Is "Cryo" Therapy? Or Is It an Illusionary Treatment Option?

I am writing this letter in response to a recent guest editorial that was featured in *Athletic Training & Sports Health Care* entitled: "21st Century Attacks on Cryotherapy in Sports Health Care—Clinician Beware."[1] The overall premise of the guest editorial is flatly wrong. They are trying to "shut things down" and "slow the flow" when the opposite is needed. If you follow their clinical advice (Rest, Ice, Compression, Elevation, and Stabilization [RICES]), you will trap waste in and around the damaged site, prevent the natural flow of oxygen and supplies, cause systemic disuse atrophy, and suppress tissue regeneration.

Because I wrote the book *ICED! The Illusionary Treatment Option*[2] and have spent the past decade successfully leading others out of the ice age, including thousands of physicians, physical therapists, athletic trainers, sports health care specialists, and strength/conditioning coaches who work directly with professional, tactical, collegiate, and other elite athletes, I feel compelled to contact you regarding the misnomer "cryotherapy." In total, more than 1 million people have heard my anti-ice message from *ICED!* and the related podcasts, articles, radio interviews, presentations, and one-on-one conversations.

Although the guest editorial provides a long list of references from which they cherry-picked various bits of marginally relevant data points, the authors failed to mention any of the systematic reviews available on PubMed and conducted in the past 20 years that all came to the same general conclusion: "There is insufficient evidence to suggest that cryotherapy (icing) improves clinical outcome,"[3] "Ice is commonly used after acute muscle strains but there are no clinical studies of its effectiveness,"[4] and "Many more high-quality trials are needed to provide evidence-based guidelines in the treatment of acute soft tissue injuries."[5] They also omitted or dismissed critical references suggesting that icing damages skin, nerves, and muscles, as well as many references to the disadvantages of "stillness."

One thing they did get right was their statement that: "Cryotherapy does not eliminate the inflammation process following an acute orthopedic soft tissue injury, nor does it stop hemorrhaging or eliminate swelling or edema. Applying cold immediately followed by heat does not produce a vasoconstriction and vasodilation response, which is often thought to be responsible for removing edema." This statement is completely accurate (albeit plainly obvious) and destroys their own argument in favor of icing.

Oddly, the authors declared a need for more "research" despite 40 years of widespread use and tens of millions of individual treatments. The benefits of icing cannot be shown simply and precisely because there are none! No amount of hoping by the icers can change the facts of the healing process, lymphatic propulsion, and the hemostatic process. For some reason, the icers just will not give it up and recognize that icing is wrong. Good grief, no more research is needed! In addition, just to make a mockery of their own argument, they admit that there is no way to build a standardized protocol because of individual treatment modes and patient characteristics. Again, this both states the obvious and invalidates any remaining anecdotal beliefs. The "ice age" is over!

So, what is my message? Well, for a detailed version, please visit www.GaryReinl.com, listen to one of my many podcast interviews available online, or I am happy to come to your office and present live. But for the purposes of this letter, here is the short version:

I always begin with this question: what are you trying to do? I do not recall anyone ever disputing this essential goal: prevent further loss and regenerate that which has been destroyed. With the goal plainly understood, I then list the three main culprits that drive further loss and the two main factors that enable regeneration:

1. Congestion that suffocates otherwise perfectly healthy cells that were not involved in the initial trauma;
2. Disuse atrophy;
3. Adhesions that limit movement;
4. Rebuilding the vascular network in and around the damaged site;
5. Reducing myostatin.

I then ask: do you believe that sitting still with a bag of ice tightly secured to the injured area while simultaneously sticking it up in the air will decongest the area in and around the damaged site, prevent disuse atrophy, remodel the repaired tissue, prompt the rebuilding of the related vascular network and reduce myostatin? So far, no one has ever said "yes."

I immediately follow up by asking: do you believe it's a good idea to trap waste in and around the damaged site and prevent the natural flow of oxygen and supplies (eg, the consequence of RICE)? So far, no one has ever said "yes."

Finally, I ask: will you ever use the RICE protocol again? So far, no one has ever said "yes!"

At that point I'm often asked: "Since RICE is wrong. . .what is right?"

That question always takes me back to my competitive athletic days. Whenever anyone got hurt, rolled an ankle, or got hit by a pitch, the coach always yelled something like: "Walk it off! Don't sit still or it will tighten up! Keep moving it!" Funny, I can still picture my coach as I write this! No one ever mentioned why it worked nor did we ask, we just all knew it did.

In 2020, we now understand that the related muscle activation stimulates the passive lymphatic system and the waste naturally "drains" from in and around the damaged site. Essentially, it is like milking a cow backwards. By the way, that is precisely the reason why the RICE protocol does not milk the cow backwards! Stillness is the enemy.

There is no doubt that walking it off, whether "naturally" (including the use of muscle activation techniques such as ankle pumps) or electronically with an electric muscle stimulator (when doing so naturally is impractical) is the key to decongesting the area in and around the damaged site; but that is NOT the end of the story. By design, the same muscle activation that milks the cow backwards simultaneously prevents or retards disuse atrophy. Moreover, that same muscle activation that stimulates the passive lymphatic system and prevents or retards disuse atrophy simultaneously remodels the repaired tissue (expert guidance recommended). Further, the same muscle activation that stimulates the passive lymphatic system, prevents or retards disuse atrophy, and remodels repaired tissue simultaneously prompts the rebuilding of the related vascular network (angiogenesis).

By now, my audience usually recognizes that the same muscle activation that decongests the area in and around the damaged site prevents or retards disuse atrophy, remodels the repaired tissue, and prompts the rebuilding of the nearby vascular network simultaneously reduces myostatin. I once had a physician say to me that I make it sound too simple. I quickly responded: "Doc, it had to be simple or we'd all be dead. Imagine if the details above required five different stimuli—one to decongest, one to prevent or retard disuse atrophy, one to remodel the repaired tissue, one to rebuild the related vascular network, and still another to reduce myostatin."

Still, even when all other allegedly beneficial claims about icing have been refuted, the die-hard icers always ask about pain control. And there is no doubt that ice is often used to provide temporary relief. But it doesn't address the cause of the pain and often causes additional harm, especially when it is used as "needed." I liken the use of ice to control pain to the sympathetic bartender who gives the alcoholic a drink so he can temporarily feel better: Did it work? Maybe. Did it solve the problem? No. Did it makes things worse? Probably.

Consider this, if you had a nasty splinter in your finger would you want to numb it with ice or take the splitter out? How about if you rolled your ankle and it was badly swollen and was various shades of purple, yellow, red, and blue—would you rather make it numb it or "take" the swelling out? Like removing the splinter, if you take the swelling out (eg, decongest the area in and around the damaged site via your passive lymphatic system either naturally or electronically), you will have less pain, less healthy cell death, less atrophy, and more function, and you will have a less obstructed path to recovery. Remember, stillness is the enemy. If, after your efforts to decongest the area in and around the damaged site you still feel that you need pain relief, don't reach for the ice. There are safer, less restrictive, more effective, and easier to administer and regulated ways to control pain (neuromuscular electric stimulation is good place to start). And those who use ice to mask pain to "exercise" should think twice before they ice or reach for any other numbing agent. Those signals are needed to alert you to harmful movement!

So no, "cryo" is NOT therapy. It is, always has been, and always will be an illusionary treatment option!

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