PHYSICAL THERAPY
AT BRIARCLIFF & JEFFERSON VALLEY, P.C.

PREVENTION OF SKIING INJURIES

As the cold weather approaches, many of us turn our thoughts and energy to the ski slopes. With this ever increasing interest we gathered information to enhance conditioning for downhill skiing to help prevent injuries.

The average injury rate seeking medical attention is approximately 6 injured for every 1000 skiers. This figure is three times higher for novices, women and children. There are two basic types of accidents that occur in skiing: falls and collisions. Collisions produce a wide variety of injuries to any part of the body. Serious falls, however, because of the nature of the sport, occur in unique and predictable ways. The most common injury in skiing is a result of turning the foot out and away from the body. In this scenario, the inner tip of the ski is caught in the snow, the skier has his weight on the opposite ski and momentum carries the skier downhill. The uphill ski turns outward and the forces on this ankle and knee are magnified by the leverage of the ski. This may result in a fracture of the lateral malleolus, tibia spiral fracture, sprains of knee and ankle, and dislocation of the hip.

The next most common injury is caused by a forward fall. This occurs when a skier digs a ski tip into a mogul while moving rapidly downhill. This causes abrupt deceleration and the skier falls forward. This may result in a boot top fracture, rupture of the Achilles tendon or fracture of thumb or forearm.

A safe and enjoyable ski season begins with a pre-slope program designed to promote adequate flexibility, strength and endurance. The scope of the conditioning program is dependent upon the physical condition of each individual.

Flexibility is among the most vital components of an effective conditioning program. Primary consideration should be given to maximizing the flexibility of the quadriceps, hamstrings, gastrocnemius, soleus, trunk rotators, shoulder girdle and low back musculature. Long, slow static stretching of these muscle groups is recommended.

Strength is another consideration. The quadriceps muscle group is of primary concern to the heavy demand placed on it when downhill skiing. Strengthening of the gluteals, hip adductors and the arms are also recommended. Inadequate strength affects ski technique and increases injury risk.

Endurance should also be ad-dressed in a ski conditioning program. As with the other components of strength and flexibility, the amount of endurance training is relative to the fitness level of the individual. One can choose from running, swimming, Nordic track, cycling, rowing and Stairmaster. Endurance workouts may also incorporate a plan that strengthens the muscles used in skiing, as well as increasing endurance. Examples of ski-oriented training are: traverse running; box jumping.

The duration of the pre-skiing conditioning program is again relative to the existing physical fitness level of the individual. Ideally this program should be initiated at least 6 to 8 weeks ahead of a ski vacation.

Skiers should also prepare themselves with an adequate warm-up of stretching the upper extremities and the back before getting the skis on in the morning and can even include jumping jacks or jogging in place. Due to the nature of the physical demands of the sport, a run or two on an easier slope is recommended as a final warm-up.

Fatigue is inherent in a full day of skiing. Studies have shown that injury rates are increased toward the end of the day. Beginners should consider skiing a half day until their endurance improves. Care should be taken to monitor physical status and pacing your runs on the slopes with adequate food and water breaks in order to have a safe day.

Possible Flexibility Program:

- Standing quadriceps stretch - pull heel toward buttock until a stretch is felt in front of thigh, hold 30 seconds, repeat on opposite side.
- Standing hamstring stretch - Place heel on a bench. Slowly lean forward reaching down towards your shin until a stretch is felt at the back of the thigh. Keep the knee straight and back straight, hold 30 seconds, repeat on opposite side.
- Calf stretch - Keeping back leg straight, with heel on floor and turned slightly outward, lean into wall until a stretch is felt in calf, hold 30 seconds, repeat on opposite side.
- Standing trunk rotation stretch - Turn shoulders to one side while keeping hips forward, hold 30 seconds, repeat on opposite side.
- Standing trunk lateral flexion stretch - Reach over and upward while sliding opposite arm down leg, hold 30 seconds, repeat on opposite side.

Some suggestions to increase strength for skiing are:

- Circuit training
- Free weights
- Isometric strengthening in the "downhill position"

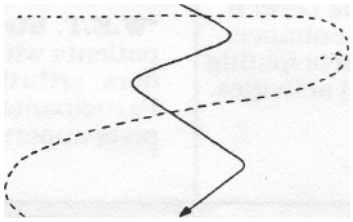
BOX JUMPING

Lateral jumping is done over a small box or block of wood. Begin with straight lateral Jumping.

As proficiency improves, progress to incorporating trunk rotation into your workout. Toes should point inward toward the box when jumping. Shoulders should remain facing forward. Hands may be placed on wall or horizontal bar to help maintain shoulders in proper position.

TRAVERSE RUNNING

Begin on level surfaces running In a traverse pattern. As program progresses, run down smooth hills, cutting sharper angles. As with box jumping, shoulders should remain facing forward to assimilate proper skiing mechanics.



Beginning Pattern **Progressive Pattern**

STRENGTHENING IN THE ISOMETRIC SKI POSITION

***Stand with back against wall, flex hips bringing trunk for-ward while flexing knees 75° to 90°.**

Begin with repetitions to tolerate maintaining position 5 to 10 seconds per repetition. Duration of each repetition is gradually increased with a goal of maintaining this position for 1 to 2 minute intervals.