



GUIDEBOOK



THERMAL
THERAPY
FOR
LONGEVITY

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NINA'S NOTES

&

VitaDAO 

written by

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INTRODUCTION

WHO AM I?

I'm Nina Patrick, a former healthtech founder & CEO with a decade working in biotech and a PhD in Pharmaceutical Science. I write the weekly newsletter, Nina's Notes on health, longevity and psychedelics. Subscribe to my newsletter: www.notes.ninapattick.xyz

WHY IT'S FOR YOU

Longevity is not achieved through a one-size-fits-all solution. It's about understanding that our bodies are unique, and so are our health and fitness needs. This guidebook offers a comprehensive approach to thermal therapies that is adaptable to individual preferences and lifestyles.

WHY THIS GUIDE?

I've created this guidebook to provide an overview of how thermal therapy affects the body backed by scientific research. I also provide practical advice for safely incorporating the practices into your daily life.

THERMAL THERAPY

Hot & cold exposure have gained popularity in recent years as a strategy to enhance human health and longevity. I'll cover both practices in this guidebook so that you can use temperature as a way to stimulate your body's natural healing and rejuvenation processes.



WHAT IS THERMAL THERAPY?



WHAT IS IT?

Thermal therapy includes both cold and hot exposure practices.

Hot exposure refers to deliberately exposing the body to high temperatures. This can be done through sauna bathing, hot baths, hot yoga, or even spending time in warmer climates.

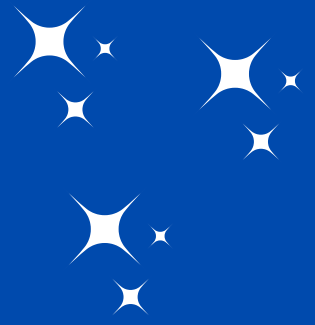
The popularity of cold exposure, particularly the cold plunge, skyrocketed in recent years due to Wim Hof, also known as "The Iceman," for his remarkable ability to withstand extreme cold temperatures.

THE HISTORY

Thermal therapy has ancient roots with practices originating from Roman baths, Native American sweat lodges and Nordic Saunas. For millennia, mankind has known the healing power of heat and cold.

These age-old traditions have since evolved. Now they integrate modern science to enhance efficacy and ease of application to promote healing, relaxation and health.

TYPES OF THERMAL THERAPY



Cold Plunge

Cryotherapy

Sauna

Hot Baths



THE SCIENCE OF COLD EXPOSURE



Techniques for cold exposure range from cold showers and ice baths to cryotherapy sessions in professional facilities. All of these forms of cold exposure introduce various physiological responses in our bodies.

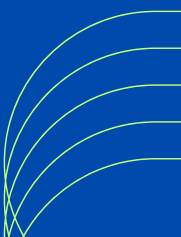
When submerged in cold water, humans experience a cooling rate two to five times faster than when exposed to air at the same temperature. This is due to the higher conductive and convective heat loss in water. Water is 25 times more thermally conductive than air.

Therefore cooling down in cold water is extremely effective, even moderately cool water can result in rapid dissipation of the body heat.

Immersion in cold water activates the sympathetic nervous system, which is the part of our nervous system responsible for responding to dangerous or stressful situations.

Triggering the sympathetic nervous system leads to increased production of neurotransmitters like dopamine, epinephrine and norepinephrine. Activation of these neurotransmitters from the shock of cold exposure can lead to hyperventilation or an increased breathing rate.

Repeated cold exposure and adaptation to the cold will subside the hyperventilation over time.





COLD EXPOSURE & METABOLISM

COLD SHOCK RESPONSE

To gain the benefits of cold exposure, you have to activate the “cold shock” response. Which means that the water for your cold plunge should be cold enough to induce discomfort. This discomfort is what triggers the cold shock response.

Individuals can become more resilient and adapt to the initial shock of the cold water over time. However, it is important to note that the process should not be comfortable, discomfort is an integral part of the experience.

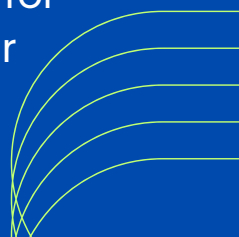
NON-SHIVERING THERMOGENESIS

After the cold shock, the body initiates a “non-shivering thermogenesis” process where the body starts to generate heat without shivering in the brown fat.

Brown fat regulates your body temperature in cold temperatures. Brown fat stores energy and burns that energy to regulate your body temperature during cold exposure. It also helps regulate blood sugar and fat metabolism.

Brown fat activates right before you start to shiver and continues to burn energy to keep your body warm while you shiver.

So, we shouldn't be afraid of shivering. It's ok to shiver in the cold for a bit but it is important to not stay in the cold water for too long. You want to be uncomfortable, but not push too far because that could lead to hypothermia.





