



Ice Vs. Heat

When to best use each

Written by Alysia Henderson, MS, LAT, ATC

On a weekly basis I am asked the question, "should I use ice or heat for my X, Y, or Z injury, pain, or soreness?" My answer is always the same, and that is it is ok to use both as long as simple guidelines are followed to facilitate healing.

Most individuals I come across prefer to use heat for the care of their injuries. It makes them feel nice and relaxed and the contrast in temperature and sensation is always more appealing than that of ice. However, when it comes to treating an acute soft tissue injury, such as a strain, sprain, or contusion, ice is the first thing the individual should reach for and apply to the affected area (5).

Ice and other cold modalities (crushed ice, gel cold packs, ice massage, cold compression units, and cold whirlpools) allow for localized vasoconstriction, which decreases the body's blood flow and tissue metabolism, limits hemorrhage and inflammation to the injured area and muscular spasm (3,4,5). Cold modalities also aid in masking and limiting pain sensations felt with an injury as the cold slows the conduction velocity of the peripheral nerves that receive pain (4,6). Another form of a cold modality are vasocoolant sprays which are topical analgesic cooling gases. These sprays cool the skin briefly and do not effectively or therapeutically penetrate tissue as the other agents mentioned above do (3).



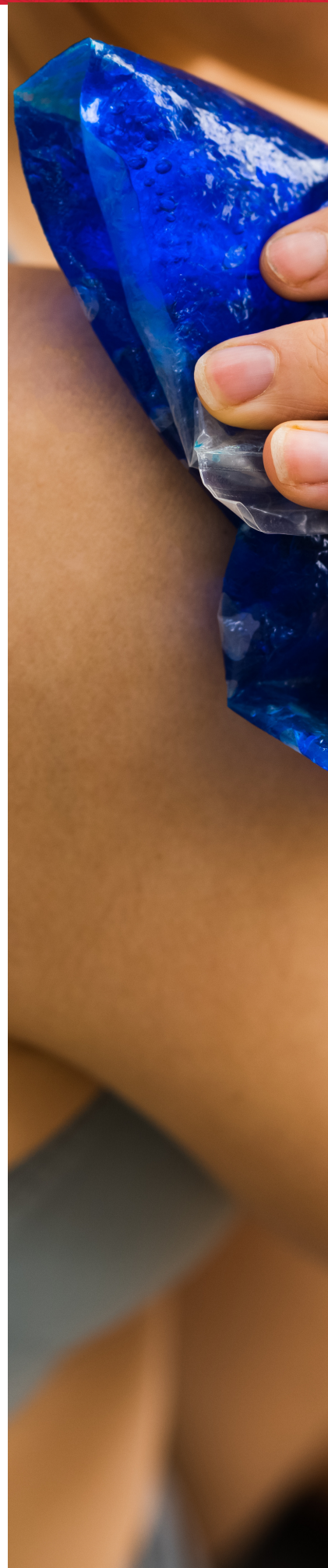
Targeting an injured area with a cold modality quickly can help to reduce injury rehabilitation time (5). It is recommended that cold therapy be used during the first 72 hours post-acute injury, as it can aid in controlling and reducing the time in the healing process known as the inflammatory phase (5). An ice bag or pack can be left on the body for 20 minutes and replaced as needed every one and a half hours (5,6). An individual should expect to feel a cold, burning or aching sensation, followed by complete numbness. When ice massage is used, complete numbness may be felt within 5-7 minutes, in which case it is ok to cease this treatment, as cold penetration with ice massage occurs quicker to that of an ice bag or pack (4,5).

Following physical activity or sport, it is good habit to apply an ice bag to areas where soreness is noted, even if no acute injury occurred or no visible inflammation is noted. Your muscles experience micro-tearing with physical activity/exercise which initiates inflammation and thus, should be treated and managed with ice proactively.

Contraindications for cold modality use occur in individuals with cold hypersensitivity, intolerance, Raynaud's disease, hypertension, mental impairment, or decreased sensation (3). Individuals with the above conditions risk injury to their tissues and body in the form of frostbite, chemical burns (if ice pack is used and left on the skin for too long), and even hives. Therefore, it is important to understand your medical history and reach out to a medical professional if you are unsure of how to best perform at-home treatments for an acute injury.

So where do heat and heated modalities fit into the injury, pain, and soreness healing process?

