

Sauna Use as an Exercise Mimetic for Heart Health

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✓ Fact Checked

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STORY AT-A-GLANCE

- › Sauna bathing can be used as an exercise mimetic (i.e., an exercise-mimicking tool) to increase your longevity and health span. Men using Finnish-style, dry heat sauna seven times per week cut their risk of death from fatal heart problems in half, compared to those who used it only once a week
- › Compared to once-a-week sauna use, those who have four to seven sessions per week have a 61% lower risk for stroke. Heat stress from sauna bathing has also been shown to lower your risk of high blood pressure
- › Heat stresses your heart and body similar to that of exercise, and produces many of the same results. As your body is subjected to heat stress, it gradually becomes acclimated to the heat, prompting a number of beneficial changes and adaptations
- › Recent research has demonstrated that sauna bathing also helps modulate your autonomic nervous system, which governs your stress responses
- › Many of the life extending benefits of sauna bathing are related to the workings of heat shock proteins, which protect protein structures and prevent protein aggregation

When it comes to improving your health, some of the simplest strategies can have a tremendous impact. Sweating in a sauna, for example, has many great health benefits, including expelling of toxins, improving blood circulation, killing disease-causing microbes and improving mitochondrial function.

The key word here is sweating. Just because you are in the sauna doesn't mean you get the benefits. The sauna has to heat your core temperature up a few degrees, your heart rate needs to increase and you need to have a river of sweat, otherwise you simply will not get these benefits. This is important as many infrared saunas fail to heat you sufficiently to achieve these benefits.

Research has even shown that regular sauna use correlates with a reduced risk of death from any cause, including lethal cardiovascular events, and may help stave off Alzheimer's disease and dementia.

For example, researchers in Finland — a country where most homes come equipped with a sauna — found that men who used a sauna four to seven times a week for an average of 15 minutes had a 66% lower risk of developing dementia, and 65% lower risk of Alzheimer's, compared to men who used the sauna just once a week.^{1,2}

How Sauna Bathing Promotes Good Heart Health

Another long-term study³ by the same Finnish research team, published in JAMA Internal Medicine in 2015, revealed that men who used the Finnish-style, dry heat sauna seven times per week also cut their risk of death from fatal heart problems in half, compared to those who used it only once a week.

This held true even after confounding factors such as smoking, blood pressure, cholesterol and triglyceride levels were factored in. In regard to time, the greatest benefits were found among those who sweated it out for 19 minutes or more each session.

Both the duration and the frequency had dose dependent effects, so the longer the exposure time of each session and the more frequent the sessions, the better the outcome.

One mechanism for this effect is thought to be related to the fact that heat stresses your heart and body similar to that of exercise, thus prompting similar effects. This includes increased blood flow to your heart and muscles (which increases athletic endurance)

and increased muscle mass due to greater levels of heat-shock proteins and human growth hormone (HGH).

In the video lecture^{4,5} above, Rhonda Patrick, Ph.D., reviews how sauna bathing can be used as an exercise mimetic (i.e., an exercise-mimicking tool) to increase your longevity and health span. As noted by Patrick:⁶

“Several studies have shown that frequent sauna bathing (4-7 times per week, 174°F for 20 min.) is associated with a 50% lower risk for fatal heart disease, 60% lower risk for sudden cardiac death, 51% lower risk for stroke, and 46% lower risk for hypertension.

Just a single sauna session has been shown to lower blood pressure, improve heart rate variability, and improve arterial compliance. Some of the positive benefits of the sauna on heart health may have to do with similar physiological changes that also occur during physical exercise.

For example, there is a 50-70% redistribution of blood flow away from the core to the skin to facilitate sweating. You start to sweat. Heart rate increases up to 150 beats per minute which correspond to moderate-intensity physical exercise.

Cardiac output (which is a measure of the amount of work the heart performs in response to the body’s need for oxygen) increases by 60-70%. Immediately after sauna use, blood pressure and resting heart rate are lower than baseline similar to physical activity.”

What Studies Show

Patrick reviews several studies in her lecture. In addition to those already mentioned, a study⁷ published in 2018, using the same Finnish cohort, looked specifically at stroke risk over a follow-up period of 14.9 years. As in previous studies, benefits were dose dependent.

Compared to once-a-week sauna use, those who had four to seven sessions per week had a 61% lower risk for stroke. A similar association was found for ischemic stroke but not for hemorrhagic stroke. As noted by the authors:

“This long-term follow-up study shows that middle-aged to elderly men and women who take frequent sauna baths have a substantially reduced risk of new-onset stroke.”

