



Integrative Health for Your Blood Pressure

What is Blood Pressure?

Like water pressure in a pipe, blood pressure is how much force is in your arteries as blood flows through them. It should not be too low (hypotension) or too high (hypertension, or HTN).

Blood pressures are given as two numbers. The systolic pressure (top number) is the pressure when your heart is forcing out the blood when it squeezes. The diastolic pressure (bottom number) is the pressure when your heart is resting between beats. The unit for blood pressure is millimeters of mercury (mmHg). Even a drop in the top (systolic) number by 2-5 mmHg is tied to a 7% lower risk of dying when someone's pressures are up.

How do you know if your pressure is high? Most groups agree that anything less than 120/80 is normal. And 140/90 or above is quite high. The harm from high blood pressure increases with every point it goes up, so some groups, like the American Heart Association, say even a top number of 130 is high, compared to 120.¹ Talk to your care team about your own blood pressure goals. Your goals may be different if you have other health problems, like kidney disease or diabetes, or based on your age. Remember only one of the two numbers - top or bottom - needs to be up to say the blood pressure reading is high. You need at least two high readings at two different medical visits for it to be called hypertension.

It is good for most people to keep blood pressure *above* 90/60. If it is over 180/120, that could be what is called a "hypertensive crisis." If you get a reading that is that high, check it again after 5 minutes and call a care provider right away if it stays up. If very high pressures like that are accompanied by symptoms like chest pain, shortness of breath, numbness, weakness, speech problems, or vision changes, call 911.

Why Does Blood Pressure Matter?

Nearly half of all adults have HTN, based on the strictest limits for high readings. Only 1 out of every 4 people with HTN have their pressures under control. We know that lowering blood pressure prevents a lot of health problems and helps you live longer.

Over time, high blood pressure can hurt the body in different ways. For example, it puts people at greater risk for heart problems, like heart attacks or heart failure. Having a healthy blood pressure also protects against problems like kidney disease, stroke, memory loss, eye problems, and blocked arteries in the legs. For men, HTN increases their chances of having erection problems.

HTN is called "the silent killer." Some people don't worry too much about high blood pressure because they do not feel it. But high blood pressure can cause harm whether you feel it or not. It can seem strange to treat something if you can't tell it is causing you problems but doing that is very important to prevent problems later.



What Can Help Prevent or Treat Hypertension?

There are many ways to bring down blood pressure or, even better, to keep it from going up in the first place. Lifestyle approaches (good health habits), dietary supplements (like vitamins, minerals, and herbal remedies), mind-body skills, and other integrative approaches are all options. Of course, medications are options too. As you take steps to prevent or treat HTN, here are some things to think about (and talk about with your health care team):

1. **Plan ahead.** The chances of problems like HTN go way down if you take good care of yourself. Work on having healthy habits before you have to react to a problem. Healthy behaviors like physical activity, working with stress, and healthy eating can help to keep pressures down. Working toward a healthy weight, connecting with nature, healthy relationships, and good sleep can help too. These can be very helpful for people at any age.
2. **Make one change at a time.** A good rule is to wait for 1-2 weeks after you change something to see how much it affects your pressure, before you try something else. For diet changes, give them even more time. It may take a month or more to see how changes in what you eat change your blood pressure. If you start a new dietary supplement, track your blood pressure over a week or so to see if it drops. The same is true for medications. Give them a week or two to take effect.
3. **Get your own blood pressure cuff**, if possible. It can help to have a blood pressure cuff at home. Readings from home are usually even more helpful than readings at a clinic. Sometimes, insurance will cover a cuff. They can be purchased at most pharmacies. It's a good idea to bring any new cuff to your healthcare provider to have it checked for accuracy right after you get it and once per year after that. If you can't get a cuff, find a place where you can have your blood pressure checked when you need it.
4. **Keep your care team updated**, whatever you choose to do. If you decide to take a supplement or change your diet, tell them. Talk to them about all your options, including medications.
5. **Medications for blood pressure can help.** They are not the only option, but there is good research showing they can help people live longer and avoid other health problems. If you start one, ask about any adverse effects to watch for. When taking blood pressure medications and dietary supplements, ask about how they could interact with each other.
6. **Every step helps.** Even dropping your pressures down a point or two if they are high can lower your risk of problems.



