MERCOLA
Take Control of Your Health

Near-Infrared Sauna Therapy — A Key Biohack for Health

Analysis by Dr. Joseph Mercola Fact Checked | October 16, 2022

STORY AT-A-GLANCE

- Near-infrared saunas provide benefits you simply can't get from a conventional sauna or even far-infrared sauna
- For all its benefits, a downside of the traditional Finnish sauna is that it offers little or no clinically insignificant amounts of infrared exposure. Conventional electrical sauna heaters and far-infrared saunas are also plagued by high EMF
- Far-infrared saunas claiming to be low-EMF or EMF-free typically have very high electric fields; only the magnetic fields have been mediated. Electric fields are a potent oxidative stressor
- Photobiomodulation (PBM) refers to the use of near-infrared light to heal and repair degenerate and damaged tissue and cells, and also optimize healthy tissue. Additionally, far-infrared has no PBM benefits
- Near-infrared exposure produces melatonin — a potent antioxidant — in your mitochondria, where it is most needed. Near-infrared also structures the water around your cells, and penetrates several inches into your body, far deeper than far-infrared

Sauna therapy is one of my absolute favorite biohacks, as it provides so many crucial health benefits. I detailed many of them in "The Stunning Health Benefits of Sauna Therapy," so I won't dive too deep into that here.

Instead, this discussion with repeat guest Brian Richards, founder of SaunaSpace, will focus on the differences between traditional Finnish saunas, conventional infrared

saunas and near-infrared saunas, and why near-infrared exposure is so important.

The basis of the traditional Finnish sauna, which has been extensively studied, is a room that has a heater of some sort that can reach air temperatures of 170 degrees Fahrenheit. The next-gen infrared saunas that SaunaSpace produces include high amounts of near-infrared, which provides benefits you can't get from a conventional sauna or even far-infrared sauna.

The first near-infrared electric sauna was invented in 1891, shortly after the advent of the incandescent light bulb in 1887. Dr. John Harvey Kellogg invented what's called the electric incandescent light bath. He used a Victorian style cabinet decked out with an array of incandescent light bulbs.

He knew there was something special about the light, and was convinced it might produce a better sauna. Today, scientists have confirmed the photobiomodulation benefits Kellogg intuited.

The Drawbacks of Most Commercial Saunas

For all its benefits, a downside of the traditional Finnish sauna is that it offers little or no clinically insignificant amounts of infrared exposure. Richards explains:

> *"The sun is 43% near-infrared, and from a photons-per-second perspective, it's like 70% photons per second of near-infrared. So, if you're not somewhere close to that, you're not in that ancestral context of what's biologically relevant and what we've evolved to get. There is a little bit from these lower energy infrared sources, but not nearly what you get from the incandescent bulb."*

Another problem with conventional electrical sauna heaters is the presence of electromagnetic fields (EMFs), especially electric fields. Electric fields in any unsealed wiring are significant, and when you're talking about an electrical heater that uses 20 or 30 amps, that's a lot of voltage in an unshielded scenario.

Electric fields travel through water, humidity and air, which is why they're so pervasive in homes. When these fields reach your body, they increase your body's voltage. Most far-infrared saunas are also plagued by high EMF.

> *"In my personal testing of those, they all tend to be high electric field and high magnetic field, especially how you sit in those,"* Richards says. *"Your back is usually a very close proximity to the ceramic heater itself. You're within that magnetic field. Then, without using shielded technology, you are exposing yourself to electric fields — both in the Finnish electric hot rock sauna, and in the traditional far infrared sauna."*

'EMF-Free' Is Usually a Lie

If you've been shopping for a sauna, you've probably come across some that claim to be low-EMF or EMF-free. However, this is a half-truth at best. While many sauna makers have effectively mitigated the magnetic fields, bringing them within biologically reasonable levels, they've not mitigated the electric fields.

