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Which Exercises Are Best for Lowering Blood Pressure?

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STORY AT-A-GLANCE

- Exercise is well-known for its ability to normalize blood pressure, but all forms of exercise are not the same in this regard
- A recent meta-analysis of 2,070 studies found that isometric exercise was the most effective for lowering blood pressure
- Effectiveness based on the "surface under the cumulative ranking curve" (SUCRA) values for systolic blood pressure — which refers to the mean probability of being the best — placed isometric exercise in the No. 1 slot with an effectiveness rating of 98.3%, followed by combined training (75.7%), dynamic resistance training (46.1%), aerobic exercise training (40.5%) and high-intensity interval training (39.4%)
- In secondary meta-analyses of submodes, the wall squat was the most effective for reducing systolic blood pressure while running was most effective for reducing diastolic blood pressure
- Dietary-wise potassium and magnesium are important for healthy blood pressure regulation. More often than not, it's not too much sodium that is the problem, but a lack of potassium

Exercise is well-known for its ability to normalize blood pressure, but are all forms of exercise the same in this regard? A recent meta-analysis[1] published July 25, 2023, in the British Journal of Sports Medicine, sought to determine the answer to this question.

Two-hundred and seventy randomized controlled trials published between 1990 and February 2023 that reported reductions in systolic blood pressure (SBP) and/or diastolic blood pressure (DBP) following an exercise intervention of two weeks or more were included, with a pooled sample size of 15, 827 people.

The top number of your blood pressure measurement, the systolic, is a measurement of the maximum pressure inside your arteries as your heart contracts. The bottom number, the diastolic, is a measurement of the pressure in your blood vessels when your heart is not contracting. Both numbers are important in determining how much damage may occur over time to your blood vessels and other organ systems.

The Best Exercises for High Blood Pressure

In rank order, analyses demonstrated significant reductions in resting SBP and DBP following:

- Isometric exercise (−8.24/−4.00 mmHg)
- Combined training (−6.04/−2.54 mmHg)
- Dynamic resistance training (−4.55/−3.04 mmHg)
- Aerobic exercise (−4.49/−2.53 mmHg)
- High-intensity interval training (−4.08/−2.50 mmHg)

Effectiveness based on the "surface under the cumulative ranking curve" (SUCRA) values for systolic — which refers to the mean probability of being the best for lowering your systolic blood pressure — placed isometric exercise in the No. 1 slot with an effectiveness rating of 98.3%, followed by combined training (75.7%), dynamic resistance training (46.1%), aerobic exercise training (40.5%) and high-intensity interval training (39.4%).

> **“ Various exercise training modes improve resting blood pressure, particularly isometric exercise. The**

> **results of this analysis should inform future exercise guideline recommendations for the prevention and treatment of arterial hypertension. ~ British Journal of Sports Medicine”**

In secondary meta-analyses of submodes, the wall squat was the most effective for reducing SBP while running was most effective for reducing DBP. In conclusion, the authors noted:[2]

> *"Various exercise training modes improve resting blood pressure, particularly isometric exercise. The results of this analysis should inform future exercise guideline recommendations for the prevention and treatment of arterial hypertension."*

What Is Isometric Exercise?

A key take-home from this meta-analysis is that static contraction of muscle as you hold your body in one position, i.e., isometric exercise, is the most effective type of exercise if you want to lower your blood pressure. Static contraction is what defines isometric exercise. Examples of isometric exercises include:[3,4,5]

Wall squat	Isometric calf raise	Planking
Hollow-body hold	Low isometric squat	Static slide lunge
Overhead hold	Iso hang	Glute bridge
Incline pushup hold	V-sit	Single-leg stand

Existing exercise guidelines for blood pressure management emphasize cardio, such as running and cycling, but following that advice will not give you the best results. In fact, aerobic exercise ended up being next to last in terms of effectiveness.