Tips for Using This Guide

There are many options for lowering your blood pressure, especially if it is only up by a few points. Here are a few tips to consider:

1. There are **5 categories** of treatments that you can think about:
 - a. Medications (not covered in detail in this material but you can learn more at the [American Heart Association website](#))²
 - b. Lifestyle
 - c. Specific foods and nutrients
 - d. Mind-body approaches
 - e. Other complementary health approaches
2. Consider a **medication**, at least for starters, especially when your blood pressure is quite high (above 150/95). As you make other changes, you may be able to go down on the dose of medication or stop it. Remember, some pills that help with blood pressure are specifically recommended for people in certain situations and should not be replaced with something else.
3. The **changes you can make add up**. It is hard to predict how much your pressure will go down with any given treatment, but you can use more than one approach. The benefits add up. A drop of 2-5 mm Hg in systolic pressure (the top number) can reduce risks of dying from any cause by 7%, dying of stroke by 14% and dying from heart disease by 9%.³
4. **Mix and match**. For example, choose at least one lifestyle change. Choose a mind-body approach. Whatever you choose will have other benefits in addition to helping your blood pressure. If you try a supplement, watch closely for any harmful effects, just as you would with a medication. As noted earlier, only make one change at a time, and give what you added enough time to work.
5. **Be mindful of cost** as well; many non-medication treatments are not covered by insurance.



Lifestyle

The following table lists different lifestyle changes you can make and how much they have been found to lower blood pressure in different studies.

Lifestyle Changes for your Blood Pressure		
Changes You Can Make	Pressure Drop (top # range, / bottom # range)	Things to Keep in Mind
Activity: Exercise	↓7	Decreases right after exercise and can stay down for nearly a day. The higher the pressure, greater the drop. 30 minutes of exercise most days of the week, if not more.
Activity: Yoga	↓33/26	Takes a few weeks to change pressure readings. Yoga therapists can tailor poses for your needs.
Activity: Tai chi, qigong	↓16/9, ↓12/10	Gentle approaches that also help with balance and preventing falls in older people.
Weight Loss	↓6 (top #)	That is a drop of 6 mm HG for every 10 pounds of weight lost (range is from 5-20).
Sleep	↓5-13 (top #) if >7 hours/ night ⁴	People who sleep <i>more than 9 hours or less than 6 hours</i> a night are more likely to have high blood pressure. Blood pressure dips at night. Sleep apnea increases it.
Manage Stress	↓10/7	Most practices will lead to a decrease in a few weeks. Choose the practice that works best for you. See the "Mind-Body" section of this handout.
Don't Smoke, including e-cigarettes	↓ 4/3	This also reduces risk of heart attack, stroke, lung cancer, and other problems. Avoid second-hand smoke. Pressure can go up by 5-10 mm Hg each time you smoke or vape.
Limit Alcohol	↓5.5/4	Blood pressure drops when people who drink more than 2 drinks daily go down to 2 drinks or less. ⁵
Connect with Others	Not given in studies	Loneliness and social isolation are linked to higher heart risk and higher blood pressures.
Spend Time in Nature	↓5.6/3.5	People who lived within a mile of green spaces, like parks, have lower blood pressures.
Explore spiritual health	Not given in studies	People who are more religious or spiritual seem to have lower blood pressures. Not tied to one religious group or type of spiritual practice. ⁶

Information from reference ⁷ unless otherwise noted.

Specific Foods and Nutrients

Some specific foods, nutrients in foods, and ways of eating can help to lower your blood pressure. Two popular eating plans, the DASH Diet^{8,9}, and the Mediterranean Diet^{10,11} have been shown to help lower blood pressure. See below for more details about these diets. The Mediterranean diet is one example of a traditional way of eating. Traditional ways of eating from other parts of the world share common features such as fresh food that is locally sourced and minimally processed. They center on various plant foods (vegetables and fruits), whole grains, legumes, nuts, seeds, herbs, spices, and a small amount of lean protein. Keep in mind that



frozen and canned vegetables are a great substitute for fresh. These ways of eating also focus on home cooking, and people coming together to share the pleasure of eating in good company.

