconstruction is performed in the operating room. Most commonly, general anesthesia ('going to sleep') is used. The surgery usually takes around 60-90 min. ACL surgery is 'day care' surgery meaning you will go home on the same day of the surgery.

How will my knee recover after ACL reconstruction?

Recovery from ACL reconstruction is a slow and gradual process. During the first few months after surgery, you will focus on getting over the pain and swelling of the operation and making sure that the knee gets all of its movement back. The next few months will focus on getting the leg stronger -but in a safe way to protect your ACL reconstruction. Returning to activities before the knee is ready will cause the new ACL to tear and the reconstruction will fail.

Returning to pivoting sports takes at least 6-9 months.

Around 80-90% of people are able to return to all the sports and activities that they were doing before their ACL injury. There is a risk of developing osteoarthritis ('thinning of the cartilage') in the knee after tearing the ACL. This is often related to other injuries in the knee, such as cartilage tears.

Around 5-8% of people who have their ACL reconstructed will go on to tear that same ACL again. Around 5% of people who tear their ACL will go on to tear their other ACL.

ACL Reconstruction: A Guide to Recovery After Surgery

Information for Recovering after ACL Reconstructive Surgery

Going Home after Surgery:

- You will need to have someone take you home after surgery, even if you are taking a taxi

Bathing:

- Keep your dressings dry until your follow up appointment at 10-14 days after surgery.
- Cleanse around the area or use a plastic bag sealed with duct tape to keep the dressings dry.
- If the dressings get wet, change them
- You may bathe 2 weeks after surgery, if the wound is healed and dry

Care of your Incision & Wound:

- Please do not change your dressing unless it gets wet or soiled
- Leave dressings clean, dry and covered until your follow up appointment 10-14 days after surgery
- If there is a bulky dressing, you can remove the bulky dressing 2-3 days after surgery and leave a simple dressing like a 'mepore' on the wound
- The tensor band should be snug but not too tight. If the tensor is applied too tightly (causes tingling or change in skin colour), loosen and reapply
- If the tensor is too loose, take it off and re-wrap it snugly, starting below the knee and working up

How to change your dressings if they become soiled or wet:

- Wash your hands with soap & water before you take care of your wound
- Remove tensor bandage
- Throw out the white gauze bandages—the dressings will be stained with blood - and remove the white mepore dressings.
- Do not remove the Steri-Strips- small tapes that are right on top of the wound. They will fall off themselves.
- Cover wounds with new dressing. Apply new 'mepore' or waterproof 'aquacell' dressing.
- You can use bandaids to cover the small (1-2 cm) wounds
- Buy 'mepore' dressings at a pharmacy. You must apply a new mepore dressing after each shower.
- Buy waterproof 'aquacell' dressing at One Bracing at Rebalance^{MD}. You may shower with the aquacell dressing on.
- After you change your dressing, put the tensor back on starting to wrap the leg below the knee and then work your way up.
- The tensor band should be snug but not too tight. If the tensor is applied too tightly (causes tingling or change in skin colour), loosen and reapply
- If the tensor is too loose, take it off and re-wrap it snugly

ACL Reconstruction: A Guide to Recovery After Surgery

Weight bearing:

- Most patients are allowed to put their weight on their leg right after surgery but will want to use crutches for around 2-3 weeks
- As the pain gets better, you will start to put more weight through the leg and slowly get rid of the crutches
- Some patients will want to use crutches for around 2 weeks and others for up to 6 weeks
- In some cases, if there has been another repair such as a cartilage repair, your surgeon may tell you not to put weight on your leg

Activity & Physiotherapy:

- Focus on resting for the first week after surgery
- Slowly restart your regular activities
- Physiotherapy exercises should be started within a few days of surgery
- A physiotherapy or rehabilitation protocol is at the end of this guide
- Give the physiotherapy protocol to your physiotherapist
- Most patients should see a physiotherapist for the first time within 1-2 weeks of surgery
- A physiotherapist can help you reduce some of the pain and swelling from the surgery

Pain:

- Discomfort will be moderate and may occasionally be severe for the first few days and will gradually get better
- Use pain medications as instructed by your surgeon
- In the first day or two after the surgery, it is better to take pain medication regularly e.g. every 4-6 hours, rather than wait until the pain is bad.
- Usually a strong narcotic and an anti-inflammatory are prescribed
- Gradually reduce pain medications as your pain decreases

Swelling & Bruising:

