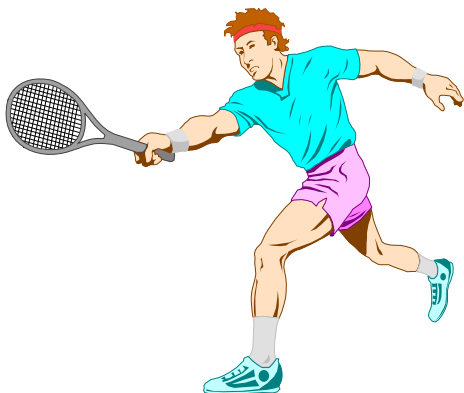


SSM Orthopedics

Sports Medicine

**Anterior Cruciate Ligament Reconstruction
Patient Handbook**



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This booklet has been designed to help answer your questions about anterior cruciate ligament (ACL) reconstruction. We hope that it will make the injury and your recovery more understandable for you. If you have any questions or suggestions about the booklet, please share them with us. We are always interested in improving the care we provide for our patients. Your input may help us provide even better care for those who come after you.

Anatomy of the Knee

The four major components of your knee are:

1. The bones

Femur or thigh bone
Tibia or shin bone
Fibula
Patella or knee cap

2. The muscles and their tendons (tendons attach muscles to bones)

Quadriceps: The muscles in the front of your thigh that straighten your knee.

Hamstrings: The muscles in the back of your thigh that bend your knee.

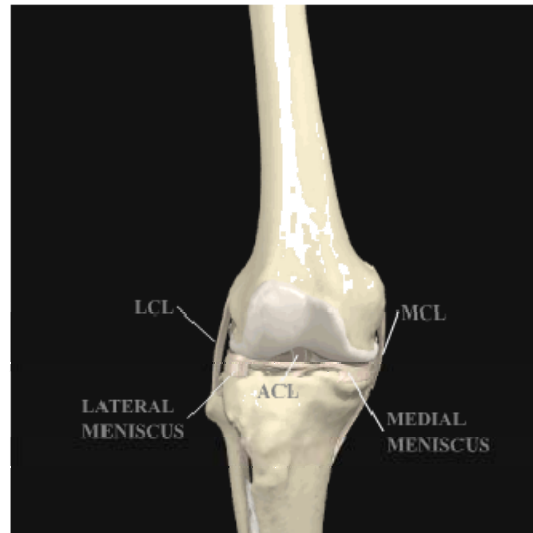
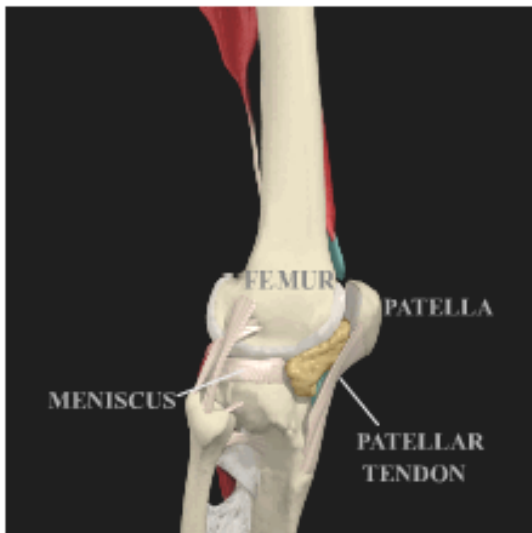
3. Ligaments (ligaments attach bones to bones)

Anterior cruciate ligament (ACL)
Posterior cruciate ligament (PCL)
Medial collateral ligament (MCL)
Lateral collateral ligament (LCL)

4. Cartilage

Articular cartilage (covers the ends of the bones)

