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When to use Ice and Heat

Quick Guide	Ice	Heat
When To Use	Use ice after an acute inflamed injury, such as an ankle sprain, or after activities that irritate a chronic injury, such as 'shin splints'. Also in later stages of rehab to reduce pain and make exercise / movement more comfortable. Do not use ice for muscle spasms or knots.	Use heat before activities that may irritate chronic injuries such as muscle strains. Do not use heat on inflamed tissues and/or muscles sore from exercising. Heat can help loosen tissues and relax injured areas. Heat is good to use before stretching muscles.
How To Do It	Read through the information here first on how to ice an injury. There are several ways ice can be used.	Wheat bags, heat pads or hot wet towels are excellent methods. Place a flannel under hot tap water and then apply to the injured area.
For How Long	Read through the information here as ice methods affect duration. Too much ice can do harm, more ice application does not mean more relief.	It is not necessary to apply heat treatment for more than 20 minutes at a time. Never apply heat while sleeping.

Did you know… The pain-killing properties of ice are deeper and longer lasting than heat.

What ice is for…

Ice is for injuries. It is *only* useful where tissue is damaged and/or inflamed. Icing is primarily an analgesic — a pain-reliever. Use it like you use ibuprofen. It *may* help to resolve chronic problems (much more about this below), but it's mostly intended to numb painfully inflamed tissues.

The most commonly iced acute injuries are fresh injuries — ligament sprains, muscle / tendon strains, and severe bruises. (When the skin is broken, things get little trickier.) And what's a "fresh" injury? When tissue has been physically damaged; it will be inflamed for a few days, give or take, depending on the seriousness of the injury. If superficial tissue is sensitive to touch, if the skin is hot and red, if there is swelling, these are all signs that your injury is still fresh, and should *not be heated*.

Icing is used to numb painfully inflamed tissues.

Ice is also helpful with chronic overuse or tissue fatigue injuries like carpal tunnel syndrome, tennis elbow, iliotibial band syndrome, patellofemoral pain syndrome, 'shin splints', achilles tendinopathies and plantar fasciitis. There are others, of course, but these are the most common.

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What ice is *not* for…

Ice will usually aggravate the pain of muscle spasm and trigger points (muscle knots). Trigger point pain is extremely common, and can easily be mistaken for an "iceable" injury.

Ice may be especially bad for most low back pain. Back pain is rarely a direct injury — that is, it rarely involves any inflammation that can be helped by ice, but instead almost always involves muscular trigger points (knots) that are usually *aggravated* by ice and helped by heat. For this reason, the great majority of people with back pain prefer heat, and have negative reactions to ice.

How ice works…

When tissue is damaged, the body responds with a complex array of chemical and neurological changes collectively known as "inflammation." For instance, the capillaries expand dramatically to bring extra oxygen and nutrients to the area. They also become more permeable, to allow the easy passage of immune system cells.

Inflammation is essential to healing. It is pure physiological goodness — a machine finely-tuned by evolution to optimize recovery. Strictly speaking, if you to want to heal as fast as possible then don't interfere with inflammation!

Inflammation is pure physiological goodness, finely-tuned by evolution to optimize recovery.

Unfortunately, like most biological processes, our *comfort* is not a priority. In fact, quite the opposite — inflammation is partly evolved to *be painful*. For humans, inflammation is … well, it's overkill. We can afford to "turn it down."

Cold slows metabolic activity, numbs nerve endings and constricts capillaries. Cold causes damaged cells (from the injury) to be starved of oxygen and die quicker so our body can get on with replacing them. Ice limits and controls inflammation. It makes it hurt less. It helps us get through the day.

Chronic inflammation

Do you have chronic pain? Chronic inflammation? 'Shin splints' for two years? Plantar fasciitis for five? Then you are probably thinking, "Inflammation is not @#!!$% essential to healing!"

Sometimes inflammation becomes chronic. But inflammation itself is not really to blame. It's just the messenger. Even after years, chronic inflammation is still just trying to do a job — it's just failing, because the tissues just keep getting re-irritated.

Chronic inflammation is also quite different than acute inflammation. The chemistry is different. For instance, most tendinitis is not really technically an "itis" after the first few weeks, but rather an "osis" — tendinosis, a "tendon condition" instead of a "tendon inflammation." To complicate it further, most non-inflammatory tendon conditions are now called "tendinopathies".

Ice can relieve the pain of chronic inflammation. It may also help to resolve chronic inflammation, and this is one of the best reasons to ice 'overuse' injuries. Unfortunately, the science on this subject is rather vague. It's really only been in recent years that we've even understood the tendinopathy thing. Exactly what ice does and does not do for chronic inflammation is really not clear.

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How to use ice

An excellent method of therapeutic icing is to use bare or "raw" ice — that is, ice applied directly to the skin, with no layer of plastic or fabric between you and your ice. Raw ice delivers more of an icy punch! This is due to the spreading of melt water into every crevice, which conducts heat more efficiently away from the skin both directly into the ice, and via evaporation.

In comparison, ice packs and bean bags are comparatively poor cryotherapies (although they have their place, as you'll see). They tend to warm up too quickly, especially where the skin is hottest and needs the most icing. There are times when they are handy or easier, but for serious icing of acute injuries or a stubborn tendinitis, you really need an ice cup.

How to make an ice cup

The humble polystyrene cup is the cheapest and most effective injury management tool. It's not the cup itself that's so useful, of course, but its contents — ice! Don't wait until you're hurt to do this — have them ready and waiting in your freezer.

Get yourself some polystyrene cups.
Fill a few cups with water, and freeze them.
Cut off the **bottom** inch from the cup, exposing some ice but leaving the rest of the cup as an insulating "handle."
Cutting off the narrower bottom end means the ice won't fall out as you're using it, clever!
As the ice melts, tear more off the cup.

