Lower Extremity Injury Prevention for Females:

Special emphasis on non-contact ACL Injuries

As a result of more opportunities afforded to female athletes over the last 20 years, there has been a tremendous growth in the number of young women who participate in sports and physical activity. This increase in sport participation has also been associated with an increased number of injuries in female athletes; specifically non-contact ACL injuries. It has been reported that females are 2 to 8 times more likely to sustain an ACL injury compared to their male counterparts who participate in the same sports.

Several factors have been identified as causes leading to an increased risk of non-contact ACL injuries in the female athlete. While there are factors such as weather, anatomical make-up and hormonal influences, which are uncontrollable, there are factors such as biomechanical (movement mechanics) and neuromuscular (muscle strength and control) characteristics that predispose the female athlete to injury which can be safely and effectively modified.

Current trends in female athlete injury prevention programs include addressing common mechanical and neuromuscular faults including:

1. landing with straighter legs (ex. Less bending in the hips and knees)\(^1\),
2. landing with greater knee valgus (their knees buckle inward)\(^5\),
3. cutting and deceleration strategies with improper biomechanics (poor upper body posture and larger decelerating steps)\(^2, 4\) and
4. improper activation of leg muscles with landing (tendency to utilize more quadriceps versus hamstrings)\(^3\).

Implementing a prevention program has been shown to decrease peak landing forces by 22% and reduce ACL injuries by 88% in younger athletes\(^6\). While no program can prevent all injuries from occurring, routinely including jumping drills, sprinting and change of direction practice with specific movement cues can help improve faulty movement patterns and reduce the risk of non-contact ACL injuries in female athletes.
Lower Extremity Injury Prevention 101

Landing Mechanics—the primary emphasis of any lower extremity program should focus on learning to decelerate (slow down) the body’s momentum. This includes activities like landing after a header, lay-up or rebound. Injuries to the ligaments most commonly occur during these high speed, high force activities. Proper landing mechanics include landing into a knee and hip flexed position; maintaining proper knee alignment; and properly activating the hamstring muscles. Common exercises we utilize to teach these skills are:

1. Athletic and Squat Positional Holds
2. Altitude landings
3. Vertical Jumps
4. Horizontal Jumps
5. Diagonal Jumps

Change of Direction—because changing direction involves a high deceleration movement, focus on proper posture and mechanics can help decrease forces at the knee. While change of direction drills may include a variety of movement patterns, the primary focus is on cutting drills as this movement seems to have a higher impact on lower extremity injury. Change of direction drills include exercises like:

1. Lateral Lunge
2. Lateral Bounding
3. Shuffle to Bound
4. 1–2 Stick
5. 1–2 Cut
6. 1–2 Quick

Watch a video of these drills at uwhealth.org/sportsrehab.

References