The Patient’s Guidebook for Knee Surgery

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How Does Your Knee Work?

The knee is an important link in an elegant mechanism that allows humans to walk upright. The knee provides the leg with the necessary flexibility to allow locomotion. The knee also functions as sort of a shock absorber. As the foot hits the ground during walking the knee automatically bends to gently cushion the blow.

The knee joint is made up of four bones: The femur (thigh bone), patella (knee cap—not in figure), tibia (shin bone), and fibula (figure 1). The femur and the tibia are the largest bones and make up what is commonly thought of as the knee joint. The patella is a kind of floating bone that sits in front of the femur and tibia to provide protection to the joint. When you bend and straighten your leg your knee cap glides against a part of the thigh bone called the trochlea (figure 1). The fibula is the smaller of the lower leg bones and provides attachment for important muscles and ligaments of the knee.

Movement is promoted by a series of powerful muscles that surround the knee. The major muscles include the quadriceps, adductors, hamstrings, and gastrocnemius (figure 2). The strength and endurance of these muscles are critical to the performance of the knee. Although the muscles are important in maintaining stability the ligaments are the primary stabilizers in the knee joint.
Ligaments are structures made of connective tissue (gristle) and connect one bone to another. There are four major ligaments in the knee: anterior (front) cruciate ligament (ACL), posterior (back) cruciate ligament (PCL), medial (inside) collateral ligament (MCL), lateral (outside) collateral ligament (LCL) (figure 3). The collateral ligaments stabilize the knee in side to side directions while the cruciate ligaments stabilize in front to back movements (figure 4).

The weight bearing surfaces of the knee are made of two kinds of cartilage. The first is called hyalin cartilage which forms a smooth coating on the end of the bones. The second type is the meniscus (fibrocartilage) (figure 5). The two menisci are like gaskets between the bones. Among other things the menisci function as shock absorbers for the knee. Significant damage to either of these structures can effect the long term function of the knee. In cases of severe injury, arthritis can eventually occur.
You have injured the anterior cruciate ligament (figure 6).
Unfortunately the anterior cruciate ligament rarely heals by itself. The reason for this is largely unknown. Loss of the ACL can cause the knee to be unstable. This is particularly true in active, athletic individuals. Without the ACL the knee can slip out of place. This usually occurs when attempting sudden changes in direction or landing from a jump. Repetitive episodes of knee instability can lead to progressive damage to the hyalin and meniscal cartilage. Over many years some patients develop disabling arthritis as a consequence.

Figure 6: Rupture of the ACL
How does surgery correct my knee problem?

ACL Reconstruction

Many years ago surgeons first attempted to directly repair (sew together) the ruptured ACL. Unfortunately the results of these surgeries were dismal. In fact these patients fared no better than patients who were left untreated. A short time later surgeons began developing techniques using other tissues to substitute for the torn ACL. Initially patients were immobilized after surgery and many patients developed stiffness and profound weakness. Most patients were unable to return to sports until a year (if at all) after surgery.

Because of continued refinements in the surgical technique, and pre-operative and post-operative rehabilitation, ACL reconstruction has become a relatively low risk and dependable operation. Currently a grafting procedure is performed to substitute the torn ACL. A graft is tissue taken from another part of the body, in this case another part of the knee. Common grafts are the patellar tendon of the injured knee (figure 7), the patellar tendon of the opposite, uninjured knee, or the hamstring tendons. Each graft has advantages and disadvantages and the graft used for reconstruction needs to be matched to each individual’s situation.

Once the graft is harvested it is prepared for implantation by placing sutures in either end to aid in later securing the graft. Interestingly the graft is truly “borrowed” as the tissue reliably regrows over a period of several months. The operation is facilitated by using an arthroscope. An arthroscope (arthro-joint, scope- to look) is a device that is 3/16 of an inch in diameter and 8 inches long which is linked to a video monitor via a fiber optic cable (figure 8). The arthroscope is inserted into the knee joint through a small puncture hole (portal). The arthroscope can be manipulated to see all of the
contents of the knee joint. There is also an assortment of tools that can be inserted through an additional portal. These tools are used to help repair or remove injured tissue. With the aid of the arthroscope the stump of torn ACL is removed at this time and any injury to the joint surface cartilage and menisci are assessed. If one or both of the menisci are torn then either partial removal or repair of the torn meniscus is performed. If a repair is not feasible then we typically remove the injured portion of the meniscus. The remainder of the meniscus is left behind to maintain as much of its function as possible.

