



PRE-OPERATIVE INSTRUCTIONS

PREPARING FOR SURGERY

1 Month Before:

If you are taking acne medication: Research has shown that Accutane (Isotretinoin) which is used to treat acne can interfere with healing after orthopaedic surgery and may be a factor in tissue and graft stretching or failure. To ensure that your surgery is not cancelled ***please stop taking Accutane at least 1 month prior to your surgery date***. You should not restart Accutane medication for at least 3 months after your surgery.

2 Weeks Before:

Stop taking: Advil, Motrin, and Aspirin as well as all Herbal Supplements for ***10-14 days prior to your surgery date***. This is important because these medications and supplements can increase your risk of bleeding.

Do not go to the dentist 2 weeks before surgery as this can increase your risk of infection.

1 Week Before (approximately):

A nurse from the hospital will contact you approximately one week prior to your surgery date to give you information regarding your surgery. Please let them know about ***any breaks in the skin*** (bites, scrapes, wounds) as these can act as an entry point for bacteria, increasing the risk of infection. If present, your surgery may need to be re-scheduled.

Day/Night Before:

- **CLEAR FLUIDS ONLY** (Gatorade, apple or cranberry juice, water - pulp free, clear) ***from Midnight (24:00) to 3hrs prior to arrival to hospital*** (4 hrs before surgery).
- Do not shave your surgical site the day before or the day of your surgery.
- You may brush your teeth and rinse your mouth but do not swallow any water.

DAY OF SURGERY

- Date and time will be confirmed with you approximately 2 weeks before your surgery.
- Check-in at the Admitting Desk or Emergency Department of the hospital.
- If required for your surgery, please bring your own crutches to the hospital, clearly marked with your name. The hospital has a VERY limited supply of crutches for sale at this time. The hospital does carry braces for purchase if needed after your surgery.
- You **MUST** have someone drive you home from the hospital.

AFTER YOUR SURGERY

- **Do not go to the dentist** up to 6 weeks after surgery as this can increase your risk of infection.
- Your first Follow up Appointment details (if required) will be included in an email from our office which you will receive on or shortly after the day of your surgery.
- If you have any problems or complications after your surgery please refer to the Post-Op Concerns section included in your surgery package or refer to our website - <https://banffsportmed.ca/after-your-surgery/>.



Banff Sport Medicine

Medial Patellofemoral Ligament (MPFL) Reconstruction/Imbrication

What is an “MPFL” tear?

The Medial Patellofemoral Ligament (MPFL) is a ligament that prevents your patella (kneecap) from dislocating to the outside of your knee. The MPFL runs from the upper half of the inside edge of the patella to the inner part of the femur (thigh bone). This ligament is commonly injured when you dislocate your patella to the outside of your knee (laterally). Approximately half of the people who dislocate their patella will have ongoing problems with instability. If you have ongoing instability, you may require surgery to tighten (imbricate) or replace (reconstruct) the MPFL. If your anatomy or alignment increases the risk of you dislocating your patella, you may require other surgeries in addition to MPFL imbrication or reconstruction. These other surgeries may be done at the same time as your MPFL surgery.

Diagnosis:

- History of a twisting episode where the patella dislocated partially or completely. This injury is often followed by pain and considerable swelling.
- Examination often shows tenderness on the inside of the knee where the torn MPFL is located. Pushing the patella towards the lateral (outside) of the knee may cause pain or nervousness or apprehension for the patient.
- X-rays should always be taken to make sure the patella is not still dislocated, or to determine if any small chips of bone were broken off during the dislocation
- MRI (magnetic resonance imaging) is not usually necessary but may be ordered by your surgeon to determine where the MPFL was torn, to see if there are loose piece(s) of cartilage in your knee, or to determine if there is damage to other structures in your knee (i.e. meniscus, other ligaments).

Why fix an “MPFL”?

- To prevent further episodes of patella dislocations, subluxations or feelings of instability.
- To prevent further damage to the articular cartilage (i.e. osteoarthritis).

Options other than Surgery

- **Rehabilitation** - some people can strengthen their muscles and cope after dislocating their patella. This involves intensive rehabilitation to improve core, hip and quadriceps strength, as well as balance and agility.
- **Knee brace** - some people with an unstable patella can participate in work or sports using a patellar stabilizing brace.

Surgery Timing

- We recommend all patients stay as active as possible before surgery. We recommend you follow the pre-surgery rehabilitation program, especially if you have weak quadriceps, hip, and core. Your goals are to maintain full range of knee motion, improve your strength and balance, and build your endurance by doing straight-line activities and sports. Regaining your strength and maintaining your fitness will prepare you for surgery and also help you to recover faster after surgery.
- If your knee symptoms improve significantly while you are preparing for surgery and you would like to discuss non-operative management of your patellar instability, please call the office (403-760-2897) to arrange a follow-up appointment before your surgery date.

The Procedure

- An MPFL Imbrication uses stitches to tighten the ligament. The stitches can be placed using an arthroscope (small camera) through a small incision, or through a longer incision to tighten the loose area of tissue.
- An MPFL Reconstruction creates a new ligament by replacing the torn MPFL with either a hamstring or quadriceps autograft (patient) tendon or an allograft (donor) tendon.
- All surgeries include a thorough knee arthroscopy to examine all the structures of the knee and to assess for injuries. In most cases this part of the surgery is performed using the two small arthroscopy incisions.
- The new MPFL graft is attached to the kneecap (patella) with 2 small plastic anchors. The thigh bone (femoral) side of the graft is attached with an absorbable screw. The graft will grow into the bone in 3-4 months, however full recovery for return to sport can take anywhere from 4-24 months.

RISKS OF SURGERY

Risk of Infection: less than 1 in 100

- Intravenous antibiotics are given before and after surgery to help prevent infection.
- If an infection occurs, it will usually happen within 5-7 days of your surgery. Some minor wound infections can be treated with a short course of oral antibiotics, whereas more severe wound or skin infections may require a longer course of intravenous antibiotics. In less than 1 in 400 cases, a deep infection can occur in the joint. In these cases, surgery is required to wash out the infection, followed by 4-6 weeks of intravenous antibiotics.

Risk of Clot in Leg Veins (deep vein thrombosis): less than 1 in 100

- If severe calf, ankle and foot swelling occurs 3 days to 2 weeks after surgery, you could have a clot in a deep vein of your leg (DVT). See a doctor as soon as possible. Treatment for a blood clot is usually blood-thinning medication (anticoagulants) for 3-6 months.

Risk of Clot in Lungs (pulmonary emboli): less than 1 in 500

- It is possible for a blood clot to travel to your lung; this is called a pulmonary embolism. If you suddenly get short of breath or have chest pain, go to the nearest emergency room or call 911.
- A pulmonary embolism is a medical emergency and can cause death.
- In certain patients with risk factors for a blood clot, preventive blood thinners will be prescribed for a short period of time after surgery.

Risk of Skin Numbness around Incision

- Every patient gets some numbness around their incision because some small surface nerves are cut during surgery. This can be along the incision or can affect a larger area of the leg (up to 20 sq. cms). This may disappear slowly over time, depending on the patient.

Risk of Knee Stiffness: less than 1 in 100

- Some patients have problems with knee stiffness after MPFL surgery. These patients will need intensive physiotherapy and may need another surgery to mobilize the joint.

Risk of Persistent Swelling and Pain: less than 5 in 100

- Knee Swelling and Pain are common for 3-6 months after surgery. Some patients will have ongoing pain and swelling from damage caused to knee structures when the MPFL injury occurred. Patients with more arthritis or chondral damage in their knee often have more long-term pain and swelling.

Risk of Hematoma: rare

- Some patients will get a hematoma (collection of blood) at the harvest incision. These patients should rest with their leg elevated and may need more intensive physiotherapy. The hematoma usually absorbs after 3-4 weeks. A hematoma rarely needs surgery. Occasionally it will drain or be drained by your surgeon and require packing and wound care for several weeks.

Your Stay in Hospital

- You will be admitted to the hospital on the day of your surgery. Your admission time will be approximately 2-3 hours before your actual surgery time. Your surgery will take 1-2 hours. You will be called approximately 5 days prior to your surgery date with your arrival time.
- You can have an MPFL reconstruction with either a general anesthetic (go to sleep) or spinal anesthetic (freeze from the waist down). Your anesthetist will discuss these options with you on the day of surgery.
- Although MPFL reconstruction is usually day surgery, in rare instances, your surgeon or the anesthetist may recommend that you be admitted to the hospital overnight, so be prepared for this.
- Please provide the office with any insurance forms you have prior to the day of your surgery, as it can take up to 2 weeks to have them completed and returned to you. Please note we do charge a fee as completion of forms is not covered by Alberta Health Care.

