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Blood Pressure Solutions You Can Start Using Today



Healthy Choices For A Better Life

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We believe that better health can be achieved through education, informed decision-making, and scholarly consumption. Our goal at Bel Marra is to provide balanced and unbiased educational books, newsletters, and special reports featuring new and scientifically established information on alternative therapies, complementary modalities, and nutraceuticals, including nutrition, a healthy diet, vitamins, minerals, and supplements. Everyone can lead a long, healthful and active life, and this is attainable through solid nutrition, healthy choices, educated consumption, and the use of natural therapies.

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High blood pressure is a very serious risk factor for a litany of health problems, not the least of which is heart disease. Let's begin with the fine points, so we can understand exactly what so many people are facing.

What Are the Risks and Concerns Associated With High Blood Pressure?

The National Health and Nutrition Examination Survey (NHANES) has been tracking the prevalence of high blood pressure (HBP) in the U.S. since 1960. In 2008, NHANES data shows that the prevalence of HBP was 28–30% in those over 18 years old. This number translated into 65 million hypertensive adults in the U.S., which is definitely much higher than the 43.2 million from 1988 to 1991 NHANES recorded. Approximately half this increase is caused by higher rates of obesity.

HBP is categorized as primary (essential) or secondary. Primary HBP, for which the cause is unknown, accounts for 90–95% of all HBP cases. Secondary HBP accounts for 5–10% of

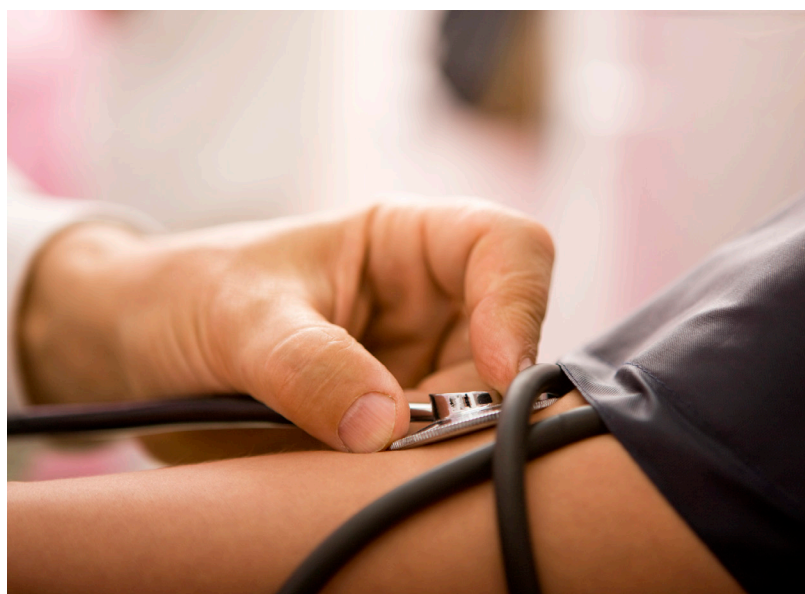
individuals with HBP, with the cause being disease of the kidneys, adrenal glands, arteries, or heart. If left untreated, HBP increases the risk of heart attack, heart failure, stroke, aortic aneurysm, peripheral arterial disease, and kidney disease.

To understand your risks and health concerns associated with HBP, you should first understand blood pressure measurements.

How Is Blood Pressure Measured?

Blood pressure (BP) measurements involve two numbers: systolic (upper) and diastolic (lower) numbers. These BP numbers are caused by the heart contracting (systole) or relaxing (diastole) between heartbeats. Here is how doctors define blood pressure levels based on these measurements:

- **Normal:** Systolic of 90–119 mmHg; Diastolic of 60–79 mmHg



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- **Prehypertensive:** Systolic of 120–139 mmHg; Diastolic of 80–89 mmHg
- **Stage 1 HBP:** Systolic of 140–159 mmHg; Diastolic of 90–99 mmHg
- **Stage 2 HBP:** Systolic over 160 mmHg; Diastolic over 100 mmHg

It is well-known that each rise in systolic BP by 20 mmHg and diastolic BP by 10 mmHg over the range of 115/75 mmHg to 185/115 mmHg, increases the risk of a fatal heart attack twofold. In other words, it's quite serious.

You Have High Blood Pressure... Now What?