The graft must be placed into the knee so that it precisely recreates the normal position of the normal ACL. Tunnels through the tibia and the femur are carefully made according to each patient’s specific anatomy (figure 9). The graft is then pulled into the tunnels (figure 10) and is secured on either end.

The method of securing the graft depends on the graft itself. Patellar tendon grafts are typically secured by tying the previously mentioned sutures over special “buttons” made of titanium and plastic (figure 11). Hamstring grafts have no attached bone, therefore, the graft is secured with special fixation devices on both ends (figure 12).
Potential Risks of Your Surgery

Any surgery that we perform has certain documented risks. These potential problems can arise even if the surgery is carefully planned and performed. The most notable risks are outlined below. Fortunately the incidence of such complications with elective knee surgery is very low. Certain factors may slightly increase your potential risk such as previous operations on the same knee or coexisting medical conditions such as diabetes, heart ailments, etc. Our surgical team will discuss any such condition prior to surgery if it may have a potential impact on your recovery. The following risks appear in the order of frequency:

Peri-operative risks

1. Anesthetic complications
   - *Sore throat*: only occurs in patients who undergo general anesthetic and is due to the breathing tube used to provide airflow to your lungs.
   - *Nausea*: occurs from the various drugs that are used during anesthesia. The newer drugs have a lower risk and several anti-nausea medications are available to minimize the symptoms.

*Herbal Supplements/Weight Loss Products*: The use of any weight loss products or herbal supplements must be discontinued 2 weeks prior to surgery. These products can interfere with bleeding control and anesthetic medications.

*Serious complications*: More worrisome complications such as severe drug reactions and death are fortunately extremely rare. The risk of death or serious injury as a result of anesthesia is said to be lower than the chance of being hit by a car!
2 Operative Risks

**Bleeding** - Bleeding is expected during surgery because of the generous blood supply to the knee. We use special instruments to cauterize small blood vessels which therefore minimizes bleeding. Blood loss during most knee surgeries is less than 1 to 2 ounces.

**Infection** - rarely occurs. The risk has been estimated at roughly 1 in 300 surgeries. If an infection does occur then further surgery and antibiotics may be necessary to treat the problem.

**Nerve damage** - to the major nerves of the knee and leg is extremely rare. *Damage to the small skin nerves around the incision is expected.* This typically leaves patients with a half-dollar sized area of numbness next to their incision. There are no functional consequences because of the numbness.

Post-operative risks

1. **Stiffness** - This can be a result of poor effort during rehabilitation or in some cases occurs for no obvious reason. In most cases the condition is temporary and resolves with diligent rehabilitation. In less than 2% the condition is persistent and requires further surgery.

2. **Re-injury** - If you are undergoing a reparative or reconstructive procedure bear in mind that we can’t make your knee better than new! If you should fail to comply with your rehab program or sustain a significant injury after surgery the result may be compromised.

3. **Failure of graft healing** - in rare cases the graft tissue fails to heal properly leading to recurrent instability.

4. **Hardware failure** - in rare cases the hardware may fail due to screw migration of material failure.

**Graft site pain**

Although not a true complication, temporary graft site pain is expected. This is soreness in the area where the graft was harvested. Graft site pain is rarely limiting and in most cases resolves slowly over a period of several months as tissue re-growth occurs where the graft was taken. In a small number of patients who have a patellar tendon graft, kneeling on a hard surface may cause discomfort. This discomfort may persist indefinitely.
Planning Before Your Surgery

Special Tests

It is most likely you have already had knee X-rays by your family doctor or in our clinic. If necessary you may have to undergo other tests such as an MRI (magnetic resonance imaging), although, in the majority of cases an MRI is not needed to make the diagnosis. Shortly before surgery the therapist will test your knee’s stability and strength. The purpose of this is to have a baseline for comparison after surgery.

Pre-operative Physical Therapy

Preparing your knee and body for surgery is one of the most important steps to ensuring a good result from your operation. It is important to understand that this operation is not an emergency procedure. In fact many times the time between injury and surgery ranges from 3 weeks to several months. Several studies have clearly shown that the better your knee looks going into surgery the easier it is to achieve a rapid and full recovery. The therapist will give you some simple but effective home exercises designed to decrease swelling, recover range of motion and strength.