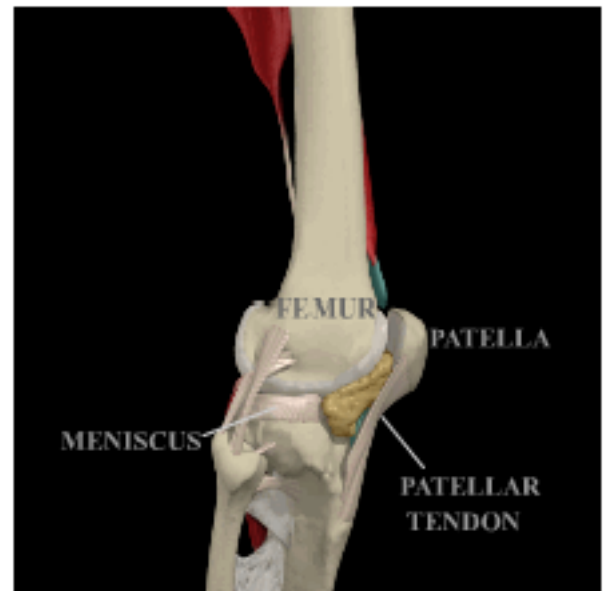
Meniscal cartilage (crescent shaped pads between the femur and tibia.)



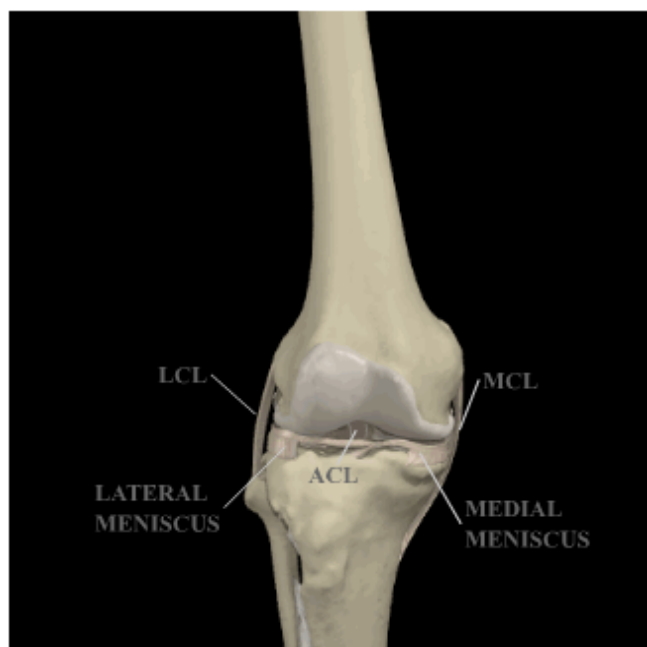
Role of the Anterior Cruciate Ligament

The ACL stabilizes your knee when you are jumping, pivoting, or cutting. It prevents the shinbone (**tibia**) from sliding forward on the thigh bone (**femur**).

ACL tears often occur when your foot is planted and you twist to the opposite side. When this ligament is torn, people often say they have a **“trick”** knee, and notice instability when pivoting.



If the knee is destabilized by a torn ACL, injury to the shock absorbers of the joint (**the meniscus**) can result. This can lead to popping/clicking or locking of your knee, and arthritis in the future.



Treatment of ACL Tears

Some people with ACL tears will do well without surgery. With strengthening of the hamstring muscles in the back of the thigh, some people will be able to return to about the same level of activity that they had before their injury. However, these people may have instability events that lead to cartilage damage in the knee causing the knee to swell and become painful. Many people will not be able to compensate for their injury and will require or desire surgery to stabilize their knee. The treatment of ACL tears is based on the age, activity level and functional disability of the person with a torn ligament. In general, the younger and more active individual will be more likely to require surgery. The 'older' and less active person may not require surgery. However, there are no hard and fast rules about age limit or activity level and ACL reconstruction. Each person is different, and must decide on treatment that fits their needs.