Most traditional ways of eating are not as well-studied as the Mediterranean diet for lowering blood pressure. However, because they are plant-centered and based on whole foods, they will likely support healthy blood pressure. The important thing to remember about these ways of eating is that they avoid processed foods and are low in sweetened foods and drinks and red and processed meat.

Healthy Eating Patterns for your Blood Pressure		
Changes You Can Make	Pressure Drop (top # range, / bottom # range)	Things to Keep in Mind
DASH Diet	↓11.4/5.5	Many studies have found this to be the best eating plan for high blood pressure.
Mediterranean Diet	↓3/2	Also helps with cholesterol, diabetes risk, other causes of heart risk, and cancer. Adding nuts or virgin olive oil cause a drop of 6-7 more points for the top number.
Lacto-Ovo Vegetarian Diet (includes eggs and dairy)	↓3/2 ¹²	Vegan diets (no meat, eggs, dairy, or other animal products) <i>may</i> lower the top # 4-5. ¹²

Information from reference ⁷ unless otherwise noted.

Here are some more details about the above eating plans you can try to keep blood pressure on track.

Nutrition: Eating Plans

- 1. The DASH Diet.** DASH stands for Dietary Approaches to Stop Hypertension. It includes foods that are:
 - f. High in fruits and vegetables
 - g. Low in dairy, animal meat, and saturated fat
 - h. High in nuts, seeds, and beans
 - i. Low in snacks and sweets.For more information, see [DASH Eating Plan](#) by the National Heart, Lung, and Blood Institute.
- 2. The Mediterranean Diet.** Also called the Medi Diet, this diet drops pressures by a few points, and it reduces risk of death in general. It includes:
 - a. High in vegetables and fruits
 - b. High in virgin olive oil
 - c. Rich in legumes (lentils, peas, peanuts, beans, soybeans, chickpeas)
 - d. Suggests seafood as the primary meat
 - e. Includes whole grainsFor more information, go to the [Mediterranean Diet](#) overview by the Cleveland Clinic.



- 3. Traditional, Vegetarian, and Vegan Diets.** These include traditional ways of eating from around the world. Like the Mediterranean Diet, they include fresh whole, minimally processed foods and distinct flavors from a particular region.

Examples of traditional ways of eating from Africa, Asia, Latin America, and also Vegetarian, and Vegan diets can be found by on the OLDWAYS Cultural Food Traditions website at [Explore heritage diets](#).

Nutrition: Nutrients and Blood Pressure

The following 7 foods and nutrients in foods affect blood pressure, and you can change how much of them you eat to bring your numbers down.

- 1. Sodium.** Sodium *increases* blood pressure, and it can help to watch how much salt you eat. Most of the salt in our diets comes from foods we choose when we eat out. The DASH Diet can help people keep their sodium at a good level. It is best to keep salt intake under 2,300 mg daily, and if you can get down to 1,500mg, that is ideal. 1,500mg of sodium is equal to 2/3 of a teaspoon of table salt. 2,300 mg of sodium is equal to one teaspoon of table salt. The average person in the U.S. eats 3,400 mg daily.
- 2. Potassium.** Potassium lowers blood pressure. When you are looking at how much potassium is in different foods, you must look at the units. Most foods give the amount of potassium in milligrams (mg), but medications usually are dosed in milliequivalents (meq). 1 *meq* is equal to 39 *mg*. (It is okay to round up and say 40 mg).

There is a “sweet spot” with how much potassium you need each day. The key is to keep it in a good range. The *lowest* amount of potassium a person needs each day depends on their age and sex. For example, a man between ages 19 and 50 needs *at least* 3,400 mg daily, and a woman in that age range needs 2,600 mg¹³. These numbers are lower for younger people. But those are just the lowest limits. Most adults need a higher total amount, especially to keep blood pressure normal. Each person’s needs are different, but one study found that in adults with normal blood pressure, 800 mg from supplements and 4,500-6,500 mg from the diet is the best range.