General Medical Check-up

This is only required for individuals who have a history of certain medical conditions (eg- heart ailments, lung disease, etc). In some cases surgery needs to be postponed while further testing or treatment is initiated.

*Herbal Supplements/Weight Loss Products*- The use of any weight loss products or herbal supplements must be discontinued 2 weeks prior to surgery. These products can interfere with bleeding control and anesthetic medications.
The Day of Surgery

Check-in

You will have to register at the hospital on the day of surgery. The specific time and location will be given to you during your office visit or by mail. Please be prompt! Failure to arrive on time unnecessarily delays not only your surgery but those who are having surgery after you. If you are significantly late your surgery will be canceled. You will be asked to arrive at least 2 hours before the actual surgery time. This is to allow for the registration process and pre-operative consultation with the anesthesiologist. After you have registered a nurse will check you into the surgical holding area (figure 13), ask you several questions relating to your past health, and take your temperature, blood pressure, etc. You will then be asked to change into a hospital gown.

Anesthesia

The nurse will start an intravenous (I.V.) line which will be used to deliver medications to your bloodstream during and after surgery. Immediately before surgery the anesthesiologist will discuss the details of your anesthetic. Any questions you have regarding anesthesia should be addressed to the anesthesiologist at this time.
Surgery

After you have been prepared the nurse from the operating room will take you to the surgery area. You will be asked to wear a surgical cap to cover your hair. After being checked in a second time you will be wheeled into the operating room (figure 14) (please note that you will be asked many of the same questions on several occasions. This is merely to prevent any important information from “slipping through the cracks.” We appreciate your patience). The surgical team is composed of the surgeon, his assistant(s), 2 to 3 nurses or surgical technicians and the anesthesiologists. The temperature in the room is typically lower than normal and warm blankets will be provided. Once the anesthesiologist is prepared he will administer medicine which will make you feel relaxed. Afterward more medicine will cause you to fall asleep. Surgical time varies from case to case but we will make a time estimate for your family so they can plan appropriately. After surgery Dr. Sallay will talk to family members to update them on your surgery. Please make sure that family members are available at this time.

Post-Anesthesia Recovery Unit (PACU)

When you awaken from the anesthetic you will be in the PACU. A nurse will be assigned to monitor your progress and address your needs. After you have stabilized you will be transferred to your room. It is only at this time that your family members will be able to see you. Family members are not allowed in the main recovery area because of need to maintain the privacy of the other patients.
Your Hospital Stay

Nursing Duties

A nurse will be assigned to you for your stay in the hospital. Occasionally one nurse may be responsible for several patients. The nurse is responsible for monitoring your progress, measuring your vital signs, aiding with hygiene and administering your medications. If you are experiencing any difficulties or if there are any questions the nurse can communicate with Dr. Sallay or the anesthesiologist.

Pain Management

Remember for the first 24 to 48 hours it is wise to stay ahead of your pain. Don’t be too timid or proud to take your medication regularly during this time. The following is a list of the common medications prescribed:

Torodol (I.V.)- a powerful anti-inflammatory medication which is administered the first day of hospitalization.

Norco, Vicodin, Percocet - narcotic pain relievers that alter your perception of pain. These medications are only given for a specific period of time after surgery because prolonged use has been associated with addiction. All of these medications can cause nausea, particularly if taken without food. Always take these medications with food. Additionally some patients will notice constipation. To minimize this be sure to drink plenty of fluids, especially fruit juices.
Control of Swelling

All patients will experience some degree of swelling after surgery. Swelling is minimized by staying in bed with your leg elevated and by using the CryoCuff. The CryoCuff is a vinyl bladder filled with ice water that wraps around the knee (figure 16). You will continue wearing the CryoCuff even at home for the first week after surgery.

Physical Therapy

The morning following surgery the physical therapist will visit with you. They will review or teach the necessary exercises to begin your rehabilitation. These exercises are critical in the success of your operation. Pay careful attention to the therapist and perform all of the exercises as instructed.