> *"I've measured many brands over time, and you're right. The far-infrared style of sauna comes in a couple different forms. The most obvious one is the cabinet style that looks like a traditional Finnish sauna, but there's ceramic tub emitters, or black carbon panels in the walls. All the ones I've seen have high magnetic fields and high electric fields.*
>
> *There is one company that I measured with Brian Hoyer. We were together at a conference, and it was low in magnetic field, which was great. But the electric fields were through the roof. They were hundreds of millivolts into the volts range. It was like 10 volts. That's a lot. So that's my experience too, especially with the style that's a little more portable, where your head sticks out.*
>
> *So, they all have issues. Even the ones where they've managed to minimize the amount of magnetic field, they all seem to have electric field issues.*

Furthermore, they don't offer any protection from the ambient electromagnetic stress that's in the environment.

That's why, for example, one of the products that I offer has a Faraday liner system that protects you from the ambient electric field. I worked really hard to provide that sort of solution. You don't see that in any of these infrared products, or Finnish saunas either, but I don't like to disparage any companies. I think there are some great products out there.

At the end of the day, I think if you sweat, and you get that sweat response, you get that elevated core temperature increase, you're getting great benefit. But to be exposed to the oxidative stress of EMF during the session, for me, it's not ideal. That would be like meditating in a polluted environment."

The Benefits of Photobiomodulation

Photobiomodulation (PBM) is a fancy term for ascribing the biological benefits of light exposure to the human body and optimizing that. Richards further defines PBM as "the use of near-infrared light to heal and repair degenerate and damaged tissue and cells, and also optimize healthy tissue."

The reason this is so important is because most people in the West spend woefully little time outside in the sun, and when they do, they typically wear shirts and pants. There is no doubt in my mind that this is a prescription for health disaster. You cannot violate one of our most pervasive ancestral practices, which is being outside regularly for long periods of time, without significant biological consequences.

To get photobiomodulation benefits from your sauna, it needs to use incandescent heat lamps that produce the majority of the heat as near- and mid-infrared, and a significant percentage of near- and mid-infrared frequencies, which is what SaunaSpace provides.

Near-Infrared Produces Subcellular Melatonin

As mentioned, 43% of the light coming from the sun is near-infrared, and a key benefit of near-infrared is that it increases melatonin in your mitochondria (subcellular melatonin). In the past, we thought almost all melatonin was produced in your pineal gland, but that's actually only 5% of your body's melatonin production; 95% of it occurs in your mitochondria, in response to near-infrared.

> **“Not only are you getting the detox and heat shock proteins that you get from any sauna, but a near-infrared sauna will also boost your mitochondrial function and energy level, and decrease damage to your cells, DNA, cell membranes, proteins and stem cells.”**

I believe this is the biggest benefit of using a PBM-capable sauna, as it will radically decrease oxidative stress, thereby lowering your risk of most chronic diseases. So, not only are you getting the detox and heat shock proteins that you get from any sauna, but a near-infrared sauna will also boost your mitochondrial function and energy level, and decrease damage to your cells, DNA, cell membranes, proteins and stem cells.

In addition to being a direct scavenger of free radicals, melatonin also catalyzes the production of other antioxidants, such as glutathione peroxidase, glutathione reductase, catalase and superoxide dismutase, all of which quench oxidative free radicals in your mitochondria. As discussed in the interview, near-infrared also structures the water around your cells, which is another phenomenal benefit. Richards adds:

> *"It's a question of more bang for your buck. It's the dual therapy together. We don't have to belabor necessarily the benefit of sauna. It's essentially increasing your health span. [It] increases the years of your life that you're really healthy and it reduces your risk of dying of all things. So, it's really great, and everybody should be doing sauna.*

But then if you look at photobiomodulation ... you're using [near-infrared] light to heal damage and also optimize what's there. If you look at the spectrum of the sun, 43% is near-infrared. If you add in red, over 50% is in this photobiomodulation range. That photobiomodulation is light controlling biology, but in this case, it's all about near-infrared light activating healing and repair biology in the body ...

It's repairing damaged tissue. It's improving protein function. It has antiaging effects in the cells in the DNA and the epigenetics, and it's boosting and modulating the immune system. People are using it for inflammation reduction, for inflammation reduction.

So, if you look at the list of photobiomodulation [benefits] and the list of sauna [benefits], there's so much overlap that it's like, wow, these are probably the two most powerful things you could do for your health.