Typically you will be told to alter your diet, increase your exercise, and decrease your weight. The goal is to lower blood pressure to below 140/90 mmHg for most individuals with HBP—and even lower for individuals with diabetes or kidney failure. Here are some general changes to keep in mind:

- Losing weight alone can reduce systolic BP by 5 mmHg to 20 mmHg.
- Changing dietary habits by consuming more fruits and vegetables and less salt could lower systolic BP by 8 mmHg to 14 mmHg.
- Exercising regularly for 30 minutes a day, such as taking a brisk walk, can lower systolic BP by 4 mmHg to 9 mmHg.
- Limiting alcohol intake to no more than two drinks a day for men and one drink a day for women can lower systolic BP by 2 mmHg to 4 mmHg.



What about prescription drugs? One large meta-analysis of 147 studies looked at the effectiveness of blood pressure-lowering drugs in preventing heart disease. The conclusion? Lowering systolic blood pressure by 10 mmHg or diastolic blood pressure by 5 mmHg using any drug can reduce your risk of major heart health issues by about 25% and stroke by more than 30%. You can also reduce the risk of death from heart disease, dementia, and heart failure.

There are five classes of drugs prescribed by doctors:

1. **Diuretics (water pills):** These help the kidneys excrete excess salt and water. They can lower systolic BP by 15 mmHg.
2. **Adrenergic receptor antagonists:** These reduce the force of the heart's contractions. They can drop systolic and dia-

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stolic levels by 17 mmHg and 10 mmHg respectively.

3. **Calcium channel blockers:** These reduce the force of the heart's contractions or dilate arteries. They can lower systolic and diastolic levels by 16 mmHg and 11 mmHg respectively.

4. **Angiotensin-converting enzyme (ACE) inhibitors:** These dilate the arteries and lower systolic and diastolic levels by about 15 mmHg and 10 mmHg.

5. **Angiotensin II receptor antagonists:** These dilate your arteries and lower systolic and diastolic levels by around 13 mmHg and 10 mmHg.

These are some of the basic recommendations for treating high blood pressure, and there are many more classes of drugs. This report, however, will discuss alternative techniques, avoiding these potentially dangerous drugs. Here are eight blood pressure-lowering solutions to start using today.

Blood Pressure Solution Number One:

The DASH Diet

There is one well-accepted way you can eat your way to lower blood pressure. In turn, it will protect you from a wide variety of serious cardiovascular problems. The diet we're talking about is the DASH diet, short for "Dietary Approaches to Stop Hypertension." Let's take a look at what it's all about.

The DASH eating plan is specifically recommended for lowering blood pressure. It is a modification of the USDA *Dietary Guidelines* that specifically recommends decreasing sodium intake to less than 1,500 milligrams (mg) per day.

More specifically, the DASH diet plan includes the following servings:

Food	Servings on a 2,000 calorie diet
Grains and grain products (include at least three whole grain foods each day)	7-8
Fruits	4-5
Vegetables	4-5
Low fat or non-fat dairy foods	2-3
Lean meats, fish, poultry	2 or less
Nuts, seeds, and legumes	4-5 per week
Fats and sweets	limited



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The DASH diet has helped more than 80% of patients diagnosed with high blood pressure to achieve a normal blood pressure. That is a very significant figure. For those with metabolic syndrome (a cluster of health issues, such as high cholesterol, blood pressure, triglycerides, and excessive body fat), this diet successfully reduced systolic blood pressure (by 12 mmHg for men; women by 11 mmHg) and diastolic blood pressure (men by 6 mmHg; women by 7 mmHg). These blood pressure reductions while on the DASH diet are much greater than those treated with diets designed simply to shed pounds.

When combined with exercise and reduced body fat, the effect of the DASH diet is much greater. Combined with the latter, systolic blood pressure was lowered by 16.1 mmHg and diastolic by 9.9 mmHg, compared to 11.2 mmHg and 7.5 mmHg when on the diet alone. Moreover, the DASH diet has a favorable influence on body weight, cholesterol, and fasting blood glucose levels.

The DASH diet deviates from the traditional American diet by providing much more fiber, magnesium, potassium, and calcium, and less fat, cholesterol, and sodium on account of the greater consumption of fresh fruits and vegetables. For these reasons, this eating plan is not palatable to most people who have tried it, and compliance is relatively low. Experts advise changing your diet slowly to the DASH eating plan, instead of jumping right into it, to ensure compliance and long-standing results.

