



# Hughston Health Alert

6262 Veterans Parkway P.O. Box 9517 Columbus GA 31908-9517

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For a Healthier Lifestyle

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## Snowboarding Injuries

Have you ever tried to surf down a mountain? In 1995, thousands of people did. They were participating in the fastest growing winter sport — snowboarding.

Who snowboards? Since its beginnings in the early 1970s, this sport has involved people of both sexes and of all skill levels. Today, more men than women snowboard (a ratio of 3:1). It seems to be most popular among young adults; the average age of snowboarders (commonly called shredders) is 20 years. Sixty percent of the shredders on the slopes describe themselves as beginners. However, competitions, such as the U.S. Extreme Snowboard-



**Ken Perkins snowboarding on Mt. Crested Butte**

*Photos courtesy of Crested Butte Mountain Resort and Tom Stillo, photographer*

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ing Championships at Crested Butte, Colorado, draw experienced snowboarders who demonstrate the sophistication of the sport. The 1997 extreme competition at Crested Butte will be held from March 30 through April 3.

#### Equipment check

The design of snowboarding equipment, which includes snowboards, boots, and bindings, has seen many advances. Snowboards are

30 cm to 40 cm wide and 140 cm to 190 cm long and may be symmetric or asymmetric. The shape of the boards allows for versatility of snowboarding style. Shredders can position their feet on the board in different ways so they can snowboard alpine, all-around, or free-style.

Snowboard boots are available in three basic designs: hard shell, soft shell, and a mix of hard and soft shells. Hard-shelled boots are similar to ski boots. Soft-shelled boots are

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strength training, the endurance training program is based on your level of ability as a skier.

During the first 2 weeks of this endurance program, a beginning skier should walk at an easy pace for at least 20 minutes each outing, three times each week. For the next 2 weeks, walk at a quicker pace for 30 to 40 minutes each outing. From week 5 through week 6, walk at a moderate pace for at least 20 minutes each outing, four times each week. Beginning with week 7, walk at a quicker pace for 30 to 40 minutes each outing.

If you are an intermediate skier, begin your endurance program with 2 weeks of walking or jogging at an easy pace for 30 minutes each outing, three times each week. For the next 2 weeks, increase your pace and exercise for 40 to 50 minutes each outing. For weeks 5 and 6, exercise at a moderate pace for 30 minutes each outing, four times each week. Beginning with week 7, increase your pace and exercise for 40 to 50 minutes each outing.

If you are an advanced skier, spend the first 2 weeks running at an easy pace for 20 minutes each outing, three times each week. Increase your pace and run for 30 minutes each outing for the next 2 weeks. For weeks 5 and 6, set a moderate pace for 20 minutes each outing, four times each week. Beginning with week 7, increase your pace and run for 30 minutes each outing.

Remember, everyone can start a strength and endurance program, but few can keep the routine once the ski season begins. If you continue your training throughout the season and into the off season, you will avoid serious injury and will remain strong for years to come. Good luck on the slopes and "don't break a leg."

Michael Popson, A.T., C., C.S.C.S., C.P.T.  
Savannah, Georgia

## Why Are Women More Prone Than Men to ACL Injuries?

An increasing number of female athletes are tearing their anterior cruciate ligament (ACL) during sports participation. Most of these tears are caused by noncontact injuries in sports, such as basketball, soccer, gymnastics, and cheerleading, in the United States. In Europe, participation in snow-skiing and team handball results in up to eight times more ACL injuries in women than in men.

### What is the ACL?

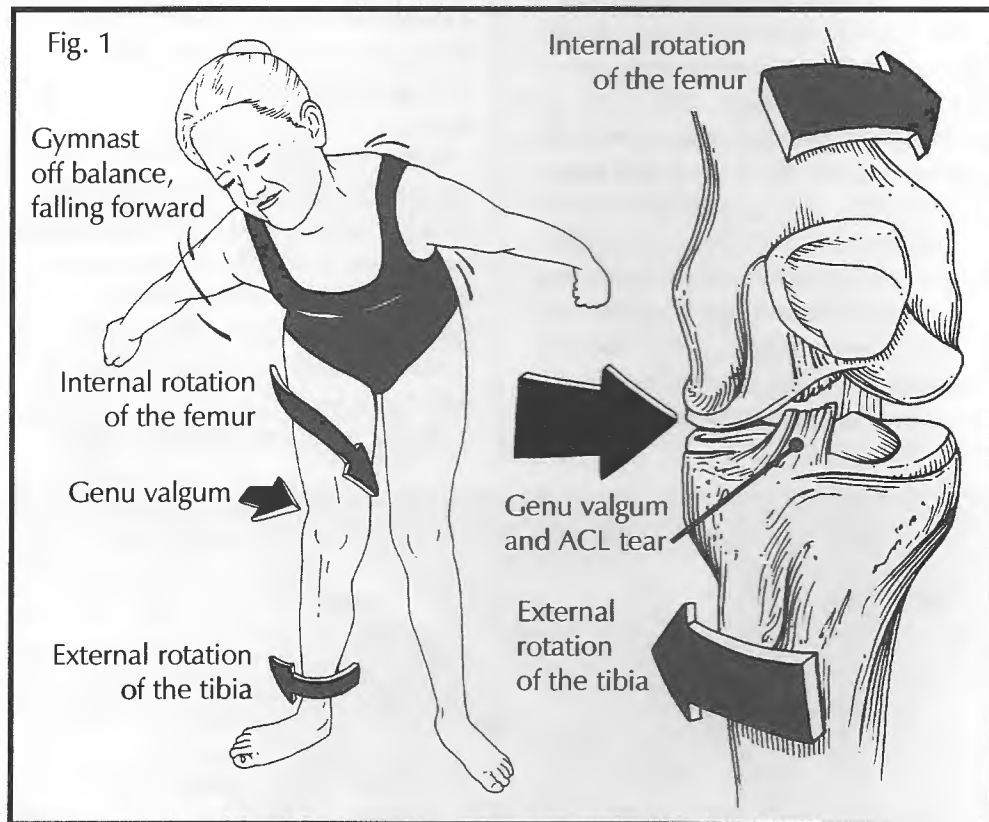
The ACL is located in the center of the knee joint and connects the femur (thigh bone) and the tibia (shin bone). Its primary purpose is to provide stability to the knee. It prevents the tibia from moving too far forward and from rotating too far inward under the femur.

