



PHYSICIAN FACTSHEET: Hypertension & Diet

How to prevent and treat hypertension with nutrition

Hypertension affects **1.4 billion** people globally, with half of them unaware they have the condition. Complications from hypertension account for **9 million deaths** annually (1).

Regular **monitoring of blood pressure** is paramount to mitigate this risk.

Modifiable risk factors for developing high blood pressure include smoking, excess body weight, sedentary lifestyle, poor diet and excessive alcohol intake.

Dietary changes including **reduced sodium intake** can lower blood pressure.

"Hypertension and its complications kill more than nine million people every year."

(World Health Organization)

Pathomechanisms Influenced by Diet

Cardiac Output

Bodyweight

Excessive **weight gain** is associated with increased hypertension and, conversely, **lowering body weight decreases blood pressure**, due in part to lower blood volume.

Sodium

Sodium intake might have a **hypertensive effect** due to a potential increase in extracellular fluid (1).

Potassium

Potassium has both **diuretic and vasodilatory** effects.

Calcium

Calcium indirectly assists in the excretion of sodium by the kidneys and acts as a **diuretic peptide** (2).

Fructose

Excessive **sugar** intake, especially fructose, leads to an acute and chronic increase in serum uric acid which, in turn, causes activation of the renin-angiotensin-aldosterone-system (RAAS). Fructose directly promotes intestinal uptake and renal **reabsorption of sodium**. This effect is **not seen with fructose ingested from whole fruit**.

Vascular Resistance

Autonomous nervous system

Caffeine

Caffeine **increases blood pressure** in non-habituated individuals, but not in regular coffee drinkers (3).

Endothelial Dysfunction

Fatty acids

Omega-3 fatty acids improve endothelial function and augment **endothelial relaxation** (4).

Saturated, trans, monounsaturated (MUFA), and omega-6-polyunsaturated (PUFA) fatty acids impair endothelial function; the effect of MUFA and PUFA can be inhibited by the intake of antioxidants in the form of whole food.

Antioxidants

Antioxidants from fruits and vegetables offer dietary **protection to oxidation** of LDL cholesterol molecules, preserve endothelial-dependent vasodilation, and **limit atherosclerosis progression** (5).

Nitrate

Nitrate from vegetables has a **vasodilatory** and thus **antihypertensive effect** (6).



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The Scientific Evidence

Epidemiological evidence

- 15.0% vs. 5.8% hypertension prevalence in male meat eaters vs. vegans.
- 12.1% vs. 7.7% hypertension prevalence in female meat eaters vs. vegans.
- 4.2 vs. 2.6 mmHg systolic (SBP) | 2.8 vs. 1.7 mmHg diastolic (DBP) mean blood pressure differences between meat eaters and vegans (7).

Evidence from RCTs and meta-analyses

- 11.3 mmHg SBP reduction among hypertensive patients by following the **DASH diet** compared to a control diet (8).

The DASH diet is high in whole grains, fruits, vegetables, and low-fat dairy products, and low in red and processed meat as well as in sugar-sweetened foods and beverages.

- 11.5 mmHg SBP reduction in patients with SBP \geq 150 mmHg by following the **DASH diet** and sodium reduction, compared to a high-sodium standard diet (9).
- -1.7 mmHg SBP/-1.5 mmHg DBP by following a **Mediterranean diet** compared to a low-fat diet (10).
- -4.8 mmHg SBP/-2.2 mmHg DBP by following a **vegetarian diet** compared to an omnivorous diet (11).
- -4.10 mmHg SBP/-4.01 mmHg DBP by following a **vegan diet** compared to a less-restrictive diet in patients with baseline SBP \geq 130 mmHg (12).

General Recommendations

Eat from a wide variety of whole plant foods:

Maximize the intake of high-quality plant foods such as vegetables, whole grains, legumes, fruits, nuts, seeds, herbs, and spices. Your health will benefit from every step towards more whole plant foods.

Eliminate or limit all processed foods, refined carbohydrates, and sugar-sweetened foods and beverages.

Eliminate red and processed meat products such as burgers, sausages, bacon, ham, salami, dried meat, canned meat, and pastrami (13).

Eliminate or limit other animal products such as poultry, fish, eggs, cheese, and dairy.

Make sure to cover **potentially critical nutrients** with a wide variety of plant foods, enriched foods/drinks, or supplements (especially vitamin B12 and vitamin D).

Disease Specific Recommendations

Fibre is especially important to tackle hypertension. Always choose **whole-grain** options (pasta, bread, rice, etc.). Include **nuts and legumes** in your daily diet, and get extra fibre with a daily tablespoon or two of (ground or sprouted) **flaxseed or chia seed** (e.g., in your muesli or on your salad).

Limit sodium to <2g per day (5g table salt). Avoid processed foods (which are often high in salt), and experiment with different **spices and herbs** to give flavour to your food while reducing the amount of salt.

Regularly include some of the following foods as they are especially effective against hypertension: **beetroots** (beetroot juice), **leafy green vegetables** (broccoli, kale, brussels sprouts, bok choy, etc.), **garlic**, **oats**, **green tea**, **hibiscus tea**, and **dark chocolate**.



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Key Points

- International guidelines recommend **dietary changes** as an initial, fundamental, and continuous treatment to maintain normal blood pressure (14).
- Dietary changes can significantly reduce blood pressure and can decrease, sometimes even prevent or eliminate, the need for medication.
- The optimal diet is **low in sodium** (< 2 g/d Na⁺ or <5g/d table salt) and high in **whole-plant foods** such as whole grains, legumes, fruits, vegetables, nuts and seeds as well as herbs and spices.
- An optimal diet does not only reduce hypertension, but it also reduces the risk for complications of hypertension, such as coronary heart disease, stroke, and kidney disease.

References

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