

# Focus on rear strength for injury-free skiing

As autumn fades and snow approaches, the time for winter sport activity preparation has moved from the back of one's mind to the front.

My one recommendation for all those who are training for the up and coming ski season? Leave the quads alone! I have been waiting to write that since my inauguration of these wellness articles back in March, because in my decade of strength training experience, I have seen more Jackson Hole sport activity athletes overdevelop, overuse and place way too much emphasis on the quadriceps.

In spite of the many sports in this valley, it is easy for a person to deduce that quadriceps development is the most important. That is where the burn is always felt first, right?

During this time of year, I witness most individuals begin strengthening the quads with typical lunges, squats, side lunges and jumps. My first question is: Why are you strengthening just the quads? The usually responses include "My quads burn the most when I ski" or "I always feel

them when I board." I am not at all against quad strength, I am against those who predominantly train the quads and believe developing strong quads is the driving force for winter sport activity preparation. It is not! The driving force is hamstring and gluteal muscle synergy, hip/leg proprioception (body awareness) and neuromuscular control, ACL (anterior cruciate ligament) prevention, and a equal development of strength, balance, flexibility, coordination/agility and power.

Generally, the quad muscle has four major muscles (hence, quads), the glutes have three major muscles and the hamstrings have three major muscles.

For the most part, there are about 60 percent of the muscles in the back of the legs and about 40 percent in the front. It is natural for an individual to feel the "burn" in the quads first, however, most winter sport enthusiasts overwork their quads, predominantly neglecting the development of the hamstring/glute muscle connection. As a result, an imbalance occurs.

The sports injury research

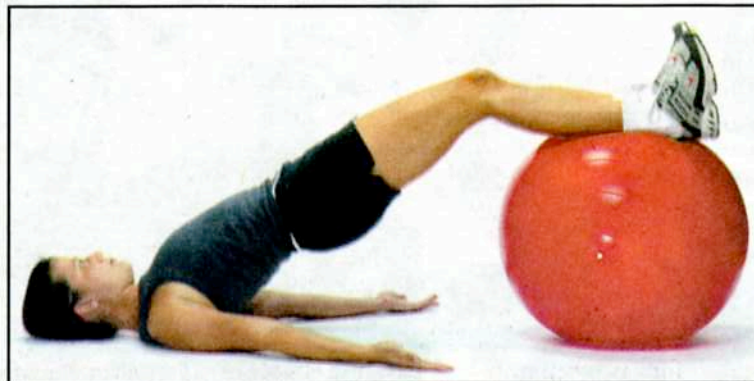


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**Strengthen hamstrings with curls. Start on your back, with heels on an exercise ball. Raise your hips so that your body forms a straight line. Pull your heels in toward your glutes, maintaining a straight line. Return to starting position.**

center at the University of Nevada, Las Vegas, reports the following: If the strength of the quadriceps significantly exceeds the strength of the hamstrings, then both the hamstrings and ACL become more susceptible to injury. The hamstring is required to lengthen during knee extension, and if it is relatively weaker than the quadriceps, a strain may occur. With assistance from the hamstrings, the ACL stabilizes the knee by preventing anterior translation of the tibia on the femur (lower leg bone moving forward). This anterior translation can occur during awkward landings and sudden changes in direction. When the quadriceps is stronger than the hamstrings, excessive anterior

translation may occur during dynamic activities, and the ACL will experience higher shear forces. If the hamstrings are too weak to counteract this force, an ACL injury is likely.

The focus of any winter sport activity program is to increase the strength and neuromuscular control of the hamstrings while maintaining the overall development of the leg musculature. Most individuals will understand this, as "the legs need strength." However, this is only 20 percent of the total development. Balance training develops the neuromuscular control needed for skiing down moguls or learning how to snowboard for the first time. Static stretching after workouts or competi-

tions improve recovery. This has been proven an effective method of enhancing long-term soft tissue adaptations when performed after vigorous physical activity.

Power is an important concept that many don't fully understand. Strength is the ability to lift a certain amount of mass. Power is lifting a certain amount of mass during a specific amount of time. Jumping with controlled landings or jumping in place with knees to chest or performing the same movement over a line are great power movements. Quick jumps onto platforms add similar movements to boarding and skiing. If one maintains proper and controlled landing then the results will carry over outside this winter.

Whether in a ski fitness class, with a trainer, or self-training this October and November, remember to train the hamstring and glute muscle synergy, body awareness and always have an equal development of the entire leg. Be safe and have fun!

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## Training to be balanced

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