Imbalanced Potassium-to-Sodium Ratio and Your Blood Pressure

Of course, your diet and other lifestyle factors may also need to be addressed if you have high blood pressure. One really important factor that is often overlooked is your potassium-to-sodium ratio.

Most conventional doctors still focus on the sodium part of this equation, but a low-sodium diet is rarely the answer. Most of the time, it's not too much sodium that is the problem, but a lack of potassium.

Potassium is one of the most abundant positively charged ions inside your cell and is essential for normal cell function. The potassium and sodium relationship is strong, and is the main regulator of extracellular fluid volume, including your plasma (blood). Your body works most efficiently when there is a balance in your potassium and sodium.

You can lose potassium through diarrhea, vomiting, excessive sweating or the use of some drugs, including excessive alcohol. However, the most common reason potassium levels are not within normal limits is related to your dietary intake.

According to the U.S. Department of Agriculture,[6] the average intake of potassium in the U.S. population is 2,640 milligrams (mg) per day. Other surveys have found similar intakes.[7] Meanwhile, the Institute of Medicine recommends 4,700 mg per day for people over the age of 14.

Potassium helps lower your blood pressure by relaxing the walls of your arteries, and according to Harvard Health,[8] many people with high systolic blood pressure can successfully lower it simply by increasing their potassium intake.

In my view the absolute best way to increase your potassium is by beating ripe fruit. I typically get around 3,000 mg from watermelon, orange juice and tangerines, and another 2,000 mg from other sources. For a more complete list, see DietaryGuidelines.gov's "Food Sources of Potassium" page.[9]

For more precise and accurate results, you can input your foods into Cronometer.com and easily find out precisely how much potassium you are getting. Taking potassium supplements is not a good strategy and will simply not provide you with the benefits you are seeking.

Magnesium Is Important for Blood Pressure Regulation

Magnesium is also important for healthy blood pressure and few people get enough from their diet these days. Hundreds of studies and scientific papers show there's a clear **correlation between magnesium and high blood pressure**.

According to a 2011 paper[10] in The Journal of Clinical Hypertension, magnesium intake of 500 mg to 1,000 mg per day may reduce blood pressure by as much as 5.6/2.8 mmHg. Its blood pressure lowering effects are most pronounced when potassium intake is also high, and sodium intake low.

Magnesium also boosts the effectiveness of "all antihypertensive drug classes," according to this paper. The mechanisms behind magnesium's BP-lowering effects were described as follows:[11]

> *"One of the mechanisms by which magnesium lowers BP is by acting like a natural calcium channel blocker.*
>
> *Magnesium competes with sodium for binding sites on vascular smooth muscle cells, increases prostaglandin E, binds to potassium in a cooperative manner, induces endothelial-dependent vasodilation, improves endothelial dysfunction in hypertensive and diabetic patients, decreases intracellular calcium and sodium, and reduces BP.*
>
> *Magnesium is more effective in reducing BP when administered as multiple minerals in a natural form and as a combination with magnesium, potassium, and calcium than when given alone.*

Magnesium is also an essential cofactor for the delta-6-desaturase enzyme, which is the rate-limiting step for the conversion of linoleic acid (LA) to gamma-LA (GLA).

GLA, in turn, elongates to form DGLA ... the precursor for prostaglandin E1 (PGE1), [which] is both a vasodilator and platelet inhibitor. Low magnesium states lead to insufficient amounts of PGE1, causing vasoconstriction and increased BP.

In addition ... magnesium regulates intracellular calcium, sodium, potassium, and pH as well ... arterial compliance. Magnesium also suppresses circulating Na+K+ATPase inhibitory activity that reduces vascular tone."

Dietary Do's and Don'ts

For those with current kidney problems, it's important to seek your physician's advice before using potassium supplements as it may lead to irregular heart rhythms.[12] Of course, excessive salt consumption can also contribute to an imbalance, but unless your intake is a) extreme, and b) you're using processed table salt and not unprocessed salt like Himalayan salt, I rarely worry about salt intake.