But make no mistake: this is an eating plan worth diving into.



Blood Pressure Solution Number Two:

Minerals

There are four minerals that can truly influence your blood pressure levels; they are sodium, calcium, magnesium, and potassium. Here is why:

Sodium

In the U.S., the average person's daily sodium intake is five grams with some parts of the country consuming much higher amounts of up to 15 to 20 grams daily. HBP subjects on a low-sodium diet can expect an average systolic BP lowering of 4–6 mmHg and a diastolic BP lowering of 2–3 mmHg. In a recent meta-analysis of 167 studies, researchers found various ethnic groups could lower their blood pressure levels by lowering their sodium intake. The conclusion? Sodium intake reduction lowered blood pressure by about 3.5% for those with HBP.



Calcium

Calcium supplements for HBP yield inconsistent results. However, there is a dramatic effect for pregnant women—calcium prevents hypertensive disorders known as preeclampsia and eclampsia. In a meta-analysis of 13 studies, 15,730 women were given at least one gram of calcium daily during their pregnancy. Their risk of preeclampsia and preterm birth was reduced by 50%.

Magnesium

The BP-lowering effect of magnesium is less consistent than those seen with sodium or potassium supplementation. In a meta-analysis of 20 studies involving 1,220 individuals, magnesium supplements led to a 4.3 mmHg lowering of systolic BP and 2.3 mmHg lowering of diastolic BP.

Potassium

The recommended daily intake of potassium is 4.7 grams. However, the average potassium intake of U.S. women and men is 2.3

and 3 grams each. In a Chinese study, 150 individuals with HBP (aged 35–64 years) were randomized and received either 60 mmol/L of potassium-chloride supplement or a placebo daily for 12 weeks.

Potassium supplements led to a fall in systolic BP by 5 mmHg (ranging from 2.13 mmHg to 7.88 mmHg) without any diastolic BP changes. But, in an Italian study, 104 subjects with HBP (aged 41–65 years) given 30 mmol/L a day of potassium for four weeks experienced a fall in both systolic and diastolic BP by 12.2 mmHg and 2.2 mmHg respectively. As well, experts say that in individuals with HBP, the additional intake of potassium by 600 mg a day will result in an estimated systolic BP drop of 1 mmHg and a diastolic BP drop of 0.52 mmHg.

Potassium-associated BP lowering significantly reduces the risk of stroke, coronary heart disease, and other cardiovascular diseases or conditions. If 4.7 grams of potassium is consumed daily, an individual's risk of stroke decreases by up to 15% and up to 11% for heart attacks.

Blood Pressure Solution Number Three:

Pomegranate Juice and Tomatoes

Pomegranate juice and tomatoes are two colorful options for lowering your blood pressure that you can easily find in the supermarket. These food cures, dense with nutrients, act as medicine.

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Pomegranate Juice

Based on both animal and human studies, foods rich in antioxidants may be useful in lowering blood pressure. Pomegranate juice is known for its rich antioxidant content, which is higher than that of any other natural juice or red wine. While there are several studies that show this vitamin-rich beverage can help lower BP levels, here are two key studies to consider:

In the first study, hypertensive patients were given pomegranate juice (50 milliliters a day) for two weeks. A 5% decrease in systolic BP and a 36% reduction in ACE activity were noted in these subjects.

In the second, 10 patients were given the pomegranate juice for one year, five of them continuing for up to three years. Systolic BP dropped after one year by 12% but had no further reduction after three years.

Tomatoes

Tomatoes are the second most produced and consumed vegetable in the U.S. (though tech-

nically they are a fruit). They contain high levels of beta carotene, folate, potassium, vitamin C, vitamin E, and flavonoids.

They are also famously rich in lycopene, a powerful antioxidant. Lycopene is the pigment responsible for the red color in tomatoes, watermelons, pink grapefruit, papayas, guavas, and rosehip. High lycopene consumption has been associated with a decreased risk of stroke, heart attack, and other cardiovascular diseases.

A recent meta-analysis of four studies on the effect of lycopene on BP levels revealed that there was a significant reduction in systolic BP by 5.6 mmHg. Lycopene did not, however, affect diastolic BP. Moreover, the BP-lowering effect of lycopene was more pronounced in those with HBP.

