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# In Motion

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## ACL Injury 101

By Matthew Panzarella, MD

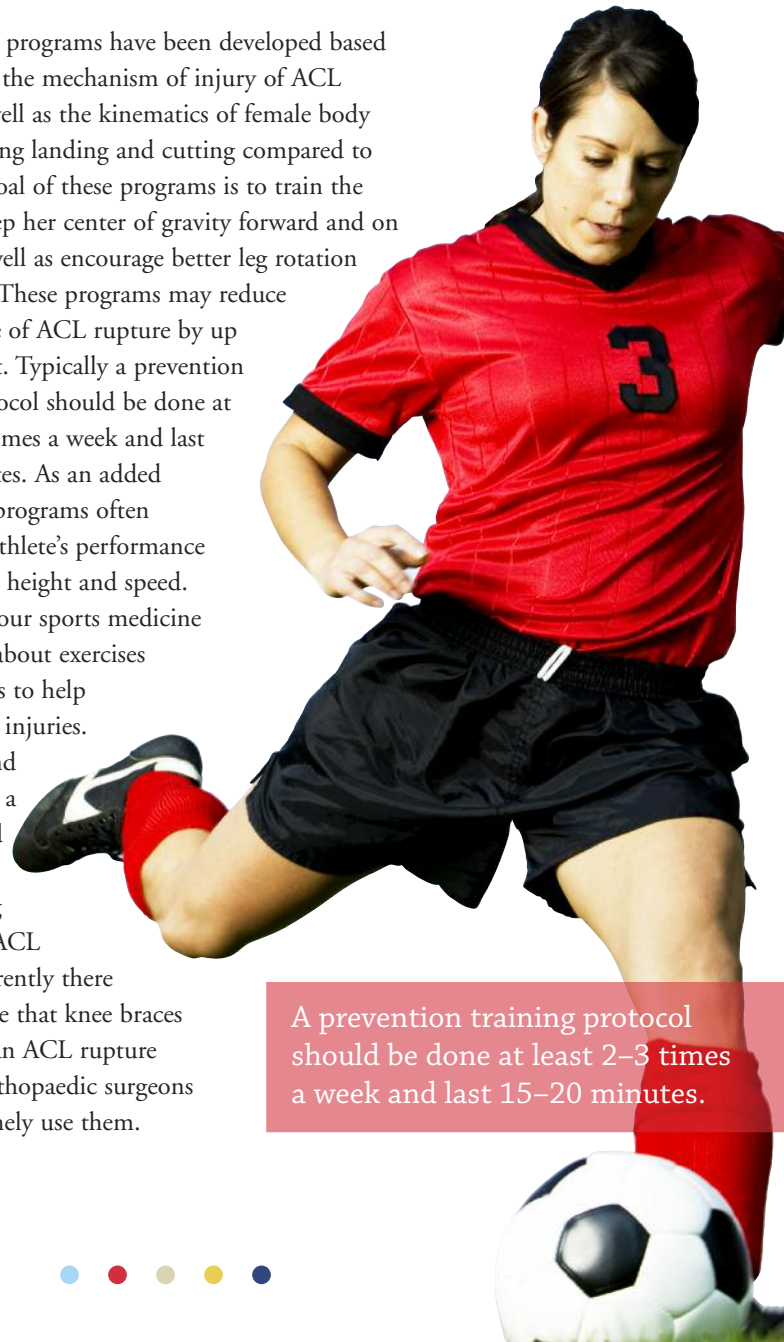
Sports participation results in 70 percent of anterior cruciate ligament (ACL) tears and the majority of these occur in 15 to 45 year olds. Approximately 70 percent of ACL injuries are noncontact injuries that occur during a sudden change in direction with a planted foot (i.e., cutting) or stopping rapidly. In the United States there are between 100,000 to 250,000 ACL ruptures annually.

The ACL is one of the main stabilizing ligaments of the knee and helps provide the hinge that allows the knee to remain stable while moving. When an ACL tear occurs the athlete often reports hearing a pop and usually cannot walk on the injured limb. During the injury it is common for the knee to partially dislocate, resulting in bruising and sometimes a small fracture at the back of the tibia and on the femur. Also common is a sprain of the medial collateral ligament (MCL) which is located on the inside of the knee. These injuries result in a painful swollen knee that is tender outside and deep within the knee.