Medical Aid Products

- **Crutches** - can be purchased at the Banff Mineral Springs Hospital or from our clinic. If you bring your own crutches with you, please make sure they are clearly labeled.
- **Cold Therapy Unit** - is used to help control pain and swelling after surgery. You can order a Cold Therapy Unit, complete with a knee pad, through the Shop found on our website or at our clinic. Alternatively, you can purchase a Cold Therapy Unit from your local healthcare provider or from an online health supply store. For portable use you can purchase a battery pack, which allows you to use your Cold Therapy Unit without an electrical outlet. We recommend that you buy your Cold Therapy Unit at least a week before your surgery to make sure that you have it delivered in time.
- **Brace** – after your surgery you will be fitted with a hinged knee brace and it will be locked in the full extension position (straight). This brace is used to protect your knee and assist with pain control for the first 48-72 hours. The brace should be unlocked by the 3rd day after surgery and you can start to work on improving your knee flexion (bending).

Post-Operative Pain Control and Wound Care

- Rest, ice, compression, and elevation of your surgery leg.
- You will be given a prescription for anti-inflammatory medication (ie Naproxen) and a narcotic analgesic (ie Oxycodone) depending on the surgeon's preference and the patient's history of allergies and drug intolerances, before you leave the hospital.
- Refer to the Post Op Concerns and Opioid Medications sheets included in your surgery package for more information
- We recommend you wait 4 days before removing your bandages and taking a shower. To minimize the risk of post-operative infection, please do not soak in a bathtub, swim, or go into a hot tub until your incisions are completely healed. This will be a minimum of 3-weeks after surgery.
- Redness and pain along the shin (caused by blood tracking into the area from the surgery) can occur 3-7 days after surgery. This usually goes away 7-10 days after surgery and is not a concern unless your incisions are also red.

Discharge from Hospital

- Ensure you have your prescriptions for pain and anti-inflammatory medications before you leave the hospital.
- You must have someone to drive you home.
- Minimum 1 week resting at home, keeping the surgery leg elevated and using ice regularly to manage swelling and pain.
- 2-6 weeks on crutches, or until you can walk without a limp.
- Discuss any travel plans with your surgeon, because long trips can increase the risk of blood clots.

Follow-up Visits

- Your surgeon will follow-up with you at: 2-4 weeks, 3-months, 6-months, 1-year and 2-years.
- Our office will provide you with the time, date and location of your first post-operative appointment, usually included in your physiotherapy prescription email approximately one week after your surgery.

Return to Work Guidelines

- Sedentary work: 4-6 weeks
- Light manual work: 3-4 months
- Heavy manual work: 4-6 months

Physiotherapy

- See your physiotherapist between 1-2 weeks after your surgery. You will be provided with a physiotherapy prescription via email from our office approximately one week after your surgery.
- Please note if you reside in Alberta you may be eligible for physiotherapy funding, please refer to the AHS website for more information: <https://www.albertahealthservices.ca/rehab/page17783.aspx>
- The hospital will provide you with the Banff Sport Medicine Post-operative Rehabilitation Protocol, it may also be found on our website: <https://banffsportmed.ca/resources-ortho/#surgeryinfo>

Return to Sport

- Your surgeon will be able to tell you when you can go back to sport. For most patients this is between 6 -12 months after surgery. The type of sport and your level of strength and function (when we test you at your follow-up appointments) will help to guide the surgeon's recommendations.
- Some patients who have more damage inside their knee may be told to protect their knee by doing fewer sports and activities that use a lot of running, jumping or pivoting. It is important to avoid too much load on damaged joint surfaces, as this may help to reduce the progression of arthritis. Your surgeon will give you advice about return to sport based on the amount of damage seen inside your knee at the time of surgery.
- MPFL reconstruction is very successful for stabilizing the patella and preventing dislocations, and most patients can return to running, jumping and pivoting sports after surgery. However, the end result for each patient depends on the amount of time spent doing rehabilitation, including strength, balance and agility exercises.

Pre-Surgery Rehabilitation Program

for
Patellar Instability (PI)

September 2025

This protocol is designed to assist you with your preparation for surgery and should be followed under the direction of a physiotherapist.



PI Pre-Surgery Rehabilitation

Scan the QR code to
watch a short video
about the importance of
pre-surgery rehab.



Why are these exercises important?

- Your surgeon recommends that you complete this exercise program to prepare for your upcoming surgery and/or to get the best possible result from your injury rehabilitation.
- Strengthening the muscles at the front of your thigh and around your knee will make your knee more stable and will help with your recovery from surgery.
- You should also incorporate 20-30 minutes of cardio exercises at least 3x/week (all low-impact, straight-line activities, e.g. elliptical trainer, skating, cross-country skiing, biking or hiking).

How often should I do these exercises?

- All exercises should be done **1 - 2 times per day**.
- It is important that you do all of the exercises on both legs (however you will be using the electronic stimulation (EMS) unit on your affected/surgical leg only).
- Carefully follow the instructions for your **EMS unit**.
- Whenever you can, do your exercises in front of a mirror to make sure you are doing them correctly.

How many exercises should I do?

- Each exercise should be done smoothly and slowly.
- Start with one set for each exercise. Your therapist will recommend the number of exercises you should do based on your muscle strength and endurance.
- Once you can comfortably do one set of each exercise, progress to 2 sets and once you are strong enough, then 3 sets. Your physiotherapist might recommend for some exercises to be done until you fatigue or until you lose the form of the original exercise position.
- Aim to challenge yourself when doing your exercises to get the greatest strength and stability improvements.

What if I have increased pain or swelling?

- If you have increased pain that lasts longer than 1 or 2 hours after you have finished your exercises, decrease the amount you are exercising by 20% the next time.
- If you have increased swelling after these exercises please use rest, ice, compression and elevation.
- If symptoms do not improve, or swelling lasts longer than 48 hours, call your physiotherapist to review your program.

Notes for Physiotherapists:

Please teach your patient how to apply and use the EMS unit, and assess the number of sets/repetitions, ranges of motion and theraband for the exercises as applicable. Thank you.

***If you have any questions please contact Sarah Kerslake at:
sarah@banffsportmed.ca or 403 760 2897 ext 6***

Phase 1: Strength Basics

- **Straight Leg Raises**

Lying on your back, draw your toes towards you, and tighten your quadriceps (front of thigh) muscles while keeping your knee straight.

Slowly lift your leg about 30 to 45 cm off the ground maintaining control throughout.

Hold the leg elevated for 5 seconds, focusing on maintaining full knee extension, core engagement, and controlled breathing. Slowly lower your leg back to the floor.

Sets: 3 Reps: 10



Note: The use of **EMS** is recommended for this exercise. Follow the guidelines provided in the EMS document for parameters and pad placement.

- **Heel Slides**

Lying on your back, slowly slide the heel of your affected leg toward your buttocks, bending your knee within a pain-free range. Assist with a towel or strap if needed.

Sets: 3 Reps: 12



- **Hip Abduction**

Lie on your side with your bottom leg bent and top leg straight, your hips stacked, and pelvis slightly rolled forward. Engage your core. Keeping your top leg straight, slowly lift it upward, leading with your heel and keeping your toes pointing forward or slightly downward. Avoid rotating your hips or leaning backward during the movement. Lower your leg back to the starting position with control.

Sets: 3 Reps: 15.



Note: To progress this exercise as your strength improves, use a looped resistance band around your thighs, just above your knees, to increase difficulty.

- **Hip Adduction**

Lie on your side with your top leg bent and resting in front of the lower leg.

Lift your lower leg upward about 20 - 30 cm, keeping it straight and focusing on inner thigh activation. Hold this position for 10 seconds, relax for 5 seconds.

Sets: 3 Reps: 12



- **Glute Bridges**

Lie on your back with your knees bent and feet flat on the floor, hip-width apart.

Tighten your buttocks (glutes) and lift your hips off the ground by pushing through your heels.

Throughout the movement, engage your core as if bracing for a punch to your abdomen or bearing down. When your knees, hips, and shoulders form a straight line, pause for 5 seconds and slowly lower.

Sets: 3 Reps: 15



- **Planks**

Place your elbows directly under shoulders, with your legs extended straight behind you. Make sure your body is lifted off the floor.

Maintain a straight line from shoulders to ankles and engage your core by gently drawing the belly button in toward the spine.

Squeeze your buttocks and lightly tuck the pelvis to prevent excessively arching your back.

Sets: 3 Hold: 15-45 seconds



- **Wall Squats**

Stand with your feet shoulder-width apart, toes pointing slightly outward, with your heels approximately 30 cm away from the wall. Rest against the wall and keep your back upright with your weight evenly distributed.

Tighten your core and slowly lower into a squat by bending at the hips and knees, as if sitting back into a chair.

Keep your knees in line with your toes; do not allow your knees to collapse inward. Descend only to a pain-free depth.

Hold briefly at the bottom position for 5 seconds before rising back up to standing with control.

Sets: 3 Reps: 12



Note: The use of **EMS** is recommended for this exercise. Follow the guidelines provided in the EMS document for parameters and pad placement.

- **Two-Legged Calf Raises with Straight Knees**

Hold onto a wall or stable surface for support if needed, with both feet flat on the ground, hip-width apart.

