



**Considerations to Help Prevent Knee Injury During Skiing:
Reducing Exposure to “Phantom Foot”**

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- The anterior cruciate ligament (ACL) is one of two major ligaments in the knee joint that connect the tibia to the femur. It prevents the tibia from sliding forward on the femur and also aids somewhat in controlling rotation. It is placed under the most amount of stress when the knee is either fully extended or fully flexed and torqued in any way.
- There are over 100,000 tears of the ACL from skiing injuries annually in the U.S.
- The rate of injuries below the knee in the past 30 years has decreased about 90% (from 5-8 injuries per 1000 skier days to about 2-3 per 1000 skier days), while the rate of knee sprains--especially serious knee injuries--has increased from 3% of all injuries in 1972 to 32-48% within the last few years.
- Important to recognize that injuries are not just to the ACL, but that all structures of the knee joint are susceptible to injury. The MCL (medial collateral ligament which runs along the inside of the knee) is actually injured as much if not more often than the ACL.

Two major classifications of knee injury mechanism in skiing:

- 1) “Boot Induced”--Landing on the tail of a ski from a jump, mogul or change in terrain which leaves the skier’s body and knee in extension. The high boot back hits the back of the tibia, forcing it forward and tearing the ACL.
- 2) “The Phantom Foot”—is essentially, sitting back at an angle on your skis. There are 6 specific criteria (as described by the Vermont Ski Safety)--if they are all present, than a serious knee injury is imminent:
 - uphill arm back
 - skier off balance to the rear
 - hips below the level of the knees
 - uphill ski unweighted
 - weight on inside edge of downhill ski tail
 - upper body generally facing downhill ski



The best way to avoid or respond to this position if it occurs is to:

- Keep your arms forward at all times
- The skis should be kept a comfortable distance apart—neither forced together nor allowed to parallel turn too far apart. The more splayed the stance, the more vulnerable to catching the inside edge or fall back onto the inside downhill edge.
- Hands should be over your skis, not back behind you at any time.
- Keep your hips above your knees when skiing by constantly driving forward through the boot to keep the weight and arms out in front.

Best responses to initial poor position when falling:

- Don't fully straighten legs when you fall. Keep them partially flexed.
- Don't try to get up or right yourself until you have stopped sliding completely.
- Don't lean back and land on your hand. Keep your arms up and forward.
- Don't sit back on your skis at any time.
- Maintain a mental image of these vulnerable positions. Critique every fall or panic stop you make. Get in the habit of watching your friends and family, looking carefully for the points above. With time, your falls and recovery attempts should become as proficient as your skiing

If falling back into Phantom Foot position, take the following steps to avoid serious injury:

- Land on the side you are falling to get the weight off the tail of the ski(s).
- Bring the arm opposite to the side you are falling up overhead, not behind you. This promotes the body to slide downhill and helps to keep the edges out of the snow.