Female athletes are two to eight times more likely to rupture their ACL than male athletes. This is primarily due to mechanical reasons, such as weaker core muscles and hamstrings. Another factor that can increase the risk of ligament rupture is the interface between the player's shoes and the playing surface that results in higher friction. For example, longer cleats or more cleats on a shoe resulting in better traction and more friction. High risk sports include soccer, basketball, volleyball, skiing, and football.

Prevention programs have been developed based on analyzing the mechanism of injury of ACL ruptures as well as the kinematics of female body position during landing and cutting compared to males. The goal of these programs is to train the athlete to keep her center of gravity forward and on her toes, as well as encourage better leg rotation and control. These programs may reduce the incidence of ACL rupture by up to 50 percent. Typically a prevention training protocol should be done at least 2 to 3 times a week and last 15–20 minutes. As an added bonus these programs often improve an athlete's performance such as jump height and speed. Speak with your sports medicine professional about exercises and programs to help prevent ACL injuries.

Athletes and patients with a reconstructed ACL often ask if bracing can prevent ACL injuries. Currently there is no evidence that knee braces can prevent an ACL rupture and many orthopaedic surgeons do not routinely use them.



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# GOOD NUTRITION

## Key to Wrestling Performance

By EStephan Garcia, MD, and Brett D. Owens, MD



Proper nutrition is essential for any athlete, but becomes a more relevant topic when discussing sports with weight classes for competition. Athletes who participate in sports with specific weight classes can often become victim to focusing on their weight rather than their sport. Wrestling is notorious for athletes who have been injured and in some instances have died because of unsafe practices when cutting weight by rapidly dehydrating themselves. Wrestling can be a safe and rewarding sport, if weight control is achieved through proper diet and exercise.

### Question: Is it safe for my child/athlete to cut weight?

#### ANSWER

“Cutting” weight through rapid water loss is something that is actively discouraged in youth wrestling. The sport of wrestling should focus on the overall well-being and health of our youth athletes, and needs to include a discussion of weight maintenance issues. Wrestling requires a great deal of physical conditioning and youth athletes’ primary focus should be on being in good shape. The process of rapid weight loss through dehydration should be avoided in all athletes. More mature and experienced athletes can safely lose weight at a rate of approximately 1 to 2 pounds per week by appropriately balancing the number of calories consumed with the number of calories burned through exercise. Part of being in good shape is maintaining a healthy body weight based upon height, age, and body fat percentage.

### Question: How should a wrestler eat before weigh in? Should they?

#### ANSWER

Wrestlers need to eat! Athletes should avoid fasting before a performance—your body

needs fuel to perform. What and how much depends on how soon before competition weigh-ins occur. A wrestler should eat the day before, night before, and morning of competition. A pre-competition meal should ideally occur at least 3 to 4 hours before competition.

### Question: What should my wrestler be eating?

#### ANSWER

During the season, it is important to consume enough calories and not worry about restricting caloric intake. Athletes should eat a balanced diet to maintain their health and fitness throughout the season. Complex carbohydrates are an important nutrient for replenishing energy lost during exercise, but plenty of protein is also required to aid muscle recovery. The key to staying strong and gaining strength without gaining weight is to control your caloric intake early on during the season. Once the workout intensity picks up and a good body weight is established, weight lifting should still be encouraged. However, weight lifting during the season should be designed as a circuit style lift geared towards muscle conditioning and endurance rather than pure strength and power.

# What is Frostbite? And How Do I Prevent It?

By Christopher J. Tucker, MD

Athletes participating in outdoor winter sports, such as alpine and cross-country skiing, snowboarding, and mountaineering, are at increased risk for developing frostbite. Frostbite is a condition in which prolonged exposure to cold temperatures cause an injury resulting in tissue damage—starting superficially with the skin and potentially spreading deeper to blood vessels, muscles, tendons, and even bone.

## What Does Frostbite Feel Like?

Many people who are developing frostbite experience early symptoms such as

numbness or a tingling sensation in the skin, such as the “pins and needles” that you can feel after a hand or foot falls asleep. The affected body part may also be extremely painful, feel itchy, or have a burning sensation. The skin can initially appear white or grey with a surrounding area of redness, and as frostbite progresses, blisters may form and the skin will feel hard, waxy, or numb.

## Who is at Risk?

While anyone can potentially develop frostbite, both the very young and the elderly are at particularly high risk and should take special precautions to prevent over-exposure in cold environments. In addition, athletes with medical conditions such as diabetes or heart conditions can be at increased risk due to decreased blood flow to the skin.