- Expect swelling & bruising for a few weeks following the surgery. This is due to inflammation and fluid that was introduced into the knee during surgery
- It is common for the swelling and bruising to go down to the toes and even up into the thigh
- There can often be quite a lot of swelling.
- It is common to have more swelling after the surgery than when the ACL was torn.
- To reduce swelling:
 - elevate the leg on pillows
 - avoid keeping the foot down for the first few days after surgery
 - wrap your leg with a snug tensor bandage, starting at the toes and working your way up above the knee to the middle of the thigh

ACL Reconstruction: A Guide to Recovery After Surgery

Numbness:

- Most patients will have some numbness around their incisions after an ACL reconstruction.
- There is often numbness over the front of the shin or the outside of the leg
- Usually this numbness gets better and becomes a smaller patch of numbness, but this takes many months
- Most patients do not find this bothersome in the long term

Icing:

- Apply ice packs or use a CryoTherapy 'Ice Machine' to reduce pain and swelling
- Apply ice for 15-20 minutes, every 2-3 hours while awake or 4-6 times per day
- Do not apply ice directly to skin

Return to Work:

- When you are able to return to work depends on:
 - the kind of job you have and its physical demands
 - how much pain & swelling you have after surgery
 - how your physiotherapy is progressing
 - if you are able to modify your job or work from home
- Your surgeon will help you decide when to return to work
- Expect to take off at least 4-6 weeks for a desk job that does not require much walking
- Expect to take off 3-6 months for more physically demanding work

Healthy Eating:

- Start with clear fluids after surgery
- Gradually increase to a well balanced diet as your appetite allows
- Drink at least 6 cups of fluids daily

Going to the Bathroom:

- Changes in medications, activity and diet can cause constipation (hard, dry bowel movements)
- To avoid constipation: drink lots of fluids, eat high fibre foods such as prunes, fruits, bran, whole grains and vegetables
- Take a stool softener or laxative if needed. Ask your doctor or pharmacist to suggest one.

Smoking:

- Smoking causes problems with the healing of bones and tissues
- Not smoking or smoking less for 2 months before surgery and for 3-6 months after surgery will reduce the chance of a problem with healing
- visit www.quitnow.ca for information about tools and medications to help you quit smoking

ACL Reconstruction: A Guide to Recovery After Surgery

Driving:

- Do not drive while taking narcotic pain medications.
- Discuss with your doctor when it is safe to drive
- If your right leg was operated on or if you drive a manual car, you may not be safe to drive for around 1-2 months
- If your left leg was operated on, you may be able to drive an automatic car around 2-3 weeks after surgery
- You must be able to walk confidently without crutches in order to safely drive with your right leg
- If your ability to safely drive (e.g swerve sharply, perform an emergency stop) is impaired, your insurance may not be valid in the case of an accident

Your Medications:

- Resume your regular medications unless instructed otherwise by your doctor
- Oral contraceptive pills (Birth Control Pills) should not be taken for 1 month before surgery and 1 month after the surgery because of the risk of blood clot. Use a different method of birth control.

Supplies/special equipment:

- **Crutches:** are required and can be obtained from a medical supply store, some pharmacies or One Bracing at Rebalance^{MD}
- **Cryotherapy "Ice Machines":** are an alternative to ice packs. They can be extremely helpful to reduce pain and swelling. These can be bought at One Bracing @ Rebalance^{MD} or other medical supply stores such as Rexall, Island Orthotics and others.
- **Knee Compression Sleeve:** a compression sleeve such as the Bauerfeind GenuTrain may help to control

swelling and pain during recovery. This type of brace can also be worn when returning to sport. These can be bought at One Bracing @ Rebalance^{MD} or other medical supply stores such as Rexall, Island Orthotics and others.

- **Compression Socks:** an above the knee compression sock can help to control swelling in the foot and leg after surgery. This may be more comfortable than using a tensor bandage. 15-30 mm Hg compression is suggested. These can be bought at One Bracing @ Rebalance^{MD} or other medical supply stores such as Rexall, Island Orthotics and others.
- **ACL Stabilizing Brace:** Not all patients need an ACL stabilizing brace. This should be discussed with your surgeon and the decision to use a brace based around your needs. Patients do not need an ACL brace immediately after surgery. Some patients who are returning to pivoting and cutting sports may decide to wear a brace for the first 6-12 months after they return to sport. This may provide some extra protection to the ACL reconstruction but a simple compression sleeve may work just as well. Patients who have had more than one ACL injury often feel more secure if they wear an ACL stabilizing brace during sports for a prolonged period of time.

