



## NIH NEWS RELEASE

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EMBARGOED FOR RELEASE  
Wednesday, May 17, 2000  
12:00 p.m. EDT

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### NHLBI Study Shows Large Blood Pressure Benefit From Reduced Dietary Sodium

The lower the amount of sodium in the diet, the lower the blood pressure, for both those with and without hypertension, according to a National Heart, Lung, and Blood Institute (NHLBI)-supported clinical study. The lowest sodium level tested, which produced the lowest blood pressure, was well below the currently recommended intake of 2,400 milligrams a day.

Moreover, the effects of reducing sodium occurred with both a diet similar to what many Americans eat and the "DASH diet," which is rich in vegetables, fruits, and lowfat dairy foods and low in saturated fat, total fat, and cholesterol. The greatest blood pressure reduction occurred with the DASH diet at the lowest intake of dietary sodium.

The blood pressure reductions occurred in men and women and in African Americans and others.

DASH stands for "Dietary Approaches to Stop Hypertension." The findings, which will be presented tomorrow at the American Society of Hypertension (ASH) annual meeting in New York City, are from the DASH-Sodium trial, a multicenter 14-week feeding study.

"This finding should answer the question of whether or not reducing dietary sodium benefits those without hypertension," said NHLBI Director Dr. Claude Lenfant. "Earlier studies had differed in their designs, leading to uncertainty over how worthwhile it is to reduce dietary sodium for those who have not yet developed high blood pressure. This well-controlled study had a diverse group of participants and its finding shows that the benefit is substantial.

"The study also should help establish the best level of sodium consumption for preventing and controlling high blood pressure. The finding suggests that an intake below that now recommended could help many Americans prevent the blood pressure rises that now occur with advancing age."

The new finding is from the second DASH study. The first DASH study examined the effect on blood pressure of whole dietary patterns, rather than of individual nutrients. Its findings, which appeared in the April 17, 1997 issue of *The New England Journal of Medicine*, showed that the DASH diet significantly and quickly lowered blood pressure.

The DASH diet is low in saturated fat, total fat, and cholesterol. It emphasizes fruits, vegetables, and lowfat dairy foods, and includes whole grains, poultry, fish, and nuts. It is reduced in red meat, sweets, and sugar-containing beverages. It is rich in potassium, calcium, and magnesium, as well as protein and fiber.

The blood pressure reductions in that study occurred without changes in weight, alcohol consumption, or dietary sodium intake. All study participants consumed about 3,000 milligrams daily of dietary sodium, which is slightly below Americans' average consumption.

DASH-Sodium, the second study, was conducted to look at the relationships between blood pressure and various sodium intakes during two different eating patterns.

DASH-Sodium involved 412 participants, aged 22 or older. About 57 percent of the participants were women and about 57 percent were African Americans. Participants had systolic blood pressures of 120-159 mm Hg and diastolic blood pressure of 80-95 mm Hg. About 41 percent had hypertension.

Participants had all of their food provided. They were randomly assigned to one of two dietary plans, each of which was followed at three sodium levels. The two dietary plans were a "usual" diet, typical of what many Americans eat, and the DASH diet. The three sodium levels, each consumed for four weeks, were: a "higher" intake of 3,300 milligrams per day; an "intermediate" intake of 2,400 milligrams per day; and a "lower" intake of 1,500 milligrams per day.

Results showed that reducing dietary sodium lowered blood pressure for both the usual and DASH diets. The lower the sodium intake, the lower the blood pressure.

The biggest reductions in blood pressure were found among those who followed the DASH diet at the lower sodium intake. That combination reduced blood pressure more than either the DASH diet or lower sodium intake alone. The combination worked best for all participants—those with and without hypertension, men and women, and African Americans and others.

Overall, the DASH diet combined with the lower sodium intake reduced systolic blood pressure by an average of 8.9 mm Hg and diastolic blood pressure by an average of 4.5 mm Hg. In those with hypertension, the combination reduced systolic blood pressure by an average of 11.5 mm Hg; in those without

hypertension, the combination reduced systolic blood pressure by an average of 7.1 mm Hg.

Other key results from the study are:

- At each of the three levels of sodium intake, blood pressure was lower for those on the DASH diet than for those on the control diet. For example, at the currently recommended level of 2,400 milligrams of sodium a day, the DASH diet reduced systolic blood pressure by an average of 5.0 mm Hg and diastolic blood pressure by an average of 2.5 mm Hg.
- For the usual diet, reducing sodium intake from higher to lower levels decreased systolic blood pressure by an average of 6.7 mm Hg and diastolic by an average of 3.5 mm Hg. More than half of that reduction occurred when participants reduced their sodium intake from the intermediate to the lower level.
- When going from the higher to the lower level of sodium intake, participants without hypertension had substantial reductions in blood pressure, whether they were on the usual diet or the DASH diet.

Those on the lower sodium intake, as well as those on the DASH diet, had fewer headaches. Otherwise, there were no significant differences in adverse effects among the two eating plans or different sodium levels.

“The results show that those with hypertension should follow the DASH eating plan at a reduced sodium intake to help lower their blood pressure,” said Dr. Frank Sacks, chair of the DASH-Sodium Steering Committee and Associate Professor of Medicine at Brigham and Women’s Hospital and the Harvard Medical School.

DASH-Sodium also found that both sodium reduction and the DASH diet had a substantial effect on the blood pressure of African Americans.

“African Americans have more hypertension than other Americans,” said Sacks. “The finding suggests that more than sodium may play a role in African Americans’ blood pressure, and they would benefit from adopting an eating plan similar to that of a lower sodium DASH diet.”

“The study shows how important it is to reduce sodium in the diet. The findings suggest that the current recommendation for how much dietary sodium Americans should consume may need to be lowered. By reducing their dietary sodium to 1,500 milligrams a day, all Americans, and especially those at high risk for hypertension, can decrease their chance of developing high blood pressure as they age,” said Dr. Eva Obarzanek, an NHLBI nutritionist and Project Officer for DASH-Sodium.

“To make that change,” she continued, “Americans should cut down on processed foods-the biggest source of sodium in the diet-use food labels as a guide to choose items lower in salt and sodium, flavor foods with spices instead of salt, and remove the salt shaker from the table. The food industry also needs to help by reducing the amount of salt they put into food products. It would help to make more low-salt food products available.

“Reducing sodium benefits blood pressure whatever your eating plan,” added Obarzanek. “But for a true winning combination, follow the DASH diet and lower your intake of sodium.”

Both DASH studies were conducted by investigators from the Brigham and Women’s Hospital in Boston, MA, Duke University Medical Center in Durham, NC, The Johns Hopkins University in Baltimore, MD, the Pennington Biomedical Research Center of the Louisiana State University in Baton Rouge, LA, and the Kaiser Permanente Center for Health Research in Portland, OR.

To arrange an interview about DASH-Sodium, contact the NHLBI Communications Office at (301) 496-4236.

*NHLBI press releases, a high blood pressure Web site, and other materials are available online at [www.nhlbi.nih.gov](http://www.nhlbi.nih.gov).*