Slowly rise up onto your toes through your full ankle range of motion, lifting your heels off the ground. Slowly lower back to the starting position.

Sets: 3 Reps: 15



- **Two Leg Hip Hinge**

Stand upright with your feet shoulder-width apart. Keep your knees “soft” (with a slight bend). Hinge forward at the hip joints, keeping your back straight. Stop before you feel your back start to bend. Squeeze your buttocks (glutes) and hamstrings to return to standing.

Sets: 2 Reps: 15



Note: To practice the form, you may want to start by holding a broomstick or straight bar along your spine. It should touch the upper back and tailbone with a small gap where your lower back naturally curves.

Phase 2: Progressive Conditioning

After you have completed 4 - 6 weeks of the first phase you should be reassessed by your physiotherapist and taught the second phase of exercises. Before you start the second phase you must be able to complete 3 sets of ≥ 10 repetitions of the phase one exercises with good control.

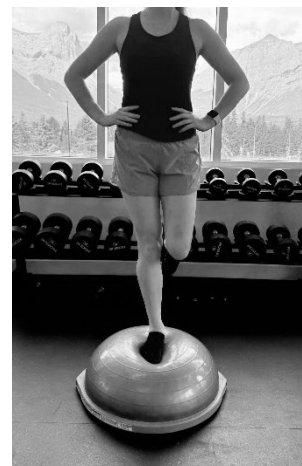
- **Single Leg Balance on BOSU**

Stand with one foot in the middle of a BOSU ball, balance pad, or slightly uneven ground. Hold onto a wall or stable surface for support if needed.

Shift your weight onto the BOSU ball or balance pad and lift the other foot off the ground. Hold this position, keeping your hips level and knee steady.

Sets: 3 Hold: 30 seconds

Note: This exercise should be done on both legs, and in both open and closed eyes conditions.



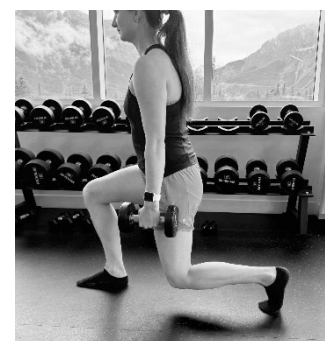
- **Forward Lunges with Weight**

Stand tall with a light dumbbell in each hand (or bodyweight if preferred) and your feet hip-width apart.

Step forward into a lunge, lowering your back knee toward the ground while keeping your front knee aligned with your toes and your torso upright.

Hold briefly in the lunge position with control, then rise back up to your starting position with control.

Sets: 3 Reps: 10



- **Prone Resisted Hamstring Curls**

Lie on your front on a comfortable surface such as a bed or exercise bench. Anchor a resistance band securely behind or below you (e.g., attached to a bed or table leg).

Wrap the loop of the resistance band around your ankle and bend your knee against the band resistance, bringing your heel towards your buttocks. Slowly return to the starting position.

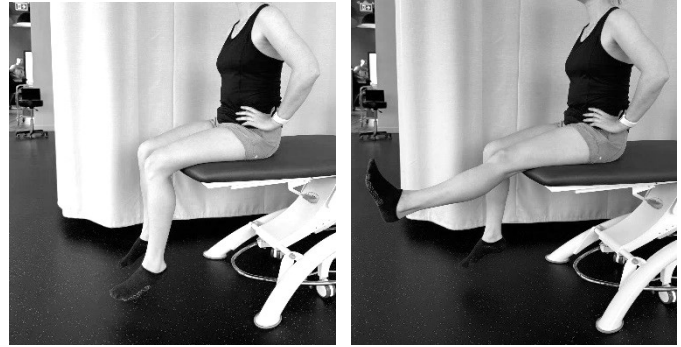
Sets: 3 Reps: 12



- **Long Arc Quad Raises**

Sit on a firm chair or bench with your thighs supported and your lower legs hanging freely, knees bent at 90°. Your feet should not touch the floor. Tighten your quadriceps, then slowly extend your knee until your leg is straight (0°). Hold the contraction at the top for 5–10 seconds, emphasizing strong, isolated quad activation. Slowly lower your leg back to the starting position (90° of flexion) in a controlled manner.

Sets: 3 Reps: 12



Note: The use of **EMS** is recommended for this exercise. Follow the guidelines provided in the EMS document for parameters and pad placement.

- **Single Leg Glute Bridge**

Lie on your back with one knee bent and the other leg straight. Press through the heel of the bent leg and lift your hips off the ground, keeping the opposite leg in line with your torso. Engage your glutes and core to maintain alignment. Hold at the top briefly, then lower with control.

Sets: 3 Reps: 12



Note: You can increase the difficulty by abducting and adducting the elevated leg in and out to the side.

- **Side Planks**

Lie on your side with the elbow of the side you are lying on directly beneath your shoulder. Bend your knees and have them stacked one on top of the other.

Maintain a straight line from head to knees and do not let hips sag or rotate.

Engage the core and lift the hips off the ground, forming a straight line from your head to knees. Keep your shoulders and hips stacked vertically to avoid rotating forward or backward.

Sets: 3 Hold: 15-45 seconds

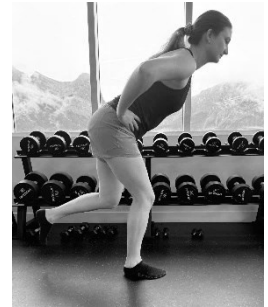


- **Single Leg Hip Hinge**

Stand upright on one leg, keeping your knee “soft” (with a slight bend).

Hinge forward at the hip joints, keeping your back straight. Stop before you feel your back start to bend. Keep your hips level by keeping your belly button pointed straight to the floor. Squeeze your buttocks (glutes) and hamstrings to return to standing.

Sets: 3 Reps: 8



- **Side Step-Downs**

Stand with one foot on the side edge of a 20cm step, and the other foot hovering just off the side. Slowly bend the knee of the leg on the step and lower the opposite foot toward the ground. Lightly tap the heel of the lower leg to the floor without shifting your weight onto it.

Keep your hips level and your knee aligned over your foot throughout the motion, avoid collapsing inward.

Press through the heel of the leg you are standing on and straighten your knee to return to the starting position with control. Avoid using momentum or pushing off with the tapping foot.

Sets: 3 Reps: 12



Note: If you are unable to perform this exercise due to pain, try a lower step or reduce the depth of the tap.

- **Squats**

Stand with your feet shoulder-width apart, toes pointing slightly outward.

Keep your chest lifted and your weight evenly distributed.

Tighten your core and slowly lower into a squat by bending at the hips and knees, as if sitting back into a chair.

Keep your knees in line with your toes; do not allow your knees to collapse inward. Descend only to a pain-free depth.

Hold briefly at the bottom, then rise back to standing with control.

Sets: 3 Reps: 10



Note: The use of **EMS** is recommended for this exercise. Follow the guidelines provided in the EMS document for parameters and pad placement.



Banff Sport Medicine

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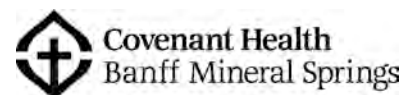
Dr. Mark Heard
Dr. Greg Buchko
Dr. Laurie Hiemstra
Dr. Michaela Kopka

Post Surgery Rehabilitation Program

for
Medial Patellofemoral Ligament Reconstruction
(MPFL)

August 2023

This protocol is designed to assist you with your rehabilitation after surgery and should be followed under the direction of a physiotherapist.



Note: This protocol may be reproduced with permission from Banff Sport Medicine. Please refer to last page for contact details.

POST SURGERY REHABILITATION PROGRAM

Progression through the phases of this rehabilitation program will vary depending on pre-operative strength and function, the extent of surgery, and commitment to the rehabilitation program.

PRINCIPLES

1. SURGICAL PROCEDURE

The medial patellofemoral ligament (MPFL) inserts near the medial epicondyle of the femur (inner part of the thigh bone) and into the superior half of the medial edge of the patella (inside upper knee cap). An **MPFL Reconstruction** creates a new ligament by replacing the torn MPFL with either a hamstring tendon autograft (patient's) or an allograft (donor) tendon. The graft is attached using a screw in the femur bone and non-metal anchors in the knee cap.

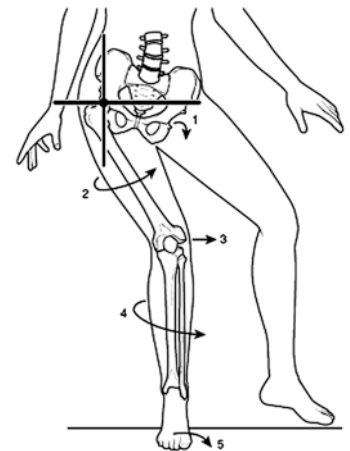
2. BIOMECHANICS

The MPFL functions as a tether or leash stopping lateral movement of the knee cap during the first 30 degrees of flexion. **Exercises with the knee in flexion greater than 30-45 degrees will not put strain on the MPFL Reconstruction.** (The MPFL does not have a distinct function once the knee cap engages in the trochlea).