It can help to look at lists of foods and how much potassium are in them. A good guide can be found here: [Food Sources of Potassium](#). Beets, chard, and potatoes have some of the highest amounts, along with yam, acorn squash, and spinach. There are dietary supplements with potassium, but be careful, because they do not always have as much as you might expect if you convert the size of a dose into meq of potassium.

- 3. Magnesium.** Magnesium blocks calcium channels, much like the drugs amlodipine or diltiazem. It is not usually mentioned in HTN guidelines, but studies do show that people who take in more of it have lower blood pressures than those who do not. If you choose to take added magnesium, magnesium glycinate is less likely to cause GI distress. Magnesium tends to be quite safe at usual doses; if you take too much, you will know because your stools will be much looser. Take it with caution if you have kidney problems. Remember that blood levels of magnesium are not good for telling you if you



are low or not, because they do not tell you intracellular levels. Foods rich in magnesium include nuts, spinach, bran cereal, beans, buckwheat, quinoa, and pumpkin seeds. This Cleveland Clinic website discusses magnesium and [25 Magnesium-Rich Foods You Should Be Eating](#).

4. **Polyphenols.** These compounds are found in a variety of plants and plant-derived foods, including various fruits (grapes, berries), vegetables, dark chocolate, coffee, tea, and red wine. They increase nitric oxide, which relaxes blood vessels, and they decrease activity of the body's renin-angiotensin-aldosterone system, which also lowers pressures (like ACE inhibitor drugs do).
5. **Nitrate-rich plants.** Beets and many other vegetables have nitrates which, like the drug nitroglycerin, can decrease blood pressure. These include spinach, mustard greens, radishes, celery, carrots, turnips, Bok choy, onions, and garlic.¹⁴
6. **Vitamins.** Vitamin C intake is tied to lower blood pressures. Vitamin C acts on nitric oxide levels and can work like a "water pill," to help your body remove excess fluids. Be sure you are getting at least the minimum or 75 mg for women and 90 mg for men daily. It is reasonable to aim for at least 250-500 mg total. The upper limit is 2,000 mg per day. Taking Vitamin D is also tied to HTN risk in large trials, but there is still debate about whether taking vitamin D helps blood pressures.
7. **Fiber.** Ideally, fiber should be part of the diet, but you may need to take extra as a supplement. Aim for a total of 30 grams of fiber each day. You can look up how much fiber different foods have at this webpage, [Food Sources of Dietary Fiber](#).

Foods and Nutrients for Your Blood Pressure			
Food/nutrient	How Much to Eat/Take Daily	Blood Pressure Change	Keep in Mind
Sodium	Keep under 2.3 grams/day (1 teaspoon). Under 2/3 tsp even better	↓4.3/2.1 (reduction when lowered) ¹⁵	Even less is better. This is the only item on the list that <i>improves blood pressure by being taken out of the diet</i> .
Potassium ¹⁴⁻¹⁶	4,500 mg in diet 800-1500 supplements	↓4.5/3	One source is salt substitutes. There are many foods that are rich in potassium too.
Magnesium	200-600 mg daily (3 mg for every pound of body weight)	↓2/1.8 (4.2/2.3 in a study of people with chronic illness)	Magnesium glycinate, malate, taurate, or threonate are easier to take than magnesium oxide. You can also increase it in your diet.



