

# Prevention Through Training: Jump Training 2003 – Part I

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Female athletes are more likely to experience major ligament knee injuries (ACL tears) compared to men and boys playing the same sports in the same positions.



Certain physiological and biomechanical factors unique to women (joint laxity, hormonal influences, limb alignment, and intercondyler notch width) combined with traditional strength training and conditioning exercises (designed for the male athlete) highlight the need for strength coaches and training programs that recognize gender differences.

Training programs should extend beyond teaching girls to land safely, because the majority of ACL tears occur during the cutting, twisting, landings, and decelerations that occur on the playing field. Sports such as basketball, soccer, volleyball, and gymnastics are examples of sports that put athletes in "risky" positions. The good news is that injuries can be prevented with specialized training.

Early programs designed towards prevention focused on "perfect landing form," however the ACL prevention training programs at BUAEC (Boston University Athletic Enhancement Center) and SPORT-Rx have implemented the next generation of knee injury prevention training. These programs appreciate gender differences, sporting demands, and competitive similarities in striving to minimize athlete injury and prepare them for competition.

Training programs emphasize putting the knee into positions of "risk" in a controlled environment. Such training prepares the neuromuscular system for similar situations on field, similar to the off-balance and variable speed positions required of the body on the playing field. Injury prevention programs include rotational exercises, changes of direction, deceleration, and landing from various jumps.

While intensive injury prevention programs require well qualified and supervised coaching, the following are some basic exercises to begin training for high performance and injury prevention:

- Hop forward with feet together while twisting feet side to side for 15-20 yards.
- Hop sideways while twisting feet side to side for about 15-20 yards.
- Performing the above exercises on one leg (unilaterally).
- Single leg squats with arms overhead – 3 sets on each leg for 5 repetitions

Be sure to warm-up prior to training, give ample rest between exercises, and stretch at the conclusion of the workout.

## How to Use Mental Toughness to Prevent ACL Injury

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While men and women have anatomical, physiological, and biomechanical differences that may heighten the incidence of injury in female athletes, all athletes face psychological tests that if not managed effectively lead to poor performance and often injury.

In particular, stress levels are closely linked to the athlete's mind and body, influencing both confidence and concentration. The fears and worries of an athlete have physical consequences of tightening of muscles reducing their fluidity and effectiveness, increasing risk of injury. An athlete who does not focus on the right things at the right times (distracted) is more prone to injury because she is not fully aware of opponents and the happenings on the playing field.

Within a basic training program, a brief three-phased approach to mental toughness is taken:

1. Honest evaluation of the mental/emotional challenges of training and competition.
2. Creation of a mental anchor to maintain concentration and confidence (this can be something as simple as a brief phrase or mental image that returns the athlete to performance-oriented thinking).
3. Recruiting of a simple behavioral tool (such as a deep breath or tensing and relaxing of muscles) to manage the physical manifestations of stress (high heart rate, excessive muscle tension, quick breathing). A simple yet purposeful approach to sport psychology education enhances optimal performance and injury prevention.

Injuries occur in sport, yet through comprehensive and purposeful training, they can often times be prevented. ACL prevention programs around the country have documented greater than 80% decreases in ACL injuries after training programs. Beyond remaining injury free, focused training programs will lead to improvements on the playing field.

After training twice a week for seven weeks in the Boston University Jump Training program, athletes displayed a 13% increase in vertical leap on average and reported competing with more confidence on the soccer fields, basketball courts, and gymnastic mats.