

guidelines. Cox proportional hazards models were used to calculate rate ratios of HF-associated hospitalization or death, determined using the Swedish inpatient and cause-of-death registers between January 1, 1998, and December 31, 2004.

Results During 7 years, 443 women developed HF. Women in the top quartile of the DASH diet score based on ranking DASH diet components had a 37% lower rate of HF after adjustment for age, physical activity, energy intake, education status, family history of myocardial infarction, cigarette smoking, postmenopausal hormone use, living alone, hypertension, high cholesterol concentration, body mass index (calculated as weight in kilograms divided by height in meters squared), and incident myocardial infarction. Rate ratios (95% confidence intervals) across quartiles were 1 [Reference], 0.85 (0.66-1.11), 0.69 (0.54-0.88), and 0.63 (0.48-0.81); $P_{\text{trend}} < .001$. A similar pattern was seen for the guideline-based scores.

Conclusion In this population, diets consistent with the DASH diet are associated with lower rates of HF.

<http://archinte.ama-assn.org/cgi/content/abstract/169/9/851>

Appleby PN et al. **Hypertension and blood pressure among meat eaters, fish eaters, vegetarians and vegans in EPIC-Oxford.** Public Health Nutr 2002;5:645-54.

Vegetarian diets do not contain meat, poultry or fish; vegan diets further exclude dairy products and eggs. Vegetarian and vegan diets can vary widely, but the empirical evidence largely relates to the nutritional content and health effects of the average diet of well-educated vegetarians living in Western countries, together with some information on vegetarians in non-Western countries. In general, vegetarian diets provide relatively large amounts of cereals, pulses, nuts, fruits and vegetables. In terms of nutrients, vegetarian diets are usually rich in carbohydrates, n-6 fatty acids, dietary fibre, carotenoids, folic acid, vitamin C, vitamin E and Mg, and relatively low in protein, saturated fat, long-chain n-3 fatty acids, retinol, vitamin B12 and Zn; vegans may have particularly low intakes of vitamin B12 and low intakes of Ca. Cross-sectional studies of vegetarians and vegans have shown that on average they have a relatively low BMI and a low plasma cholesterol concentration; recent studies have also shown higher plasma homocysteine concentrations than in non-vegetarians. Cohort studies of vegetarians have shown a moderate reduction in mortality from IHD but little difference in other major causes of death or all-cause mortality in comparison with health-conscious non-vegetarians from the same population. Studies of cancer have not shown clear differences in cancer rates between vegetarians and non-vegetarians. More data are needed, particularly on the health of vegans and on the possible impacts on health of low intakes of long-chain n-3 fatty acids and vitamin B12. Overall, the data suggest that the health of Western vegetarians is good and similar to that of comparable non-vegetarians.

http://www.martinfrost.ws/htmlfiles/july2008/epic_veg.pdf

He J et al. **Long-term effects of weight loss and dietary sodium reduction on incidence of hypertension.** Hypertension 2000;35:544-9.

Abstract—To examine the long-term effects of weight loss and dietary sodium reduction on the incidence of hypertension, we studied 181 men and women who participated in the Trials of Hypertension Prevention, phase 1, in Baltimore, Md. At baseline (1987 to 1988), subjects were 30 to 54 years old and had a diastolic blood pressure (BP) of 80 to 89 mm Hg and systolic BP <160 mm Hg. They were randomly assigned to one of two 18-month lifestyle modification interventions aimed at either weight loss or dietary sodium reduction or to a usual care control group. At the posttrial follow-up (1994 to 1995), BP was measured by blinded observers who used a random-zero sphygmomanometer.

