



The Proper Use of Heat & Ice

by Dr. Chris Sanders, D.C.

as previously printed in *Houston Sports News*

There is always a great deal of confusion regarding the proper use of ice and heat as therapeutic vehicles. At the request of many, I shall offer a straightforward explanation of their mechanisms, appropriate usage and the various ways to effectively heat and cool tissue for injury treatment and as a prophylactic agent.

Ice is a constrictor of the various soft tissues (muscles, tendons, ligaments) upon which it can be placed. It reduces swelling, controls inflammation, manages pain and increases circulation; all of which facilitate the healing process. Ice also reduces the elasticity of these same structures. If you were stranded on the top of Mount Everest, your circulatory system would shunt all of your blood to your cardiopulmonary system for heat in an effort to prolong your life. You can live without your extremities, but you cannot live without your heart and lungs.

However, if you place ice on your knee, your body recognizes that there is only a localized area of cold. This triggers a physiological response that sends the blood to the knee in an attempt to warm it. This process brings additional oxygen and nutrients to the injured tissue as well as removes the byproducts associated with cellular destruction. Normal human body temperature is approximately 98 degrees and freezing is 32 degrees. The difference between these two is 66 degrees. This difference is large enough to cause a significant physiological response which enhances the healing process.

Always use ice for the first 72 hours of an acute injury and whenever there is swelling. When an area is swollen, you should also *Rest, Ice, Compress and Elevate* the injury in a comfortable manner above the heart. Maintain this position for about 15 minutes. In severe injuries, it may also be necessary to brace an injury in order to prevent further damage from instability or weight bearing. Remember, you can always use ice for an injury, unless you have a systemic illness for which ice is contraindicated.

There are different ways to apply ice. You can simply put ice in a plastic bag and place it on the injury. You can use a frozen bag of peas that you mark and keep in your freezer for injuries. You can buy one of the heavy-duty gel packs at your doctor's office. The good gel packs are effective because they get very cold and are moldable to the body part in question. You can also buy a cryo-cuff for the shoulder. This holds ice and fits like a tight sleeve all around the joint (baseball pitcher). The most effective way to ice an area is to submerge it in ice water. This is what most professional athletes do by way of an ice bath.

Basic chemistry states that heat is an expander. It increases circulation and facilitates the flexibility of both contractile and non-contractile tissues (muscles, tendons and ligaments). If you were in an extremely hot whirlpool, your circulatory system would shunt all of your blood to your cardiopulmonary system to cool it in an effort to prolong your life. You can live without your extremities, but you cannot live without your heart and lungs.

However, if you place heat on your knee your body recognizes that there is only a localized area of heat. This triggers a physiological response that sends the blood to the knee in an attempt to cool it. This process

brings more oxygen and nutrients to the injured tissue as well as removes additional byproducts associated with cellular destruction. Normal human body temperature is approximately 98 degrees and the hottest whirlpool temperature tolerable is approximately 115 degrees. The difference between these two is only 17 degrees. This difference is not large enough to cause a significant physiological response in circulation and only slightly accelerates the healing process.

You should use heat when there is no swelling, no open wounds, no longer an acute injury, or prior to treatment or an activity. Using heat prior to receiving therapeutic treatment softens the tissue and enhances its ability to regain normal range of motion. Muscles are analogous to a piece of chewing gum. A cold muscle is like a piece of gum just unwrapped; they are both stiff and have a reduced elasticity. As the gum is placed in your mouth, it begins to warm and moisten. This makes it very pliable, just like a properly warmed muscle. Heat can also be an effective aid when working on your flexibility (Ashtanga Yoga).

There are two types of heat: *endogenous* and *exogenous*. Endogenous heat is created internally by performing physical activity. When possible, this is the best way to generate heat. This is generally done in a non-weight bearing or non-impact activity such as a stationary bicycle prior to treatment. When warming up for a sporting activity, it is best to remember the rule of specificity and warm-up in a slowly progressive manner with the same activity. Exogenous heat is generated externally and placed on the area that needs to be heated. This can be done with a hydroculator pad in a doctor's office, with a topical analgesic or even using a hot tub or whirlpool.

Never use an electric heating pad. When you place an electric heating pad on your leg for 15 minutes, there is moisture on your leg after you remove the pad. This moisture is from the tissue in question. Essentially, you have taken an injured muscle and dehydrated it. This is not a good thing and certainly does not aid in the healing process.

There are many advanced uses of heat and ice for prevention and treatment of injuries. Post exertion icing is prophylactic in nature and is best used after a very long or strenuous activity. For example, a major league baseball pitcher ices his throwing arm after every game he pitches regardless of pain or injury. Many marathoners, Ironman triathletes and ultra-marathoners use an ice bath after their races. After such demanding events, there is a significant break down of muscle tissue and a build-up of endogenous heat. After rehydrating and getting some proper nutrients, the ice bath is a good idea. Resist the temptation to put some warm soothing heat on your body. It will only delay your recovery. For those needing to go the extra mile, you can alternate cold/heat/cold. This acts like a pump that contracts, expands and contracts again. This process is practically free and also accelerates the healing process.

Hopefully this clarifies the dilemma concerning the best times to use ice and heat. By adding these inexpensive therapeutic devices to your training regime, you can effectively reduce recovery times and promote healing.

Dr. Chris Sanders, D.C.



Clinical Director of MultiSport Health Center. Certified ART® Instructor & Provider of the Upper Extremity, Spine, Lower Extremity, Biomechanics and Nerve Entrapment. Certified Graston Technique Provider. For more information, visit www.multisporthealthcenter.com or call 713/572-4100.