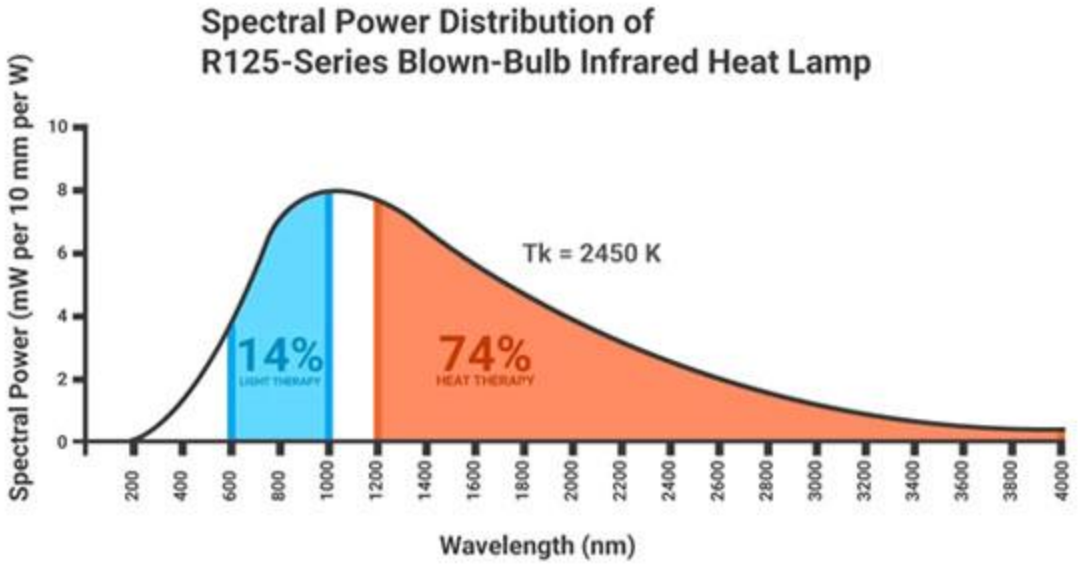
Especially here in the Northern hemisphere in the Western culture, we have the highest incident of cardiovascular disease, cancer ... neurodegenerative diseases like MS, Alzheimer's and dementia. Both of these therapies, this near-infrared therapy and the sauna therapy, appear to be quite beneficial for neurodegenerative diseases ... So, why would you not do sauna that way?

It comes down to the form of the light. A couple other things to note about sunlight: It's not just that a majority is near-infrared. It's also not so much far-infrared. If you look at the spectrum of the sun, it's only about 3% far-infrared. So, we don't have much historical exposure to it.

One could argue, maybe from an evolutionary perspective, that's why our mitochondria have not evolved to harness that. They're designed to harness the No. 1 stimulus, which is the near-infrared portion."

The SaunaSpace Light Spectrum

The bulbs used in the SaunaSpace saunas are 250 watt incandescent thermal light bulbs that put out 39% near-infrared, which is close but not identical to what you get from sunlight. There's no blue light, no ultraviolet and very little red. So, most of the light is in the near-infrared and mid-infrared (about 40% each), plus 15% far-infrared.



Near-Infrared Penetrates Far Deeper Into Your Body

While one of the selling points of infrared saunas is that far-infrared penetrates deeper into your body, this actually isn't the case. Near-infrared has far greater penetration power. Richards explains:

> *"The radiant heat benefits come from the body absorbing light through water absorption. Water absorption starts in near-infrared at 980 nanometers at the first overton of water, but then increases very quickly, so that once you're into the mid-infrared spectrum, 1,500 to 3,000 nanometers or so, you're getting strong water absorption. That's a really effective way to radiantly heat the body ...*
>
> *Infrared A, aka, near-infrared, is much better for heating biological tissue because of tissue penetration. That's because water begins to absorb light in the near-infrared region, but not a 100%. As you proceed into the mid-infrared*

and the far-infrared, water absorption increases. One of the protective mechanisms of our body is the chromophore, that is, water. It absorbs light in different ways.

