After Exercise - Does an Ice Water Bath Speed Recovery?

After Exercise Recovery - Ice Bath - Contrast Water and Cold Water Immersion

By Elizabeth Quinn, About.com Guide
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After Exercise Ice Bath - Does It Help Recovery?

Taking an after exercise plunge in an ice water bath (a tub of 12 to 15 degrees Celsius ice water) is a common practice among many elite athletes as a way to recover faster, and reduce muscle pain and soreness after intense training sessions or competitions. From elite runners like Paula Radcliff to nearly all professional rugby players, the ice bath is a standard practice routine.

In addition to the ice bath, some athletes use and contrast water therapy (alternating between cold water and warmer water) to get the same effect.

So, what's behind the ice bath and does it really work?

The Scientific Theory

The theory behind ice baths is related the fact that intense exercise actually causes microtrauma, or tiny tears in muscle fibers. This muscle damage not only stimulates muscle cell activity and helps repair the damage and strengthen the muscles (muscle hypertrophy), but it is also linked with delayed onset muscle pain and soreness (DOMS), which occurs between 24 and 72 hours after exercise.

The ice bath is thought to:

• Constrict blood vessels and flush waste products, like lactic acid, out of the affected tissues
• Decrease metabolic activity and slow down physiological processes
• Reduce swelling and tissue breakdown

Then, with rewarming, the increased blood flow speeds circulation, and in turn, improves the healing process. Although there is no current protocol regarding the ideal time and temperature for cold immersion routines, most athletes or trainers who use them recommend a water temperature between 12 to 15 degrees Celsius and immersion times of 5 to 10 and sometimes up to 20 minutes.

So, while that’s the theory behind the cold water immersion for exercise recovery, conclusive research about the pros, cons and ideal time and temperatures is still a ways off.

The Scientific Research

Of the studies that have looked at the effects of ice baths, cold water immersion and contrast water therapy on exercise recovery and muscle soreness, most offer inconclusive or contradictory findings.

One study from the July 2008 issue of the International Journal of Sports Medicine found cold water immersion and contrast water therapy may help recovery from short maximal efforts, or during events like stage races where athletes repeat high-intensity efforts on successive days. In this study, researchers had cyclists complete a week of intense daily training routines. After each workout, they used one of four different recovery methods and took nine days off between each week of workouts.

The four recovery methods included:

- Immersion in a 15 degree C (59 degree F) pool for 14 minutes;
- Immersion in 38 degree C (100.4 degree F) water for 14 minutes;
- Alternating between cool and hot water every minute for 14 minutes;
- 14 minutes of complete rest.

They reported that the cyclists performed better in the sprint and time trial after cool water immersion and contrast water therapy, but their performance declined with both hot water baths and complete rest.
Another study published in the 2007 British Journal of Sports Medicine found that ice-water immersion offered no real benefit and, in fact, may increase post-exercise muscle soreness after heavy weight training. In this study the researchers compared 1-min immersions in either an ice bath (5 degrees Celsius) or a tepid bath (24 degrees Celsius) following an intense workout. They found that the athletes who used the ice baths reported no difference in physical pain measurements such as swelling or tenderness. The athletes did, however, report more leg pain the following day, when going from a sitting to a standing position than those who had the tepid water bath treatment. According to the researchers, "Ice-water immersion offers no benefit for pain, swelling, isometric strength and function, and in fact may make more athletes sore the next day."

In 2007, a study from the Journal of Strength and Conditioning Research looked at the effect of contrast water therapy on delayed onset muscle soreness after intense leg press exercise. They found a smaller reduction, and faster restoration, of strength and power in athletes using contrast water therapy than those using passive recovery.

**Real World Recommendations**

It's clear that more research is needed before a real conclusion can be made, but so far the information that is available indicates the following:

- Cold water immersion after a hard workout won't hurt and may, in fact, help recovery.
- Alternating Cold water and warm water baths (contrast water therapy) may also help athletes recover.
- Ice baths are not necessary; cold water baths (24 degrees Celsius) are as good and perhaps better, than ice baths.
- Active recovery may be as good as cold water immersion for exercise recovery.
- Passive recovery is not an effective way to recover.
- Hot baths after hard exercise may decrease recovery time.