Heat stress from sauna bathing has also been shown to lower your risk of high blood pressure. In one such study,⁸ which had a median follow-up of 24.7 years, the hazard ratio for high blood pressure in those using the sauna two to three times a week was 0.76, compared to 0.54 for those using it four to seven times a week.

In other words, using it two to three times a week may lower your risk of high blood pressure by 24%, while using it four to seven times a week can push your risk down by 46%, and this is likely one of the mechanisms by which sauna bathing helps lower your cardiovascular mortality risk.

Even a single sauna session has been shown to reduce pulse wave velocity, blood pressure, mean arterial pressure and left ventricular ejection time.⁹ Here, systolic blood pressure decreased from an average of 137 mm Hg before sauna bathing to 130 mm Hg afterward. Diastolic blood pressure decreased from 82 to 75 mm Hg, mean arterial pressure from 99.4 to 93.6 mm Hg and left ventricular ejection time from 307 to 278 m/s.

Different Types of Saunas

Most studies on sauna use involve wet Finnish saunas. Traditionally, rocks are heated to a temperature of about 174 degrees Fahrenheit in a wood burning stove, and water is then poured on the rocks to create steam.

But there are several other types of saunas to choose from as well, including far-infrared saunas and near-infrared emitters and lamps.¹⁰ Most sauna makers would have you believe that the difference between an infrared sauna and the traditional Finnish-style

saunas (whether wet or dry) is that the Finnish-style sauna heats you up from the outside in, like an oven.

But this is simply untrue. The wavelengths of a far-infrared sauna only penetrate a few millimeters, so if you have a far-infrared sauna, unless the temperature in the sauna is around 170 degrees F, it is unlikely you will be getting many benefits.

That said, near-infrared saunas have several additional benefits over other types of saunas, including far-infrared saunas. For starters, it penetrates your tissue more effectively than far-infrared because wavelengths under 900 nanometers (nm) in the near-infrared are not absorbed by water like the higher wavelengths in mid- and far-infrared, and thus can penetrate tissues more deeply.

When you look at the rainbow spectrum, the visible part of light ends in red. Infrared-A (near-infrared) is the beginning of the invisible light spectrum following red. This in turn is followed by infrared-B (mid-infrared) and infrared-C (far-infrared).

While they cannot be seen, the mid- and far-infrared range can be felt as heat. This does not apply to near-infrared, however, which has a wavelength between 700 and 1,400 nm. To learn more about this, see my interview with Dr. Alexander Wunsch, a world class expert on photobiology.

Near-Infrared Radiation Is Important for Optimal Health

My personal sauna preference is the near-infrared, as this range affects your health in a number of important ways,¹¹ primarily through its interaction with chromophores in your body. Chromophores are molecules that absorb light, found in your mitochondria and in water molecules. (To make sure the near-infrared rays can penetrate your skin, avoid wearing clothing when using a near-infrared sauna.)

In your mitochondria, there's a specific light-absorbing molecule called cytochrome c oxidase (CCO), which is part of the mitochondrial electron transport chain and absorbs near-infrared light around 830 nm. CCO is involved in the energy production within the mitochondria. Adenosine triphosphate (ATP) – cellular energy – is the end product.

ATP is the fuel your cells need for all of their varied functions, including ion transport, synthesizing and metabolism.

Most people don't realize that light is an important and necessary fuel just like food. When your bare skin is exposed to near-infrared light, CCO will increase ATP production. Near-infrared light is also healing and repairing, and helps optimize many other biological functions. (Its absence in artificial light sources like LEDs and fluorescents is what makes these light sources do dangerous to your health.)

We now know that mitochondrial dysfunction is at the heart of most health problems and chronic diseases, including many signs of aging. For these reasons, I strongly recommend using a sauna that offers a full spectrum of infrared radiation, not just far-infrared.

Just keep in mind that most infrared saunas emit dangerous electromagnetic fields (EMFs), so look for one that emits low or no non-native EMFs. You need to look beyond their claim and measure them, as many state they have no EMF but have only addressed magnetic fields and still generate off the chart electric fields. Ultimately, you need to independently validate any claims, as some of the biggest names in the business are doing this.

The near IR sauna I use and highly recommend is made by Sauna Space and I use every day I am at home. It has lower EMFs than ANY electrically heated far IR sauna. While some far IR saunas do have relatively low magnetic fields around 1 mG, they are still higher than Sauna Space. But any electric heater far IR sauna has very high electric fields while Sauna Space has zero.

