

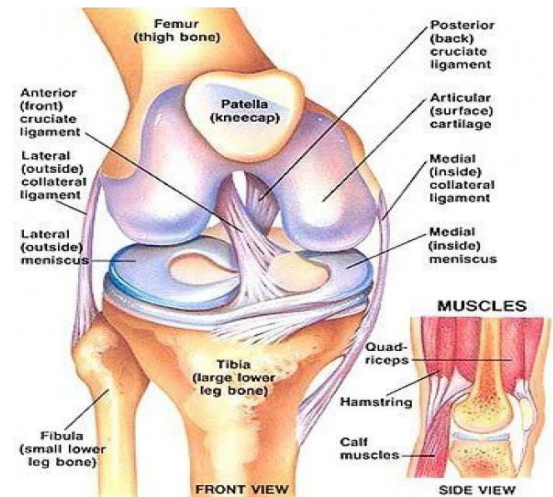
## Frequently Asked Questions: ACL Tears/Surgery

### What is the ACL?

There are two long ligaments that cross deep inside of the joint behind your knee. They are called the ACL (anterior cruciate ligament) and PCL (posterior cruciate ligament) and go from the femur (thigh bone) to the tibia (shin bone). They serve to stabilize the knee and allow it to glide through a smooth range of motion as you bend and straighten the leg. The ACL is the ligament in the front and the one most commonly injured.

### Why is it important?

Without the ACL, the knee is less stable. Without its stabilizing influence, the knee can buckle suddenly while in motion, which leads to cartilage damage and eventually, arthritis. This is usually not a problem for "straight-ahead" activities such as walking or jogging. However, it can be a big problem for athletic, daily, recreational and work-related activities involving twisting, pivoting, jumping, or suddenly changing direction. Examples of these activities include most sports (especially basketball, football, volleyball, soccer, skiing, etc.) and many jobs (such as carpentry, warehouse, refinery, etc.).



### Is anything else damaged inside of my knee?

About half of the time when the ACL is torn there is also damage to the meniscus cartilage inside of the knee. Additionally, there can be damage to the articular cartilage (the cartilage on the ends of the bone) from a shear force. If present, these injuries can be taken care of at the same time ACL surgery is performed. A torn cartilage is typically noticeable upon examination, but sometimes it is difficult to assess for certain. An MRI study can assist in the diagnosis of associated injuries when performed in conjunction with a thorough history and physical exam.

### What would happen if I did nothing about this injury?

Usually within weeks of tearing the ligament, the pain and swelling go away and the knee starts to move well. The knee usually starts to feel nearly normal. The issue resurfaces when attempting to cut, pivot, or twist on the knee. Without the stabilizing influence of the ACL it will likely buckle and give way. Patients usually end up with a "trick knee" that gives way unexpectedly. The issue with this is that with each episode of buckling, the joint gets scuffed and cartilage often tears, leading to arthritis. Former President Gerald Ford is a good example of someone who had this type of injury. He used to trip and fall frequently because of this same injury which he sustained playing football at Michigan. He was fine walking but whenever he tried to twist or turn suddenly, his knee would buckle. He never had the ACL fixed (the current surgery did not yet exist) and he ended up with bad arthritis and a knee replacement. Some people who elect to live less active lives (no jumping, cutting, pivoting, running sports) can get by without this ligament. Currently, the conservative way to treat the injury is with reconstructive surgery for those who intend to remain active in agility sports, or for those who have episodes of your knee "giving out" or "buckling" during any activities for that matter (basketball, football, volleyball, skiing, etc.).

## Frequently Asked Questions: ACL Tears/Surgery

### How is the ligament fixed?

Older techniques consisted of sewing the torn ends of the ligament back together. This relatively simple operation did not work long term and the ligament usually tore again. The standard operation now reconstructs the ACL ligament with other tissue as replacement. The term for a piece of tissue that is transplanted surgically is called a graft. Autograft refers to your own tissue, allograft refers to tissue from a cadaver. For the last several decades, ACL reconstruction with a graft has been the standard way of treating ACL injuries in young, active individuals. Over the last decade, the importance of putting the new ACL graft in its correct (anatomic location) during ACL reconstruction has been better understood and it is very important that your surgeon be familiar with anatomic reconstructions to give the best outcomes.