Treatment of new ACL tears is the same *initially* regardless of whether surgery is desired or not. The first goal of treatment is to restore the appearance of the knee to normal. This means *no swelling, full range of motion, and the ability to walk without a limp*. This may take 2-6 weeks. Past experience has clearly shown that performing surgery before these goals are achieved leads to scarring and stiffness after surgery. You may be given exercises or sent to physical therapy to help you achieve these goals. If you have torn a meniscus in your knee and have a "locked knee", you will need to have an arthroscopic procedure to address that problem before treating the injured ligament. Although this involves two separate operations, we have found that this provides far superior results.

Anterior Cruciate Ligament Reconstruction

The surgery for ACL tears has changed a lot in the last 10-15 years. Past ACL surgery has often been painful, required a great deal of physical therapy, and limited participation in athletic activities. We have seen that patients can get better faster and with less pain if we allow their knee, not a rigid time schedule, to dictate the pace of rehabilitation. Once the ACL is torn it cannot be successfully sewn back together. This has been tried in the past with unreliable and often poor results. To successfully restore stability, the ligament has to be replaced with a piece of tendon from somewhere else (**a graft**). The most common source for this graft is the tendon that attaches the kneecap to the shin bone (**patellar tendon**). The average patellar tendon is about 3 centimeters wide. A 1-centimeter strip from the middle of this ligament is an excellent replacement for the torn ACL. This graft can be passed through small drill holes in your shin and thigh bone and attached with two surgical buttons or screws in the place where the old ACL used to be. This restores stability to the knee. Compliance with your exercises, attitude, personality, and tolerance for discomfort all play a role in the return of your motion and strength.

There are risks associated with everything we do in life. Surgery is no exception. The complications of anterior cruciate ligament reconstruction include:

- 1. Bleeding:** Seldom a significant problem. A tourniquet is used during surgery to prevent blood loss.
- 2. Infection:** Very uncommon. Occurs in about one of every 200 surgeries. Antibiotics are given before and after surgery to help prevent this.
- 3. Blood clots in the legs:** An uncommon problem but potentially devastating in rare instances. We provide you with special stockings to minimize this risk. The exercises after surgery are also helpful in preventing this.
- 4. Stiffness:** Operating early after the injury before your knee appears normal increases the risk of this problem. If we notice that you are having problems with regaining your extension (**straightening your knee**), we will give you a special device that will help you straighten your knee. Rarely, people will require another operation to remove scar tissue after ACL reconstruction.
- 5. Fracture of your knee cap or rupture of the patellar tendon:** This is a very rare event and usually happens from a fall immediately after surgery.
- 6. Numbness of the skin around the incision:** There are small nerves that are unavoidably cut when making incisions. An area of numbness near your scar will gradually shrink in size over 3-12 months. This can be permanent in up to 50% of people, however, after a while most people are not troubled by it.
- 7. Graft rupture or recurrent stability:** A very small percentage of people, 3% - 7%, unfortunately do tear their graft. Following our rehab protocol can significantly reduce a graft rupture from occurring.
- 8. Bruising:** Having a cryo-cuff around your knee continuously for the first week can cause temporary bruising around your knee and calf regions. This bruising generally subsides during the second week as your knee swelling decreases.

Before Surgery

Do not eat or drink anything after midnight the night before surgery. If you have a fever or cough before surgery, please call our office at **(314) 291-3399**.

Day of Surgery

You will spend about **two to two and a half hours** in the operating room. Actual operating time is **around one hour** if you **do not have** any meniscal damage. If your meniscus is torn and can be repaired with stitches, operating time is usually **increased by 30 - 45 minutes**.

After surgery is over, you will spend between one to two hours in the recovery room where your blood pressure, pulse, respiration, and temperature will be closely monitored.

You will have elastic stockings (**TED hose**) and a light dressing on your knee. The Cryo-Cuff or Game Ready ice cuff will be placed over all of this.