If you already have a far IR sauna you use it as enclosure and just purchase the Sauna Space bulbs which are far less expensive.

Far-Infrared Sauna Benefits Chronic Heart Conditions

All of that said, in her lecture, Patrick discusses the benefits of Waon Therapy or far-infrared dry sauna, which has been used in some studies. Far-infrared saunas typically

have a max temperature of about 140 degrees F (60 degrees Celsius). Because it's not as hot, the recommended duration is typically around 45 minutes, and the frequency is daily. Two studies looking at Waon Therapy for heart health include:

- A 2016 study¹² that found Waon therapy was helpful for the management of chronic heart failure, improving endurance, heart size and overall status in hospitalized patients with advanced heart failure.

Patients used the far-infrared dry sauna, set at 140 degrees F, for 15 minutes a day for 10 days. Each session was followed by bed rest for 30 minutes, covered with a blanket.

- An earlier study,¹³ published in 2013, found Waon therapy improved myocardial perfusion in patients with chronically occluded coronary artery-related ischemia. Patients used the far-infrared dry sauna, set at 140 degrees F, for 15 minutes a day for three weeks. Each session was followed by bed rest for 30 minutes, covered with a blanket.

The best results were seen in patients with the highest summed stress score and summed difference score at baseline. The improvements were attributed to improved vascular endothelial function, and according to the authors, Waon therapy “could be a complementary and alternative tool in patients with severe coronary lesions not suitable for coronary intervention.”

How Your Body Responds to Heat

As mentioned, one of the reasons sauna bathing improves health has to do with the fact that it mimics the stress your body undergoes during exercise. While “stress” is typically perceived as a bad thing, intermittent stressors such as exercise and temporary heat stress actually produces beneficial physiological changes.

As explained by Patrick, once your core temperature reaches 102.2 degrees F (39 degrees C), blood is redistributed away from your core toward the surface of your skin to

facilitate sweating. You can easily get an inexpensive ear thermometer to measure and confirm that your temperature is reaching this level.

Your heart rate increases from about 60 beats per minute to about 150, equivalent to moderate intensity exercise, and your cardiac output increases by 60% to 70%. This process is the same whether your core temperature is raised by exercise or sitting still in a sauna.

As demonstrated in a June 2019 study,^{14,15} spending 25 relaxing minutes in a sauna has the same physical effects as bicycling on a stationary bike with a load of 100 watts for 25 minutes. Heart rate and blood pressure were found to be identical for both activities, with blood pressure and heart rate increasing during the sessions, followed by a drop below baseline levels afterward.

This prompted the researchers to conclude that “The acute heat exposure in the sauna is a burden comparable to moderate physical exercise,” and that “The sustained decrease in blood pressure after heat exposure suggests that the sauna bath will have a beneficial effect on the cardiovascular system.”¹⁶

Sauna Bathing Improves Autonomic Nervous System Balance

Recent research¹⁷ has also demonstrated that sauna bathing helps modulate your autonomic nervous system, which governs your stress responses.¹⁸ To examine the acute effects of a sauna session, the researchers looked at the participants’ heart rate variability (HRV), which is an indicator of your body’s capacity to respond to stress.

Your autonomic nervous system has two branches: the parasympathetic branch (“rest and digest”) and the sympathetic branch (“fight or flight”). HRV is an indicator for how these two branches are functioning. Higher HRV means your body is better equipped to handle stress. As reported in the abstract:

“A total of 93 participants ... with cardiovascular risk factors were exposed to a single sauna session (duration: 30 min; temperature: 73 °C; humidity: 10-20%) and data on HRV variables were collected before, during and after sauna.”

Time and frequency-domain HRV variables were significantly modified by the single sauna session, with most of HRV variables tending to return near to baseline values after 30 min recovery. Resting HR [heart rate] was lower at the end of recovery (68/min) compared to pre-sauna (77/min).

A sauna session transiently diminished the vagal component, whereas the cooling down period after sauna decreased low frequency power and increased high frequency power in HRV, favorably modulating the autonomic nervous system balance.

This study demonstrates that a session of sauna bathing induces an increase in HR. During the cooling down period from sauna bathing, HRV increased which indicates the dominant role of parasympathetic activity and decreased sympathetic activity of cardiac autonomic nervous system.