Heated modalities such as moist hot packs, electric heating pads, hot baths/showers, heated stones, saunas, paraffin wax, steam, and hot water bottles are recommended for use post-acute in the healing process, in the fibroblastic repair and maturation remodeling phases(3,5). The fibroblastic repair phase is step two in the three step healing process and begins following the inflammation phase around post-injury day 4 through to 6 weeks (5).



Heat and its modalities, such as a hot pack allow for localized and increased blood flow to the area where it is applied, thus increasing the metabolism, and elasticity of tissues (1,6). The elevated temperature allows for collagen tissues to relax and elongate easing tension and scarring that may be found in the tissue and muscles (5,6). Thus, thermotherapy is a great option for anyone looking to warm-up prior to conditioning or exercising. Individuals with generalized stiff joints and soreness will also likely benefit.

As with cold modalities, there are **contraindications** and individuals who should cautiously consider utilizing heat therapy modalities. Individuals with multiple sclerosis, rheumatoid arthritis, spinal cord injuries, diabetes mellitus, or poor circulation may want to refrain from heated modalities as these conditions often impair an individual's ability to feel which can then lead to burns of the skin and

body, skin ulcers, and increased inflammation, further exacerbating the effects of their disease or condition (3,6). As with the cold contraindications, always consult with your medical provider if you have any question about your condition and treatment options. Topical heat can be applied for approximately 15- 20 minutes at a time, as long as discomfort or burning does not occur.

While both cold and hot modalities provide therapeutic and analgesic effects to injured and sore areas, it is my hope that you now have an understanding of when to best use each, while recognizing and following your injury timeline, health history, and treatment guidelines. For a quick recap, refer back to the two lists below as needed and feel free to reach out to the RecWell athletic trainers or other trusted healthcare professional with any questions you may have.



General Guidelines for use of Ice:

- Use during the first 72 hours post- injury or post-physical activity, practice, or game.
- Always wrap the ice/cold modality in a light towel or other covering/barriers prior to placing on skin as it will help to protect and prevent injury to the skin
- Ice bag/pack can be applied to the affected area of the body for no more than 20 minutes
- Ice bag/pack can be re-applied every 1.5 hours or as needed
- Once applied, be sure to check the skin every 5 minutes or so to look for possible adverse skin reactions (redness or hives)

- Do not fall asleep while using an ice bag/pack/modality
- If in an athletic training room setting, know that it is less effective to have your ice bag wrapped on and walked with as you leave your treatment session. Taking your ice wrapped on "to go" does not adequately decrease muscular temperature, so it is best to either sit stationary in the athletic training room for 20 minutes OR take the ice bag with you and apply it once you get to your next destination for 20 minutes (2,5).

General Guidelines for use of Hot Pack:

- Use prior to physical activity or game to warm-up, post-acute injury (day 4-5), or when swelling/bruising is no longer noted
- Always wrap the heated modality in a light towel or other covering/barriers prior to placing on skin as it will help to protect and prevent burns to the skin
- Hot pack can be applied to the affected area of the body for no more than 20 minutes
- Once applied, be sure to check the skin every 5 minutes or so to look for possible adverse skin reactions (redness, blistering, burning)
- Do not fall asleep while using a hot pack, heating pad, or other heated modality
- Moist heated modalities, like a moist hot pack, may offer more thermal effects compared to that of dry heat modalities

Resources:

1. American Society for Surgery of the Hand. (2014). Heat treatment and cold treatment. <https://www.assh.org/handcare/condition/heat-treatment-cold-treatment>
2. Cullen, K. & Ostrowski, J. (2020, October). Is "icing to go" the right answer? NATA News, 32 (9), 30-31.
3. Malanga, G.A., Ning, Y., & Stark, J. (2015) Mechanisms and efficacy of heat and cold therapies for musculoskeletal injury. Postgraduate Medicine, 127(1), 57-65, DOI: 10.1080/00325481.2015.992719
4. Nadler, S.F., Weingand, K., & Kruse, R.J. (2004). Cryotherapy and thermotherapy for the pain practitioner. Pain Practitioner, 7 (3), 395-399. <https://www.painphysicianjournal.com/current/pdf?article=MTU3&journal=20>
5. Prentice, W.E. (2008). Essentials of athletic injury management (7th ed). McGraw-Hill
6. Three Rivers Orthopedic Associates. (2017). Heat vs. Cold Therapy: How they work and when to use them. <https://3riversortho.com/2017/05/16/heat-vs-cold-therapy-work-use/>