**Cold Water Therapy - How to Do It**

**Cold Water Immersion**

If you are going to try cool or cold water immersion after exercise, don't overdo it. Ten minutes immersed in 15 degree Celsius water should be enough time to get the benefit and avoid the risks. Because cold can make muscles tense and stiff, it's a good idea to fully warm up about 30 to 60 minutes later with a warm shower or a hot drink.

**Contrast Water Therapy (Hot-Cold Bath)**

If you prefer alternating hot and cold baths, the most common method includes one minute in a cold tub (10-15 degrees Celsius) and two minutes a hot tub (about 37-40 degrees Celsius), repeated about 3 times.

Whether the science supports the ice bath theory or not, many athletes swear that an ice bath after intense training helps them recover faster, prevent injury and just feel better.

**Active Recovery**

**Low intensity exercise may be better than complete rest after competition**

By Elizabeth Quinn, About.com Guide

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After athletic competition or a hard workout, it would seem that complete rest would be the best way to encourage recovery. However, research is beginning to find some advantages in active recovery. Active recovery refers to engaging in low-intensity exercise after workouts. There are two forms of active recovery. One is during the cool-down phase immediately after a hard effort or workout. The second form of active recovery includes the days following a competition or other intense workout. Research is growing on the benefits of both types of active recovery. One study published in *Medicine & Science in Sports and Exercise* (1) found that active recovery
immediately after the event encourages recovery and reduces muscle lactate levels faster than complete rest. After hard intervals, one group rested completely while a second group exercised at 30 percent intensity between intervals. The active group reduced blood lactate levels faster and could achieve a higher power output throughout the workout.

Another study (2) found that adding low intensity exercise to the rest period after competition did not decrease an athlete's physical recovery and actually had positive effects on psychological recovery by improving relaxation.

A third study found active recovery encouraged lactic acid removal and helped speed recovery. (3) The general theory is that low-intensity activity assists blood circulation which, in turn, helps remove lactic acid from the muscle. Low-intensity active recovery appears to significantly reduce accumulated blood lactate and speed muscle recovery. However, all agree that more study is necessary to establish a clear answer regarding the best way to recover from intense exercise.

**The Bottom Line**

Active rest appears to allow an athlete to physically and psychologically recover from the stresses of training and competing while still maintaining fitness levels. It is becoming a common part of most training plans and appears to offer more benefit than harm. Consider adding a bit of easy, low-intensity exercise to your post-competition recovery plan and see if you feel better faster.

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**From Runner's World Mag.**

Injury Prevention: Staying Healthy

Ice baths are one of the most effective ways to offset the damage done on a run.

By Nikki Kimball

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Nikki Kimball, a physical therapist in Bozeman, Montana, was named USATF's Ultrarunner of the Year in 2004, 2006, and 2007.

Long runs are essential to the training distance runners because they enable the body to adapt to running greater distances safely and efficiently. Unfortunately, long runs also increase the runner's risk of injury, which can result in unplanned—and unwelcome—time off. One simple way to offset the risks inherent to long bouts of running is cold-water immersion, known to many runners as the ice bath.

Cryotherapy ("cold therapy") constricts blood vessels and decreases metabolic activity, which reduces swelling and tissue breakdown. Once the skin is no longer in contact with the cold source, the underlying tissues warm up, causing a return of faster blood flow, which helps return the byproducts of cellular breakdown to the lymph system for efficient recycling by the body. "Ice baths don't only suppress inflammation, but help to flush harmful metabolic debris out of your muscles," says David Terry, M.D., an ultrarunner who has finished both the Western States 100-Mile Endurance Run and the Wasatch Front 100-Mile Endurance Run 10 consecutive times.