THE DROP

THE DROP IN CORE BODY TEMPERATURE


Cold exposure experts refer to the decrease in your core body temperature after a cold immersion as “The Drop.”


Upon entering cold water, your blood vessels undergo vasoconstriction, a process where blood vessels narrow. This constriction is essential for maintaining warmth in your vital organs by retaining the blood in your core.

Once you leave the cold water, your blood vessels dilate, allowing warm blood to flow from your core to your extremities. As this warm blood transfers heat throughout your body, it gradually cools before returning to your core.

This decrease of the temperature in your core is what cold exposure experts refer to as “The Drop.”

This drop in core temperature activates shivering which increases your metabolism in order to warm your body back up again.





COLD EXPOSURE PROTOCOLS




Dr. Susanna Søberg, author of the book “Winter Swimming” which explores various aspects of deliberate cold and hot exposure, discovered that in order to get the benefits from cold exposure, people only need a total of 11 minutes of cold exposure per week.

This is not done in one session, but over 2 or 3 separate visits into the cold water. This corresponds to being in cold water for 1 or 2 minutes at a time.

Dr. Søberg also recommends cycling between both cold and hot exposure, starting in the cold and ending in the cold.

- 1 – 2 minutes in the cold water
- 10-15 minutes in the sauna
- 1 – 2 minutes in the cold

To reap the benefits of hot exposure, the sessions do not need to be long. Several studies show that healthy stress occurs after being in the sauna for about 10 minutes per session. It is not recommended to exceed 30 minutes per session. Going beyond that does not show any additional health benefits.



HOT EXPOSURE

WHAT IS IT?

Hot exposure refers to deliberately exposing the body to high temperatures. This can be done through sauna bathing, hot baths, hot yoga, or even spending time in warmer climates.

BENEFITS

Of the different forms of hot exposure, sauna bathing has been the most extensively studied for its health benefits. Several studies have shown that sauna bathing (78°C / 174°F) four to seven times per week for 20 min is associated with:

- 50% lower risk for fatal heart disease
- 60% lower risk for sudden cardiac death
- 51% lower risk for stroke
- 46% lower risk for hypertension
- 77% less likely to develop psychotic disorders
- 66% lower risk for developing dementia

Studies show that the physiological responses to sauna are similar to those experienced during moderate to vigorous intensity exercise. Sauna use has been proposed by researchers as an alternative to exercise for people who are unable to engage in physical activity due to chronic disease or physical limitations.



THE SCIENCE OF HOT EXPOSURE




HEAT SHOCK RESPONSE

One of the main reasons hot exposure can boost longevity is due to a process called heat shock response. When our bodies are exposed to high temperatures, they produce heat shock proteins.

These proteins play a vital role in maintaining the proper function of our cells, reducing inflammation, and promoting cellular repair.

Heat shock proteins have been shown to prevent and slow the progression of neurodegenerative diseases like Alzheimer's and Parkinson's, and can slow human muscle atrophy.

Some studies have been done where individuals sat in a hot bath 40°C (104°F) for 1 hour with their body temperature rising about 1°C (1.8 °F). The benefits were shown to mimic that of sauna and exercise:

- Decreased blood sugar levels
 - Increased heat shock proteins
 - Improved cardiovascular health
 - Relief from muscle soreness
- 



HOT BATHS

WHAT YOU DO IF YOU DON'T HAVE ACCESS TO A SAUNA

Having access to a sauna can be challenging. It is a luxury in many countries and visiting a sauna daily is not possible for most people. Therefore a common question is, does a hot bath or hot tub have the same effects?

Bathing in hot water for health benefits has been practiced for millennia, with the oldest recorded use of hot springs being in Japan over 3000 years ago.

One drawback of hot baths is everyone's unique sensitivity to hot water. Saunas are boxes of hot air, but your sensitivity is heightened when you add water to the mix. If you try a hot bath as an alternative, the water should be hot enough that you start sweating after immersing yourself for a few minutes. Staying in a bath at home for 1 hour can be challenging, as the bath will gradually lose the heat.

Remember to stay hydrated as it is less obvious to notice that you are sweating when you are in water.

HOT EXPOSURE PROTOCOLS



FREQUENCY

4-7 times per week

DURATION

20 minutes

- If you are unable to tolerate 20 minutes, start with shorter durations like 5 min, 8min, 10 min and so on gradually increasing until you reach 20 minutes

TEMPERATURE

78°C / 174°F

POST-SAUNA COOLING

After the sauna or hot bath, take a cold shower, plunge in a cold pool, or sit in a cooler environment until you feel you have returned to your regulated body temperature

HYDRATION

Remember to stay hydrated. Drink an electrolyte beverage to replenish the salt lost through sweating

LISTEN TO YOUR BODY

Exit the sauna immediately if you feel uncomfortable, nauseous or dizzy



Thank
You



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NINA PATRICK, PHD

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