In another study 32 type-2 diabetic male patients were assigned to consume 200 grams of raw tomato daily for eight weeks. In this study, tomato consumption had a significant effect, lowering systolic and diastolic BP levels.

Blood Pressure Solution Number Four:

Chocolate

The next method to lower your own blood pressure levels turns to the dessert aisle. Can powerful cocoa products, dark chocolate in particular, work to your advantage?

The initial observations of the blood pressure-lowering effects of cocoa products (dark chocolate and cocoa drinks) came from the Kuna, peoples indigenous to Panama and



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Colombia, who now live on islands off the Panama coast.

HBP is rare in the Kuna primarily due to their high consumption of natural cocoa drinks rich in flavanols. In contrast, those Kuna who live in Panama City consume cocoa from the local grocery stores that is devoid of flavanols.

The mechanisms by which cocoa products lower BP are unknown. It is speculated that flavanol-rich cocoa products may increase the amount of nitric oxide known to dilate blood vessels, in addition to inhibiting the angiotensin-converting enzyme (ACE).

In a meta-analysis of 10 randomized controlled trials involving 297 participants, both those with a healthy BP measure and those with prehypertension or stage 1 hypertension. For two to 18 weeks, the participants were randomly assigned cocoa products or placebos. Cocoa products were found to lower systolic BP by an average of 4.5 mmHg and diastolic BP by an average of 2.5 mmHg.

The BP-lowering effects reported in this meta-analysis are comparable to another meta-analysis on dark chocolate, which found the sweet treat lowered systolic BP by 4.7 mmHg and diastolic BP by 2.8 mmHg.

The most recent meta-analysis of chocolate's effect on blood pressure involved 15 studies and came to the following conclusions:

- 1.The BP-lowering effect of cocoa-chocolate products was only significant for those with prehypertension or high blood pressure. In those with high blood pressure, systolic levels dropped 5 mmHg and



diastolic levels 2.7 mmHg. This decline in systolic BP levels of 5 mmHg through consuming cocoa products is comparable to other lifestyle modification methods, such as moderate exercise (30 minutes/day), which tends to lower systolic levels by 4–9 mmHg. What's more, a 5 mmHg systolic drop translates to a reduction in the risk of a cardiovascular event by 20% over the next five years.

- 2.Dark chocolate is found to be superior to a placebo in lowering systolic levels in those with HBP and diastolic levels in those with prehypertension.
- 3.Flavanol-rich chocolate did not significantly lower mean systolic BP below 140 mmHg or diastolic BP below 80 mmHg.

Blood Pressure Solution Number Five:

Tea

Other than water itself, tea is the oldest bever-



age on the planet. Its health effects are commonly the focus of medical studies, and in the past few years, green tea's protective effects against cancer have been under the microscope. But here, we look at the strange but true effects of tea on blood pressure.

The acute and chronic effects of tea on blood pressure are quite different.

An Acute Study

The acute effects of drinking green tea and black tea, at a daily dosage equivalent to four standard cups, were tested in 20 men with normal BP measurements. Both green and black tea raised systolic and diastolic pressure 30 and 60 minutes later.

- Green tea: systolic BP raised 5.5 mmHg (as much as 12.4 mmHg); diastolic BP raised 3.1 mmHg (as much as 6.3 mmHg).
- Black tea: systolic BP raised 10.7 mmHg (as much as 17.4 mmHg); diastolic BP raised 5.1 mmHg (as much as 8.4 mmHg).

However, BP measurements 24 hours later

did not show any significant increase, so it seems that tea's immediate effect is to raise blood pressure, but only temporarily.

Chronic Studies

1. The effects of long-term tea consumption on blood pressure, using a biomarker of exposure to tea-derived chemical polyphenols, were examined in 218 women over 70 years old. The average tea intake in these women was 525 mL (or two cups) daily. The mean systolic BP in these women was 138 mmHg and diastolic BP was 73.5 mmHg. The study shows that one cup of tea was linked to a 2.2 mmHg drop in systolic BP and a 0.9 mmHg drop in diastolic BP.
2. The effect of tea consumption on the risk of HBP was studied in 1,507 subjects over 20 years old and without a history of HBP. In this study, 39.8% were habitual tea drinkers, namely drinking 120 mL (half a cup) or more of tea per day. When compared to non-habitual tea drinkers, the risk of developing HBP dropped by 46% in those who consumed half a cup to two cups a day. This risk was further reduced by 65% in those who drank more than two cups a day.
3. The effects of hibiscus tea on BP were studied in 65 individuals with either pre- or stage 1 HBP who were not taking medication. They had either one cup a day of brewed hibiscus tea or a placebo for six weeks. Compared with the placebo, hibiscus tea lowered systolic BP by 7.2 mmHg. The change in diastolic BP was not different from the placebo group.