Incident hypertension was defined as systolic BP 160 mm Hg and/or diastolic BP 90 mm Hg and/or treatment with antihypertensive medication during follow-up. Body weight and urinary sodium were not significantly different among the groups at the posttrial follow-up. After 7 years of follow-up, the incidence of hypertension was 18.9% in the weight loss group and 40.5% in its control group and 22.4% in the sodium reduction group and 32.9% in its control group. In logistic regression analysis adjusted for baseline age, gender, race, physical activity, alcohol consumption, education, body weight, systolic BP, and urinary sodium excretion, the odds of hypertension was reduced by 77% (odds ratio 0.23; 95% confidence interval 0.07 to 0.76; P=0.02) in the weight loss group and by 35% (odds ratio 0.65; 95% confidence interval 0.25 to 1.69; P=0.37) in the sodium reduction group compared with their control groups. These results indicate that lifestyle modification such as weight loss may be effective in long-term primary prevention of hypertension.

<http://hyper.ahajournals.org/cgi/content/full/35/2/544>

Whelton SP, Chin A, Xin X, He J. **Effect of aerobic exercise on blood pressure: A meta-analysis of randomized, controlled trials.** *Ann Intern Med* 2002;136:493-503. Abstract

Purpose: Physical activity has been associated with reduced blood pressure in observational epidemiologic studies and individual clinical trials. This meta-analysis of randomized, controlled trials was conducted to determine the effect of aerobic exercise on blood pressure.

Data Sources: English-language articles published before September 2001.

Study Selection: 54 randomized, controlled trials (2419 participants) whose intervention and control groups differed only in aerobic exercise.

Data Extraction: Using a standardized protocol and data extraction form, three of the investigators independently abstracted data on study design, sample size, participant characteristics, type of intervention, follow-up duration, and treatment outcomes.

Data Synthesis: In a random-effects model, data from each trial were pooled and weighted by the inverse of the total variance. Aerobic exercise was associated with a significant reduction in mean systolic and diastolic blood pressure (−3.84 mm Hg [95% CI, −4.97 to −2.72 mm Hg] and −2.58 mm Hg [CI, −3.35 to −1.81 mm Hg], respectively). A reduction in blood pressure was associated with aerobic exercise in hypertensive participants and normotensive participants and in overweight participants and normal-weight participants.

Conclusions: Aerobic exercise reduces blood pressure in both hypertensive and normotensive persons. An increase in aerobic physical activity should be considered an important component of lifestyle modification for prevention and treatment of high blood pressure.

<http://www.annals.org/content/136/7/493.long>

Appel LJ, Brands MW, Daniels SR, et al. **Dietary approaches to prevent and treat hypertension: a scientific statement from the American Heart Association.** *Hypertension*. 2006;47:296–308.

A substantial body of evidence strongly supports the concept that multiple dietary factors affect blood pressure (BP). Well-established dietary modifications that lower BP are reduced salt intake, weight loss, and moderation of alcohol consumption (among those who drink). Over the past decade, increased potassium intake and consumption of dietary patterns based on the "DASH diet" have emerged as effective strategies that also lower BP. Of substantial public health relevance are findings related to blacks and older individuals. Specifically, blacks are especially sensitive to the BP-lowering effects of

reduced salt intake, increased potassium intake, and the DASH diet. Furthermore, it is well documented that older individuals, a group at high risk for BP-related cardiovascular and renal diseases, can make and sustain dietary changes. The risk of cardiovascular disease increases progressively throughout the range of BP, beginning at 115/75 mm Hg. In view of the continuing epidemic of BP-related diseases and the increasing prevalence of hypertension, efforts to reduce BP in both nonhypertensive and hypertensive individuals are warranted. In nonhypertensive individuals, dietary changes can lower BP and prevent hypertension. In uncomplicated stage I hypertension (systolic BP of 140 to 159 mm Hg or diastolic BP of 90 to 99 mm Hg), dietary changes serve as initial treatment before drug therapy. In those hypertensive patients already on drug therapy, lifestyle modifications, particularly a reduced salt intake, can further lower BP. The current challenge to healthcare providers, researchers, government officials, and the general public is developing and implementing effective clinical and public health strategies that lead to sustained dietary changes among individuals and more broadly among whole populations.