Discharge from the Hospital

If you were admitted after surgery you will be seen by our surgical team the next morning. You will be discharged after the following conditions are met:

- Your pain is under control with oral medications
- You are able to eat and drink
- You are able to go the bathroom
- You have been visited by the surgical team
- You have seen the therapist and have learned your rehab exercises
Limitations after Surgery

Activity

One of the most important goals after your surgery is to limit swelling in your knee. Although the CryoCuff helps to minimize swelling, your activity, being up on your feet, has the most impact on swelling. For the first week after surgery you should minimize the amount of time you are on your feet. You should only get up to go to the bathroom or to shower. At all other times you should be laying down with your leg propped up in the CPM machine or performing your exercises. Our experience has shown that those patients who are on their feet too much experience more swelling and then struggle more with rehab.

Work/School

In general it is ideal to be off work for two weeks. In some cases it is appropriate to return to a part-time schedule the second week after surgery. For students who are in school surgery is typically postponed until a natural break in the semester (ie- spring break, etc). Delaying surgery is not detrimental as long as the patient avoids high risk activities.

Driving

You should not drive for at least one week after surgery. If you had surgery on your right knee it may take up to 2 weeks to drive comfortably and safely.
What to Expect at Home

Physical Therapy Exercises

Although the surgery itself is an important step in restoring your knee function, physical therapy is equally important to ensure a good result from the surgery. A poor understanding of how to perform the exercises correctly, or a lack of motivation and consistency on your part to perform the exercises, can seriously jeopardize the final outcome of your surgery. Therefore it is important to read this material carefully and perform all the exercises prescribed every day unless Dr. Sallay or your physical therapist have advised you differently.

*Note - all exercises are done during waking hours only
Heel prop/Quad set - heel prop ten minutes six times a day while performing 10 quad sets holding contraction 5 sec. during the time period: This exercise is designed to maintain full hyperextension (straightening) of your knee while minimizing strength loss in the quadriceps musculature. Patients who lose the ability to fully straighten their knee after surgery often suffer from chronic pain in the front of their knee. Performing this exercise soon after your surgery allows you to easily maintain the ability to straighten your knee and contract your quadriceps muscle. Prop your leg off of the bed using a rolled blanket or towel while you are lying down (figure 17). It is important that your knee doesn’t touch the bed so
What to expect at home

that it can fully straighten. Also your knee cap should be pointing straight up, this ensures that your knee can achieve the most extended position. Keeping your knee straight, flex or “set” the quadriceps muscles (figure 18). You may find it difficult at first to get the muscle to work. With diligence and practice you’ll get the hang of it.

**Straight leg raise – ten repetitions every hour after heel prop (Do uninjured side first):** This exercise also helps strengthen your leg. To perform this exercise straighten knee and concentrate on locking it in that position. Now pick your foot up about 12 inches off the bed and hold it there for a count of five seconds (figure 19). The first week after surgery you may find it difficult to keep your knee perfectly straight, this will improve with time.

**Towel Stretch - ten repetitions, hold 5 seconds. Do every hour post heel prop.** This exercise will help you regain the extension (straightening) in your knee. Hold the towel with one hand, hold your thigh down with the other. Pull in an upward direction until a stretch is felt in the back of your knee (figure 20).

**Active Heel Height - ten repetitions, hold 5 sec. Do following post towel stretch.** This exercise will help activate your quadriceps muscle in an extended position. Tighten your thigh muscle and try to pop your heel up off of the floor or table (figure 21).
CPM flexion exercise – perform six times a day: Gradually increase the flexion angle of your knee to 110° by pushing the pause button on the CPM machine. Once you have attained 110° push the stop button and stretch for 10 minutes. Lay flat while performing this exercise.

Goals: By the time you return to Dr. Sallay’s office one week after surgery you should:
- have full straightening of your knee equal to your opposite side.
- complete active heel height
- be able to easily lift your leg with minimal bend in your knee
- be able to bend your knee to at least 110 degrees or more (heel equal to opposite knee)
- have minimal swelling in your knee
- partial weight bearing with crutches to full weight bearing when walking normally without a limp or bent knee

CPM (continuous passive motion) machine

The CPM machine gently and slowly helps to bend your knee back and forth. The CPM machine is not a substitute for your physical therapy exercises.

The main purpose of the machine is to make your knee feel better by minimizing the stiff feeling your knee can get if you keep it in one position. You can use the machine between your exercises. Start the machine at –5° to 30° and increase the flexion setting each day as tolerated. Turn the CPM down to 30° at the lowest speed to sleep at night. You will only need the CPM machine for the first week; bring it back to the office at your first appointment after surgery.

