

Thinking about adding the coolest new trend to your post-workout recovery regimen? We decode the latest research on cryotherapy to give you the cold, hard facts.

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COULD CRYO THERAPY

What Is Cryotherapy?

Literally “cold therapy,” cryotherapy has historically been used in medicine and dermatology, and only recently as a tool for sports recovery. In the context of recovery, cryotherapy—whether icing an injury, soaking in an ice bath, or stepping into the increasingly popular cryosauna—involves super-cooling the body to speed up recovery, and relieves post-workout pain and muscle soreness.

The trendy treatment offered at your local cryo clinic will typically have you standing in a cryosauna for 2-3 minutes, with your head out and your exposed body cooled by liquid nitrogen that is -220 to -260°F. (This version is generally referred to as whole body cryotherapy, or WBC, although it's technically not. But more on that later.)

Cryotherapy originated in Japan as a treatment for rheumatoid arthritis, and the technology was refined in the '80s. And while its application in medicine is only documented in Europe, despite glowing endorsements from the likes of LeBron James and Floyd Mayweather, the research on its benefits in the sports recovery realm is still murky at best.

“The body of research on [whole body] cryotherapy in the exercise recovery space is very green,” says Llion Roberts, PhD, Human Physiology lecturer at the School of Allied Health Sciences & Menzies Health Institute Queensland, Griffiths

University in Australia.

Kevin Kramer, co-owner and COO of US Cryotherapy in California, agrees. “The data that's there right now is probably not set up the way we would accept it in North America,” he says. “But that doesn't mean there isn't some good data there.”

Cold Reception

A lack of clinically validated data hasn't deterred enterprising clinics from setting up shop in the unregulated Wild Wild West that is the cryotherapy industry. Kramer, who has a clinical product development background, says his company was the first to bring the cryo technology to the North American market in 2011, but now, “a lot of people in the industry have gotten into opening businesses without having a background in the sciences or physiology,” he says.

Without established treatment and safety protocols, this lack of knowledge combined with inexperience has raised skepticism about the safety and effectiveness of WBC following the highly publicized death of one woman from suffocating in a nitrogen cryosauna, along with reports of skin burns, respiratory issues, lightheadedness, and other adverse reactions.

In fact, the novelty cold treatment was feeling the

heat after the FDA issued a consumer warning in 2016, stating that no WBC devices had been approved for the treatment of any medical conditions, and that it found little evidence to support claims that WBC improves blood circulation, increases metabolism, improves recovery and soreness post-workout, or relieves joint and body pain. But a search of “whole body cryotherapy” on *PubMed* generates over 500 hits, over a hundred of them clinical trials—and a small number of these have focused on WBC in athletes.

Research in Review

So what exactly does the available research have to say when it comes to WBC and exercise recovery? In 2017, the journal *Frontiers in Physiology* published a review of all the research on WBC in athletes that's been conducted since 2010. Citing 66 references, the authors concluded that most of the evidence supports WBC as an effective way to relieve the symptoms of a number of inflammatory conditions that may affect athletes. It was also found to improve post-workout recovery, and to limit (and possibly prevent) exercise-induced muscle damage.

This latest assessment contradicts a 2015 review of four studies published on the *Cochrane Database of Systematic Reviews*, which found insufficient evidence that WBC reduces self-

Stripping down and exposing your body to unfathomably frigid temps probably isn't your first instinct after a hard workout — let alone paying as much as \$100 to do it.

But for many pro athletes, fitness junkies, and biohackers, cryotherapy is the cutting-edge tool that promises faster recovery from workouts, reduced inflammation, and less muscle soreness.

But can cryotherapy really net you these admittedly chill benefits? We went straight to the experts to get the latest word on whether arctic air can boost your recovery or if you should give it the cold shoulder.

WHOLE-BODY CRYO USERS SPEND A MAX OF 2.5-3 MINUTES IN THE CHAMBER PER TREATMENT.