Foods and Nutrients for Your Blood Pressure			
Food/nutrient	How Much to Eat/Take Daily	Blood Pressure Change	Keep in Mind
Beet juice ¹⁴	1-2 cups a day	↓3.5/1.3 (as high as 76.7/5.2 after 4 weeks of taking)	More of an effect the longer you drink it. One reason it works is because of nitrates, which open blood vessels.
Cocoa	100 mg (1/4 of a dark chocolate bar)	↓4.7/2.8	White chocolate does not help. Dark chocolate should have 50-70% cocoa.
Garlic	½ to 2 raw garlic cloves	↓6.7/4.8	Can also take as a supplement, to avoid garlic breath.
Nuts ¹⁷	A handful daily (28 grams)	Eating nuts decreases overall HTN risk by 30%	Pistachios are among the best. Almonds, cashews, and other tree nuts also helpful. Salted, roasted and raw nuts all seem to lower pressures.
Fiber	30 grams (23 tablespoons) daily.	↓6.0/4.2	Ideally, best to get in diet. 30 grams daily a good target.
Flaxseed	30 grams daily	↓2.8/2.4	Best effects after taking for 3 months. Grind in small quantities; turns into linseed oil with age.
Pomegranate ¹⁸	300 ml (1 ¼ cups) daily	↓4.6/2.9	Effect may not last over 2 months.

All of these foods can be incorporated into a healthy eating plan, but it may be easiest to change just one thing at a time.

Information from reference⁷ unless otherwise noted.

Some dietary supplements are also used to lower blood pressure. The following table summarizes some of the ones that are best-studied.

Dietary Supplements for Your Blood Pressure			
Supplement	How Much to Take Daily	Blood Pressure Change	Keep in Mind
Coenzyme Q10	100-350 mg daily	↓17/10 (16/8 in some studies)	Take with meals that contain some fat. Good safety profile. Possible bleeding increase with blood thinners.
L-Arginine/L-citrulline	L-arginine: Up to 5g twice a day	↓5.4/2.7 for arginine	These are amino acids. Citrulline absorbed better and changed in to



Dietary Supplements for Your Blood Pressure			
Supplement	How Much to Take Daily	Blood Pressure Change	Keep in Mind
	Citrulline: Up to 2g twice a day	↓7.5/3.8 for citrulline	arginine in the body. Affects nitric oxide levels. Nitric oxide relaxes blood vessels.
Vitamin C	250-500 mg	↓3.8/1.5	Liposomal form is preferred. Tends to be quite safe.
Melatonin	2-5 mg	↓6.1/3.5	Take extended release form.
Garlic	0.4-1.2 grams powder, 200-1,000 mg extract, 2,400 mg of aged extract daily ¹⁹	↓6.7/4.8	Standardized doses containing 4000 mcg of allicin or 1.2 mg of S-allylcysteine
Hibiscus (Roselle)	2 tsp full of tea daily or 100 mg have been used	↓7.5 (top #) ²⁰	Works in 2-6 weeks. Reviews are conflicting about efficacy. ²¹
Probiotics ²²	1 capsule of 10 ⁹ colony forming units daily	↓2/1	Fermented foods also show promise.

Information from reference ⁷ unless noted otherwise.

NOTE: Dietary supplements are intended to supplement the diet. They are not medicines and are not intended to treat, diagnose, mitigate, prevent, or cure disease. In some cases, dietary supplements may have unwanted effects, especially if taken before surgery or with other dietary supplements or medicines, or if you have certain health conditions. Also, supplements are not regulated with the same degree of oversight as medications. Products vary greatly in terms of accuracy of labels, presence of contaminants, and the validity of claims on the label. Work with your health care provider to determine how best to achieve optimal health.

Mind-Body Skills

An array of mind-body practices seem to reduce blood pressure by an average of 10/7 mm Hg. All of the following have shown some promise in the research. To learn more, click on the link next to each, or go to the link on your web browser:

- [Biofeedback](#).
- [Mindfulness-based stress reduction](#).
- [Transcendental Meditation](#) (which includes Mantram Meditation).
- **Yoga and tai chi** (both physical activity and a way of stilling the mind).
 - [Yoga](#)
 - [Tai Chi](#)
- [Relaxation](#).



People are encouraged, whether they have HTN or not, to choose a mind-body practice they can do daily, building up to at least 20 minutes a day. Try different ones and pick the practice or practices that work best for you.