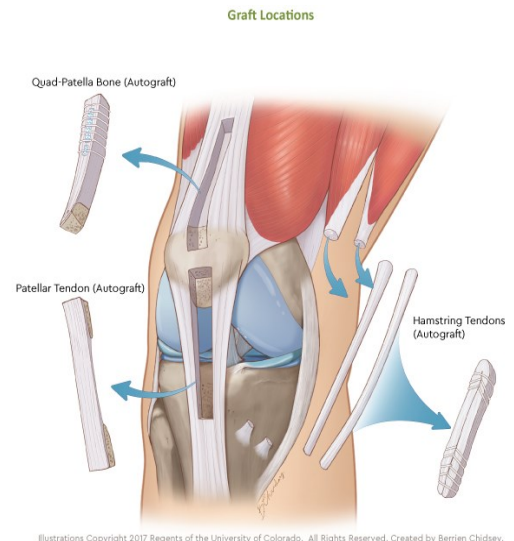
While ACL reconstruction has been around for decades and has a long track record of success there has always been interest in finding a way to get the native ACL to heal or to repair it directly rather than building a new ACL with a graft (ACL reconstruction). As mentioned above, older techniques of sewing the ends of the ligament together had a high failure rate. Recently, there is a new technique (BEAR) that shows promise that may be able to repair the ACL rather than reconstruct it. More information about BEAR can be found further down in this discussion. Regardless of the surgery type (repair versus reconstruction) ACL surgery is done arthroscopically.

In our practice for ACL reconstruction there are 4 main choices for graft selection. Additionally, with the recent introduction of the BEAR technique, ACL repair may be an option for you. You and Dr. Stewart will discuss ACL repair versus reconstruction and if ACL reconstruction is preferable, then you will discuss which graft is most appropriate for you and your goals.

The 4 main choices for reconstruction are:

1. Patellar Tendon Autograft
2. Quadriceps Tendon Autograft
3. Hamstring Tendon Autograft
4. Allograft

There are pros and cons to each. It should be noted that the most recent research shows similar outcomes, regardless of which type of replacement is used to build your new ACL. In fact, there are many current professional and collegiate athletes who have continued to be competitive after ACL surgery with any of the above. The final decision for which graft type is a matter of personal preference.



### Patellar Tendon Autograft

This graft has been used for years because it provides a strong replacement for the ACL and can be securely fastened in place in the knee because of the bone graft. This technique uses the middle third of the patellar tendon along with a bone plug from the tibia (shin) and the patella (knee cap). This is still considered the “gold standard” by which all grafts are compared. It has the lowest document retear risk of all the grafts in young competitive athletes. However, use of this graft has a higher chance of side effects consisting primarily of pain, inflammation, and/or tendinitis in the region of the patella and the patellar tendon. This is particularly a problem in those that need to kneel or crawl such as wrestlers or carpenters.

## **Frequently Asked Questions: ACL Tears/Surgery**

### **Quadriceps Tendon Autograft:**

This graft option has recently gained exposure although it is a technique that has been used for years. The middle third of the quadriceps tendon with or without a bone plug from the upper end of the patella (kneecap) is used. The advantage to this graft is consistency in size. Due to the original size of the tendon, surgeons can harvest the appropriate size graft every time. It also does not cause the kneeling pain that some patients develop with the patellar tendon autograft. In most studies, retear risk with this graft appears similar to patella tendon autograft.

### **Hamstring Tendon Autograft:**

Provides a graft that is just as strong, and the newer fixation methods are at least as strong as those for the patellar tendon. The two hamstring tendons sometimes re-grow; however, when they do not, the remaining three hamstrings get stronger to compensate for their loss. Most people do not notice any significant strength weakness after removal of these two hamstrings, but athletes in sports such as gymnastics, sprinting, or ballet dancing may notice some weakness of knee flexion. There may be a somewhat higher retear rate for hamstring tendon autograft in young competitive athletes. There is a smaller scar with hamstring autograft compared to the other autografts.

### **Allograft:**

The use of donor tendons (allograft) is the final choice. Using the donor tendons is advantageous because there is less trauma to the patient's leg because we do not have to remove any tendons to place them in the knee. Thus, there is less pain after the surgery and the early phases of the rehabilitation progress more quickly. Also, we can obtain as large a tendon as we need. When we take tendons from one area of the body to use in another, we are limited by how much the body has to spare. Essentially, we are "robbing Peter to pay Paul." In small individuals with small tendons, there may not be enough to spare. Note that using the allograft does not accelerate your return to sports, as the maturation process that every graft must undergo is actually slower with the donor graft.

There are some risks with the donor graft that the other grafts do not have. Specifically, it is theoretically possible that infection could be transmitted by the graft. The grafts are thoroughly tested, but it is possible that HIV or hepatitis could be transmitted through the graft. A few cases of HIV transmission occurred in approximately 1990 and none have been reported since. At about that time, the testing methods improved significantly. The risks are less than those with blood transfusion and the most recent figures indicate that the risk of HIV is less than 1 out of 2.5 million. Thus, while it is theoretically possible that HIV could be transmitted by the graft, it is extremely unlikely.