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Moreover, those with a higher baseline systolic BP showed a greater response to hibiscus' BP-lowering effect. The authors speculated that the BP-lowering effect of hibiscus tea could have been due to the flavonoid chemicals it contained. In animal studies, this herbal tea contains chemicals which can dilate blood vessels, inhibit the ACE, and increase sodium excretion by the kidneys.

Overall, it shows that regular tea consumption will likely help lead to moderate drops in blood pressure.

Blood Pressure Solution Number Six:

Omega-3 Fatty Acids

Everyone who pays attention to health news knows that omega-3 fats in fish are extraordinarily healthful. In my ongoing series on blood pressure, we find that omega-3s can help those who suffer hypertension.

The inverse relationship between fish intake (specifically omega-3 fatty acids) and heart disease was well established after it was discovered that inhabitants of Greenland had a low death rate from heart disease despite a fat-rich diet. Later on, large population studies showed an inverse relationship between omega-3 fatty acids and the incidence of stroke. This observation helped fuel intensive research into the effect of omega-3 fatty acids on blood pressure. Here are some of the studies that followed:

1. A meta-analysis found that omega-3s'



effect on blood pressure is dependent on the dose. The minimal dose to be effective is three grams a day. The BP-lowering effects in untreated HBP were 5.5 mmHg for systolic BP and 3.5 mmHg for diastolic BP.

2. In a meta-analysis of 31 studies with 1,356 individuals, omega-3 fatty acids were shown to lower blood pressure again. Each gram of omega-3s consumed led to 0.66 mmHg and 0.35 mmHg drops in systolic and diastolic BP levels. While individuals with an average BP saw no significant effects from omega-3 consumption, those with HBP saw a drop of 3.4 mmHg and 2.0 mmHg in systolic and diastolic pressure levels from omega-3 intake.
3. In a meta-analysis of 36 studies, systolic BP dropped by 2.1 mmHg and diastolic by 1.6 mmHg with an average of 3.7 grams a day of omega-3 fatty acids. The blood pressure-lowering effects of omega-3s were more significant in adults over 45 years old and those with HBP.

Now, there are two major omega-3 fats in

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fish—eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA)—which have different effects on blood pressure:

In one study, 59 overweight patients were randomly assigned to receive four grams of purified EPA, DHA, or olive oil capsules (the placebo) a day for six weeks. Only DHA lowered BP. Compared to the placebo, DHA lowered systolic BP by 5.8 mmHg and diastolic BP by 3.3 mmHg, while also lowering the individual's heart rate.

In another study of 265 adults (aged 30–54 years), the effect of modest variations of omega-3 fatty acid intake on BP levels was studied. DHA, again, was the most effective treatment, lowering diastolic levels by 2.1 mmHg.

Blood Pressure Solution Number Seven:

CoQ10 and Melatonin

Here we take a peek at whether Coenzyme Q10 (CoQ10) and melatonin, two popular natural remedies, can help those trying to lower their blood pressure.

Coenzyme Q10 (CoQ10)

CoQ10, also known as ubiquinone on account of its ubiquitous (widespread) distribution, is found in every cell. The highest concentration of CoQ10 lies in the heart. Decreasing CoQ10 is related to aging and heart disease and, in particular, HBP.

Since 1975, there has been intensive

research on the role of CoQ10 and its effects on blood pressure. The following studies highlight some of the latter effects.

In a meta-analysis of 12 studies with different study designs (randomized controlled studies, crossover studies, and open label studies), 362 people with HBP were studied. In the three types of studies, here is what happened:

Randomized Studies

- Number of HBP patients: 120
- BP changes in CoQ10 group: systolic BP lowered by 16.6 mmHg and diastolic BP lowered by 8.2 mmHg. Placebo group had no significant changes.

Crossover Study

- Number of HBP patients: 18
- BP changes in CoQ10 group: systolic BP lowered by 11 mmHg and diastolic BP by 8 mmHg. Placebo had no significant changes.