<http://hyper.ahajournals.org/cgi/content/full/47/2/296>

Burke V, Beilin LJ, Cutt HE, et al. **Effects of a lifestyle programme on ambulatory blood pressure and drug dosage in treated hypertensive patients: a randomized controlled trial.** *J Hypertens.* 2005;23:1241–1249. Abstract only

Abstract:

Objective: To assess effects of multifactorial lifestyle modification on antihypertensive drug needs in treated hypertensive individuals.

Design: Randomized controlled trial.

Setting: Research studies unit.

Participants: Overweight hypertensive patients, receiving one or two antihypertensive drugs, were recruited by advertising, and allocated randomly to a usual care group (controls; n = 118) or a lifestyle modification group (programme group; n = 123).

Intervention: A 4-month programme of weight loss, a low-sodium 'Dietary Approaches to Stop Hypertension'-type diet with added fish, physical activity and moderation of alcohol intake. After 4 months, if mean 24-h ambulatory blood pressure (ABP) was less than 135/85 mmHg, antihypertensive drugs were withdrawn over 4 weeks and long-term home blood pressure monitoring was begun.

Main outcome measures: Antihypertensive drug requirements, ABP, weight, waist girth at 4 months and 1-year follow-up.

Results: Ninety control group and 102 programme group participants completed the study. Mean 24-h ABP changed after 4 months by $-1.0/-0.3 \pm 0.5/0.4$ mmHg in controls and $-4.1/-2.1 \pm 0.7/0.5$ mmHg with the lifestyle programme ($P < 0.01$). At follow-up, changes in the two groups were not significantly different ($4.1/1.3 \pm 1.1/1.0$ mmHg in controls; $2.5/-0.1 \pm 1.1/0.8$ mmHg in the programme group; $P = 0.73$). At 4 months, drug withdrawal differed significantly between the groups ($P = 0.038$) in men (control 44%; programme 66%) but not in women (65 and 64%, respectively; $P = 0.964$). At follow-up, sex-related differences were not significant, and 41% in the control group and 43% in the programme group maintained drug-withdrawal status. With the programme, net weight loss was 3.3 kg ($P < 0.001$) at 4 months and 3.0 kg ($P < 0.001$) at follow-up; respective net decreases in waist girth were 3.3 cm ($P < 0.001$) and 3.5 cm ($P < 0.001$).

Conclusions: A 4-month multifactorial lifestyle modification in patients with treated hypertension reduced blood pressure in the short-term. Decreased central obesity persisted 1 year later and could reduce overall cardiovascular risk.

<http://journals.lww.com/jhypertension/toc/2005/06000>

Nicolson DJ, Dickinson HO, Campbell F, et al. **Lifestyle interventions or drugs for patients with essential hypertension: a systematic review.** *J*

Hypertens. 2004;22:2043–2048.

Objective: To compare the effectiveness of lifestyle and drug interventions for treating patients with essential hypertension.

Methods: Systematic review of randomized controlled trials (RCTs), with 8 or more weeks follow-up, enrolling patients with blood pressure of at least 140/85 mmHg, which directly compared lifestyle and drug interventions. Planned outcome measures were cardiovascular morbidity and mortality and blood pressure.

Results: We found five RCTs meeting our inclusion criteria and additionally included one quasi-randomized trial. These trials enrolled between 27 and 64 participants, mean age 55 years, with follow-up of less than 1 year; none reported cardiovascular outcomes.

The lifestyle and drug interventions and patient populations were heterogeneous.

Overall, the trials were of poor quality and had inconsistent results. Although dietary interventions did not always lower blood pressure as much as antihypertensive drugs, secondary analysis suggested that they might be better at lowering cholesterol levels.

Conclusions: In the short term, lifestyle treatment may be effective at reducing blood pressure for some individuals. A healthier diet, by lowering blood pressure and cardiovascular risk, may reduce, delay or remove the need for long-term drug therapy in some patients. However, further comparisons of lifestyle and drug interventions for hypertension are required, with larger clinical trials of longer duration and better quality. Future trials should aim to identify the characteristics of patients most likely to benefit from lifestyle changes.

http://journals.lww.com/jhypertension/Abstract/2004/11000/Lifestyle_interventions_or_drugs_for_patients_with.1.aspx