3. WEIGHT BEARING

Weight bearing, without rotation or valgus, will not damage the MPFL reconstruction. Valgus knee and hip internal rotation (moving the knee inwards) during weight bearing will put the knee in a position that may stress the reconstruction and should be avoided.

Image of knee valgus and hip internal rotation movements that should be avoided after surgery (Fithian; Clin Sport Med 2010)



4. BRACING

The brace helps to protect the knee and leg after surgery while the quadriceps (thigh) muscle is not contracting well. Once the quadriceps are firing well enough for the patient to do a straight leg raise with no quadriceps lag, the patient can wean into the Patellar Stabilizing Brace (PSB). The other consideration for initiating the PSB will be the amount of swelling and tenderness around the incisions because the neoprene sleeve is tight. **The brace should be used during activity until full quadriceps strength and function is restored.** The brace does not need to be used during activities that are not prone to knee valgus or hip internal rotation.

5. RANGE OF MOTION

Range of motion exercises will not stretch the MPFL graft. A properly positioned and securely fixed graft can withstand the physiologic loads placed on it during range of motion exercises. Full extension is usually achieved soon after surgery. Flexion may be limited by pain caused the surgical dissection around the medial epicondyle of the femur.

6. STRENGTHENING

MPFL reconstruction causes significant quadriceps muscle inhibition (weakness) post-operatively. Early rehabilitation must focus on regaining quadriceps control and strength. Straight-line quadriceps strengthening exercises will not harm the graft. An **electrical muscle stimulation (EMS) machine** can increase strength gains when combined with your own voluntary muscle contraction. We highly

recommend that you **use EMS at all phases** of this rehabilitation protocol. EMS machines can be purchased from medical equipment stores, physiotherapy clinics, or from the BSM online shop (www.banffsportmed.ca). Most third-party insurance companies cover the cost of the EMS machine.

7. CORE & HIP STRENGTHENING

These exercises are very important for good function after surgery and can be started in the first week after surgery.

8. PHYSIOTHERAPY

Rehabilitation after MPFL reconstruction requires careful monitoring by a physiotherapist. **There is no time restriction for the progression of phases. Progression will be decided by the physiotherapist based on each patient's clinical progress.** Each patient should have a frank discussion with their physiotherapist about how to best utilize the physiotherapy visits that they can afford. Patients will generally need physiotherapy care and guidance for 6 - 12 months after surgery.

9. RETURN TO SPORT

Return to sport is based on progression to sport specific activities and depends on quadriceps, hip and core strength and control. The MPFL reconstruction will be well healed by the time this strength and control is obtained. Most patients take between 6 months - 2 years to rehabilitate well enough to return to sport, although some patients may return slightly earlier with dedication to their rehabilitation programme.

10. COLD THERAPY

Cold therapy is the use of ice or cold to reduce pain, inflammation, swelling and muscle spasms after surgery. Cold therapy can be applied with a bag of ice, an ice pack, gel pack, or by using a specialized Cold Therapy Unit. Research has shown that cold therapy decreases pain, inflammation, swelling, blood loss, and narcotic (pain medication) use after surgery.

You should use cold therapy a minimum of 5 times per day for 20 minutes each for the first 5-7 days after surgery. **It is essential that you protect your skin from the cold therapy product using a cloth or towel.** If you are using a Cold Therapy Unit it is possible to safely keep the cold pads on for longer periods of time. To get the best results and prevent skin injury, you should always carefully follow the instructions that come with the Cold Therapy Unit. After the first 7 days, cold therapy should continue at least 3 times per day when any swelling remains in the knee.

PHASE 1: Early Post-operative Phase

This is the initial recovery phase and it normally lasts 1 - 3 weeks. In the first week you should rest and elevate your leg for a significant amount of the time.

GOALS

1. Control inflammation and swelling
2. Range of motion exercises within pain limits, i.e. active and active-assisted knee flexion (bending) and extension (straightening)
3. Quadriceps muscles activation
4. Hip strengthening

BRACE

A brace will be placed on your leg after surgery and it should be worn at all times when you are walking and sleeping. You may remove the brace to ice your knee or if you are resting quietly.

WEIGHT BEARING

Use your crutches to weight bear by putting about half of your weight through your operative leg. With your crutches, try to walk using a normal “heel-toe” pattern. Your progression to full weight bearing will depend on swelling, pain, and quadriceps control. Increase to full weight bearing as soon as you are able to tolerate.

COLD THERAPY & ELEVATION

A Cold Therapy Unit or an ice pack should be applied immediately after surgery and used for at least 20 minutes every other hour while you are awake and especially after exercises. Your surgical leg should be elevated with your knee straight when applying cold therapy or resting.



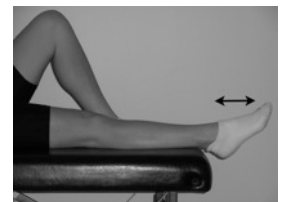
EXERCISES

1. Ankle Pumps:

- The foot and ankle should be actively “pumped” up and down 10-20 times every hour.

2. Range of Motion:

- **Flexion:** In lying, bend your knee by sliding your heel towards your buttocks. You can use your other leg to help you as needed. Perform up to 20 times; repeat 2 - 3 times daily.



- **Extension:** In lying, place a roll beneath your ankle to passively (i.e. allow gravity), stretch your knee into extension. Start with 2 minutes at a time and increase as tolerated up to 5 minutes. Perform 2 or 3 times daily. It is very important in this phase to work on straightening your knee.



3. Strengthening:

- **Quadriceps Contraction:** In sitting with your knee straight and leg supported, tighten your thigh muscle by pushing your leg downwards. Focus on tightening the muscle and avoid lifting your leg from the hip. Perform exercise 5 -10 times holding each contraction for 5 secs. Progress to 30 times holding each contraction for 10 secs, resting for 5 secs in between reps. The use of EMS is recommended for this exercise.
- **Hip Adduction:** In lying with your knees bent as shown, squeeze a soft ball or a pillow between your knees. Perform exercise 5 - 10 times holding each contraction for 5 seconds. Progress to 30 times holding each contraction for 10 - 15 secs, resting for 5 secs between reps.



**** Perform all exercises 2-3 times per day to build your strength and endurance**

ALSO CONSIDER

- Hip strengthening as tolerated
- Straight leg raises, Quads over roll with EMS
- Other ROM exercises as tolerated (heel slides on wall/passive flexion in sitting using other leg to push)
- Stationary bike
- Resisted ankle exercises in sitting using rubber tubing

REQUIREMENTS FOR PROGRESSION TO PHASE 2

- ✓ Ability to activate quadriceps (specifically VMO)
- ✓ Pain levels managed to enable exercise progression
- ✓ Full knee extension
- ✓ Knee flexion $\geq 60^\circ$

PHASE 2: Quads Activation and Core Stability

This is the initial muscle strengthening phase and it normally lasts from 3-12 weeks. This phase emphasizes progressive activation of the quadriceps muscles and significant core strengthening.

GOALS

1. Manage pain and swelling
2. Range of Motion: 0° to $\geq 90^\circ$ by end of 6th week post-operative
3. Good quadriceps muscle contraction; able to perform a straight leg raise
4. Full weight bearing with crutches wearing unlocked or patella stabilizing brace
5. Include stationary bike in daily rehabilitation
6. Focus on quadriceps activation (using EMS) and hip strength

BRACE

The brace placed on your leg after surgery may be taken off at night for sleeping. As your ability to contract your quadriceps improves, you can start to wean into the Patellar Stabilizing Brace (PSB). This is usually 4 - 6 weeks after surgery. A brace should be worn whenever you are walking outside the house.

WEIGHT BEARING

In order to stop using crutches, you must be able to walk without a limp while using crutches (i.e. you must be able to fully weight bear on the operated leg without compensation). Continue to use your crutches until you can fully weight bear and have good quadriceps control. If you still need support to walk normally, you may use one crutch or a cane, depending on the recommendation of your surgeon. Your physiotherapist can also help guide you through this process. You should wean off using the crutches by the end of this phase.

COLD THERAPY & ELEVATION

Manage knee swelling by continuing to use cold therapy and elevation, particularly after exercise.

EXERCISES

1. Range of Motion:

- Progress flexion using active, active-assisted and passive exercises.

2. Strengthening:

- **Quadriceps:** Slowly squat with equal weight on each leg. Bend your knees from 0° to a maximum of 90° of flexion, making sure your knees do not move beyond your toes. Start with one set of 10, holding each squat for 5 secs and increase the number of reps as your strength increases, up to 30 reps x 15 sec holds. EMS should be used with this exercise with the 'contraction' time at least double the 'rest' time.