Magnesium-rich foods[13] include baked potato and white rice, just to name a few. That said, the magnesium content of most foods is dwindling due to the destruction of soils, so it's one nutrient, unlike potassium, that I recommend taking as a supplement.

However, as with potassium, before taking any magnesium supplement, be sure to consult with your health care practitioner, especially if you have kidney disease. An alternative way of supplementing with magnesium is to soak in magnesium sulfate, commonly known as Epsom salts.

In addition to making sure you're getting enough potassium, also avoid the following foods, which are notorious for causing blood pressure levels to rise:[14]

- Processed foods

- Most grains
- Partially hydrogenated oils (synthetic trans fats), found in many processed foods, including packaged cookies, crackers, chips and other snacks
- Seed oils (aka vegetable oils) such as corn, canola, soy and safflower oils

Isometric Exercise Instructions

Getting back to isometric exercises, here are instructions for how to perform several of the most popular ones. Also remember that an amazing resource is YouTube. Although you absolutely can't trust it for truth about politics or health, it has not censored exercise content.

Just type in the exercise you want to perform, and you will typically find dozens if not hundreds of incredibly useful videos. It is always best to watch at least several of them so you can get a consensus and different types of exercises from instructors.

Wall squat and low squat — For the wall squat, stand with your back flat against a wall, then walk your feet about 1.5 feet (0.5 meter) out from the wall. With your feet shoulder-width apart, back flat against the wall and your abs tight, squat until your knees are bent at a 90-degree angle, or as low as you can comfortably go. Remain squatting for as long as you can, then stand back up by pushing up from your heels.

The low squat is similar, but here you're not using a wall. Start by standing with your feet slightly more than hip-width apart. Keep your hands on your hips, or straight out in front of you. Push your hips back into a sitting position while bending your knees. Keep your spine long (don't round forward). Hold for 10 to 30 seconds, then return to the starting position.

High plank and side plank — For the high plank, start in a kneeling pushup with your hands shoulder-distance apart. Straighten your knees, pushing down into the balls of your feet to raise your body into a high plank position, which looks exactly like the upward position of a pushup.

With your hands aligned with your shoulders and legs straight, engage your core and hold for 20 to 60 seconds, or as long as you can maintain proper form.

For the side plank, start out lying on your left side with legs straight (your hips, knees and feet stacked). Bend your left elbow and place your forearm on the ground under your shoulder. Push your left forearm into the ground to lift your torso and hips off the ground.

Engage your core to maintain your body in a straight line from head to heel. You can keep your right arm by your side or stretched up in the air. Hold for at least 10 seconds. Lower your torso down and switch sides.

Overhead hold — Using a suitable weight (based on your level of fitness) with both hands, engage your core and extend your arms above your head. Keep your arms fully extended and in line with your shoulders. Hold the weight steady over your head for 20 to 30 seconds.

Glute bridge — Lie on your back. Bend your knees so that your heels are about 12 to 16 inches from your behind. Keep your arms by your sides. Press into your heels, brace your core, and push your pelvis upwards by squeezing your glutes. Maintain the bridge position for 30 seconds without letting your hips sink.

Hollow-body hold — Lie on your back with your legs extended toward the ceiling, perpendicular to the floor. Squeeze your core to press your low back into the floor, then raise your head and shoulders a few inches off the floor while simultaneously lowering your legs as close to the floor as possible. Hold until you can't hold any longer, then lower your head and shoulders to the floor.

Incline pushup hold — Place your hands on a sturdy surface, such as a bench or low table. Position your hands slightly wider than your shoulders. Walk backward until you're in a pushup position, with your body weight supported on your hands and the balls of your feet. Engage your core and make sure your shoulders are not pushing up toward your ears.

Bend your elbows as in the downward motion of a pushup until your chest nearly touches the bench or table. Your arms should flare outward, forming 45-degree angles with your torso. Pause here and hold as long as you can, then step forward to stand up.

Sources and References

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