Point of no return: the importance of proper leg alignment

The knee contains the anterior cruciate ligament (ACL), one of four ligaments (tough bands of tissue) that connect the femur (thigh) bone to the tibia (lower leg) bone. In combination with the posterior cruciate ligament (PCL), the ACL makes a diagonal "X" through the center of the knee joint and provides stability to the knee and allows it to twist/rotate and move side-to-side. The ligament becomes injured or torn when it is stretched beyond its normal range of movement.

ACL injury facts:

- Almost 50 percent of ACL injuries involve other structures in the knee, such as the meniscus, cartilage or other ligaments.
- ACL injuries are among the most common of all sports injuries.
- One in 3,000 people sustain, rupture or tear an ACL during their lifetime.
- ACL injuries usually require surgery and lengthy rehabilitation of six to nine months.
- They can also lead to significant traumatic effects on academic achievement, sports performance and psychosocial well-being.
- Up to 70 percent of ACL injuries can be described as non-contact, resulting simply from cutting, pivoting or sudden deceleration (slowing down) while landing from a jump.
- Compared to males, females show increased knee valgus (knock-knee position) when performing cutting maneuvers and when landing from a jump.
- Females are four to six times more likely to have an ACL injury.
- How the leg is positioned while performing cutting maneuvers and jumping is believed to contribute to an ACL rupture.

Knee valgus (knocked-knee position):

- Knee valgus can be described as a knocked-knee position, meaning the knees are inside the hips and ankles.
- Having a knee valgus position places increased stress on the ACL.
- Increasing this knocked-knee position five degrees from the neutral alignment can increase the load on the ACL by six times.

Bad alignment:

- Upright trunk posture.
- Hip adducted (pulled inward).
- Knocked-knees (knees close together).

Proper alignment:

- Slightly bent trunk posture.
- Hips, knees and ankles are in a straight line.
- Knee aligned over second toe.
- Knees behind toes.

Prevention strategies:

- Watch how the athlete lands from a jump. The legs should be in proper alignment.
- Athletes should avoid the knocked-knee position at all times.
- Athletes need training to improve their neuromuscular control (body awareness) to assist with obtaining proper trunk/leg alignment.
- Athletes should participate in an injury prevention program prior to sports participation. A program as short as two weeks prior to a sport can reduce the risk of an ACL injury.
- It is recommended that athletes be evaluated prior to sport participation to test their body's awareness, strength, flexibility and technique during sport-specific drills.

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