

# Healthy changes in diet, activity improved treatment-resistant high blood pressure

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People with treatment-resistant hypertension successfully reduced their blood pressure by adopting the Dietary Approaches to Stop Hypertension (DASH) eating plan, losing weight and improving their aerobic fitness by participating in a structured diet and exercise program at a certified cardiac rehabilitation facility, according to new research

published today in the American Heart Association's flagship journal *Circulation*.

Uncontrolled high [blood](#) pressure (130/80 mm Hg or higher) despite the use of three or more medications of different classes including a diuretic to reduce blood pressure is a condition known as resistant [hypertension](#). Although estimates vary, resistant hypertension likely affects about 5% of the general global population and may affect 20% to 30% of adults with high blood pressure. Resistant hypertension is also associated with end-organ damage and a 50% greater risk of adverse cardiovascular events, including stroke, [heart attack](#) and death.

Diet and exercise are well-established treatments for [high blood pressure](#). In June 2021, the American Heart Association advised that physical activity is the optimal first treatment choice for adults with mild to moderately elevated blood pressure and blood cholesterol who otherwise have low heart disease risk.

This new study, Treating Resistant Hypertension Using Lifestyle Modification to Promote Health (TRIUMPH), is the first to evaluate the impact of [lifestyle](#) modifications in people with resistant hypertension. Researchers found that [behavioral changes](#), including regular aerobic exercise, adoption of the DASH (Dietary Approaches to Stop Hypertension) diet, reducing salt consumption and losing weight, can lower blood pressure significantly and improve cardiovascular health in people with resistant hypertension. The DASH eating plan is rich in fruits, vegetables, low-fat dairy products and limited salt, and aligns with the American Heart Association's nutrition [recommendations](#).

The four-month clinical trial involved 140 adults with resistant hypertension (average age 63; 48% women; 59% Black adults; 31% with type 2 diabetes; and 21% with chronic kidney disease). Participants were randomly divided into two groups—90 participants received weekly

dietary counseling and exercise training in an intensive, supervised cardiac rehabilitation setting three times a week. The other 50 participants received a single informational session from a health educator and written guidelines on exercise, weight loss and nutritional goals to follow on their own.

Researchers found:

- The participants in the supervised program had about a 12-point drop in systolic blood pressure, compared to 7 points in the self-guided group. Systolic blood pressure (the first number in a blood pressure reading) indicates how much pressure blood is exerting against artery walls when the heart beats and is recognized as a major risk factor for cardiovascular disease for adults ages 50 and older.
- Blood pressure measures captured through 24 hours of ambulatory monitoring during a typical day revealed that the group in the supervised lifestyle program had a 7-point reduction in systolic blood pressure, while the self-guided group had no change in blood pressure.
- Participants in the supervised program also had greater improvements in other key indicators of heart health, suggesting that they had a lower risk of a heart event in the future.

"Our findings showed lifestyle modifications among people with resistant hypertension can help them successfully lose weight and increase their physical activity, and as a result, lower blood pressure and potentially reduce their risk of heart attack or stroke," said James A. Blumenthal, Ph.D., first and senior author of the study, and J.P. Gibbons Professor of Psychiatry and Behavioral Sciences at Duke University School of Medicine in Durham, North Carolina. "While some people can make lifestyle changes on their own, a structured program of supervised exercise and dietary modifications conducted by a multidisciplinary

team of health care professionals in cardiac rehabilitation programs is likely more effective."

Blumenthal noted that the success of the supervised program doesn't mean people with resistant hypertension can stop taking their medications; however, it suggests that they may want to talk with their physicians about possibly reducing the dosages or altering their medications based upon their lowered blood pressure values.

The study was conducted at a single institution—Duke University School of Medicine—so findings may not be generalizable to broader groups of people. However, the intensive, structured, supervised part of the study occurred at several representative cardiac rehabilitation centers in central North Carolina, with educational and cultural diversity well represented. Researchers believe the program could be implemented with success at similar cardiac rehabilitation centers throughout the county. Also, the study's impact beyond the four months of monitoring is limited by whether participants who made significant lifestyle changes will maintain them. "The benefits of the lifestyle modifications may be reduced unless the healthy lifestyle habits can be maintained," Blumenthal said.

"The most important point is that it is not too late to lower blood [pressure](#) by making healthy lifestyle choices," he said. "Adopting a healthy lifestyle pays huge dividends, even for people whose [blood pressure](#) remains elevated despite being on three or more antihypertensive medications."

American Heart Association volunteer expert Bethany Barone Gibbs, Ph.D., FAHA, noted that this data gives clinicians another evidence-based tool for helping patients with resistant hypertension.

"Though we usually think about recommending lifestyle changes like

losing weight and getting more [physical activity](#) before starting medications, this study provides important reinforcement that adding lifestyle changes in conjunction with medications—and when medications alone are not doing the job—is an effective strategy," said Gibbs, an associate professor in the department of health and human development and clinical and translational sciences at the University of Pittsburgh. "Also exciting is that Blumenthal, et. al., used a cardiac rehab model, which can be duplicated in many settings."

Gibbs, chair of the statement writing group of the Association's June 2021 scientific statement on lifestyle treatment for hypertension, urged patients to commit to lifestyle changes—losing 5% to 10% of their bodyweight, greater adherence to the DASH-style diet, and increasing steps by at least 1,000 per day can yield health benefits.

**More information:** *Circulation* (2021).

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