The Cryo-Cuff or Game Ready ice cuff should be on at all times during the day except while you are doing your flexion (**bending**) exercises. The coldness will feel good to you and help to reduce swelling, but more important than the cooling effect is the compression that the cuff provides. Always keep the cuff snugly on the knee to maintain compression. This decreases the amount of space available for swelling to occur. Remember our goal is to prevent swelling from occurring rather than having to get rid of swelling after it occurs.

You will begin the rehabilitation of your knee as soon as you arrive home. A CPM should have been delivered to your house. You should place your leg in the CPM when you get home. The CPM machine will gently bend (**flex**) and straighten (**extend**) your leg.



The machine will also keep your leg elevated above the level of your heart, which will help to decrease the swelling in your knee. Your leg is to be in the CPM machine **at all times for one week except** when you are doing your exercises, going to the restroom, taking a shower, or if you have to get up to get your meals.

A log sheet, like the one on the following page, will be used by you for the first week. This log has the exercises you will be performing and the medications you will be taking. Please keep track of the exercises as you do them by checking off the appropriate box, and also check off the medications as you take them.

Post – op Instructions

- It is extremely important that you start your exercises as soon as you get home. Early rehab prevents stiffness in the knee and allows you to return to normal activities faster, including your sport. Average return to sport is 5-6 months.
- Exercises to be done every hour that you are awake.
 - Heel props x 10 minutes (on canister or rolled up towel)
 - Quad sets 10x
 - Straight leg raises 10x
 - Towel stretches 10x
- Exercises to be done every other hour.
 - Heel slides 10x
 - Flexion in the CPM to 120 degrees - hold for 5 minutes
- If you forget how to do the exercises, please refer to your book or view the exercise videos on the website (kburnsmd.com).
There is no excuse for not doing your exercises!
- You may remove your dressing 3 days post-op (eg. If your surgery is on Friday, you may remove your dressing on Monday). If the incision is dry and not oozing, you may shower after the dressing is removed.
- You should continue to wear your TED hoses since these provide light compression to help control the swelling.
- It is important to take your medication as prescribed. Do not wait till you start experiencing severe pain – it will be too late. Our goal is to prevent pain from occurring instead of treating pain

once it has already started. Do not be afraid to take your pain medication!

- You are to remain in bed and your CPM at all times. You may come out of the CPM to do your exercises, use the bathroom, shower, and eat meals.
- You may put as much weight on your leg as you can tolerate using your crutches or walker as needed. Putting weight on your leg will not affect the surgery that was just done, but remember that being up with your knee below your heart will cause your knee to swell and may slow down your recovery time.
- You may eat any type of food that you feel comfortable with. You can take Pepcid to prevent stomach upset that can occur after anesthesia.
- You should use your Cryo-cuff or Game Ready ice cuff as much as possible. These devices provide ice therapy and compression to help reduce swelling and pain.

First Week at Home

While at home, you should remain lying down and only get up to walk to the bathroom, to take a shower, or to get your meals.

Continue to use the Cryo-cuff or Game Ready ice cuff and CPM machine as instructed. You should also continue to increase your flexion (**bending**) and maintain full extension (**straightening**) by performing all your exercises hourly during the day.

You should report the following symptoms to us:

1. **Increase** in temperature. It is normal to have a slight temperature after any type of surgery; however, a temperature **above 101** degrees may indicate a problem.
2. **Increase** in swelling in the knee.
3. **Increase** in drainage from the knee.
4. **Increase** in the soreness of the knee that is unrelieved by the medications you have been given.
5. **Upset stomach** after taking the medication.
6. **Difficulty** with sleeping.

MEDICATIONS

The goal of our pain management is to prevent pain from occurring rather than trying to control the pain once it occurs. We use several different types of medications that each work in separate ways to prevent pain.

Marcaine. This is a local anesthetic that is given during surgery. It numbs the joint and surrounding soft tissue to help provide pain relief.