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Medications and Pain Management

You will be given a prescription for pain and anti-inflammatory medications. You should stop on your way home to fill your prescription so that you don’t have to rush out to get them when you are already in pain. Please let us know if you have any allergies or side effects to any pain medications or anti-inflammatory medications (ie: ibuprofen, motrin, aspirin). Stay ahead of your pain. Take the medicine regularly for the first 48 hours after surgery, then slowly wean yourself off of the pain medicine and substitute with an over-the-counter medication. Make sure to take your medicines with food.

Narcotic pain relievers alter your perception of pain. These medications can make you feel sleepy therefore you should not drink alcohol, drive, or operate machinery while taking them. Narcotic pain relievers can cause nausea, particularly if taken without food. Additionally some patients will notice constipation. To minimize this be sure to drink plenty of fluids, especially fruit juices.

Anti-inflammatory medications will help with swelling, stiffness, and pain. These medications can cause stomach upset and rarely, ulcers. They too should be taken with food. If stomach irritation occurs Pepcid AC can be taken in conjunction with the medication. If stomach irritation persists or if you notice blood in your stools, immediately discontinue the medication and call our office.

Cryotherapy

Cryotherapy (cold therapy) is just as important in your pain management as the medications. The cold helps to decrease inflammation and therefore swelling and pain in the knee. You should apply the CryoCuff (figure 22) to your knee at all times except when you are up walking, doing your exercises, or showering. You should keep the CryoCuff on even when you are in the CPM machine, however, you may need to loosen the bottom straps when you begin to get to the higher degrees of flexion. Apply the CryoCuff at night before you go to bed. You do not have to recharge it at night. Simply leave it in place and recharge it in the morning. When using the CryoCuff, please have a thin cloth between the skin and the CryoCuff.
Activity

One of the most important goals after your surgery is to limit swelling in your knee. Although the cryocuff helps to minimize swelling, your activity, being up on your feet, has the most impact on swelling. For the first week after surgery you should minimize the amount of time you are on your feet. **You should only get up to go to the bathroom or to shower.** At all other times you should be laying down with your leg propped up in the CPM machine or performing your exercises (figure 23). Our experience has shown that those patients who are on their feet too much experience more swelling and then struggle more with rehab.

Crutches

You will be provided with crutches to use at home you should use the crutches the first week after surgery. You may put as much weight on the operated leg as is comfortable.

Wound Care

In surgery we apply a sterile dressing sealed with a plastic protective covering. **You do not need to change the dressing.** Leave the dressing on until you return for your first visit after surgery. You may shower with this type of dressing, however, you may not submerge your knee in a bath tub or a hot tub. If your dressing should accidentally come off or become soaked call our office.

Driving

You should not drive for at least one week after surgery. If you had surgery on your right knee it may take up to 2 weeks to drive comfortably.

Exercise

You may begin upper body exercises (free weights, weight machines) two weeks after surgery. You should not resume any lower body exercise (except physical therapy) until you have consulted with Dr. Sallay.

Sexual Activity

You may resume sexual activity as soon as you are comfortable. Avoid direct pressure on your wound (ie kneeling).
Common Problems

Pain

Some degree of pain is anticipated with any surgery. Once you have begun to experience the pain, treat it promptly and stay ahead of it by regularly taking your pain medicine. A common mistake is to wait too long between doses because the pain level seems reasonable. Then the medicine wears off abruptly and you are in significant discomfort. After you take your medicine it takes 20 to 30 minutes to take effect. The medicine works much better to prevent the pain rather than treating the pain once it has occurred. Take it regularly for the first 48-72 hours. Remember some pain is normal! However, your pain should diminish day to day. If you notice worsening pain after several days call the office.

Nausea

Nausea and vomiting can occur for several reasons. In the first 24 hours the anesthetic agents you received during surgery can make you nauseous. The anesthesiologist typically administers anti-nausea medications, however, patients can still become nauseated. If you experience nausea at home it may be related to one of your pain medicines. All of the narcotic medicines (ie – Lortab, Darvocet) can cause nausea particularly if you take them on an empty stomach. **Never take your pain medicine on an empty stomach.** Once you become nauseated you may not be able to take your medicines and it may be necessary to take rectal suppository anti-nausea medicine.
**Itching**

Norco and Percocet can cause itching over the entire body. In most cases over-the-counter benadryl, 25mg tablets, every 4-6 hours will relieve the symptoms. If you still experience itching after 12-24 hours call the office.