Near-infrared light tends to penetrate several inches into the body. There's actually one NASA study that showed water-filtered near-infrared penetrated like 20 centimeters into the body — 5, 6 or 7 inches. But on average, it's several inches of penetration.

Once you get out to this long wavelength, low energy infrared called far-infrared, which starts at about 3,000 and greater nanometers, the tissue penetration is a fraction of an inch. It's a millimeter or a few millimeters.

We're talking about the average photons that go into the body. So, with near-infrared, on average, there are some photons that are absorbed by water in the skin, but then others go in and get absorbed by water in the liver, deep in the body. Others hit the mitochondrial light receptor protein and activate photobiomodulation.

So, every second that you're exposed to millions of near-infrared photons, you're getting a radiant, deeper penetrating heat that heats you from within and raises core body temperature more quickly. Because you're not just relying on the hot air around you.

The most effective way to heat biological tissue is using a near-infrared centric light source ... and using light to heat the body via radiant heating will always be more efficient than using just hot air or contact with water, like a hot tub or a bath ... And, I would say you don't get photobiomodulation from far-infrared wavelengths, period. There's no photobiomodulation effect. It's just heat."

Basic Recommendations

Classical Finnish saunas are typically heated to 170 degrees F. or higher. An infrared sauna will rarely get that high, however, which means you may need to stay in a bit

longer in order to get a good sweat.

A benefit of SaunaSpace's near- and mid-infrared bulbs is that you're heating up from deeper within, so the air temperature doesn't need to be as high as a traditional sauna in order for you to sweat. Richards recommends starting out with a four-bulb system and build up from there with an additional two-, three- or four-bulb panel as you acclimate.

> *"The core panel is four 250-watt bulbs. That's 1,000 watts. We're bringing back a three-bulb system which would make it 1750 watts when combined with the four-bulb system. This is about 14.5 amps. It's just under the 15-amp threshold for the standard household breaker. So, the seven-bulb system can be plugged in anywhere, more or less, in any standard home electrical circuit.*
>
> *You could potentially use an eight-bulb system, but it requires a 20-amp dedicated circuit. That's not so common throughout homes. You see that in kitchens and baths. You can swap [the circuit] out ... but again, it's also something that you can achieve through just staying in a little longer."*

Two ways to check whether your sauna is hot enough are:

- Measure your water loss by weighing yourself, naked, before and after the sauna. A 1- to 2-pound loss is normal
- Take your oral temperature right after your sauna. A 3- to 5-degree increase from baseline is good, or somewhere in the 101- to 103-degree range

Richards recommends staying in the sauna for 20 to 30 minutes, or until you reach subjective fatigue, which is a sign that you've maxed out the benefits you're going to get. It's not about reaching a point of suffering — just that point where you're feeling mildly anxious and tired and want to get out.

As for the frequency, research has consistently shown that it's dose-dependent, so the more often you do it, the greater the benefits. The sweet-spot seems to be right around four times a week, because you'll also be losing minerals along with toxins. So, you need to rehydrate and replenish those minerals.

How to Make Your Own Sauna

If you already have an infrared sauna, you can turn it into a near-infrared one by removing the bench and installing the SaunaSpace bulb panels. I described how to do this in "**The Stunning Health Benefits of Sauna Therapy**."

> *"You can also do that in any enclosed space, such as a small closet,"* Richards says. *"We offer a shower conversion kit. It really doesn't matter what the enclosure is. It is just a space that needs to be enclosed, the smaller, the better, as long as it's big enough to allow for the 2-foot clearance from the bulbs and, ideally, the ability to rotate.*
>
> *Our panels are about 9 inches deep plus 2 feet of clearance from the chest to the panel. So, you need something that's at least 4 feet deep at the minimum.*
>
> *That's why it's really nice to take the bench out in the standard far infrared sauna and either get one of our stools or purchase a seat of your own, and do the near-infrared sauna protocol, which is a quarter turn rotation about every five minutes."*

To learn more about the health benefits of sauna, the SaunaSpace light technology and the dangers of EMF, check out **SaunaSpace.com**'s learning space and research archive.