



## Anterior Cruciate Ligament (ACL) Injury Prevention

### Definition

The Anterior Cruciate Ligament (ACL) connects to the femur (thigh bone) and the tibia (shin bone). It is one of four ligaments that function to stabilize the knee by minimizing forward and lateral shifting, as well as, rotational torque within the joint. If the ACL is stretched too far or too rapidly during a movement it can result in a tear.

### Mechanism of Injury

- Deceleration (Non-contact)
  - Landing: When landing from a jump and the knee collapses inward.
  - Rapid Deceleration: When slowing down to prepare for a stop or change directions and the knee can't control the forward shift of the femur past the tibia.
  - Plant and Cut (change in direction): When the foot is planted in preparation to change direction and the knee shifts forward, collapses inward, or rotates.
  - Hyper Extension: When landing or planting with a straight leg, causing the tibia to shift backwards in relation to the femur.
- Contact: Another object or person hits the knee forcing the ACL to be stretched too far.

### Risk Factors

- Multi-Directional Sports
- Incorrect Movement Mechanics
- Weakness – Primarily Eccentric Strength
- Overtraining
- Females

### ACL Injury Prevention Program

- **Strength**. The majority of ACL injuries occur during deceleration movements, therefore, we will be focusing on eccentric strength through the hips, hamstrings, and quads.
- **Stability**. The muscles and ligaments surrounding the joint, as well as, the ability to maintain proper posture through the entire body affect the knee's stability. We will be focusing on imbalances and stability in the hips, core, hamstrings, and quads.
- **Proprioception**. We will train body awareness by challenging the nervous system, through balance and coordination drills.
- **Flexibility**. Stretching maintains the elasticity of a muscle, decreasing the risk of an injury during high intensity eccentric demands.
- **Movement Training**. We will address proper mechanics during deceleration, changing direction, and landing. Correct movement patterns help athletes avoid the compromising positions that are so common to ACL injuries.