Other Integrative Health Approaches²³

- **Massage.** A large review concluded that massage could be of benefit for people with elevated blood pressure. A 2016 review concluded that pressure changes were 7.4/5.0 on average.
- **Acupuncture** combined with blood pressure medications has significant benefit too. Some studies have concluded that acupuncture is often superior to medication groups, but it has been noted that some studies are small.²⁴

In Conclusion

Congratulations on taking steps to improve your blood pressure, and your overall health. Keep at it. Explore the different approaches described in this handout, one at a time, and it will likely help you keep your blood pressures where you want them to be. And that will increase your ability to be at your healthiest.

The information in this handout is general. **Please work with your health care team to use the information in the best way possible to promote your health and happiness.**

For more information:

ORGANIZATION	TITLE	DESCRIPTION
University of Wisconsin Integrative Health Program	Clinician and Patient Education	A variety of handouts on <ul style="list-style-type: none">• Personal Development• Mindful Awareness

What we know about integrative health care has come to us thanks to the efforts, experiences, and collective wisdom of people from many cultures and backgrounds. We wish to acknowledge all the healers, researchers, patients, and peoples who have informed the content of this tool.

This handout was updated by J Adam Rindfleisch, MD Professor of the Osher Center for Integrative Health, from the original created by David Rakel, MD, Professor & Chair, Dept. of Family Medicine, University of Wisconsin-Madison.

Date Created: June, 2024

References

1. American Heart Association. Understanding Blood Pressure Readings. Accessed May 19, 2024, <https://www.heart.org/en/health-topics/high-blood-pressure/understanding-blood-pressure-readings>
2. American Heart Association. Types of Blood Pressure Medications. Accessed May 20, 2024, <https://www.heart.org/en/health-topics/high-blood-pressure/changes-you-can-make-to-manage-high-blood-pressure/types-of-blood-pressure-medications>
3. Whelton PK, He J, Appel LJ, et al. Primary prevention of hypertension: clinical and public health advisory from The National High Blood Pressure Education Program. *JAMA*. Oct 16 2002;288(15):1882-8. doi:10.1001/jama.288.15.1882