- **Hamstrings:** Lying on your stomach, place a resistance band around your ankle and also have it attached to an anchor point as shown. Bend your knee slowly against the resistance of the band pulling your foot towards your buttock. Start with 1 set of 10 reps and increase to 3 sets of 15 reps.



- **Gluteals:** In lying with your knees bent and your arms by your sides, squeeze your buttocks and lift up to create a bridge. Keep equal weight on each leg and straight alignment from your shoulders to your knees. Be careful not to push down on your neck or shoulders - use your buttocks to do the work. Start with one set of 10, holding each lift for 5 secs. Increase the number of reps as your strength increases. Once you can complete 20 reps holding for 10 secs each, change to single leg bridges.



- **Planks:** Place the forearms on the ground with the elbows aligned below the shoulders, and arms parallel to the body at about shoulder-width distance. Engage your core and glute muscles and lift the hips up off the ground. Start with one set of 10, holding each lift for 15 secs. Increase the holding time as your strength increases.



- **Side Planks:** Lie on one side with the legs stacked on top of one another then prop the body up on the hand or elbow while keeping the feet stacked. Start with one set of 10 repetitions on each side, holding each lift for 15 secs. Increase the holding time as your strength increases.



- **Dead Bugs:** Lie flat on your back with your hands extended above you toward the ceiling. Bend your knees in a 90-degree angle and raise your thighs until they are perpendicular to the floor. Now deeply exhale and engage your abs to bring your ribcage down and flatten your back onto the floor. Slowly lower the right arm and the left leg down towards the floor at the same time. Lower them until just before your lower back starts to arch off the ground. Breathe out slowly as you lower your arm and leg, and then slowly return to the starting position while breathing in again. Alternate sides. Start with one set of 10, holding each lift for 5 secs. Increase the number of reps as your strength increases.



- **Calf Raises:**

Both legs: Start with feet shoulder width apart and toes pointed straight ahead, and raise up onto your toes. Start with one set of 10 reps, holding each raise for 5 secs. Increase the number of reps up to 30 with 5 sec hold. Start by using support at a wall or table and progress to no support as able.



Single leg: Start on one leg with toes pointed straight ahead, and raise up onto your toes. Start with one set of 10 reps, holding each raise for 5 secs. Increase the number of reps up to 30 with 5 secs hold. Start by using support at a wall or table and progress to no support as able.



3. Proprioception/Balance:

- **Weight Shifting:** Stand without your brace on, slowly shift weight from your non-operated to your operated leg. Slowly increase the amount of weight supported through your operated leg.
- **Single-leg Stance:** Once you can comfortably shift all your weight onto your surgical leg progress to balancing. Stand on your non-operative leg first and hold for 10 seconds; then stand for 5 secs on your operative leg. Slowly increase the amount of time you can balance, up to 30 seconds, 5 times each leg.

ALSO CONSIDER

- Isometric exercises (quadriceps, hamstrings, hip flexors/extensors/rotators)
- Adductors/abductor with resistance tubing
- Clam shells
- Double leg squats with ball squeeze
- Abdominal and core strengthening (i.e. curl-ups, obliques, transversus abdominis, physio ball and Pilates)

REQUIREMENTS FOR PROGRESSION TO PHASE 3

- ✓ **Straight leg raise with no quadriceps lag**
- ✓ **Good core strength**
- ✓ **Double leg squat with good motor control**
- ✓ **Single leg bridges 10 repetitions x 10 sec hold each**

PHASE 3: Strength and Control

This is a progressive strengthening and balance phase and normally lasts from 9 – 18 weeks but may take up to 6 months to master.

GOALS

1. Full range of motion
2. Walking without crutches normal gait, wearing patellar stabilizing brace
3. Improve proprioception and balance.
4. Aerobic activity 20 - 30 minutes per day.
5. Increase quadriceps, hamstrings, gluteal and core strength

BRACE

You should be in the patellar stabilizing brace for all at risk activities. You do not need to wear the brace in safe environments such as at home or while sleeping.

WEIGHT BEARING

You should be full weight bearing without walking aids at this phase.

COLD THERAPY & ELEVATION

Manage knee swelling by continuing to use cold therapy and elevation, particularly after exercise.

EXERCISES

1. **Range of Motion:** Should be full at this stage.

2. **Strengthening:**

- **Single Leg Squats:** Initially use a chair or railing for support. Standing on one leg, slowly squat bending your knee from 0° to a maximum of 90°, making sure your knee does not move beyond your toes. Start with one set of 10, holding each squat for 5 secs and increase the number of reps as your strength increases, up to 30 reps x 15 sec holds.

- **Step-ups:**

Do graduated heights, starting at 4" and increasing to 8".

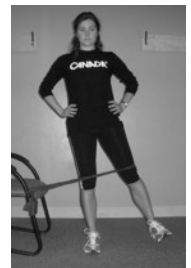
Stand in front of a stair or stepping stool and place one foot on the step in front of you. Rise up onto the step by shifting all of your weight onto this leg and tighten your quadriceps muscles. Put all of your weight through this leg and do not step up onto the step with your other leg. Start with one set of 10, holding at the top of the step-up for 5 secs. Increase the number of reps up to 20 reps with 15 sec holds on each leg.



- **Squats with Rubber Band:** Stand with legs shoulder width apart with a resistance band around your thighs just above your knees. Slowly squat with equal weight on each leg. Bend your knees from 0° to a maximum of 90° of flexion, making sure your knees do not move beyond your toes. The rubber band will push your knees into internal rotation (inwards), so make sure the patella is aligned with the second toe the whole time. Start with one set of 10 reps, holding each squat for 5 secs and increase the number of reps as your strength increases, up to 30 reps x 15 secs hold. EMS is recommended for this exercise with the 'contraction' time at least double the 'rest' time.



- **Hip Abduction:** With a resistance band around your outside thigh just above your knee, lift your leg to place slight tension on the band. Move this leg sideways slowly against the resistance of the band using the muscles in your buttock and your hip. Start with 1 set of 10 reps and increase to 3 sets of 15 reps.

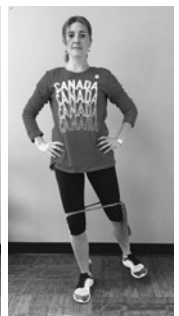


- **Hip Extension:** Stand with legs shoulder width apart with a resistance band around one of your thighs just above your knee. Extend your leg to place slight tension on the resistance band. Move the leg backwards slowly against the resistance of the band using the muscles in your buttock and the back of your thigh. Start with 1 set of 10 reps and increase to 3 sets of 15 reps.



*IMPORTANT: if you had a hamstring graft you **should not** perform this exercise until 6 weeks post op.*

- **Combination: Hip extension + external rotation + abduction:** In standing with legs hip width apart and feet straight forwards, tie a resistance band around your thighs as shown. Move your leg outwards and backwards in a **45-degree** angle with your toes slightly pointing out. Keep your pelvis square and still, so you don't compensate with your back muscles. Engage your "back pocket muscles" as you perform the movement. Start with one set of 10, holding each movement for 5 secs. Increase the number of reps as your strength increases.



- **Step-downs:** Do graduated heights, starting at 4" and increasing to 8". Start with one leg standing on the step and slowly bend your knee to lower your other leg to lightly touch the floor. Keep all of your weight through the leg that is on the step. Start with one set of 10, holding at the bottom of the step-down for 5 secs. Increase the number of reps as your strength increases, up to 20 reps with 15 sec holds on each leg.



- **Standing Hamstring Curls:** Attach one end of the tubing securely at heel height and attach the other end to your ankle. Standing with both knees slightly bent, slowly contract your hamstring muscles to bend your knee. Slowly return to your starting position; repeat 15 times on each leg. Increase the resistance of your band and the number of repetitions as you become stronger. Keep a check on your posture and contract your core muscles for stability while you are bending your knee.



- **Single Leg Dead Lift With Pole:** Stand on your non-operated leg first and hold the pole behind your back to keep it in a neutral position. Keep the supporting knee still. Flex forward from the hips, allowing the opposite hip to extend while keeping the spine neutral and the hips facing forward. The foot that goes up should be pointed down to help prevent hip rotation. Hinge forward through the hips only as far as you are able to maintain a neutral spine, keeping the shoulders and hips parallel to the floor.



- **Reverse Bridge:** Place your palms, with fingers spread wide, on the floor slightly behind and outside your hips in a sitting position. Press into your palms, and lift your hips and torso toward the ceiling, trying to keep a straight line from head to knees, which will be bent at 90 degrees. Hold for 10 seconds and slowly lower the hips back down. Start with one set of 10. Increase the number of reps as your strength increases, up to 20 reps with 15 sec hold.