Toradol. This is an anti-inflammatory drug that we use to help with pain control. It acts in the body by stopping the production of certain chemicals that in turn tell the brain that the body has been injured. You are given a dose of this drug before surgery even starts. You will also be given a dose of Toradol before you go home to help with pain control the rest of the day. You will be given a prescription for Toradol before you go home. You should start your toradol pills the day after surgery. You will take 1 pill 3x/day for a total of 4 days. You should take your toradol pills with food or meals.

Ibuprofen 800mg (1 tablet three times a day) This is also an anti-inflammatory drug, but it is taken by mouth. You will begin taking Ibuprofen only after you have completed taking the Toradol tablets. You will be given a prescription for Ibuprofen before you go home. Continue to take Ibuprofen three times a day for the first week following surgery. An upset stomach can occur when you take this, so remember to always take Ibuprofen with food. If your stomach continues to be upset, call our office at **(314) 291-3399**.

Vicodin. (1-2 tablets every 4-6 hours as needed for pain) This is a narcotic pain medication. You will start this medication after surgery. You can take 1-2 tablets every 4-6 hours as needed for pain. Remember that our goal is to prevent pain from occurring instead of treating your pain after it occurs! We will give you a prescription for Vicodin before you leave the hospital. Once your Vicodin runs out or you no longer need Vicodin, you will start taking Tylenol. **Never take Vicodin and Tylenol at the same time.**

Tylenol Extra Strength. *(2 tablets 4 times a day)* This is a mild pain relief drug. You should start taking Tylenol when your Vicodin runs out or you no longer need the Vicodin. Once you start the Tylenol, continue to take it until we see you back in the office, even if your knee is not sore. This will help to maintain a constant blood level of the drug in your body and help keep you from having soreness in your knee. **You should never take Vicodin and Tylenol at the same time.**

Pepcid. *(2 tablets twice a day)* This is an antacid. This will help to prevent stomach upset that can occur after anesthesia and with some of our pain medications. If you are having nausea, you can take two pills with breakfast and dinner as needed for stomach upset.

Ancef. This is an antibiotic. You will be given a dose of antibiotic through your IV during surgery. After surgery, your nurse will give you a dose of antibiotics before you go home. This will help to prevent an infection.

Rehabilitation for ACL Surgery

Phase I – Before Surgery

Goals:

1. **No swelling:** You should apply ice to your knee to help reduce the swelling. You should limit your activities as much as possible. You may go to work and go to school if you can do it with a minimal amount of walking. Avoid twisting, pivoting, jumping, and sharp turns, as these movements may cause your knee to “buckle” and swell. You can take Ibuprofen 800 mg three times a day to help reduce pain and swelling.
2. **Normal range of motion:** You will be given exercises to do to help you get your knee fully straight and fully bent.



- Heel Props: to straighten leg



- Straight Leg Raises



- Knee Lockbacks: To straighten leg



- Prone Hangs: To straighten leg

Phase I - Before Surgery

Goals (cont.):

2. Normal range of motion (cont.):



- Wall Slides (Pt. 1):
To bend knee



- Wall Slides (Pt. 2)
To bend knee



- Heel Slides (Pt. 1)
To bend knee



- Heel Slides (Pt. 2)
To bend knee

3. **Normal gait (no limp):** This will return as your swelling decreases and your knee motion improves. Practice a normal gait by walking towards a mirror.

Phase II – Day of Surgery through Week 1

Goals:

1. **Return of full extension (straightness) and at least 120 degrees of flexion (bend) in reconstructed knee:** We will give you a log to record your exercises that are pictured below. You will be given a CPM machine immediately after surgery that you will use in the hospital and at home to help return motion in your reconstructed knee.



- CPM Machine-

- a) **In the CPM machine – range 0-40 degrees** at slow speed **except** when exercising, getting meals, showering, or going to the bathroom.
- b) **Every hour from 08:00 a.m. to 10:00 p.m., for 10 minutes do heel props.**
These are followed by **10 straight leg raises**, and **10 quad sets**

Heel Props



Quad Sets

Straight Leg Raises



- c) **Every hour** do **10 towel stretches** on your ACL knee, holding each stretch for **5 seconds**.