The postoperative rehabilitation is similar regardless of the graft chosen. Allografts are less painful compared to the hamstrings and less pain with the hamstrings compared to the patellar/quad tendon. However, usually after a few weeks, this all equalizes. Each graft has an excellent track record and in truth the differences between them is quite small. Regardless of the graft that we choose, you have a 90% or better chance of getting back to your desired activities.

**Bridge Enhanced ACL Restoration (BEAR):**

The BEAR implant is a novel first technology to clinically demonstrate the ability to heal the torn Anterior Cruciate Ligament (ACL) and restore its original orientation and anatomy. This presents a potentially significant improvement, because until now the torn ACL would have been treated with a procedure called ACL reconstruction. As discussed above, during ACL reconstruction the surgeon removes the torn ACL and replaces it with a tendon graft harvested from another part of the leg (called autograft) or uses a tendon graft from a deceased donor (called allograft). Although ACL reconstruction is effective, this procedure has some drawbacks. Using an autograft from your own body is associated with a more invasive procedure and can leave your body with sometimes permanent deficits. Using allograft can be associated with increased re-tear rates in young, active individuals. Furthermore, ACL reconstruction does not completely restore normal ACL anatomy and joint mechanics and some people are not able to return to the same level of activities after ACL reconstruction. In addition, ACL tears are associated with a higher risk for development of osteoarthritis.

The BEAR implant is different because it works with your own blood to heal the torn ends of your ACL back together. BEAR is supported by high quality scientific data and 15+ years of research. It enables the restoration of patient's own ACL to its anatomic orientation with the potential for more normal joint mechanics. By preserving the native ligament, this technique helps to preserve important mechanoreceptors contained in the native ACL which are otherwise lost when the ligament is removed during reconstruction of the ACL with a tendon graft.

Due to its groundbreaking nature, the BEAR implant has received special DeNovo clearance by the U.S. Food and Drug Administration and is indicated for skeletally mature patients at least 14 years of age with a complete ACL rupture, as confirmed by MRI. Patients must have an ACL stump attached to the tibia to allow for the restoration of the ACL and the implantation must be performed within 50 days from the original injury. BEAR has been shown to be effective across a broad range of tear types.

***However, we do not have long term data on this. In addition, in preliminary studies it does appear to have a higher re-tear rate for young competitive athletes than ACL reconstruction. Because of this, ACL reconstruction has been and continues to be the most common treatment option for ACL tears in young active athletes. For patients that understand the pros and cons and desire an option that avoids cadaver grafts and does not sacrifice any of their other tendons (hamstring, patella tendon or quadriceps), BEAR is an option. BEAR shows promise and does offer some potential benefits for treating ACL injuries compared to ACL reconstruction.***

**Potential Advantages of BEAR include:**

- Restores native ACL and orientation
- Preservation of ACL mechanoreceptors with potential for more normal joint mechanics
- Superior hamstring strength (compared to hamstring autograft ACL reconstruction)
- Superior Knee function scores (KOOS)
- No permanent donor site deficits/symptoms
- Reduced invasiveness compared to autograft
- Avoidance of potential allograft/donor tissue complications
- Potential for decreased post-traumatic osteoarthritis
- Revisions easier than a revised ACLR

**Potential Disadvantages of BEAR include:**

- Reported higher re-tear rate in the first two years when compared to autograft reconstruction in young athletes
- New, which means we lack long term outcomes to know how it does over time
- More restricted activity and rehab program for the first several months after surgery compared to ACL reconstruction

## **Frequently Asked Surgical Questions:**

### **What do I have to do to get my knee ready for surgery?**

The amount of swelling and stiffness you experience after surgery is related to the amount of swelling and stiffness you had before surgery. In other words, it is important to reduce as much swelling and stiffness as possible before the operation. If the injury is old, your knee may bend well and have no swelling, in which case you are ready for surgery already. Usually when the injury is new, there is a lot of swelling and stiffness and you need "prehab" to prepare your knee for surgery by doing exercises and icing. This "prehab" process enables your knee to be in the best possible shape (full motion and no swelling) for surgery. "Prehab" is also beneficial as it gives you a chance to familiarize yourself with some of the exercises you'll be doing in the early postoperative period. Occasionally we may delay scheduling surgery until you have regained motion. We will often see you in the office a few weeks after your MRI review to check the way that your knee will bend and straighten.

#### **Risks of Surgery (possible, but still uncommon)**

The most frequent problem is stiffness, which is why exercises that promote flexibility beforehand are imperative as well as attending physical therapy regularly after surgery. Normal motion and function is fully expected upon the completion of rehabilitation.