Though you could use individual ice packs, cold-water immersion generally produces a greater and longer lasting change in deep tissues and is more a more efficient means of cooling large groups of muscles simultaneously. The discomfort associated with sitting in a tub full of ice water scares off some athletes. I admit that after my long runs I'd rather reward myself with a hot shower and a big plate of scrambled eggs than an ice bath. However, I have been running ultramarathons for nearly 10 years without any significant injuries, and I credit my ritual of post-workout ice baths for much of my orthopedic health.

Over those years, I've discovered tricks to make the ice bath experience more tolerable. First, I fill
my tub with two to three bags of crushed ice. Then I add cold water to a height that will cover me nearly to my waist when I sit in the tub. Before getting in, I put on a down jacket and a hat and neoprene booties, make myself a cup of hot tea, and collect some entertaining reading material to help the next 15 to 20 minutes pass quickly.

Though scientific research exists to support the use of ice baths to promote recovery, no exact protocol has been proven better than others. In general, water temperatures should be between 50 to 59 degrees Fahrenheit, and immersion time should ranges from 10 to 20 minutes. Among top runners, I see ice bath techniques that vary within and on either side of these ranges. My favorite method is the post-race soak in a cold river or lake with fellow competitors.

Runaddicts.net

Ice Bath Therapy: Speed up Recovery and Enhance Performance

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If you haven’t heard or just plain curious about Ice bath therapy, then you’re in the right place. World class athletes have adopted this practice, so begs the question, why shouldn’t you? Maybe you’ve tried it once or twice, and you didn’t see any changes at all. Well, are you sure you did it right? Ice bath recovery, when done properly and regularly, will speed up the recovery process of your body as well as improving your overall athletic performance. Ice bath therapy is ideally done in hydrotherapy pools for the best results.

Why should I take a bath with ice? It’s freezing!

Yes, it is chilling. Although most of us don’t like a cold shower, an ice bath right after an intense running session can actually do wonders for your body. It’s a fact that right after an intense activity, like a long run or a set of short sprints, your muscles experience microtrauma. These are small tears in the muscle fibers, which are perfectly normal for runners. You’re probably feeling some of it when your muscles hurt after an exhausting run, but you won’t feel every tear since they are, as the name implies, micro.

Because of the very low temperature, ice bath also becomes a great treatment for muscle soreness, strain, and inflammation. It also prevents the breakdown of muscle tissues. The cold water will stimulate muscle cells to start repairing the muscle tears.

As you immerse yourself in the ice bath, you’ll get relief from your sore muscles, let’s say your calves. The good thing about the ice bath is that your other leg muscles are also being treated in the process, like your hamstring, gluteus, and quadriceps. Thus, it gives your body optimal conditions for recovery.

How can I do it at home? I don’t have a hydrotherapy pool

You don’t have to be an owner of a five thousand dollar hydrotherapy pool for you to enjoy ice bath therapy. In fact, you’ll just need a bath tub, water, and a lot of ice packs. Here are the steps that you can take to conduct ice bath therapy at home:

Prepare a lot of ice cubes or packs

Remember that your target temperature for an ice bath is from 12° to 15° Celsius. You can make your own if you have a decent freezer, or you can buy some at the nearest convenience store.

Fill the tub with cold water before you run

Put enough water to fill up to your waists so that the whole lower body can benefit from the therapy.

Right after your run, add ice

If you have a thermometer, you should measure how cold the tub is before going in.

Slowly step in the tub and prepare for the extremely cold water

Things to remember

• Don’t stay too long in the tub

Ten minutes should be more than enough time to stay in the tub. Stay for more than
twenty and you’ll risk suffering from cold-induced muscle damage.

- **Your first few sessions will be the hardest**
  It would be a great idea if you would have something to keep you warm by your side, perhaps a cup of hot chocolate or tea. You might also want to find something to do while under ice bath therapy. You could bring a running book or a magazine with you.

- **Take a warm bath or shower around 30 minutes to an hour later**
  Muscles, along with the tissues, have a tendency to become stiff and tense in extreme cold.

