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Titel	What Does Sauna Do to Blood Pressure?
Subtitel	Acute responses, vasodilation, individual differences and what repeated heat exposure may mean
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Short answer: Sauna does not produce one fixed blood-pressure response in every person. Heat dilates skin blood vessels and lowers peripheral vascular resistance, while heart rate and cardiac output rise to maintain circulation. During or after a sauna session, blood pressure may fall, remain relatively stable, or show different systolic and diastolic responses depending on the person, posture, heat dose, hydration and timing of measurement. A well-studied 30-minute Finnish sauna protocol reduced mean blood pressure immediately afterwards, but this result should not be turned into a universal rule. Repeated passive heating may modestly lower blood pressure in some populations, although recent randomized-trial evidence remains heterogeneous and does not establish sauna as a replacement for hypertension treatment.

Blood pressure is one of the most frequently discussed cardiovascular effects of sauna bathing. The common statement that “sauna lowers blood pressure” contains an important observation, but it is too simple to describe what actually happens.

Heat changes several parts of the circulation at the same time. Skin blood vessels dilate, blood is redistributed toward the body surface, heart rate rises, cardiac output changes, sweating reduces body water, and standing up or cooling can rapidly alter the haemodynamic situation again. The blood-pressure value measured at any one moment is the result of this entire interaction.

> **Sauna does not act directly on a blood-pressure number. It changes the circulation—and blood pressure is one result of that adaptation.**

What determines blood pressure?

Arterial blood pressure is governed principally by the interaction between cardiac output and systemic vascular resistance. In simplified form, pressure can be understood as the result of how much blood the heart pumps and how much resistance the circulation presents to that flow.

This explains why heart rate alone cannot predict blood pressure. During sauna bathing, heart rate can increase substantially while peripheral resistance falls because cutaneous vessels dilate. A faster pulse therefore does not necessarily mean that arterial pressure must rise.

Why does the skin circulation change in the sauna?

The body must transport internally stored heat toward the surface. Cutaneous vasodilation is one of the principal mechanisms for doing so. As skin vessels dilate, skin blood flow can increase markedly, allowing more heat to be transferred from the core toward the skin.

The vascular system is therefore being used as part of the body's heat-transport system. The resulting fall in peripheral vascular resistance tends to favour a reduction in arterial pressure. At the same time, the cardiovascular system compensates by increasing heart rate and redistributing blood flow.

What happens during a sauna session?

There is no single blood-pressure trajectory that applies to every sauna session. Systolic pressure may remain relatively stable, rise transiently or fall, while diastolic pressure often tends to fall as peripheral vasodilation develops. The exact response depends on temperature, duration, humidity, posture, previous heat exposure, hydration, cardiovascular status and medication.

This is one reason why studies cannot be compared simply by asking whether participants were 'in a sauna'. A 10-minute exposure at very high temperature, a 30-minute moderate Finnish sauna, repeated sauna rounds with cooling, and a low-temperature infrared protocol represent different thermal and cardiovascular doses.

What happens immediately after sauna?

A useful experimental study examined 102 adults with at least one cardiovascular risk factor during a single 30-minute Finnish sauna session at approximately 73 °C and 10–20% relative humidity. Mean systolic pressure fell from 137 to 130 mmHg and mean diastolic pressure from 82 to 75 mmHg immediately after the session. Systolic pressure remained below the pre-sauna value after 30 minutes of recovery [1].

The same experiment found a reduction in carotid-femoral pulse-wave velocity immediately after sauna, consistent with a temporary change in arterial stiffness and vascular function [1]. These results demonstrate that a fall in pressure can occur after sauna, but they describe the average response of a defined study population under a defined protocol—not a guaranteed response in every bather.

> **A mean fall in blood pressure in a study population does not mean that every individual will show the same response.**

Why can blood pressure fall after sauna?

The most direct explanation is vasodilation. If a large vascular bed in the skin remains dilated after heating, systemic vascular resistance is reduced. Blood can also pool more readily in dilated peripheral vessels, especially when a person changes from lying or sitting to standing.

Sweating adds another variable. Loss of body water reduces plasma volume unless fluid is replaced. With increasing dehydration, the cardiovascular system has less central blood volume available while still attempting to support skin blood flow and arterial pressure.

The combination of persistent vasodilation, reduced central blood volume and an abrupt change in posture helps explain why some people feel light-headed when standing after heat exposure.