3. Proprioception:

- **Double leg squats on an unstable surface** (thick carpet → camping mattress → foam pillow → balance disc → BOSU)
- **Single leg stance on an unstable surface** (thick carpet → camping mattress → foam pillow → balance disc → BOSU)
- **Wobble board** balance and weight shift activities
- **Single leg calf raises +/- mini squat**

4. Stretches:

- **Hip Flexors:** Stand with good posture with left leg up on chair. Tuck your tailbone under. Push your hips forward until you feel a stretch in front of your right thigh. Avoid arching through the lower back.
- **Hip Internal Rotators:** To stretch the **left side**, cross your left leg over the right so that your left ankle is lying across your right thigh. Put your left hand on your left thigh and gently press down until you feel resistance. Then tilt forward at the hips slowly as you exhale. Remember to keep your chest up and your back straight. Don't allow yourself to hunch forward. Repeat with the other leg. Hold each stretch for at least 30 seconds and repeat 3 times.
- **Hip External Rotators:** To stretch the **right side**, cross your right leg over your left so that your right ankle rests on your left knee. Use your hands to grab hold of your right knee and pull it gently toward the opposite shoulder. You should feel the stretch in your buttocks and hips. Repeat with the other leg. Hold each stretch for at least 30 seconds and repeat 3 times.



ALSO CONSIDER

- Hip adduction (open chain) in standing; progress to resistance with tubing or weights
- Lunges - forwards/backwards
- Abdominal and core strengthening (i.e. curl-ups, obliques, transversus abdominis, physio ball and Pilates)
- Hamstring curls in lying with a physio ball
- Open kinetic chain weight-training exercises (leg press, knee extension, hamstring curls, hip strengthening with pulleys)
- Walking/hiking/jogging/cycling as tolerated
- Pool: flutter kick, easy jogging in waist deep water and running in deep water with aqua-belt

REQUIREMENTS FOR PROGRESSION TO PHASE 4

- ✓ **Improved strength and endurance**
- ✓ **Ability to demonstrate good core control and posture in single leg stance activities**
- ✓ **Must be able to perform a controlled single leg squat to 70° before commencing plyometrics**

PHASE 4: Sport Readiness

This phase begins as early as 3 months after surgery but usually starts around 18 weeks and may last up to 2 years. This phase focuses on improving agility and strength through plyometric exercises, and return to functional activities including sports.

GOALS

1. Improve proprioception and balance
2. Increase aerobic endurance
3. Maximize quadriceps, hamstrings, gluteal and core strength with functional exercises
4. Accurately perform plyometric drills
5. Training with sport specific drills

COLD THERAPY & ELEVATION

Manage knee swelling by continuing to use cold therapy and elevation, particularly after exercise.

EXERCISES

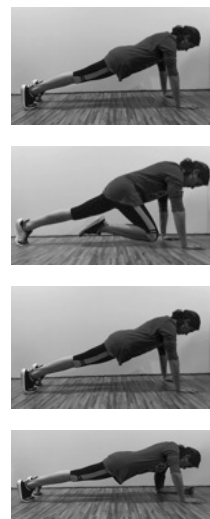
1. Proprioception:

- **Lunges on BOSU:** Step forward/back and lunge as shown. Control the descent ensuring your knee that is forward does not move beyond your toes. Start with 1 set of 10, holding each lunge for 5 secs. Increase the number of reps as your strength increases up to 3 sets of 10 on each leg.
- **Single Leg Squats On Trampoline:** Standing on one leg, slowly squat bending your knee from 0° to a maximum of 90°, making sure your knee does not move beyond your toes. Start with one set of 10, holding each squat for 5 secs and increase the number of reps as your strength increases, up to 20 reps x 15 sec holds on each leg.
- **Single Leg Stance With Ball Toss:** Standing on one leg on a BOSU or other unstable surface (i.e. foam block), toss and catch a light ball against a wall. Start with 2 sets of 15 tosses on each leg and increase as strength and balance improve.



2. Dynamic Core:

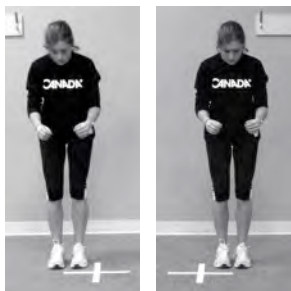
- **Mountain Climber:** Assume a press up position so your hands are directly under your chest at shoulder width apart with straight arms. Your body should form a straight line from your shoulders to your ankles. Lift your right foot off the floor and slowly raise your knee as close to your chest as you can. Return to the starting position and repeat with your left leg. Start with 1 set of 10. Increase the number of reps as your strength increases up to 3 sets of 15.
- **Ups and Downs:** Assume a press up position so your hands are directly under your chest at shoulder width apart with straight arms. Your body should form a straight line from your shoulders to your ankles. Lift your left hand off the ground and then place your left forearm on the ground where your hand just was. Do the same with your right arm. Now pick your right forearm off the ground and put your palm back on the ground. Follow again with your left arm. This completes one repetition. Start with 1 set of 10. Increase the number of reps as your strength increases up to 3 sets of 10.



3. Plyometrics:

Patient must be able to perform a controlled single leg squat to 70° before commencing plyometric exercises.

- **Agility Jumping:** start with straight-line jumping, backward/forward/side-to-side and progress to diagonals and combined patterns. Once speed and agility are good with jumping, progress through activities using single-leg hopping on each leg.

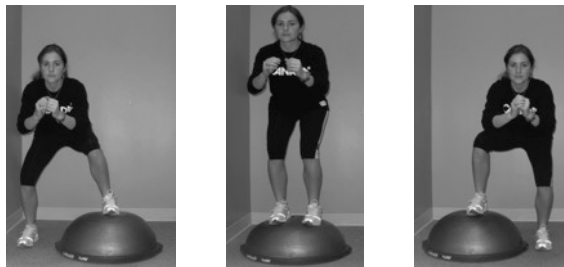


Agility Jumping



Agility Hopping

- **Side to Side Jump Steps on the BOSU:** Perform quick steps in both directions over BOSU. Start with 1 set of 10 steps in both directions and progress to 3 sets of 15 steps in both directions as your strength increases.



- **Jumping:** tuck jumps, box jumps, long jumps
- **Hopping:** single-leg hop (distance), 6m timed hop, triple hop (distance), zig-zag hops

4. Agility:

- Quick Lateral shuttles from cone to cone



- Skipping rope - double and single leg
- Grapevine/Cariocas
- Figure 8's around cones
- Agility Ladder

5. Running Drills:

- Shuttle sprints, stop and go drills
- Zig-zag running, sideways and backwards drills
- Sprinting with cutting and pivoting drills

6. Sport-specific Drills:

- **Basketball:** lay-up drills, lateral shuttle runs while throwing/catching ball off wall, run-pivot-vertical jump, dodging drills, defence drills (running/jumping backwards)
- **Soccer:** dribble around cones, shooting drills, defence drills, lateral shuttle runs while kicking ball off wall, tackling drills
- **Football/Rugby:** dodging/deking drills, running and throwing drills (all directions), defence tackling drills
- **Hockey:** skating figures, stick handling drills, shooting drills, deking drills

ALSO CONSIDER

- Open kinetic chain weight-training exercises (leg press, knee extension, hamstring curls, hip strengthening with pulleys)
- Wobble-board balance activities +/- perturbation (throwing/catching ball, raising arms)
- Box hops (up/down starting with 6" block)
- Tiptoe and heel walking along a line → progress to tiptoe and heel skipping
- Rocker board lunges (forwards/backwards)
- Single-leg calf raises + mini squat
- Forward and Sideways leg swings (special attention to core stability)
- Abdominal and core strengthening (i.e. curl-ups, obliques, transversus abdominis, physio ball and Pilates)

NOTE: If you have specific questions about how to train for returning to your sport please ask your surgeon at your 6 and/or 12-month post-operative appointment

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Please contact our office for more information:*

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Scan the QR code to
watch a short video
about EMS



Electrical Muscle Stimulation (EMS)

What is EMS?

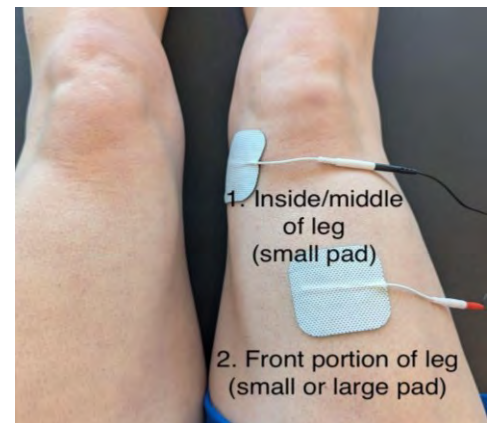
EMS (electrical muscle stimulation) uses a device to help stimulate muscle contraction. It is useful pre- and post-surgery to help get the right muscles working at the right time. The machine sends out an electrical signal which helps a muscle contract via pads on the skin that sit on top of your muscles. Typically, the quadricep muscle has the EMS unit pads attached to it, and exercises are completed to coordinate the hip and core muscles being activated at the same time.

Why use EMS?

Using an EMS unit daily helps improve muscle bulk, strength and overall function of the muscles around the knee. Pre-surgery, having better muscle function will help you recover more quickly after surgery. Post-surgery, using the EMS unit will help you restore strength and stability to increase functional improvements and get you back to doing more in your day to day or returning to activity sooner.

