



Effective Public Health Practice Project Summary Statement



December 2005

This is a summary statement written to condense the work of the authors of a systematic review. The reference for the full review is below. The intent of this summary is to provide an overview of the findings and implications of the full review. For more information on individual studies included in the review, please see the review itself.

Reference for Review in APA: Hooper, L., Barlett, C., Davey Smith, G. & Ebrahim, S. (2002). **Systematic review of long term effects of advice to reduce dietary salt in adults.** *British Medical Journal*, **325**, 628-636.

Issue: About 14% of Canadian adults have been diagnosed with high blood pressure (Statistics Canada, 2005a) and another 40% of hypertensive Canadians are unaware of their condition (Campbell, Joffres and McKay, 2005). High blood pressure is considered the leading risk factor for death in women and the second leading factor in men in industrialised countries such as Canada (Campbell et al., 2005). High blood pressure is also a key risk factor in cardiovascular disease, along with dietary and alcohol intake, body weight, physical activity level/sedentary behaviour, diabetes, smoking and stress (Angus, Evans, Lapum, Rukholm, St. Onge, Nolan and Michel, 2005; Chahoud, Wady Aude and Mehta, 2004). In Canada, cardiovascular disease accounts for approximately 200 deaths per 100,000 people per year with 78,942 related deaths in 1999 (Filate, Johansen, Kennedy and Tu, 2003; Statistics Canada, 2005b). There is a need to reduce morbidity and premature mortality from preventable chronic diseases such as heart disease. The Canadian Hypertension Education Program (2005) recommendations for managing and preventing hypertension include dietary changes such as reduced sodium intake (Campbell, 2004). Several systematic reviews have concluded that restricted sodium intake reduces blood pressure in the short term. The long-term impact of sodium reduction on mortality and cardiovascular disease rates, relative to other risk reduction strategies such as weight loss and increased physical activity, remains unclear.

Review Content Summary: A systematic review with meta-analysis was conducted to examine the long-term effectiveness of a reduced sodium intake in healthy adults. Outcome data reported for 11 randomised controlled trials in adults who were normotensive (three trials, 2326 participants), had untreated hypertension (five trials, 387 participants) or were being treated for hypertension (three trials, 801 participants) included mortality, cardiovascular events, blood pressure, urinary sodium excretion, quality of life and use of anti-hypertensive drugs. Data for meta-analysis were available for blood pressure and urinary sodium. While there was a modest decrease in blood pressure with intensive dietary interventions that included instruction to reduce salt intake, there was insufficient evidence to determine effects on other outcomes including mortality and cardiovascular events because of low event rates.

Comments on this review's methodology: Several electronic and other sources were used to locate articles, but the literature search terms were not described. Searches were not restricted

by language of publication. Two reviewers independently selected and assessed all references. Eligibility criteria for selecting studies were described and only randomised trials were eligible. Easily evaluable and well accepted criteria were used to assess the quality of the trials included in the review. Of 11 trials, there was adequate concealment of allocation reported for four and blinding of outcome assessors for six. Where possible, meta-analysis and meta-regression were used to synthesise data and explore sources of heterogeneity. Interpretation of the evidence available from these randomised trials is hampered by variation in the interventions used, outcomes reported and length of follow-up. Although the reviewers concluded that “advice to reduce sodium intake may help people on anti-hypertensive drugs to stop their medication while maintaining good blood pressure control”, there was no strong evidence provided to support this statement.

Evidence points ARE NOT weighted or ranked according to strength

What’s the evidence?	Implications for practice and policy:
<ul style="list-style-type: none"> > The interventions evaluated in the studies reviewed were highly intensive and short term and are not suitable for primary care practice or population prevention programs. 	<ul style="list-style-type: none"> > The effect of sodium reduction on hypertension remains controversial. Applying and promoting the principles of a low sodium diet to the general population are challenging without changes in the food industry. > A policy on sodium reduction in food products such as processed foods could be evaluated for its effectiveness in hypertension prevalence across a population over sustained periods of time. > To be useful for primary prevention and population level practice, data such as food consumption patterns (e.g. Canadian Community Health Survey Cycle 2.2) may provide correlational data on health outcomes such as hypertension. > Population health surveys should include sensitive and specific hypertension and lifestyle questions to accurately evaluate awareness and treatment. > Food intake and analysis studies need to include other dietary components which can effect blood pressure and sodium excretion (e.g. alcohol, potassium, calcium, magnesium, vitamin E, L-arginine, folic acid, fibre and energy intake). > The accurate analysis of dietary intake requires: <ol style="list-style-type: none"> 1. The use of valid and reliable tools (e.g. food records, food frequency questionnaires); 2. Accurate reporting and recording of food and beverage amounts and portions, food

