

ACL injuries in adolescent females:

A female basketball player is five times more likely to suffer a non-contact ACL tear than a male basketball player of the same level. Further evidence comes from a survey completed by athletes who competed in the 1988 US Olympic trials. Thirteen out of 64 females suffered an ACL tear compared to only three out of 80 males.

1. There are a number of anatomical and physiological differences between men and women which may account for the increased ACL tear risk that women bear. These differences biomechanically predispose women to having the knee internally rotated; thus they are more likely to find themselves in the vulnerable ACL position.

The femoral notch width or condyle size.

2. Shoe and surface interface.
3. Deficiencies in training with regard to skill level, proprioception, coordination, muscular balance, and recruitment.
4. Lower extremity malalignment.
5. The effect of estrogen on ligament laxity

Women have a wider pelvis which leads to a greater Q angle of the femur. This means the femur angles inward from hip to knee, which leads to greater internal rotation forces of the knee joint and an internally facing patella (knee-cap). Women have less muscular development, especially in the vastus medialis oblique, which plays a crucial role in patella alignment. Women have greater knee flexibility, which may decrease joint stability. They also have a smaller intercondylar notch which impinges the ACL, thus placing it under greater tensile stress. Finally, women have increased foot pronation, which also places internal rotation forces on the knee.

The coordination of the muscular recruitment is important for knee injury prevention. Neuromuscular coordination must occur optimally for the knee joint to be safely controlled. Thus coordination drills and proprioceptive training are equally as important as muscular strength training in preventing ACL injury. Sporting movements are very rapid. Landing and cutting movements involve little knee flexion movement but require large deceleration forces. "When female athletes land, they tend to land stiff-legged with their knees coming together a little bit, versus male athletes who tend to land and bend their knees with their knee straight in front of them." He says helping athletes with this type of training is leading to an overall decrease in knee injuries.

4 ways to reduce ACL injuries in your daughter

- 1) Proper leg muscle strength training and core strengthening
- 2) Proper neuromuscular (balance and speed) training
- 3) Proper coaching on jumping and landing to avoid straight-leg landing
- 4) Proper footwear and orthotics if necessary