Where should I purchase a unit?

You can purchase the machine online or from [BSM](#).



Where should I place the pads?

Each pad placement will be specific to the individual so speak with your physiotherapist to have them help you find the best placements for activating your quadricep muscles.

How often should I use the machine?

You should be doing your exercises *daily* with the EMS unit for 15-20 minutes each day for 8-12 weeks or until you see your doctor again.

What setting should I use?

Common parameters, or settings, for the EMS unit include:

Frequency: 30-50 Hz

Pulse duration: 300 μ sec

Ramp up: 5-10 seconds

On/Off time: 5-10/10-20 seconds

Total time: 15-20 minutes

It is recommended that you bring your EMS unit to your physiotherapist so they can tailor the settings to work best for you.

What can I do if the signal reduces intensity or stops working?

First attempt changing the pads as they typically need replacement within 4-6 weeks. If that does not resolve the issue, try bringing it to your physiotherapist as they may have other troubleshooting suggestions.

MANAGING PAIN SAFELY

Pain is an expected part of having surgery.

Managing your pain safely is important to help your recovery.

PAIN AFTER SURGERY

After surgery, a moderate amount of pain is a normal and expected part of the process.

The goal of pain medication is to keep you moving and help you cope with your pain, but these medications *will not eliminate your pain entirely*.

In general, the most painful time is the first 72 hours (3 days) after surgery.

The amount of pain usually decreases after these first few days.



Scan to watch a short video on managing your pain



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MANAGING PAIN SAFELY

Opioids, such as morphine, oxycodone (Percocet), tramadol, hydromorphone or codeine, are strong pain relief medications that may be prescribed to help you manage the most intense postoperative pain.

Opioids should be used with caution as research shows that up to 1 in 12 patients prescribed an opioid for short-term use after surgery are at risk of becoming chronic users.

The regular use of over-the-counter Tylenol® and Advil, in addition to Cold Therapy*, can effectively manage pain and significantly reduce, or eliminate the need for opioids.

If you are still experiencing intolerable pain after regularly using Tylenol® and Advil in addition to Cold Therapy*, take the opioid in the lowest dose possible.

Also, only use the opioid for the shortest amount of time. No more than 2 - 7 days.



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*Scan for more
information on
Cold Therapy

CONTACT US

If you have questions about managing your pain, or your pain increases or does not decrease with medication, please contact our team:

- Banff Sport Medicine 403-760-2897 ext 1 (during business hours 8 am - 4 pm Monday to Friday)
- Banff Mineral Springs Hospital 403-762-2222 (for urgent concerns outside of regular business hours)



Banff Sport Medicine

Opioid Medication: Pain Control after Surgery

What are my options for safe and effective pain control?

Managing your pain after surgery is important. Combination therapy (using different medications together) along with education can offer the best pain relief. Some of these medications work via different pathways and can be used together. After surgery a moderate amount of pain is a normal and expected part of the process. Pain medications help you function better and cope with the amount of pain you are experiencing, but **these medications will not eliminate your pain entirely.**

Talk to your surgeon about medication options, which can include both prescription strength and over the counter drugs. These medications include:

- **Non-steroidal Anti-inflammatory Drugs (NSAIDs)** can be used to decrease swelling and fever, and to treat mild to moderate pain. (These can be prescription or over-the-counter medications, such as Naprosyn, naproxen: *Aleve*, ibuprofen: *Advil*, *Motrin*).
- **Acetaminophen** is used to decrease mild to moderate pain and fever. (These are over-the-counter medications such as Tylenol or Paracetamol).
- **Local anesthetics** which can be injected near a set of nerves (nerve block) or the surgery wound site. (This option is performed immediately after your surgery at the hospital).
- **Opioids** are used to decrease severe pain. (These are prescription medications such as Morphine, Tramacet, Percocet, OxyContin, Vicodin or Tylenol #3 which contains codeine).
- **Nerve pain medication** used to prevent nerve pain and irritation. (These are prescription medications such as Lyrica and Neurontin).

When should I take pain medication?

The goal is to keep you moving and control your pain. In general, the most painful time is the first 72 hours (3 days) after surgery. The amount of pain usually decreases after these first few days. If your pain increases or does not decrease with medication you should contact your surgeon. Call our office at 403-760-2897 (during regular business hours 8am-4pm Monday to Friday), or the Banff Mineral Springs Hospital at 403-762-2222 (outside of business hours).

Some medication is taken on a schedule (for example, every 4-6 hours) and other medications can be taken when you feel pain. Here is a useful guide:

- I am moving slowly and either have no pain or only a little pain = I don't need any medication.
- I am feeling some pain and having trouble moving around = I could use some over-the-counter medication. (For example, ibuprofen: *Advil*/*Motrin* or acetaminophen: *Tylenol*).
- I am thinking about my pain all the time and it is painful for me to move = I should take some stronger medication. (For example, a prescription medication such as Morphine, Percocet or Tramacet).

It usually takes 25-40 minutes for the medications to start working effectively so you should take your medication before your pain becomes severe or you are unable to move because of the pain.

Are there ways to reduce my pain besides medication?

Yes! You can do a number of things to help decrease your pain (*continued on next page*)

- Use ice packs or cold therapy to decrease swelling and pain.
- Rest for the majority of time for the first few days after surgery.
- Elevate and support your surgical limb as shown on your rehabilitation exercise protocol.
- Keep moving after the first few days, without over doing it.

- Distraction such as watching movies, listening to music, playing games, or talking to friends and family, has been shown to help reduce pain after surgery.

Why are opioids used?

Opioids are strong medications and when used properly, they can help to relieve short-term pain like the pain experienced after surgery. When opioids are used improperly, they can cause dependence or addiction, overdose and death.

How to use your prescribed opioid medication.

If you have been prescribed an opioid medication, such as Percocet or Tramacet, it should:

- **Only** be taken as prescribed
- **Never** be used by someone for whom it was not prescribed
- **Never** be taken with alcohol or other medications (except as prescribed).
- **Never** to be used while driving or operating machinery

Keep your medication safe to help prevent use by others by:

- **Never** sharing your medication with anyone else. (Sharing opioid medication is illegal and may also cause serious harm or death to the other person).
- **Keeping track** of the number of pills remaining in the package
- **Storing** opioids in a safe and secure place, out of the reach of children and teenagers

Unused portions of opioid medicine should always be:

- Kept out of sight of children and pets
- Stored in a safe place to prevent theft, problematic use or accidental exposure
- **Returned to the pharmacy** for safe disposal when no longer needed or expired. Medications should never be thrown in the trash or flushed down the toilet.
- This will prevent the possibility of illegal use and protect the environment from contamination.

Opioid Side Effects

Short-term side effects	Long-term side effects
Drowsiness	Increased tolerance
Decreased reaction time, which can impair driving and decision-making	Substance use disorder or dependence (addiction)
Constipation	Liver damage
Impotence in men	Infertility in women
Nausea and vomiting	Worsening pain
Difficulty breathing, which can lead to or worsen sleep apnea	Life-threatening withdrawal symptoms in babies born to mothers taking opioids
Euphoria (feeling high)	Overdose
Headaches, dizziness and confusion, which can lead to falls or fractures	

Anyone who takes prescription opioids can become addicted.

If you take opioid medications for more than a few weeks, your body becomes used to that dose. This physical dependence means you may experience withdrawal symptoms if you stop taking the drug.

Withdrawal symptoms include: insomnia, anxiety, racing heartbeat, and headaches. Withdrawal symptoms can be managed by gradually decreasing your medication dose with advice from a health care provider.

**Signs of opioid overdose include small pupils, trouble breathing and unconsciousness.
Call 911 immediately if you think you or a family member took too much pain medication.**



Post-Operative Concerns

Contact us if you have any concerns after your surgery

For Surgery performed at Banff Mineral Springs Hospital (Banff)

- ✓ During regular business hours - 8 am to 4 pm, Monday to Friday (closed Statutory Holidays):

403-760-2897 Ext 1

*Note: Call our office and **not** the hospital. If you get a voice mail response, please leave a detailed message, our office staff will call you back as soon as they are able.*

- ✓ Weekends and after regular hours:

If you have any urgent concerns **after** regular business hours that cannot wait please call the Mineral Springs Hospital at 403-762-2222 and ask for Acute Care.

- ✓ Anytime:

Health Link (811) will connect you to a nurse 24hrs a day who is able to give advice.