Why does heart rate rise if blood pressure can fall?

There is no contradiction. Blood pressure and heart rate are different variables. When peripheral vessels dilate, the cardiovascular system can compensate by increasing heart rate and cardiac output. This helps preserve blood flow despite the lower vascular resistance.

Sauna therefore produces a characteristic situation in which cardiac work and heart rate can increase while arterial pressure does not necessarily increase. The response resembles some circulatory aspects of exercise, but passive heating is not physiologically identical to exercise because skeletal-muscle work, metabolic demand and regional blood-flow patterns differ.

What happens when the bather stands up?

Posture matters. Standing shifts blood toward the legs under gravity. Normally, the baroreflex rapidly increases sympathetic vascular tone and supports venous return and arterial pressure. After strong heating, however, the skin circulation may still be markedly dilated and sweating may have reduced circulating fluid volume.

The transition from a hot bench to standing and walking is therefore a period in which transient dizziness can occur. Rising slowly, allowing circulation to stabilise and avoiding unnecessary dehydration are simple practical consequences of the physiology.

What does cooling do to blood pressure?

Cooling changes the haemodynamic situation again. Cold exposure causes cutaneous vasoconstriction and reduces skin blood flow. This raises peripheral vascular resistance and shifts blood centrally. Depending on the intensity and method of cooling, arterial pressure can therefore rise.

A gentle period in fresh air, a shower and a cold-water immersion are not haemodynamically identical. Sudden cold-water immersion adds a strong cold-shock stimulus and can rapidly increase sympathetic activity. This is one reason why the warm and cold phases of sauna bathing should be understood as separate cardiovascular stimuli rather than as a single continuous 'blood-pressure-lowering' procedure.

Does sauna lower blood pressure in the long term?

Repeated heat exposure is being studied as a possible vascular training stimulus. Proposed mechanisms include repeated increases in skin blood flow and shear stress, changes in endothelial function, adaptations in vascular control and reductions in resting vascular resistance.

Earlier systematic evidence was encouraging. A 2021 systematic review and meta-analysis of 15 heat-therapy studies reported reductions in systolic, diastolic and mean arterial pressure after repeated heat therapy, although the included interventions were not limited to sauna [2].

More recent analyses make the picture more nuanced. A 2025 meta-analysis covering 51 passive-heating papers found small reductions in some blood-pressure outcomes: mean arterial pressure fell after both single and repeated heat exposure, diastolic pressure fell modestly, and systolic pressure was lower after repeated exposure [3]. However, the included modalities ranged from sauna to hot-water immersion and water-perfusion suits, and heterogeneity was substantial.

An especially relevant 2025 meta-analysis restricted to randomized controlled trials lasting at least one week found no statistically significant overall pooled reduction in systolic or diastolic pressure across all passive-heating interventions. Subgroup analysis did, however, find a systolic reduction with systemic whole-body heating of about 4 mmHg and a smaller reduction among participants with coronary risk or cardiovascular disease. The authors explicitly cautioned that the evidence was limited by small trials and heterogeneity [4].

The long-term evidence is promising enough to study seriously, but not uniform enough to describe sauna as an established antihypertensive treatment.

Why do studies sometimes appear to disagree?

The apparent disagreement is partly methodological. 'Passive heat therapy' includes different interventions with very different heat-transfer mechanisms. Studies also vary in participant age, health status, baseline blood pressure, number of sessions, exposure duration, temperature, hydration and the time at which blood pressure is measured.

The newer randomized-trial evidence is therefore particularly useful because it prevents an attractive physiological hypothesis from being presented as a settled clinical effect. Vasodilation during heating is well established. A durable reduction in resting blood pressure after weeks or months of sauna bathing is a different question.

What about people with hypertension?

People with hypertension are not a uniform group. Some have uncomplicated, well-controlled hypertension; others have additional cardiovascular disease, autonomic dysfunction, kidney disease or medication effects that change their response to heat.

Antihypertensive drugs can also interact with sauna physiology. Vasodilators may add to heat-induced vasodilation, while diuretics can increase susceptibility to fluid depletion. The relevant issue is therefore not simply whether a person 'has high blood pressure', but how stable the condition is, which medications are used and how the individual responds to heat and cooling.

Is low blood pressure a reason for caution?