ACL Reconstruction: A Guide to Recovery After Surgery

Follow Up Appointment:

- A post-operative appointment should be scheduled for approximately 10-14 days after surgery
- Call the office if you do not have an appointment scheduled
- Write down your questions for the doctor before the appointment

Call your Surgeon if you have:

- Worsening pain or swelling that does not get better with rest, elevating the leg, loosening the tensor bandage and icing
- Incisions that are red, puffy, hot or leaking fluid more than 72 hrs after surgery
- Fever greater than 38.5°C
- Signs of circulation problems in your leg (e.g coolness, change in skin colour, numbness that is getting worse) which is not relieved by loosening the tensor and elevating the leg
- Irritation or blisters from your dressings, Steri-Strips or tape
- Nausea and vomiting that continues for hours
- Difficulty passing urine
- Signs of a blood clot like worsening leg swelling and trouble breathing or pain in your chest that is unusual for you

If you cannot reach your Surgeon:

- Call your family doctor, go to a walk-in clinic or hospital emergency department

Non-emergency health information and services:

- HealthLinkBC www.healthlinkBC.ca
- Tel: 811 from anywhere in BC
- Tel: 711 for deaf and hearing impaired assistance (TTY)

The information in this handout is intended only for the person it was given to by the health care team. It does not replace the advice or direction given to you by your doctor.

Physiotherapy Protocol for ACL Reconstruction Follows Below

ACL Reconstruction: A Guide to Recovery After Surgery

Physiotherapy Protocol for ACL Reconstruction:

This protocol has been developed in keeping with certain biological markers, and drawing from work from the Melbourne ACL Protocol, The Fowler Kennedy Clinic and the British Consensus Group.

Please read and follow the instructions in this protocol to guide your activity and rehabilitation after surgery. The protocol should be given to your physiotherapist who will use their best professional judgement to incorporate this protocol into your individual treatment plan.

Guidelines Throughout Your Rehab:

A level of discomfort is expected with rehabilitation exercises, but it should quickly subside and not be any worse if you repeat the same exercise another day.

After the initial swelling is controlled, measuring the girth of the knee around the mid (or supra) patellar upon rising in the morning and then again at bedtime can help give an objective measure of exercise tolerance. If the girth (swelling) has increased by more than 1cm, then you might be doing too much.

Phases of Rehab:

Pre-Op
Post Op Recovery
Progressive Loading - Strength and Neuromuscular Control
Sport Specific Task Training
Unrestricted Sport Specific Task Training

Pre-Op Phase:

The most important goals of this phase are to:

Get a 'quiet' knee prior to surgery
Reduce swelling as much as possible
Regain as close to full ROM as possible
Regain 90% of both quads and hamstrings strength.

Goals to Strive for in this Phase:

- 1) 0° knee extension
- 2) 125° knee flexion
- 3) Minimal or no swelling on the swipe test and minimal activity related swelling (< 1cm swelling from am to pm)
- 4) 90% isometric quads and hams strength at 90°
- 5) leg press limb symmetry index <5%
- 6) single leg hop for distance at 90% (average of 2 readings)

ACL Reconstruction: A Guide to Recovery After Surgery

Post Op Recovery Phase:

People often think that the sooner and harder they work immediately after the operation, the faster their recovery will be. On actuality, ACL surgery is very traumatic to the knee, and it needs to recover! Rushing into a vigorous exercise routine almost always just delays when the knee will settle down, and actually slows things down in the long run.

The hamstring donor site is quite fragile at this time; sudden or forceful contractions can damage it further. Avoid running, pulling things towards you with your foot, and even pulling your heel out of a tight shoe.

This phase generally takes 6-9 weeks.

Activities:

Walking with Crutches:

You may put as much weight on your operated leg as possible, with crutches used for support until you are confident in the operated knee's ability. If you have a splint or brace, wear it when walking. Crutches can be used to improve balance and should be used when walking outside, or in crowded environments. Crutches are not necessary while at home. Practice walking without crutches in a safe space, aiming for a heel to toe walking pattern.

Icing:

Apply ice packs or use a Cryo Therapy "Ice Machine" five times daily for 20-minute periods each. Do this for the first week.

Wound Care:

Follow the instructions in this guide for how to take care of your wound.

Exercises:

Exercises in this phase are designed to minimize swelling, get the knee straight and start getting the muscles to respond post-surgery.

Most patients should see a physiotherapist within 1-2 weeks of surgery. Unless specifically restricted by your surgeon, some exercises that can be safely started prior to physio include:

Seated Active Leg Extension

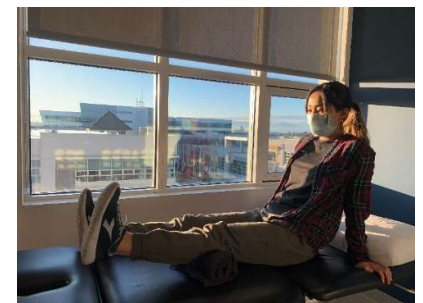
Sit with a rolled up towel, or a foam roller, or equivalent under the knee.

