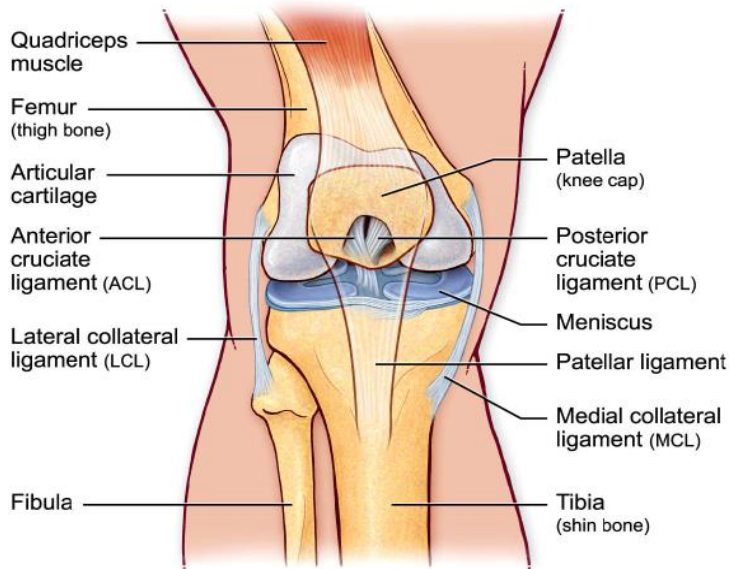




## ROTHMAN INSTITUTE

# PATIENT GUIDE TO ACL INJURY PREVENTION



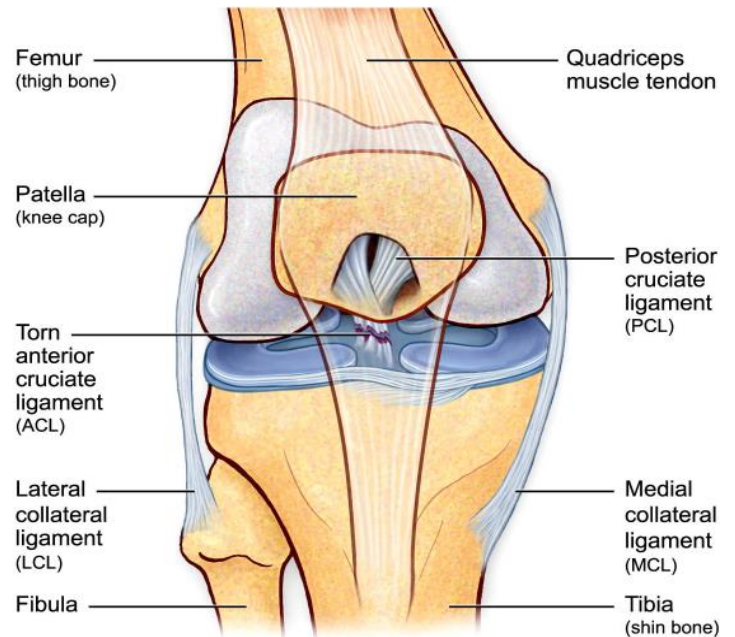
**FIGURE 1**

### What is the Anterior Cruciate Ligament (ACL)?

The anterior cruciate ligament (ACL) is the main ligament in the center of the knee (**Figure 1**). It runs from the back of the femur (thigh bone) to the front of the tibia (shin bone). It assists in proper movement of the knee joint and prevents the tibia from shifting out from underneath femur. Abnormal slippage can create an unstable knee that “gives way” during activity, especially cutting and pivoting sports.

### How is the ACL injured?

The ACL is most commonly injured during a pivoting or twisting injury to the knee when the foot is planted on the ground (**Figure 2**). This can occur during such sports as football, soccer, basketball, or skiing. It is most commonly injured during “non-contact” activities. It can also be injured during a direct blow to the knee, or with hyperflexion or extension of the knee.



**FIGURE 2**

### How common are ACL injuries?

More than 250,000 ACL injuries occur each year in the United States, with ACL reconstruction becoming one of the most common surgeries performed by Orthopaedic Surgeons. This is why ACL Injury Prevention is an important issue, especially for female athletes.