### How does the injury happen?

There are several ways noncontact ACL injuries occur, including stopping quickly, cutting sharply, and landing and changing direction with both feet planted. Most commonly in court sports, such as basketball, a **pop** is felt. This pop also refers to the way the athlete lands with both feet **planted and out** of control and feels a **pop**. It usually signals that the ACL is torn completely.

The gymnast in Figure 1 demonstrates this mechanism of injury as she tears the ACL in her right knee during a floor exercise. Notice that her hip is turned inward (internal rotation), her tibia is turned outward (external rotation), her knee is bent about 30°, she is knock-kneed (genu valgum), her foot is rolled inward, and her body is falling forward. This motion causes a very quick whip-type action in the knee that tears the ACL.

As mentioned, in Europe more female than male skiers injure their ACL. The mechanism of injury in



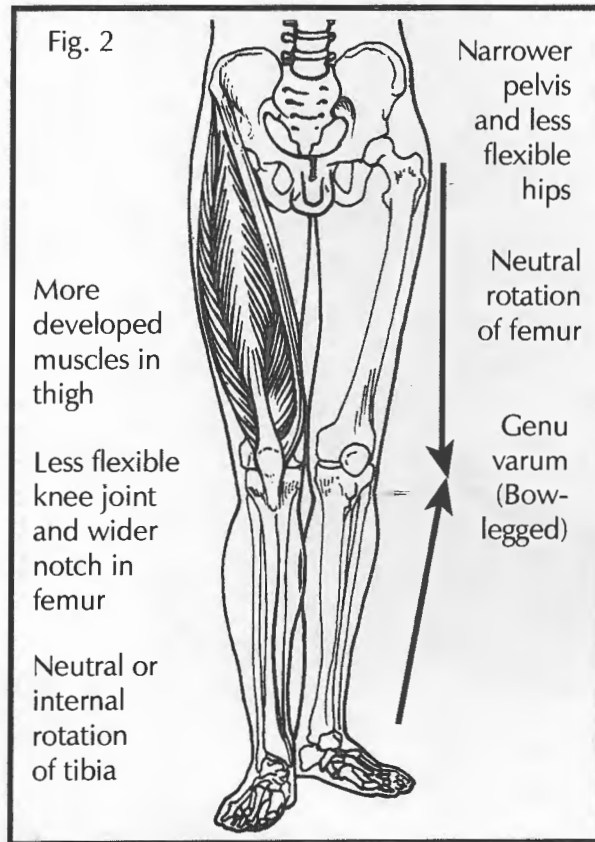
skiers is different than in court sport participants. When skiers injure the ACL, they are moving out of control with the knee bent or extended. The uphill arm is back, the body is off balance, the hips are lower than the knees, and the weight is placed on the inside edge of the downhill ski. Dr. Robert Johnson describes this mechanism of injury as the phantom foot ACL.

A knee joint with a torn ACL is abnormally loose, or lax. Because of this severe laxity, the female athlete is actually at greater risk for her knee giving way or pivoting without warning. The risk of other serious, and possibly irreparable, knee damage also increases.

**Anatomic differences**

Naturally, women are built differently than men. These differences are evident when examining the muscles and bones of their hips and legs. Compared with men (Fig. 2), women have a wider pelvis (Fig. 3); their hips are more flexible and have more rotation; their femur is tilted forward more at the top and is angled more toward the knee; their lower leg is turned inward and angled more toward the knee, but there are forces pushing outward; they have less developed thigh muscles, making the knee more dependent on the ligaments for stability; they have increased flexibility and hyperextension in their joints; and they have a narrower notch in the femur where their smaller anterior cruciate ligament is attached.

Why do these anatomic differences cause women to be more prone than men to ACL injuries? Because the thigh muscles are lax, the ACL must



serve as the main stabilizer of the knee. However, the small ACL often cannot handle the forces put on it during sports participation, so it tears. Other contributing factors are associated with the sport and with the physical make-up of a woman. Her position, coordination, skill, talent, and coaching affect the way the female athlete uses her body and can affect whether she is at increased risk for ACL injury. A poorly conditioned or overweight body puts more pressure on the knee joint and puts the athlete at greater risk for ACL injury. Hormonal levels at certain times during the menstrual cycle and extremely low percentage body fat cause the ACL to be more lax and, therefore, at increased risk for injury. Medical professionals are continuing to do research

to find the exact reason for this problem in women and to find the best ways to prevent it.

In hopes of preventing ACL injury in female athletes, some experts have suggested that basketball players and other court sport participants try to land on two feet rather than jump stopping and try to round off turns rather than cutting sharply.

The female athlete is very competitive and the mental drive to be the best burns brightly within her. Upon returning to competition after ACL reconstruction, a University of Tennessee female basketball player stated that she would do anything to win a national championship including tearing her ACL. Competitive female athletes need to take measures to prevent ACL injuries. Finding ways to prevent ACL injuries will ensure longer, more active athletic participation for women.

Mary Lloyd Ireland, M.D.  
Lexington, Kentucky

