

## **Preventing ACL Injuries in Women**

In general, musculoskeletal injuries are sports-specific rather than gender specific. Injuries to the anterior cruciate ligament (ACL), for example, occur frequently in soccer, basketball, and volleyball. However, data collected since 1995 suggest that ACL injury patterns are different in men and women who participate in the same sport. The incidence of ACL injuries among women basketball players is twice that for men, and female soccer players are four times more likely to suffer an ACL tear than their male counterparts. Both women and men incur ACL injuries in non-contact situations. Nearly 60 percent of ACL injuries in female basketball players occur when landing from a jump.

### **What is the ACL?**

The ACL is located inside the knee joint and stabilizes the joint by preventing the shinbone (tibia) from sliding forwards beneath the thighbone (femur). A hard twist or excessive pressure on the ACL can tear it, so that the knee gives out and can no longer support the body.

Unless an injured ACL is accurately diagnosed and treated, the cushioning cartilage (the menisci) in the knee could be seriously damaged. Without this cushion, the thighbone and the shinbone would rub against each other, leading to further damage.

Studies have identified several risk factors that contribute to a higher incidence of ACL injuries among women athletes. Based on these studies, training methods that could reduce the risk of injury are now being developed.

### **Safer jumping skills**

Because women don't bend their knees as much as men do when landing from a jump, the pressure on the knee joint is increased. The knee is exposed to higher forces per pound of body weight. Learning to land safely is a skill that can and should be taught early.

### **Cutting maneuvers**

Women also turn and pivot in a more erect position, which also strains the ACL. Learning to crouch and bend at the knees and hips could reduce the stress on the ACL. These maneuvers are motor skills that can be learned, practiced and improved, just like a golf swing or tennis stroke.

### **Muscle control techniques**

The hamstring muscles in the back of the thigh work with the quadriceps muscles in the front of the thigh to bend or straighten the leg. As one set contracts (shortens), the other relaxes (stretches). Muscles that are being stretched produce more force than muscles that are contracting.

Many women athletes use their quadriceps muscles when they are changing direction rapidly. This can put enough force on the shinbone to tear the ACL if the knee isn't bent enough. By strengthening and using the hamstrings rather than the quadriceps muscles, a female athlete could reduce her risk of an ACL injury.

### **Prevention and treatment**

Women athletes can take three steps to reduce their risk of ACL injuries.

1. Training and conditioning should be a year-round program. Skill drills and strength and flexibility exercises will enhance balance and coordination so you will be ready when the season starts.
2. Make strengthening exercises for the hamstrings and quadriceps muscles a regular part of your conditioning program. To stretch the quads, stand and use a wall or table for support. Lift one leg and pull your foot towards your buttocks. Hold for five seconds, then release the foot and stand straight. Repeat six to ten times on one side, then turn and repeat on the other side. To stretch the hamstrings, sit with one knee bent and the other leg extended, toes pointing to the ceiling. Lean forward until you feel a stretch. Hold for five seconds then return to your original position. Repeat six to ten times on each leg.



3. Practice proper landing technique (from a jump) and learn to do cutting maneuvers in a crouched posture with a slight bend at the knee and the hip.

If an ACL injury does occur, it can often be successfully treated. Both operative and nonoperative treatment options are available. Nonoperative treatment can sometimes be used if the athlete is willing to reduce her athletic participation.

An athlete who wishes to return to sports that involve jumping, cutting, and pivoting will probably need surgery to reconstruct the ligament. This stabilizes the knee, preserves the cartilage, and enables a return to sports at the same level as prior to the surgery. Outcomes after reconstruction are comparable between men and women with high satisfaction and nearly identical success rates. After surgery, exercise and rehabilitative therapy are required to strengthen the muscles and restore mobility. Most athletes can return to their chosen sport.

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