**SKIN SURFACE
TEMP DROPS
BY ABOUT 30
DEGREES IN LESS
THAN A MINUTE.**

MODEL: KIM BUCETA

reported muscle soreness or improves subjective recovery post-exercise in active men any better than passive rest or no WBC.

One caveat to consider with this conclusion: all four studies were based on just a few sessions, with one study maxing out at a grand total of six. “The number of sessions is crucial for WBC effectiveness,” write researchers in the latest review. They recommend a minimum of 20 consecutive sessions (and optimally 30) to fully evaluate its effectiveness.

Another key finding from a 2014 study published in *BioMed Research International*: women, despite having on average 13 percent more fat than men, actually experience a greater average temperature drop following WBC, which may need to be accounted for during treatment.

Partial Benefits

Also important to consider is that all of the studies reviewed were done on walk-in cryo chambers—picture a single- or multiple-person sound booth where the air is cooled to an ambient temperature of -110 to -150°C (that’s -166 to -240°F). The cryosaunas (or cryocabins) found in most clinics pump cold nitrogen gas directly into the unit, and since your head remains exposed (a.k.a. “open-faced”) to prevent asphyxiation, the treatment isn’t actually considered whole body, but partial body. The researchers speculate that this may affect results by activating different mechanisms in the body.

There’s also a safety concern with the uneven cooling that has to happen to compensate for the rising heat in open-face cryosaunas. According to Kramer, whose company is one of the few that markets WBC chambers that run on electricity, open-face units can be dangerous because of the direct contact with nitrogen gas. “The forced air burns that have happened have all been in nitrogen units,” he says. “And it’s because they’re blowing nitrogen on people’s feet to

“The temperature shock triggers a response that floods the bloodstream with feel-good endorphins that dull pain.”

get enough cooling in the upper half of the body, so they’re probably overcooling the bottom.”

A 2013 study published in *PLoS ONE* that compared WBC using a cryo chamber to partial body cryo (PBC) using a nitrogen unit, found that WBC was better than PBC at activating the autonomic nervous system (ANS) response that’s credited for cryo’s reputed benefits. However, since both cooling systems immediately activated the ANS, the researchers concluded that PBC may still be an effective (and more portable) alternative to WBC.

Whether you choose partial body or whole body cryotherapy, always make sure you’re working with a knowledgeable technician who won’t put you at risk.

A High-Tech Ice Bath?

So is WBC nothing more than a high-tech ice bath? Although there’s been some research comparing WBC and cold-water immersion (CWI), vocal proponents of either method will tell you that the two should not be compared. “It’s not really an icing modality, and I think people need to stop thinking of it that way,” says Kramer. “I really don’t think they understand the physiology.” In fact, few of the studies included in the 2017 review of WBC in athletes have been able to explain the mechanisms involved in the observed results.

One thing everyone can agree on, however, is that water is a much better conductor of heat than air—by a whopping 24 times!—which means it’s better at drawing heat out of

the body and bringing down the muscle, fat, and core temperature. But according to Kramer, that’s not even the goal of WBC.

“All you’re trying to do when you go into a cold chamber is activate the self-repair mechanism in the body with central nervous system activation through thermogenic shock,” he explains. The temperature shock to the skin triggers a response that floods your bloodstream with the cold-shock protein norepinephrine (a neurotransmitter with vasoconstricting and anti-inflammatory properties), feel-good endorphins that dull pain, and a host of other good chemicals, which are then rapidly circulated as blood vessels constrict and then dilate post-treatment. This whole-body parasympathetic response is responsible for rest and digestion—both critical for recovery.

Case Closed?

While the FDA and consumers wait for more convincing evidence to emerge, Kramer is committed to changing the perception of cryotherapy as just another marketing gimmick. “It’s unfortunate because there’s a lot of skepticism and a lot of misreporting and miseducation,” he says. “And the reality is, we have close to a million treatments and amazing testimonials.”

Bottom line: if you’re set on speedier recovery and reduced muscle soreness post-workout, cryotherapy can be an effective—but potentially pricey—option. As always, do your research. Find a credible clinic with experienced technicians before you brave the chill. **S**