

## When to Use Heat & Cold for Athletic Injuries

Common injuries seen in athletics are bruises (contusions), muscle pulls (sprains), sprains and fractures. A contusion is a bruise without a break in the skin, usually caused by a hard blow to a muscle. The result is internal bleeding, swelling, and pain with movement. Muscle pulls or strains occur when muscle or tendon is damaged by a contraction while it is under excessive strain. The muscle fibers stretch and tear, resulting in internal bleeding and swelling. Strains usually involve the quadriceps, hamstrings and calf muscles. A sprain is an injury to the ligament of a joint. Sprains occur when a joint is forced beyond its normal range of motion. Swelling is usually great and the pain can be severe. An important question is whether to use heat or cold in treating the injury. A general guideline to follow is to use cold in the early stage of most injuries then use heat later for certain types of injuries. Remember “**PRICE**” as a guide to treating acute injuries. **PRICE** stands for **Protect** the injured part from further injury; **Rest** the injury; apply **Ice**; apply **Compression** firmly (but not too tightly); and **Elevate** the injury to decrease bleeding.

### How Cold Works

Using cold with gentle compression after you suffer an injury helps stop internal bleeding in the tissue, relieve pain, reduce muscle spasms, cool deep tissues, lower metabolic activity, and reduce swelling and inflammation. It can produce dramatic drops in tissue swelling because cold initially constricts the walls of blood vessels and decreases blood flow to the injured tissue. Compression also decreases the blood flow to an injured body part. *If you feel pain with gentle compression contact your physician immediately.* (Also, elevation, helps to “drain” excess fluid from injured areas.) Compared to heat, cold works better to decrease swelling and discomfort.

Cold’s pain-killing effect is caused by its “deadening” of nerve activity; patients who use cold therapy on injuries tend to require much less pain medication. It also creates a “window of pain relief” during rehabilitation so that patients can reestablish normal motion. This effect, though, can sometimes be counterproductive; an athlete who has iced down an injured body part may get so much pain relief that he/she returns to activity too soon. Cold decreases muscle spasms by making muscles less sensitive to being stretched, and, like heat, cold can be used to treat low-back pain. (As an aside, research suggests that cold works better for individuals who have had back pain for more than 14 days, while heat may be more effective for those with more recent pain.)

### When to Use Cold

Cold therapy is used for contusions, muscle pulls and strains, sprains and fractures. **PRICE** is the recommended treatment. Apply ice with pressure and elevate the limb. Activity can be resumed gradually after the pain and swelling have gone and full use of the limb has returned. Cold eases pain and helps restore motion.

### How to Apply Cold Therapy

The earlier the cold is started the better. You should apply ice as soon as possible after the injury and continue using it for the next two or three days, or until the swelling goes away. Don’t place ice or ice packs directly on the injury site – you could suffer frostbite. Place the ice pack over a wet towel or washcloth and use an elastic bandage to hold the ice pack in place. Apply the ice pack to the injury site for ten to 15 minutes every three to four hours while awake. However, individuals with large amounts of fat under their skin may require longer periods of icing (but no longer than 20 minutes). An ice massage is a good way to treat an overuse injury. Freeze water in a paper or Styrofoam cup. Then tear away the cup’s top lip and rub the ice over the injured area for five to ten minutes. If you are unable to tolerate cold therapy, do not use it.

Apply cold therapy daily until the discoloration and swelling are gone. Exercises to regain full use of the injured area should be started as soon as possible. It is important to allow some mobility during icing. Instead of sitting around with ice packs on, try taking a roll of plastic wrap, cut it down the middle, and use the half roll as a quick "sports wrap" to easily and firmly secure the ice pack over a treatment area. This makes it easier for you to follow through with your icing properly.

Ice chips in a plastic bag are most effective, followed by the use of frozen gel packs and blue ice packs, which are better than chemical reaction packs or gas refrigerant-filled packs.

### **How Heat Works**

The application of superficial heat to your body can improve the flexibility of your tendons and ligaments, reduce muscle spasms, alleviate pain, elevate blood flow and boost metabolism. Exactly how heat relieves pain is not exactly known, although some believe that it inactivates nerve fibers which can force muscles into irritating spasms, and that it may cause the release of endorphins (powerful body chemicals which block pain transmission). Heat does help tissue rebuild by increasing blood flow and tissue repair. Increased blood flow occurs in heated parts of the body because heat tends to relax the walls of blood vessels. That's why sports doctors recommend that you do not heat up already inflamed joints.

### **When to Use Heat**

*Heat therapy can be used during the repair stage of an injury when new tissue is being formed. This is usually 48 to 72 hours after the initial injury (once the risk of internal bleeding is minimal), and after ice has been used and swelling is reduced.* That's because heat increases the blood flow to the injury area, and that can increase swelling. Heat in any form should not be applied to an acute injury or where discoloration or swelling is present.

While heat shouldn't be used to treat an acute injury, it can be used to reduce muscle spasms, increase flexibility, decrease joint stiffness and limber up soft tissue. It can loosen tight muscles and joints during a warm-up before you exercise, possibly preventing injury. Moist heat is good for muscles that are sore, tired or overworked. Heat and massage also help shinsplints. Heat is effective for treatment of muscle cramps along with stretching and massage. Although heat can reduce muscle spasms after a back injury (which is usually muscular), heat should not be used on ligament injuries like sprained ankles or strained joints. Heat should not be applied to infants or elderly persons.

### **How to Apply Heat Therapy**

Hot water bottles, heating pads on the lowest setting, warm soaks in the tub or shower, and warm moist towels are effective sources of heat. The heat should not come in direct contact with the skin. Apply heat for 15 to 20 minutes at a time. The proper tissue temperature for heating is probably 104° to 113° Fahrenheit (40° to 45° Celsius) and the correct application time is about five to 30 minutes. Apply heat for three to four days and begin stretching exercises. Do not sleep on your heat source. Always check the temperature of the heat source to prevent accidental burns.

This handout should not be considered complete nor a substitute for evaluation and treatment by a physician. Always consult your doctor first.