Or just use an ice cube

With no cups around, just use an ice cube held in a teatowel — less convenient, especially for larger areas, but as effective.

The art of icing: when you're numb, you're done

Move the ice over the inflamed area in a slow but steady pattern, small circular movements are good. It's important to keep it moving, as long as you don't try to ice such a large area that tissue gets a chance to warm up before you complete return to the starting point. The optimal size area for effective tissue cooling using raw ice is an area 4 cm x 4 cm.

Continue ice massaging for 1–5 minutes, or until it is numb, whichever comes first. "When you're numb, you're done," is the rule of thumb. Areas with thick tissue, like the top of the thigh, will take longer to get numb. Thin areas, like the side of the knee, will usually go numb quickly. What does numb feel like? Just close your eyes and lightly touch the skin. If you can't feel it at all, or if you can feel only pressure, that's numb enough. Stop icing and let the tissue warm up.

Commercial ice cups

One of the downsides of the polystyrene cup option is that it's a bit wasteful. There are several brands of re-usable ice cups, like the CRYOCUP™ and the Pro-Tec Ice-Up Portable Ice Massager. They are especially for anyone who lives on the edge and brings home new sports and adventure injuries on a regular basis.

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Can raw ice "burn" you?

You may have heard that raw ice is too cold to use directly on the skin in this way. This is untrue. Although a cold-sensitive person may find raw ice too uncomfortable, tissue damage can only occur after sustained icing — well after you have gone completely numb. Stopping roughly when you get numb and when the skin is red pretty much guarantees that you won't hurt yourself. See the precautions below though.

Precautions for using ice

Do not use ice:

× Over areas of skin that are in poor condition.
× Over areas of skin with poor sensation to heat or cold.
× Over areas of the body with known poor circulation.
× If you have diabetes.
× In the presence of infection.
× Do not use ice packs on the left shoulder if you have a heart condition.
× Do not use ice packs around the front or side of the neck.

How often should ice be used?

Once your tissues warm up again, you can repeat the treatment. In fact, you can apply the ice as often as you like, as long as your tissues have a chance to warm up between treatments, usually around 2-3 hours. In the case of tendinitis, you can continue doing a lot of icing — many applications per day — as long as you still have symptoms, and even when you are feeling better.

In the case of injuries, icing is mostly just useful while the injury is still hot, red, swollen or painful — this 'acute' phase may last for a few hours or several days. When these signs begin to fade, you may be certain that you would have had them for a lot longer if you had not been icing.

When to use ice packs instead of raw ice (the tissue depth issue)

Ice packs and other non-raw icing are preferable when you are trying to "reach" deeper tissues. Obviously, cryotherapy takes longer to affect deeper tissues than it does to affect shallow ones. Moments after you apply raw ice, your dermis and epidermis are definitely colder — but tissues under that may be unchanged. How deep can ice reach? How long does it take? Unfortunately, it's just not clear. It may not reach very far, and it may not happen very quickly, and it undoubtedly depends on a number of different variables.

However if you want to chill deeper, thicker tissues, you need gentler, slower cooling, ideally with compression. Ice packs to the rescue! Ice packs can be made from ice cubes in a plastic bag or wet tea towel. A packet of frozen peas is also ideal. These mould nicely and can go in and out of the freezer. Purpose made cold packs can also be bought from pharmacies. Wheat bags (the microwave ones commonly used for heat treatments) can also be used frozen.

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How to use ice packs

- If the skin is broken or there are stitches in place, protect the area with a plastic bag. This will stop the wound getting wet.
- Place a cold damp flannel over the area (do not need if using plastic bag).
- Place the ice pack over the flannel or plastic bag.
- Check the colour of the skin after 5 minutes. If it is bright pink/red remove the pack. If it is not pink replace the pack for a further 5-10 minutes.
- Ice can be left on for 20 minutes but there is little benefit to be gained by leaving it on for longer. You run the risk of damaging the skin if ice is left on the skin for more than 30 minutes at a time.
- The effect of the ice pack is improved if compression can be added by pressing gently onto the injured area, or by strapping the pack to the area.

HEAT, finally!

Do not use heat on a new injury (for example soaking in a hot bath, using heat lamps, hot water bottles, deep heat creams, etc). These will increase blood flow and make an inflammatory condition worse. If you've over-done the exercise and have sore muscles, the worst thing you can do is have a hot bath – have a warm shower instead.

For injuries older than 48 hours, heat can be applied in the form of heat pads, hot water bottles, wheat bags or heat lamps. Heat causes the blood vessels to dilate (open wide) which brings more blood into the area. It also has a direct soothing effect and helps to relieve pain and spasm.

If heat is applied to the skin it should not be hot, gentle warmth is better. If heat is applied there is the risk of burns and scalds. The skin must be checked at regular intervals.

So when *can* I use heat?

Stiff necks, aching shoulders etc respond well to heat.

Heat is also very good for treating sub-acute muscle strain injuries – when the main inflammation has subsided. Depending on the severity of your strain this may be a week after your injury. If you have this type of injury, contact us for more specific advice on using heat with some movement and / or gentle stretching.

Deep heat creams / sprays

Finally, a word about deep heat creams Tiger balm etc. They work on the skin's dermal layer only – they do not penetrate to muscle tissue depth. Seriously, did you think they were magic?! The 'warming effect' on the skin is created by the cream's chemicals reacting with exposure to the air. They can feel nice though – the next time you have a headache, try rubbing your temples with some Tiger balm on your fingertips and see if it alleviates it. As with all warming creams, avoid contact with eyes and mucous membranes.