Future randomized controlled studies are needed to show if HR and HRV changes underpins the long-term cardiovascular effects induced by regular sauna bathing.”

Sauna Bathing Improves Longevity

Seeing how sauna bathing protects and improves heart and vascular health and lowers your risk of Alzheimer's, it's no major surprise to find that it also increases longevity. In fact, it's precisely what you'd expect.

The 2015 JAMA Internal Medicine study¹⁹ mentioned earlier in this article also looked at all-cause mortality, in addition to sudden cardiac death, fatal coronary heart disease and fatal CVD.

Sauna bathing four to seven times a week lowered all-cause mortality by 40% after taking into account confounding factors such as age, blood pressure, smoking and other variables, while two to three sessions per week lowered it by 24%.

Table 2. Hazard Ratios of Sudden Cardiac Death, Fatal Coronary Heart Disease, Fatal Cardiovascular Disease According to the Frequency of Sauna Bathing

Frequency of Sauna	Sudden Cardiac Death (n = 190)*		Fatal Coronary Heart Disease (n = 281)		Fatal Cardiovascular Disease (n = 407)
	Hazard Ratio (95% CI)	P Value	Hazard Ratio (95% CI)	P Value	Hazard Ratio (95% CI)
Age-Adjusted Hazard Ratios					
1 Time per week (n = 601)	1 [Reference]		1 [Reference]		1 [Reference]
2-3 Times per week (n = 1513)				.01	0.68 (0.55-0.84)
4-7 Times per week (n = 201)				.04	0.55 (0.36-0.85)
P value for trend					<.001
Multivariable-Adjusted Hazard Ratios*					
1 Time per week (n = 601)	1 [Reference]		1 [Reference]		1 [Reference]
2-3 Times per week (n = 1513)	0.78 (0.57-1.07)	.12	0.77 (0.60-0.99)	.04	0.73 (0.59-0.89)
4-7 Times per week (n = 201)	0.37 (0.18-0.75)	.006	0.52 (0.31-0.88)	.01	0.50 (0.33-0.77)
P value for trend	.005		.005		<.001

Source: [JAMA Internal Medicine 2015;175\(4\):542-548, Table 2](#)

How Sauna Bathing Increases Longevity

As explained by Patrick, the life extending benefits of sauna bathing are related to the workings of heat shock proteins, which respond to stress (be it heat stress, exercise or fasting) by:

- Protecting protein structures, i.e., maintaining their proper three-dimensional properties inside your cells, which is crucial for their proper function
- Preventing protein aggregation (which is a hallmark of neurodegenerative diseases such as Alzheimer's, Parkinson's and Huntington's)
- Slowing muscular atrophy

Heat shock proteins have also been shown to play an important role in human longevity. Patrick cites a 2010 study²⁰ showing the heat shock protein 70 (Hsp70) gene plays a functional role in human survival and life extension.

This makes sense considering Hsp70 is an anti-inflammatory protein involved in cellular maintenance and repair mechanisms. So, whether you have one copy, two copies or are a non-carrier can influence your longevity.

If you are not one of the lucky carriers of this allele, you can boost your survival range by taking regular saunas, as it increases your heat shock proteins regardless. According to Patrick, heat shock proteins stay elevated for up to 48 hours after you've finished your sauna.

Another way by which sauna bathing increases longevity (and health span) is by lowering systemic inflammation, which not only plays a significant role in the aging process but also underpins virtually all chronic diseases that ultimately take a toll on life span. Sauna use has also been shown to increase anti-inflammatory biomarkers, such as IL-10.²¹

In one 2018 study,²² people who reported more frequent sauna use had lower C-reactive protein levels, which is a blood marker for inflammation. Sauna frequency of use and mean C-reactive protein levels were as follows:

- Once a week: 2.41 mmol/L
- Two to three times a week: 2.00 mmol/L
- Four to seven times a week: 1.65 mmol/L

A Sauna Can Be a Great Health Investment

As you can see, sauna bathing can go a long way toward improving your health and increasing your life span. Here, I've focused primarily on heart and cardiovascular health, but there are many other health benefits as well, including improved mood, pain reduction, increased metabolism, detoxification, skin rejuvenation, stress reduction and immune support, just to name a few.

To learn more, listen to Patrick's lecture. You can also find more information in my previous articles, "Sauna Therapy May Reduce Risk of Dementia and Boost Brain Health," "How to Achieve Superior Detoxification with Near-Infrared Light," and "Are Saunas the Next Big Performance-Enhancing Drug?"

Sources and References

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