### Are there risk factors associated with ACL injuries?

There are a number of factors that have been investigated as possible risk factors for ACL injuries. These factors include anatomic factors, such as the size of the ACL or the size of the notch (space inside the knee for the ACL); hormonal factors, such as estrogen levels, and biomechanical factors, such as muscle strength, endurance, and control.

training.

### **Are women at higher risk for ACL tears?**

Yes. Several studies have shown that female athletes are at 2 to 4 times higher risk for ACL tears than males. This is why ACL prevention programs are commonly focused on female athletes.

### **Why are women at higher risk than men?**

There are likely a variety of factors that contribute to the higher risk of ACL tears in women, but the most likely reason is biomechanical differences between men and women. This includes muscle strength and endurance and jumping and landing patterns.

### **What are the factors that contribute to ACL tears when jumping and landing?**

Several studies that have evaluated men and women during jumping and pivoting activities have shown that women appear to land with less knee and hip flexion, increased knee valgus (knock-kneed), increased internal rotation of the hip, increased external rotation of the tibia, less knee joint stiffness, and high quadriceps activity relative to hamstring activity (“quadriceps dominant contraction”). ACL Injury Prevention Programs are designed to address these factors.

### **Can I lower my risk of ACL injury?**

**YES.** ACL Prevention Programs are designed to lower your risk of ACL injury. Of all the possible risk factors for ACL tears, the one that is most easily modified is the neuromuscular training of the knee and leg. Through training, the factors mentioned above that may lead to ACL tears can be modified.

### **Do ACL Prevention Programs work?**

There are several different ACL Prevention Programs, all of which have been shown to be effective at reducing the risk of ACL tears, especially in the female athlete.

### **What factors are worked on during ACL Prevention Programs?**

ACL Prevention Programs are designed to improve the dynamic muscle function around the knee to decrease the strain on the ACL during activities. The program is designed primarily to increase hamstring strength, increase endurance of the muscles crossing the knee, and increase knee stiffness during landing and pivoting.

### **How do the ACL Prevention Programs work?**

Most ACL Prevention Programs require about 15 minutes of training each day. These programs typically replace the traditional warm-up for sports activities.

### **What is the purpose of the program?**

Nearly all successful programs have the same elements: traditional stretching and strengthening activities, aerobic conditioning, agilities, plyometrics, and risk awareness

### **How can I get an ACL Prevention Program?**

There are several programs available. For basketball and volleyball athletes, we generally recommend the “**Girls Can Jump**” program. For field athletes, including soccer, lacrosse or other field sports, I recommend the “**PEP Program**” or the “**FIFA 11+**”

### **How do I get the “Girls Can Jump” program?**

The Girls Can Jump program can be ordered online. This can be found at [www.girlscanjump.com](http://www.girlscanjump.com). The DVD or VHS tape can be ordered directly. We recommend the “Knee Care and Jump Training Conditioning Program”

### **How do I get the “PEP” program?**

The PEP program can also be obtained online. This can be found at [www.aclprevent.com](http://www.aclprevent.com). Click on PEP program for an overview of the program and a printout of the exercises. Also, click “AAF” logo for a video classroom explanation of the program and demonstration of the exercises.

### **How do I get the “FIFA 11+” program?**

The FIFA program can be obtained online. This can be found at [www.f-marc.com/11plus/home/](http://www.f-marc.com/11plus/home/). There are several resources available including print out and video of the entire program.

### **When should I perform the ACL Injury Prevention program?**

It is important to start an ACL Prevention Program prior to the start of your season, and continue throughout the season for optimal conditioning.

### **Can I perform the ACL Injury Prevention program if I’ve had my ACL reconstructed?**

ACL Injury Prevention Programs are an important part of retraining the knee following ACL Reconstruction, and can help protect the contralateral knee from injury. We generally recommend the ACL Prevention Program to begin about 4 months after ACL reconstruction to prepare for return to sports. This program can help protect the new ligament from re-injury as well.

### **Questions?**

If you have questions about getting started in an ACL Prevention Program, please contact our office.

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