Blood clots are also possible, but rare (less than 1%). Keeping your leg mobile decreases this risk. We know that for the first few weeks after surgery, you will however be less able to be up and moving. Most patients will be instructed to take an 81mg Aspirin 2 times daily for the first 21 days after surgery. Based on your age, history, and additional risk factors (smoking, birth control pills, previous clots or phlebitis, kidney disease, etc.) we may discuss other options with you.

Infection also is rare, but possible (less than 1%). We sterilize your leg and use antibiotics during surgery to prevent this. Proper wound care is essential after surgery.

It is possible to stretch or re-tear the graft. For the first 6-12 months the graft is weak, so you will need to avoid twisting/cutting activities. Even after the graft is mature, you can still tear it.

**While any surgery should be taken seriously, complications with ACL reconstructions are relatively rare.**

### **Will I have to stay in the hospital?**

Most patients go home on the day of surgery; however, if you desire, we can make arrangements for you to stay overnight. Everything is done arthroscopically (through small poke holes). I recommend to almost every patient that when they arrive to the surgical holding area they receive a Femoral Nerve Block performed by the anesthesiologists. This nerve block helps reduce pain in the first 24 hours.

### **Do the screws ever come out?**

Almost never. They are inside of the bone and rarely cause any discomfort.

### **Doesn't this weaken the hamstrings/patellar/quadriceps tendon?**

There are five hamstring tendons and only one or two are used in the ACL reconstruction procedure. The remaining three compensate by growing stronger— sometimes the two tendons even regrow. If you elect to use the patellar tendon, the remaining portion is strong enough, while scar tissue fills in the defect.



## Frequently Asked Post-Surgical Questions:

### When can I walk on my leg after surgery?

If there was no meniscus repair or other ligaments involved, then you can walk the same day as the surgery as long as your leg is braced and straightened. You are given crutches, but you may put your weight on the leg right away. People frequently end up carrying the crutches by the end of the first week, but crutch use is recommended until you can walk without a limp. If the meniscus was repaired, or you had other procedures done, then weight-bearing on the operative leg may be delayed.

### Will I need rehab or physical therapy?

**Yes, this is very important.**

Your chance of achieving normal knee function after the surgery is greatly increased by proper rehab. In fact, it takes a great commitment from the patient to get to the physical therapist and do the exercises with the appropriate diligence. It is also important to do only the correct exercises, as doing the wrong exercises can be more damaging than doing none at all. Unless otherwise instructed, you should start supervised physical therapy (PT) after your first post-operative visit. We want to minimize swelling first, then PT emphasizes obtaining your full range of motion and some strengthening exercises. As your motion improves, more emphasis is placed on strengthening. Usually within a week you are on a stationary bike and gradually progressed to a stair climber. You will also be doing some weight lifting exercises such as mini-squats and leg press. In the first 1-4 weeks, therapy is recommended three times per week. Gradually, you may transition to a home or gym-based program, typically after your 12 week follow-up. Jogging is usually allowed at approximately 3 months if your motion and strength allow. If you are interested in resuming higher level athletics or activities, a prescription for functional testing and Sportsmetrics will be given at the 6 month follow-up visit. Sportsmetrics is a program designed to build a solid foundation of strength, coordination, and overall physical conditioning, as well as teaching patients proper technique for deceleration and accelerations. Full-speed sports are usually allowed no earlier than 9 months assuming your strength and agility have returned to near normal and you have passed functional testing, Dari Motion Analysis and completed Sportsmetrics.

### When can I go back to work?

This depends on what type of work you do. Usually desk work can resume after three to five days. Jobs requiring significant amounts of walking can usually be resumed after 2-4 weeks when you feel comfortable off of crutches. It is usually a couple of weeks before you can drive safely. Pushing/pulling heavy loads is not recommended before 3 months. Again, all of this is variable as everyone's healing process is different. This can be discussed and updated after each of your follow-up visits.

### Disability and FMLA

Typically we write you off of work from the date of surgery through the day that you see us for your first post-operative appointment (usually 8-12 days post-surgery). You will return to work with restrictions and have restrictions for at least 6 months after surgery. If you have further questions, please contact our office to discuss.

### Will I need a brace?

This reconstruction is strong enough that you rarely need a brace for more than a few weeks, though there are a couple of exceptions. The most common is when the MCL (a ligament along the inner aspect of the leg) is torn at the same time. Patients require a brace for four to six weeks when the MCL and ACL are torn together. You can also use a "sport brace" for the later stages of physical therapy and for sporting activities for the first year after surgery, much like many football players wear on the field. It is an option, although rarely mandatory.