Towel Stretch (Pt. 1)



Towel Stretch (Pt. 2)

- d) **Every other hour** bring the CPM machine up to **115 degrees** and hold for **5 minutes**. Return the CPM to **0-40 degrees** upon completion.



CPM Machine: 115 degrees of bend (**Cryo-cuff is off**)

- e) **Every other hour** do **10 heel slides** on your ACL knee, holding the last heel slide at a full bend for **30 seconds**.



Heel Slide (Pt. 1)



Heel Slide (Pt. 2)

- f) **Every other hour - for opposite side grafts only** - place your graft leg in the leg shuttle and slowly push **100 times**. Use as many bungee cords as you feel comfortable doing (**Cryo-cuff is off**).



Leg Shuttle: (Pt. 1)



Leg Shuttle: (Pt. 2)

- g) **Then do a heel slide on your graft knee.** Try to get your heel up to your buttocks, and hold this full bend for **5 minutes**.



Heel Slide (Pt. 1)



Heel Slide (Pt. 2)

Phase II - Day of Surgery through Week 1 (cont.)

Goals: (cont.)

2. **Minimize swelling.** You should use your Cryo-cuff as much as possible during the first week. See the instructions on use of the cryo-cuff. You will need to take it off when you are doing your bending exercises. The knee should be elevated above the heart (**in the CPM machine**) about **90%** of the time. You may get out of bed to go to the restroom, shower, and to get your meals. The more you are on your feet, the more your knee will swell. Wear your **TED** hose during the day and night.

3. **Walking with a normal gait.** Use a walker or crutches until you can walk without a limp. You may put as much weight on your leg as you feel comfortable.

- **One week after surgery, you will return to the office to be checked.**

We will check your incision and change your bandages. In addition, we will check your range of motion for straightness and bending. bring your exercise/medication log with you, so we can review your exercises and progress your rehabilitation. We can also show you the video and pictures of your knee arthroscopy in the office.

Week 2:

Goals:

1. **Maintain full extension and increase flexion to at least 130 degrees in your reconstructed knee.** When standing, place your weight on your ACL leg and lock it backwards. Continue to do heel props for 10 minutes, straight leg raises, quad sets, towel stretches and vertical heel slides. Do these exercises 4-6 times daily.



To Use the Cryo-Cuff

1. Fill the canister with ice and water to the levels indicated inside the Canister (water first, then ice). If you are using two cuffs, you may need to add more water than for a single cuff.
2. Open the air vent at the top of the canister.
3. Hold the tip of the hose below the level of the canister and depress the spring-loaded tip until a little squirt of water comes out.
4. Place the cuff on the knee so the opening in front is above the kneecap. Always put the cuff on empty. Do not attempt to adjust the straps with water in the cuff. This greatly reduces the effectiveness of the cuff. The velcro strap above the knee should be tightened to allow one finger beneath the cuff. The velcro strap below your knee should be slightly looser.
5. Connect the hose to the valve on the top of the cuff.
6. Lift the canister above the knee allowing cold water to fill the cuff.
7. Disconnect the hose from the valve when the cuff is pressurized to a comfortable, snug level.



To Drain the Cryo-Cuff

1. Connect the hose to the top of the cuff.
2. Lower the canister below the level of the knee.
3. Swish the water around in the canister for a few minutes.
4. Lift the canister above the knee allowing cold water to fill the cuff.
5. Disconnect the hose from the valve when the cuff is pressurized to a comfortable, snug level.

Note: The ice in the canister will generally last from **4-6 hours**. The cuff should be drained and refilled **every 30-45 minutes** during the day. You may remove the cuff at night when you are sleeping. Do not adjust the upper strap when the cuff is full. Instead, drain the cuff, then adjust the strap prior to refilling the cuff. Keep the cryo-cuff on over your TED hose. Do not try to bend your knee more than 30-40 degrees when the cuff is on.