People who already tend toward low pressure or orthostatic dizziness may be more susceptible to symptoms when heat-induced vasodilation is combined with standing and fluid loss. The practical endpoint is not a particular universal blood-pressure threshold inside the sauna, but maintenance of stable circulation and absence of warning symptoms.

Dizziness, near-fainting, unusual weakness, chest discomfort, severe breathlessness or neurological symptoms should not be interpreted as desirable evidence that the sauna is 'working'. They are reasons to end the heat exposure and assess the situation appropriately.

Can sauna replace blood-pressure medication?

No conclusion from current sauna research supports stopping prescribed antihypertensive treatment in favour of sauna. Even if repeated heat exposure eventually proves useful as an adjunct in selected patients, an adjunct is not the same as a substitute.

Medication changes require clinical assessment because cardiovascular risk depends on more than a single blood-pressure reading. The scientifically responsible position is to separate the potential supportive role of regular heat exposure from established hypertension management.

So, what does sauna do to blood pressure?

The immediate response begins with heat-induced redistribution of the circulation. Skin vessels dilate, peripheral resistance falls, heart rate rises and the cardiovascular system works to maintain adequate pressure and blood flow. In many people, blood pressure is lower after the heat exposure, but the magnitude and timing of that response vary.

Cooling, standing, hydration status and individual cardiovascular regulation can then change the pressure again. Over the longer term, repeated whole-body heating may produce modest reductions in resting blood pressure in some populations, but the clinical evidence remains heterogeneous.

> **Sauna changes vascular resistance, blood distribution and cardiac compensation. Blood pressure is the result—not the whole story.**

Conclusion

Sauna bathing produces a substantial but normally regulated cardiovascular response. The skin circulation dilates to transport heat, heart rate rises to support cardiac output, and blood pressure often falls during recovery from heat. A well-controlled Finnish sauna study demonstrated average post-sauna reductions of about 7 mmHg in both systolic and diastolic pressure, but individual responses cannot be inferred from an average.

Repeated passive heating may also influence resting blood pressure. Current meta-analyses suggest small potentially favourable effects, particularly with systemic heating, while simultaneously showing substantial variation between studies. This is a good example of why acute physiology, long-term adaptation and clinical treatment must not be treated as the same claim.

For health-oriented sauna bathing, the practical objective is therefore not to force blood pressure downward. It is to apply a tolerable thermal stimulus, preserve circulatory stability, cool appropriately and allow complete recovery.

References

1. Laukkanen T, Kunutsor SK, Zaccardi F, et al. Acute effects of sauna bathing on cardiovascular function. Journal of Human Hypertension. 2018;32:129–138. doi:10.1038/s41371-017-0008-z.

2. Pizzey FK, Smith EC, Ruediger SL, et al. The effect of heat therapy on blood pressure and peripheral vascular function: a systematic review and meta-analysis. Experimental Physiology. 2021;106:1317–1334. PMID: 33866630.

3. Price et al. Heat thermotherapy to improve cardiovascular function and cardiometabolic health: a systematic review and meta-analysis. Experimental Physiology. 2025. PMID: 41166412.

4. Hamaya R, Joyama Y, Miyata T, et al. Non-acute effects of passive heating interventions on cardiometabolic risk and vascular health: systematic review and meta-analysis of randomized controlled trials. American Journal of Preventive Cardiology. 2025;23:101082. doi:10.1016/j.ajpc.2025.101082. PMID: 41049507.

5. Johnson JM, Minson CT, Kellogg DL Jr. Cutaneous vasodilator and vasoconstrictor mechanisms in temperature regulation. Comprehensive Physiology. 2014;4(1):33–89. doi:10.1002/cphy.c130015.

6. Crandall CG, González-Alonso J. Cardiovascular function in the heat-stressed human. Acta Physiologica. 2010;199(4):407–423. doi:10.1111/j.1748-1716.2010.02119.x.

7. Hannuksela ML, Ellahham S. Benefits and risks of sauna bathing. American Journal of Medicine. 2001;110(2):118–126. doi:10.1016/S0002-9343(00)00671-9.

8. Gröning K. Health-Orientated Sauna Bathing. International Sauna Academy, 2026. Sections on thermoregulation, circulation, cooling and recovery.

Editorial note: This article is intended for scientific and educational information and does not replace individual medical assessment. People with known cardiovascular disease, symptomatic low blood pressure, poorly controlled hypertension or medication-related concerns should discuss the appropriate use of sauna with a qualified healthcare professional.