Open Label Studies

- Number of HBP patients: 214
- BP changes in CoQ10 group: systolic BP lowered by 13.5 mmHg and diastolic BP by 10.3 mmHg.

In a study involving 74 type-2 diabetic patients randomized to receive either 100 mg CoQ10 twice a day or 200 mg fenofibrate once a day, both CoQ10 and fenofibrate, or neither for 12 weeks, the results showed that:

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- CoQ10 lowered systolic by 6.1 mmHg and diastolic by 2.9 mmHg
- CoQ10 reduced glycated hemoglobin (a measure of the average blood sugar in the previous months) by 0.4%.
- Controlled-release melatonin lowered systolic BP by 6.1 mmHg and diastolic BP by 3.5 mmHg.
- Fast-release melatonin failed to lower either systolic or diastolic blood pressure.

Melatonin

Melatonin is a hormone produced by the pineal gland in the brain. It is released mainly during the evening hours since daylight tends to shut down its production. Systolic and diastolic BPs usually drop during sleep, but BP levels didn't drop in nearly 50% of patients with HBP.

The lack of nocturnal BP fall is associated with damage to the heart, brain, and kidneys, and with a higher incidence of strokes and heart attacks.

In a recent meta-analysis of seven different studies on the effect of melatonin on nocturnal BP levels, three using controlled-release melatonin and four using fast-release melatonin, results showed that:

Blood Pressure Solution Number Eight:

Vitamins

Here's how you can naturally lower your own blood pressure levels, beginning with vitamin D, looking at other supplements, and moving to a conclusion—the bottom line:

Vitamin D

Vitamin D deficiency is quite prevalent, estimated to occur in 30–50% of the general population. There is growing evidence that vitamin D deficiency or insufficiency can adversely affect the cardiovascular system.

In a large population study, the third National Health and Nutrition Examination Survey (NHNES III), a sufficient level of 25-hydroxyvitamin D (over 80 nmol/L) was shown to help reduce the age-related increase in systolic blood pressure by 20%.

Only one quality study demonstrates a BP-lowering effect with vitamin D supplements. It was conducted in postmenopausal women (146 women, 74 years old) and used either 1,200 mg of calcium with 800 IU vitamin D3 or calcium alone. They studied the effects of these supplements on blood pressure, heart rate, and vitamin D levels. The changes in blood pressure were as follows:



- Vitamin D and calcium dropped systolic levels from 144 to 131 mmHg. Calcium alone dropped them from 141 to 135 mmHg. Vitamin D and calcium together reduced diastolic levels from 85 to 77 mmHg. Calcium alone lowered them from 83 to 76 mmHg.
- Overall, 81% in the vitamin D and calcium group (vs. 47% in the calcium group) showed a drop in systolic blood pressure of at least 5 mmHg. Vitamin D and calcium proved more effective in lowering systolic BP than calcium alone.

Nine Other Supplements

There are many exciting preliminary studies that show the following dietary supplements may be effective in lowering blood pressure, mainly in those with hypertension.

Supplement	Lowered Systolic BP	Lowered Diastolic B
Vitamin C	9.9 mmHg	4.4 mmHg
Linolenic acid	10 mmHg	8 mmHg
Garlic	8.4 mmHg	7.3 mmHg
L arginine	5.4 mmHg	2.7 mmHg
Flaxseed oil	3.1 mmHg	6.3 mmHg
Seaweed	14 mmHg	5 mmHg
Alpha lipoic acid	9 mmHg	—
Taurine	9 mmHg	4.1 mmHg
Pycnogenol	7.2 mmHg	—

The Bottom Line

In a recent article, a leading expert on diet and supplements for hypertension came to the conclusion that certain steps help control blood pressure in 62% of people with HBP over a period of six months. These steps are as follows:

1. Fix any deficiencies you might have in biotin, folate, pantothenate, calcium, magnesium, zinc, copper, alpha lipoic acid, coenzyme Q10, cysteine, glutathione, selenium, chromium, oleic acid, choline, inositol, asparagines, glutamine, serine, carnitine, and all vitamins.
2. Use selected supplements and nutraceuticals, like those I've investigated in this article.
3. Incorporate diet, exercise, and weight management. This can help as well to stop using prescription medications to reduce blood pressure.



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