

## Cold vs. Heat...or why you should never kick a hornet's nest

By John Longphre, M.D., M.P.H.

### **The application of cold or heat is often recommended for muscle aches and pains. Here's an explanation why.**

Blood vessels are essentially braided-tubing, similar to a child's finger-trap toy (aka Chinese handcuffs).

**Cold** constricts blood vessels, decreasing blood flow to a tissue. Tight blood vessels do not leak the water component of blood. When water is reabsorbed, swelling goes down.

**Heat** dilates blood vessels, increasing blood flow to a tissue. When blood vessels are dilated, the water component of blood leaks out of the vessel, causing soft tissues to swell.



### Ice First

Consider this analogy. Imagine you have just kicked a hornet's nest. The angry hornets represent the acute inflammatory process. You would most likely regret adding energy (heat) to an already angry bunch of hornets.

In the first five to seven days following a muscle strain or sprain, the acute inflammatory process is overactive and can be counter-productive (like people frantically clamoring to abandon a sinking ship). The initial, overactive inflammation causes blood vessels to dilate. This brings excessive blood flow to the injured area.

Dilated, stretched-out blood vessels leak water that soaks into the soft tissue around the blood vessel. This swelling process is called edema, which stretches tissue and sets off pain receptors. (Ever have bad gas pain from stretched guts or sore muscles the day after a hard workout at the gym?)

This is why we generally do not heat orthopedic injuries that are less than five to seven days old. After five to seven days, the acute inflammatory process calms down and the hornets return to the nest. The need for ice disappears.

There is one exception to initially using cold as therapy: When there is a palpable spasmed muscle - usually in the low back - people tend to say cold therapy does not provide relief. A muscle spasm is a sudden, involuntary contraction of one or more muscles. A sustained muscle contraction creates a "knot" that can be felt during a physical examination. Ice may make the knot tighten. Alternatively, 15- to 30-minute applications of heat are sometimes helpful.

### Heat Next

After five to seven days, heat is used to feed the injured tissue a meal of blood. You eat three to four times a day; the same applies to injured tissue.

### What to Avoid

Following an injury, avoid these common pitfalls that may impede the recovery process:

1. Still icing an hour at a time weeks or even months after an initial injury. Healing is impaired by lack of sufficient blood flow.
2. Jumping into a Jacuzzi or hot bath on the day of the injury. Rather than providing relief, hot water causes swelling and increases pain. People who strain their back often make this mistake.

3. Heating for an excessive amount of time (generally more than 25-30 minutes). This practice tends to increase rather than decrease pain, although it does not damage tissues or delay recovery.

## Cold, Heat and Medications

Cold or heat therapy is often used in combination with an over-the-counter nonsteroidal anti-inflammatory drug (NSAID) that helps relieve pain and swelling.

These medications are typically taken at non-prescription strength as directed. Continuous, around-the-clock NSAID use is usually stopped after two weeks because there is a slightly increased heart attack risk in older adults after that point. It's advisable to consult with a qualified medical provider or pharmacist about the correct dose and duration of use before taking any kind of medication.

*Dr. John Longphre is Senior Vice President of WorkCare, Inc.*

### Applying Cold or Heat

Recommended: 3-4 times daily for 25-30 minutes per application

#### Cold therapy

Apply an ice pack, cold compress (e.g., frozen vegetable pack) or chemical cold pack to the inflamed area but not directly on the skin.

#### Heat therapy

Apply safe heating devices, such as a hot compress, heat wrap or electric heating pad to the affected area.