Push the back of the down firmly into the towel while you straighten the leg, lifting the heel up off the floor.

Try to pull the kneecap upwards and fully straighten your leg.

Hold 3-5 seconds.

Do 10 reps, several times a day.



ACL Reconstruction: A Guide to Recovery After Surgery

Supine Elevated Calf Pumps

Lie on your back with your calf propped up on a cushion or the arm of a sofa.

Pump your ankle back and forth lightly by pulling the toes towards you, then pointing them away. You should be able to feel a comfortable stretch in the back of your leg.

Pump back and forth for about 5 minutes, and do this several times per day.



Supine Wallslides / Knee Flexion

Lie on your back with your feet propped up against a wall.

Slowly lower your foot down the wall, feeling a gentle stretch in your knee.

Hold this for 5-10 seconds, then slide your foot back up again.

Do this 10-20 times, several times per day.



ACL Reconstruction: A Guide to Recovery After Surgery

The following milestones tell you when you are done with this phase and can progress to the next phase:

- 1) 0° knee extension
- 2) 125° knee flexion
- 3) Minimal or no swelling
- 4) Straight leg raising with no lag x 10
- 5) Bilateral squat to thighs parallel to ground with even weight bearing
- 5) Glut activation – able to do 10 bridges to neutral hip extension
- 6) Hamstring activation – able to flex the knee to 90° in standing and do 10 bilateral straight leg bridge with feet on 30cm box to hip neutral
- 7) Normal gait
- 8) Able to bike
- 9) Lower Extremity Functional Scale (LEFS - an outcome measure) of 45-49

Progressive Loading / Strength and Neuromuscular Control:

In this phase, we can start to get your leg stronger and regain some of your balance and coordination. Some exercises will take longer for your knee to get used to than others.

Exercises will be progressed from slow to fast, two legs to one, and light to heavy.

This phase generally takes 8-12 weeks.

The following milestones tell you when you are done with this phase and can continue on:

- 1) No swelling (-ve swipe test) and minimal activity related swelling (<1cm change am-pm)
- 2) Good Functional Alignment Test – 5 single leg squats to 60°, QASLS 0-1 (Qualitative Assessment of Single Leg Squat)
- 3) Single leg squat/rise test at 85% of uninjured side
- 4) Single Leg Bridge Test at 85% of uninjured side
- 5) Single Leg Calf Raises at 85% of uninjured side
- 6) Soleus Calf Raises at 85% of uninjured side at 50° of knee flexion
- 7) Side bridge endurance test at 85% of uninjured side
- 8) Single Leg Stance Balance Test
 - a) eyes open 43 seconds
 - b) eyes closed 9 seconds
- 9) Bilateral jump drop test from 30cm box, QASLS 0-1
- 10) Star Excursion Balance Test (SEBT)
 - anterior and posterior reaches should be symmetrical
 - medial and lateral reach has <10% difference side to side
 - composite score is <10%
- 11) LEFS 55-66

Supplementary Goals:

- 12) Single leg press to 90° 1RM at 1.5 body weight
- 13) Single leg squat at 1.5 body weight

ACL Reconstruction: A Guide to Recovery After Surgery

Sport Specific Task Training: Running, Agility, and Landings:

This phase will introduce more agility, plyometric and power to the strengthening you have been working on. This is one of the most important phases, and, as always, technique during the exercises is paramount to retrain healthy movement patterns.

This phase generally takes 8-12 weeks.

Running:

There are some non-negotiable guidelines for returning to running:

- pain < 2/10
- 95% knee flexion
- full knee extension
- no swelling
- normal walking pattern

By the end of this phase, and to progress to returning to your sport or activity, you should be able to:

- 1) Single Hop Test >95% compared with the other limb, or equal or greater than pre-op data (either limb)
- 2) Triple Hop Test >95% compared with other side
- 3) Triple Cross Over Hop Test >95% compared with the other limb
- 4) Side Hop Test >95% compared with the other limb
- 5) Single Leg Squat/Single Leg Rise Test \geq 22 reps
- 6) Star Excursion Balance Test >95% compared with the other limb

- 7) Sports Vestibular Balance Test, passed side/side, up/down
- 8) Forward hop from 30cm box, QASLS score 0-1
- 9) Side hop from 30cm box, QASLS score 0-1
- 10) Tuck jump, score 0-1
- 11) Vertical hop test <5% limb symmetry index

Supplementary goals:

- 12) Single Leg Press 1RM @ 1.8x body weight
- 13) Squat 1RM @ 1.8x body weight