4. Makarem N, Shechter A, Carnethon MR, Mullington JM, Hall MH, Abdalla M. Sleep Duration and Blood Pressure: Recent Advances and Future Directions. *Curr Hypertens Rep.* Apr 5 2019;21(5):33. doi:10.1007/s11906-019-0938-7
5. Roerecke M, Kaczorowski J, Tobe SW, Gmel G, Hasan OSM, Rehm J. The effect of a reduction in alcohol consumption on blood pressure: a systematic review and meta-analysis. *Lancet Public Health.* Feb 2017;2(2):e108-e120. doi:10.1016/s2468-2667(17)30003-8
6. Shattuck EC, Muehlenbein MP. Religiosity/Spirituality and Physiological Markers of Health. *J Relig Health.* Apr 2020;59(2):1035-1054. doi:10.1007/s10943-018-0663-6
7. Plotnikoff G, Foley C, Dusek J. Non-Pharmaceutical Approaches to Hypertension. In: Rakel D, ed. *Integrative Medicine.* 5th ed. Elsevier Ltd.; 2023.
8. Filippou CD, Tsioufis CP, Thomopoulos CG, et al. Dietary Approaches to Stop Hypertension (DASH) Diet and Blood Pressure Reduction in Adults with and without Hypertension: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Adv Nutr.* Sep 1 2020;11(5):1150-1160. doi:10.1093/advances/nmaa041
9. Theodoridis X, Chourdakis M, Chrysoula L, et al. Adherence to the DASH Diet and Risk of Hypertension: A Systematic Review and Meta-Analysis. *Nutrients.* Jul 24 2023;15(14)doi:10.3390/nu15143261
10. Guasch-Ferré M, Willett WC. The Mediterranean diet and health: a comprehensive overview. *J Intern Med.* Sep 2021;290(3):549-566. doi:10.1111/joim.13333
11. Filippou CD, Thomopoulos CG, Kouremeti MM, et al. Mediterranean diet and blood pressure reduction in adults with and without hypertension: A systematic review and meta-analysis of randomized controlled trials. *Clin Nutr.* May 2021;40(5):3191-3200. doi:10.1016/j.clnu.2021.01.030
12. Lee KW, Loh HC, Ching SM, Devaraj NK, Hoo FK. Effects of Vegetarian Diets on Blood Pressure Lowering: A Systematic Review with Meta-Analysis and Trial Sequential Analysis. *Nutrients.* May 29 2020;12(6)doi:10.3390/nu12061604
13. National Institutes of Health. Potassium. Accessed April 3, 2024, [https://ods.od.nih.gov/factsheets/Potassium-HealthProfessional/#:~:text=Potassium%20has%20a%20strong%20relationship,mg%20potassium\)%20%5B3%5D](https://ods.od.nih.gov/factsheets/Potassium-HealthProfessional/#:~:text=Potassium%20has%20a%20strong%20relationship,mg%20potassium)%20%5B3%5D).
14. Bahadoran Z, Mirmiran P, Kabir A, Azizi F, Ghasemi A. The Nitrate-Independent Blood Pressure-Lowering Effect of Beetroot Juice: A Systematic Review and Meta-Analysis. *Adv Nutr.* Nov 2017;8(6):830-838. doi:10.3945/an.117.016717
15. Huang L, Trieu K, Yoshimura S, et al. Effect of dose and duration of reduction in dietary sodium on blood pressure levels: systematic review and meta-analysis of randomised trials. *BMJ.* Feb 24 2020;368:m315. doi:10.1136/bmj.m315
16. Filippini T, Naska A, Kasdagli MI, et al. Potassium Intake and Blood Pressure: A Dose-Response Meta-Analysis of Randomized Controlled Trials. *J Am Heart Assoc.* Jun 16 2020;9(12):e015719. doi:10.1161/jaha.119.015719
17. Schwingshackl L, Schwedhelm C, Hoffmann G, et al. Food Groups and Risk of Hypertension: A Systematic Review and Dose-Response Meta-Analysis of Prospective Studies. *Adv Nutr.* Nov 2017;8(6):793-803. doi:10.3945/an.117.017178
18. Ghaemi F, Emadzadeh M, Atkin SL, Jamialahmadi T, Zengin G, Sahebkar A. Impact of pomegranate juice on blood pressure: A systematic review and meta-analysis. *Phytother Res.* Oct 2023;37(10):4429-4441. doi:10.1002/ptr.7952
19. Drugs.com. Garlic. May 14, 2024, <https://www.drugs.com/npp/garlic.html>



20. Hoang T, Kim J. Phytonutrient supplements and metabolic biomarkers of cardiovascular disease: An umbrella review of meta-analyses of clinical trials. *Phytother Res*. Aug 2021;35(8):4171-4182. doi:10.1002/ptr.7079
21. Pattanittum P, Ngamjarus C, Buttramee F, Somboonporn C. Roselle for hypertension in adults. *Cochrane Database Syst Rev*. Nov 27 2021;11(11):Cd007894. doi:10.1002/14651858.CD007894.pub3
22. Zhao TX, Zhang L, Zhou N, Sun DS, Xie JH, Xu SK. Long-term use of probiotics for the management of office and ambulatory blood pressure: A systematic review and meta-analysis of randomized, controlled trials. *Food Sci Nutr*. Jan 2023;11(1):101-113. doi:10.1002/fsn3.3069
23. Niu JF, Zhao XF, Hu HT, Wang JJ, Liu YL, Lu DH. Should acupuncture, biofeedback, massage, Qi gong, relaxation therapy, device-guided breathing, yoga and tai chi be used to reduce blood pressure?: Recommendations based on high-quality systematic reviews. *Complement Ther Med*. Feb 2019;42:322-331. doi:10.1016/j.ctim.2018.10.017
24. Vilaval T, Sasinan W, Mayuree C, Chananun P, Somchai S. Effect of acupuncture on blood pressure control in hypertensive patients. *J Tradit Chin Med*. Apr 2019;39(2):246-250.