## How Cold is Too Cold?

Generally, the risk of frostbite is low when the outside temperature is above 14°F (-10°C), but that risk can go up significantly with prolonged exposure, increased elevation (>17,000 feet), and increased wind speed.<sup>1</sup>

## How Do You Treat Frostbite?

Preventing injury begins with protection from the elements, which requires getting out of the cold

as soon as possible and replacing all wet clothing with dry, warm, insulated layers. Immobilizing the extremity to prevent damage to the cold, stiff skin and muscles can prevent further injury. Once inside, rewarming the affected extremity should be done rapidly by immersion in a warm water bath at 104°–107.6°F (40°–42°C) for 15 to 30 minutes until thawing is complete.<sup>1,2</sup> If warm water is not available, body heat can be used to rewarm the hands or feet, such as tucking them in your armpits. When successful, the skin becomes soft and pinkish again. Avoid rubbing or massaging the skin to avoid damaging the skin or rupturing blisters.

## An Ounce of Prevention

While outdoor winter sports provide an excellent opportunity for physical exercise and competition, they can be dangerous if athletes are not properly prepared. Useful tips to help prevent frostbite include:

- **Check weather forecasts** to prepare for inclement weather or avoid extreme weather.
- **Wear adequate clothing** to protect from the cold and wind—dressing in loose-fitting layers, including fabric that wicks away body moisture and sweat is best.
- **Cover exposed skin** with gloves or mittens, a hat, scarf, and face mask, if needed.
- **Minimize alcohol consumption and tobacco use.**
- **Stay active!** Physical activity maintains core body temperature as well as increases blood flow to the hands and feet.

## References

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2. McIntosh SE, Hamonko M, Freer L, Grissom CK, et al. Wilderness medical society practice guidelines for the prevention and treatment of frostbite. *Wilderness Environ Med.* 2011;22:156-66.





### About AOSSM and *In Motion*

As a world leader in sports medicine education, the American Orthopaedic Society for Sports Medicine (AOSSM), we have designed the publication to highlight relevant information for multiple age groups from exercise and rehabilitation to nutrition and psychology.

This important educational tool is published quarterly and distributed electronically.

AOSSM members can add their practice name and logo to *In Motion*. Personalizing *In Motion* is an easy way to get pertinent, patient-friendly sports medicine information to your patients with just a click of a mouse. For more information, please e-mail Lisa Weisenberger at [lisa@aossm.org](mailto:lisa@aossm.org) or contact the Society at 847/292-4900.

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# Jammed Fingers:

## WHEN IS IT TIME TO SEE A DOCTOR?

By Robert S. Eberly, MD and Lance E. LeClere, MD

It has happened to all of us at some point. You're playing sports and a ball glances off the tip of your finger. Or you reach for something and jam the tip of your finger. Typically there is a lot of swelling and discomfort afterwards. But when is a jammed finger something more than a sprain and needs to be evaluated by a doctor?

The finger is a brilliantly designed machine with tendons running on both sides that allow you to flex and extend at each joint. Covering those tendons is a sheath that allows smooth movement and pulleys that keep the tendons where they need to be for added mechanical advantage.

So when you jam your finger there are a lot of structures that could be damaged. Injuries can occur at any of these structures. Most injuries are soft tissue injuries that heal well without surgery or immobilization. However, there are several symptoms that should raise your suspicion for a more serious underlying injury and may require evaluation:

- **Is your joint not sitting in a normal position?** If so, you may have an underlying dislocation or fracture that needs to be seen at the emergency room

or urgent care center. Joints need to be in a normal anatomic position to prevent further damage and preserve function.

- **Can you flex and extend through each of your finger joints?** If not, you may have an injury to either one of the flexor tendons, extensor tendons, or bones that they attach to. This needs to be evaluated on an urgent basis as well, as the sooner it can be evaluated and repaired the better chance of avoiding a loss of function.

Barring any of the above symptoms, jammed fingers should reliably improve over the course of a few days with rest, icing for swelling, and anti-inflammatories for pain control. Depending on the location of the injury and the structure injured, your finger may need to be immobilized for a period of time. Immobilization can include taping the injured finger to an adjacent finger, a splint for the end of the injured finger to keep the joint extended, or a cast that extends to the forearm. Periods of immobilization vary depending on the structure injured.

Prompt assessment and treatment are the keys to ensuring that serious injuries do not result in any disability and maximize the opportunity for a full return of function.