**Change in appetite/bowel habits**

A temporary loss of appetite is observed in some patients. This is typically short lived and improves as you recover. Constipation is commonly associated with a decrease in your activity and your pain medications. The narcotics are especially constipating. You should drink more fluids than usual, especially fruit juices.

**Stiffness**

Most patients notice that their knee feels stiff after surgery, especially when they first get up in the morning. This is normal and should improve rapidly within the first several weeks after surgery.

**Bruising/swelling**

After two or three days you may notice significant bruising in your knee and many times into your calf and foot. This is normal. The blood from the time of surgery slowly leaks out of the deep tissues and takes the path of least resistance under the skin. Because of gravity it ends up going down the leg. Swelling is also expected. Swelling in the knee, leg, and foot is typical. If your swelling becomes more severe decrease your time up walking and get in bed elevating your knee and foot above the level of your heart. The surgical stockings and the CryoCuff also help to minimize swelling.

**Numbness and tingling**

Many patients will experience numbness over the outer half of their knee next to the incision. This is normal. During surgery small sensory nerves in the skin are cut leaving a small patch of skin feeling numb. Numbness in the foot may be due to swelling or an over tightened CryoCuff. Try to control swelling (see above) and loosen the CryoCuff if you feel it may be too tight.
When to Call the Doctor

*If you experience any of the following problems, call our office:*

**Fever**

A low grade fever below 100° F is common. A temperature above 101° F, especially if it persists after the first 48 hours after surgery should be reported.

**Pain**

Pain is expected after surgery. Your pain can be aggravated if you fail to take your medicine as directed or if you are overactive with your knee after surgery. If your pain is steadily increasing over consecutive days despite all of the normal pain control measures (see section 1) call our office.

**Wound Problems**

You should expect some minor bloody drainage to be visible on the dressing. The dressing acts as a wick, therefore, a small amount of blood can make moderate sized spot on the dressing. If your dressing becomes soaked with blood or if you notice any pus drainage call our office.
Methodist Sports Medicine Center office hours are from 8:00am to 5:00pm Monday through Friday and 8:00am to 10:00am Saturday. The clinic is closed for official holidays.

General clinic telephone number:

Indianapolis: 317-817-1200
Toll Free: 800-867-9250
FAX number: 317-817-1220

Answering Service: 317-817-1200 - After hours call the answering service and ask for Mike Hinkle or Dr. Sallay

Dr. Sallay’s assistants:

Pam Sterrett (Secretary/Assistant): 317-817-1271
Mike Hinkle (Surgical Assistant) surgery, scheduling, post-operative questions: 317-817-1291

Physical Therapy: 317-817-1200 (North)
Clinic billing department: 866-942-2687
Return to Work/School and Sports

Follow-up visits

You will have an appointment to see Dr. Sallay 6-8 days after surgery. During this visit your dressing will be removed and your knee will be examined by Dr. Sallay. Following the exam you will see the therapist to review your exercise program and to add other exercises if appropriate. Most patients are taught a home exercise program which they can do on their own. You will then return for subsequent visits at 2 wks, 1 month, 2 months, 3-4 months, 6 months and 1 year after surgery. At each visit your knee will be re-examined and if necessary you will see the therapist to update your home exercise program.

You will periodically receive questionnaires in the mail for research purposes. Please make every effort to fill these out and return them to us promptly. This information will be used to improve our understanding and treatment of knee problems like yours. We appreciate your time and input in this most important process.

Work

You may return to work/school within one to two weeks if you have a sedentary job. If you have a job that requires manual work (factory, construction, etc) then you may return to light duty within 2 weeks. Return to full duty manual work will be based on your specific job and your progress in rehabilitation. The range is 2-4 months.

Sports

Your doctor and therapist will give you specific guidelines to return to sports. You can typically return to upper body weight training in 2 weeks. Lower body weight training will typically begin at 4-6 weeks. Return to all weight lifting and contact sports usually occurs approximately 3-4 months after surgery. Remember each patient moves through rehabilitation at his or her own pace. An individual may progress faster or slower than the average times listed above.