For surgery performed at other locations:

- ✓ Golden and District General Hospital (Golden): 250-344-5271
- ✓ Hinton Healthcare Centre (Hinton): 780-817-5019
- ✓ Elk Valley Hospital (Ferne): 250-423-4453

Common Concerns

1. **Uncontrolled pain**, if the prescribed pain medications and cold therapy are not controlling your pain, try loosening the tensor bandage and elevating the leg. If these do not improve the pain, please contact us.
2. **Calf, foot and ankle pain and swelling** within the first 2 weeks after knee surgery is common. If you have calf pain and swelling, you should loosen the tensor bandage around your knee and also elevate your leg so that your knee and ankle are above your heart. (Please see the Cold Therapy and Elevation picture on the first page of your rehabilitation protocol). If this does not improve the pain and swelling, please contact us. *If the pain and swelling is associated with sudden chest pain and/or shortness of breath immediately go to the nearest emergency department.*
3. **Swelling and redness of the shin** after ACL or other knee ligament surgery is not uncommon. Contact us only if the redness extends into the surgical incision sites or if there is persistent drainage of fluid (yellowish or cloudy fluid) after removing your bandage at the recommended time.



Banff Sport Medicine

4. **Skin redness above or below the bandages**, when you get home from the hospital, you may notice that the skin is red above or below the bandage. The most likely cause of this is the surgical preparation solution that was used to clean your skin before the operation. This solution has a red dye in it so if you are concerned that the redness may be caused by an infection, try washing that area with soap and water to see if it comes off. If your leg is still red and/or hot to touch after you have washed the area, then you should go to your local doctor or hospital to be assessed.
5. A **fever** is not uncommon within the first 48 hours after surgery. Call us only if the fever continues more than 2 days after surgery and is associated with a feeling of general unwellness. Fevers occurring within the first 48 hours post-operatively can be managed with Tylenol and deep breathing exercises.
6. A small amount of **bleeding** through the bandage can occur within the first 48 hours after surgery. Call the office or hospital if the bandage becomes saturated with blood, or if bleeding continues after removing the bandage at the recommended time.
7. **Swelling of the hand** is common after shoulder and elbow surgery. This swelling can be prevented or reduced by frequent pumping of the fingers (or squeezing a rubber or foam ball) and by taking your arm out of the sling and fully straightening your elbow (as when doing a pendulum exercise).
8. For post-operative **nausea and vomiting** if you can tolerate the pain, try stopping your prescribed painkiller, or take gravol (can be purchased over the counter in pill and suppository form). Sometimes taking the painkiller with food will help. Call us if you have uncontrolled vomiting.
9. Occasionally, an itchy, red, blotchy **skin rash** can occur with the use of ice packs or a cold therapy unit. This is not an infection but is a skin reaction to the cold. This can happen when cold is used for long periods of time, even when a cloth is used to protect the skin. If this happens, stop using the cold therapy until the rash settles down (this may take hours or even a day or two). When you start using cold therapy again, apply it intermittently (20 minutes on, then 20 minutes off).
10. After ACL surgery using your **hamstring tendons**, it is not uncommon to strain or pull the hamstring muscle in the first 6-weeks after surgery. This may occur while pulling on your socks or shoes, or bending over to pick something up. You may feel a sudden painful “pop” in the back of your knee or lower thigh. This does not mean that you have torn your ACL graft and the pain will settle down within a few days. You may also notice some bruising or swelling at the back of your thigh. However, if the pain is not improving after a few days, or is associated with a significant increase in knee swelling, please call our office and not the hospital, as this concern can wait until regular office hours.
11. When you remove your bandage for the first time, you may notice a clear string that looks like fishing line sticking out of the skin near the incision(s). This is a **biodegradable stitch or suture** that is used to close the skin incision. It will eventually fall off. However, you may snip these clear strings off at the level of the skin as early as 2 weeks after surgery, or you can wait to have this done by your surgeon at your first follow-up appointment. After removing your bandage, avoid the temptation to touch your healing incisions as your own hands are the most common source of bacteria which can cause wound infections.
12. **Steri-strips** are white strips of tape that are used to reinforce the stitching of the skin incisions. You may peel these strips of tape off by yourself 2-weeks after surgery, by which time the incision should be healed.



Patient Services

Questionnaires

We aim to provide excellent post-operative care. As such, we ask you to come back for appointments for up to 2-years after your surgery.

In addition to these visits, you may be asked to complete questionnaires, these provide the Surgeon with information regarding your overall function, your ability to participate in recreational or sporting activities, and your social and emotional well-being, both before and after surgery. From each questionnaire a score is generated reflecting your current level of function. Using these scores, the Surgeon can assess your recovery progress.

These questionnaires will be provided to you via an email with a link to a secure site to complete the questionnaire electronically before your appointment.

Online Shop

Our Online Shop (<https://banffsportmed.ca/shop/>) offers medical aids for purchase to help with your recovery and rehabilitation. You may order cold therapy units, range of motion (ROM) and off-the-shelf braces, electric muscle stimulator (EMS) units, and exercise kits from our site. Purchases are made through PayPal or via a secure credit/debit transaction.

The electronic receipt received through the website may be used to submit for insurance claims.

Prescriptions required for Cold Therapy Units will be provided to you by our office.

Some medical aids such as cold therapy units and knee walkers can also be rented for defined periods of time.

Frequently Asked Questions (FAQ)

You can consult our Frequently Asked Questions page on our website (<https://banffsportmed.ca/faq/>) to find answers to questions that are common to many patients in your situation. Answers include what your surgery will involve, how to manage your pain, when you can drive after surgery, how long you should avoid contact with water at the site of your surgical incision, common physical effects after surgery, and what to do if you require medical attention. If your question is not answered on the FAQ page, please contact your surgeon's medical office assistant with your question by phone or email for more information.



Cold Therapy Information

What is Cold Therapy?

Cold therapy is the use of ice or cold to reduce pain, inflammation, swelling and spasm from an injury or after surgery. Cold therapy can be applied with a bag of ice, an ice pack, gel pack, cold compress or by using a specialized Cold Therapy Unit.

Cold therapy is used as part of rehabilitation after knee, shoulder and ankle surgeries, such as arthroscopy, anterior cruciate ligament (ACL) reconstruction, shoulder reconstruction or rotator cuff repair.¹

What does it do?

Cold therapy slows down the blood flow to an injured area. Research has shown that cold therapy decreases pain, inflammation, swelling, blood loss, and medication use after surgery.²

WHEN	WHAT	HOW OFTEN
To Use Cold Therapy	Do We Recommend?	To Use Cold Therapy
> For the first 3 months after surgery	> bag of ice / ice pack / gel pack / cold compress	First 5 - 7 days - minimum 5 x per day for 20 minutes*
> When experiencing pain and swelling	> Kodiak Cold Therapy Unit	After 7 days - as needed
> After therapy and exercise sessions	> Polar Care Wave Compression Cold Therapy Unit	*up to 5 hours if using a Cold Therapy Unit
To prevent skin injury when using cold therapy, it is essential that you protect your skin by using a cloth or towel. Always carefully follow the specific Cold Therapy Unit instructions		

Where can I buy a cold therapy unit?

You can order a Cold Therapy Unit, complete with a knee or shoulder pad, through our website. Visit <https://banffsportmed.ca/shop/> or scan the QR code.

Alternatively, you can purchase a Cold Therapy Unit from your local healthcare provider or from an online health supply store, or rent one from the clinic for a defined period.

We recommend that you buy your Cold Therapy Unit at least two weeks before your surgery to make sure that you have it delivered in time.



¹ Raynor MC, Pietrobon R, Guller U, Higgins LD. Cryotherapy after ACL reconstruction: a meta-analysis. J Knee Surg. 2005 Apr;18(2):123-9.

² Wilke B, Weiner RD. Postoperative cryotherapy: risks versus benefits of continuous-flow cryotherapy units. Clin Podiatr Med Surg. 2003 Apr;20(2):307-22.

OPTIMIZE YOUR RECOVERY

Along with physiotherapy, we offer several services to help you reach your optimal recovery after surgery.

Getting you back to your activities and reducing your risk of another injury.



DIETETICS & NUTRITION

Consulting a Registered Dietitian* prior to surgery can help in many ways. They can:

- Conduct a nutrition pre-screen to ensure optimal surgery outcomes
- Support your increased nutrition needs during the inflammatory and healing phases of surgery
- Provide strategies that help to reduce muscle loss
- Help you manage post-surgical symptoms such as reduced appetite, nausea, and constipation

*Our Registered Dietitian works with clients 18 years and older

STRENGTH & CONDITIONING

Our strength and conditioning coaches (kinesiologists) and physiotherapists work together to help you:

- Prepare for surgery
- Recover after surgery



While our physiotherapists focus on reducing your pain, restoring range of motion, and progressing your rehabilitation exercises, our kinesiologists gradually reintroduce functional exercises to help you return to sport, activity, and performance.

This seamless collaboration is tailored to your surgery and goals to help you optimize your recovery and reduce your risk of another injury.



OTHER SERVICES

Our multidisciplinary team can also provide the following services for your surgery:

- Bracing
- Cold Therapy
- Massage Therapy
- Medical Devices and Equipment
- Blood Flow Restriction Therapy

BOOK A CONSULT



403 760 2897 ext 3



banffsportmedphysio.janeapp.com

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