- **There are times when you might want to jump out of the tub because you can’t handle the cold**
  I would suggest that you try your best to handle it. Keep yourself motivated by keeping in mind that this therapy will help your muscles recover, thus, possibly allowing you to have a better performance in your next run.

- **Extremely cold ice baths, colder than the advised temperature, could result to fainting**
  It’s always best to check the temperature from time to time. It’s also better if you let someone know that you’re in the tub with ice. Do this for safety reasons.

Now, you’re quite ready to take an ice bath. The therapy will surely help you reach your athletic goals, whatever they may be. Famous athletes will tell you that ice bath therapy works great. They believe that ice bath therapy gives them speedy recovery, and at the same time, helps in preventing injuries.

**Ice Baths Get Chilly Review**
By Nate Dougherty
On the surface, it sounds like medieval torture. Filling up a tub with ice and jumping in following a workout can bring moments of incredible pain to an athlete, but those who dare to take the dip say the feeling afterward makes the discomfort well worth it. But as the steamy summer days continue and outdoor practices and competitions pick up, new research shows that athletic trainers may want to think twice about having athletes submerge into ice water to relieve cramping muscles.

A new study suggests that ice baths—immersing muscles in icy water to prevent damage and alleviate soreness—not only fail to speed up recovery after a workout, they may actually do more harm than good. An Australian study published in the *British Journal of Sports Medicine* compared athletes who dipped into ice baths to those who used tepid baths following a workout. The result: those who used the ice baths reported more pain after 24 hours than their counterparts. Because the study relied on participants to report their level of pain—a measure difficult to quantify—some find the results don’t carry much weight. “I don't find it hard to believe that the ice doesn't have any long-term benefit, although I would question whether the ice group really did feel more pain after 24 hours than the tepid group,” John Brewer, Director of the Lucozade Sports Science Academy, told *BBC News*.

“The problem with pain is that it is subjective and very hard to measure,” Brewer continues. “And because it's subjective, there may even be a placebo effect on those who take the cold bath. It's part of their ritual, it finishes off the endurance test, and many clearly report that it makes them feel better.”

It’s not just baths to treat sore muscles that’s been questioned. When it comes to using ice baths to treat hyperthermic athletes, some research has already shown there is no significant difference between using ice and cold water. A 2002 National Athletic Trainers' Association study that looked at 17 heat-acclimated runners after a hilly run found both cold water and ice water helped bring down rectal temperatures at about the same rate.
“Given the similarities in cooling rates and rectal temperatures between ice-water immersion and cold-water immersion, either mode of cooling is recommended for treating the hyperthermic individual,” the study’s conclusion read.

The knock on ice baths, Brewer says, is that the benefits may be all in the heads of those using ice baths. After a few minutes of the painful submersion, the body overcomes the flight response and sends a rush of blood through the muscles that effectively flushes toxins like lactic acid. But for reaching deep into muscles, ice baths are also believed to be more effective than ice packs, which mainly work on surface muscles.

“When an individual removes an ice pack after the typical 20-minute application, temperatures within the muscles increase instantly,” Craig Ashley, Athletic Trainer at Saint Andrew’s School in Boca Raton, Fla., told Running Times Magazine. “Even after the conclusion of the treatment, the muscles will continue to cool.”

Much of the evidence in support of ice baths comes from the mouths of athletes themselves. Without using scientific measurements or even a full understanding of what’s going on inside their muscles, many of these athletes reach a simple conclusion—ice baths make them feel better.

“After the first few tortuous minutes I got used to the water,” writes recreational runner Mary Kay Robinson in The Bellingham Herald. “It actually started to feel good on my muscles. I drank my hot tea and cooled off in the tub for 20 minutes. I was chilled after getting out and put on a warm sweatshirt. I had to wait at least 30 minutes before taking a hot shower.

“After that wonderful shower, I ate breakfast,” she continues. “I felt great. My muscles felt fine.”

For more information on beating heat-related illness, see “Hot But Not Bothered” and “When It’s Hot” from Training & Conditioning.

Nate Dougherty is an Assistant Editor at Training & Conditioning.