Strengthen Your Body for the Ski Slopes

Strengthening your body for the slopes involves eccentric weight training, lateral coordination, and aerobic stamina. **Preparation builds a solid foundation for injury prevention.**

If you are the typical skiing enthusiast, be it an amateur or an exceptional downhiller, tis the season to turn your expectations to bright sunny days and fresh flakes of powder. The average skier won't do much to prepare for the stressful demands placed on their bodies from multiple trips down the hill, other than perhaps pick up their aerobic activities a bit.

Our regular form of exercise, weightlifting, cycling, running, aerobics, even swimming require us to use explosive concentric type muscle contractions. Skiing, however, requires a different type of muscle contraction eccentric thus requires a specific approach to strengthening these eccentric muscles. Which is exactly what we'll discuss in this article.

First let's define these two different types of muscle contractions—Concentric and Eccentric. Envision yourself curling a dumbbell, as you bring the weight toward you the bicep muscle fibers shorten, contract, and bunch together. This is known as a concentric contraction. The eccentric contraction occurs when you slowly lower the weights, and the muscle fibers lengthen yet remain under stress. Preparing your body to gracefully descend vertically, thousands of feet require development of these eccentric muscle fibers.

When skiing, your legs are being stressed in an extended eccentric contraction over 75 percent of the time. It's these continuous intense eccentric contractions to the unconditioned athlete that will invariably trigger the syndrome physiologists term delayed onset muscular stress—DOMS for short. Anyone who has ever over exercised or excelled in a particular sport for the first time is familiar with this condition. That deep ache that develops in the muscle and renders us immobile for days after a weekend on the slope. Exactly what causes this DOMS phenomenon is believed to be faulty pumping mechanism in the muscles and associated with prolonged eccentric muscle contractions resulting in damage to the actin and myosin protein filaments, which lead to lactic acid buildup and muscle pain. But that is all "physiological stuff," and this article is focusing on strengthening and exercise preparation, so back to the fun stuff.

The key to preseason training is to begin 4 to 6 weeks before your fast ski trip. Your workouts should be designed to mimic the stresses placed upon your body during the sport you are conditioning for, in this case snow skiing. These workouts should concentrate on improving the eccentric strength of the thighs and buttocks muscles. Special emphasis should be placed on improving movements and coordination. Finding exercises that place enough stress to strengthen the eccentric muscles can be difficult. You can control (lower) much greater weight than you can lift (press). So, unless you have a couple of partners handy who can raise the weight off you every time you've lowered it, you'll need to develop an exercise program to actually target the eccentric contractions.

A key factor in preseason training is to develop your routine with the same short interval, high intensity exercises with ample rest between sets to mimic a run on the slopes. If you're

going 20-30 minutes between rest intervals, your intensity is too low. You don't ski non-stop for 30 minutes without resting. Train hard for a few minutes then rest for 5-10 like you would if you were taking a chair life ride back up the mountain.

Exercises:

High Box Jump- a great aerobic conditioner that mimics the motion of skiing. Use a box approximately one foot high with a solid foundation. Stand on the box and begin by hopping off one side, hop back on top, then off the other side. Repeat this motion as fast as you can while maintaining a relatively stationary torso for 1-2 minutes. If you have a history of knee or ankle problems, stop is pain is present.

Lateral Squat- great for developing balance and control. Exercising the adductors, abductors, and hips while providing a good eccentric overload. Use a weight that is light enough for you to control as balance is key here. Rest the bar on your shoulders as you would for a squat. Keep your feet and hands wider than shoulder width, back straight with low back tight. Squat until thighs are parallel to the floor then shift the weight to one leg until the other one is straight. Hold this position for 2-3 seconds before slowly recentering your body. Repeat to the other side. Complete 4-5 reps on each side.

Single Leg, Leg Presses- This altered technique to the leg press is great for taxing your eccentric muscles. Start with approximately two thirds of the weight you normally can press. Lower the weight slightly then remove one foot off the platform. Slowly lower the weight using one leg. Press the weight back as you would with both legs, then repeat with the opposite leg. Complete 3 set of 10 reps.

Sissy Squat on a Rope- Secure a rope approximately 3 ft. long to solid, stationary object. Grasp the rope at one end and perform a squat. Make sure to descend until your thighs are parallel with the floor, hold this position for 3-5 seconds, then extend your thighs to ¼ flexion. Repeat this motion for 15-30 reps.

Seated of Lying Leg Curls- An excellent exercise for developing the eccentric muscle of the hamstrings. Underdeveloped hamstrings in relation to the quadriceps muscle is one of the major contributors to knee problems in skiers. Use either a prone or seated leg curl and keep your low back tight and straight. Contract the weight, then slowly lower it to the starting position. Concentrate on trying to hold the contraction halfway through the eccentric part of this exercise. *Alternative: Lying dumbbell leg curl on stomach.

Enjoy your ski season, and remember the key to injury prevention is preparation, everything in moderation, and know your limitations.