

Strength Training Reduces the Risk of Knee Injury

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The risk of knee injury and loss of playing time is a major concern for athletes. There are multiple studies that show the most common form of knee injury is a “non-contact” injury. It may be a chronic pain that steadily worsens, or it may be an acute “pop” that occurs during a sudden stop or cut. Coaches, trainers, and doctors are becoming more and more aware of how to train athletes in an attempt to prevent knee injuries.

Strength and Conditioning Programs

Many athletes are working to improve their strength, power, and quickness with “sport-specific” training methods. These excellent programs are designed to optimize the athlete within their sport. They often focus on sprint speed and quickness, explosive multidirectional movements, and power training for the sporting activities.

These programs are an excellent resource for athletes to improve their abilities within a given sport, but they are rarely designed to be a “stand-alone” program for total body fitness. Sometimes, the “core” muscle stabilizers are not incorporated in the training regimen and imbalance between the core and the extremities can lead to nagging pains about the knee known as patellofemoral pain syndrome.

The “core” muscle groups are any of the muscles that support the pelvis and spine. The goal of building core strength is to create a solid foundation for the transfer of energy to the extremities. This is just like the foundation upon which a house must stand. “Core” muscles include the abdominal muscles, gluteus muscles, erector spinae, the hip flexors, hip adductors, and the hamstrings. When assessing a training regimen, one always wants to assure a solid element of core strengthening is

included. Common tools used for core strengthening include, but are not limited to: medicine balls, bosu balls, stability balls, wobble boards, and handheld weights.



Risk vs. Safety Positions

Once the foundation is built, there are ways to train the neuromuscular centers of the athlete’s brain to avoid the positions of risk. The traumatic “non-contact” knee injury has some predictable positions of risk. **The positions of risk include:**

- Ground contact in the “flat foot” position,
- The extended knee and 1-step stops or turns,
- The center of body mass behind the foot, and
- Landing a jump with knees together.

Coaches and trainers work on plyometric programs that train athletes to assume positions of safety during sports. A plyometric program is a focused technique based in the positions

of safety. **The positions of safety include:**

- Increased knee flexion with 3 step stops or turns,
- Ground contact with weight toward the toes, and
- Landing a jump with knees separated.

In order to elicit a fundamental change in the neuromuscular centers of the athlete, a plyometric program must be maintained 3-4 days per week over the course of 6-8 weeks. At the conclusion of a plyometric program, athletes have been shown to lower their peak landing force, improve their maximal knee flexion, and improve their hamstring power so it better balances with their quadriceps musculature. In some studies this has shown a lowered risk of knee injuries.

With athletes getting bigger, faster, and stronger, there is a concern that we might see a higher propensity for joint injury. Through study and science-based methods, we may be able to lower that risk for our athletes. □



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