	<p>types and brands, food purchasing and cooking practices, and seasonal variations in the composition of foods and beverages;</p> <ol style="list-style-type: none"> 3. Appropriate nutrient databases to calculate dietary intake (Canadian or American); 4. Knowledge of the sodium sources and levels in drinking water, water used for cooking, and water used to reconstitute (e.g. beverages such as frozen juice concentrate). Levels will vary with source, seasons, use of road salt and run-off into water sources. <p>> Food and nutrition knowledge such as reading food labels, food purchasing and preparation practices and skills are needed in dietary intervention studies to ensure accuracy in dietary reporting and recording.</p>
<p>> There is insufficient evidence to determine if salt-reduced diets improve mortality or cardiovascular event rates. The small number of deaths reported (eight in the low-sodium groups and nine in the control groups) preclude making any conclusions about the impact of diet on mortality. Cardiovascular events were reported for only two trials.</p>	<p>> There is no evidence on the unconfounded effects of salt restriction at the population level.</p> <p>> Hypertension is only one risk factor for cardiovascular disease and the overall clinical benefits (or harms) of a low sodium diet are not clear.</p>
<p>> There is evidence that intensive dietary interventions that include instruction to reduce dietary sodium chloride intake can result in modest blood pressure reductions. Pooled analysis of data from four trials (one in untreated hypertensive and three in normotensive subjects) detected a statistically significant difference in favour of salt reduction versus control for systolic blood pressure over 13 to 60 months (average difference, 1.12 mmHg); the overall difference in diastolic blood pressure did not reach statistical significance (average difference 0.61 mmHg).</p> <p>> Sensitivity analyses suggest that inclusion of weight reduction in a dietary and behavioural change intervention reduces the effect on blood pressure.</p>	<p>> Most trials included white, middle-aged males as subjects, which limits generalizability.</p>

<p>> Pooled analysis of data from six trials (one in treated hypertensive, two in untreated hypertensive and three in normotensive subjects) detected a statistically significant difference in favour of salt reduction versus control for urinary sodium excretion over 6 to 12 months (average difference, 48.94 mmol Na/24 hours). Longer-term follow-up data, available for four of these trials, demonstrated a similar effect at 13 to 60 months. There was significant heterogeneity among trials in both case, even when the meta-analysis was restricted to trials with concealment of allocation prior to random allocation as a marker for trial quality. The degree of reduction in dietary sodium intake was not related to a change in blood pressure.</p>	
<p>> Low salt diets may allow people with hypertension to stop anti-hypertension medications without the loss of blood pressure control, but it is not clear if sodium reduction affects overall health.</p>	
<p>> The reviewers reported that “information on quality of life was patchy, with no common outcome measures.”</p>	
<p>General Implications: The promotion of low sodium diets in the general population is controversial. There needs to be more accurate information on the actual sodium intake of the general population as well as subpopulations along with data on other related health measures (e.g. total dietary intake including calories, macro and micronutrients, body weight, physical activity level) to assess relationships with hypertension. Population level approaches need to be enhanced to promote health eating with more work on evaluating the effectiveness of heart health education interventions.</p>	

Cost Benefit or Cost-Effectiveness Information: Not included in the review.

References Used to Outline Issue:

Angus, J., Evans, S., Lapum, J., Rukholm, E., St. Onge, R., Nolan, R., & Michel, I. (2005). “Sneaking disease”: the body and health knowledge for people at risk for coronary heart disease in Ontario, Canada. *Social Science & Medicine*, 60, 211-2128.

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Other References on this Topic:

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- Parikh, P., McDaniel, M.C., Ashen, M.D., Miller, J.I., Sorrentino, M., Chan, V., Blumenthal, R.S., & Sperling, L.S. (2005). Diets and cardiovascular disease: An evidence-based assessment. *Journal of the American College of Cardiology*, 45, 9, 1379-1387.

Summary Statement Author: Lee Rysdale, MEd, RD, Dietitian Researcher, Sudbury & District Health Unit, Sudbury, Ontario.

Contact Information for the Effective Public Health Practice Project (EPHPP):

Public Health Services
Effective Public Health Practice Project
2 King Street West, 3rd Floor
Dundas, Ontario L9H 6Z1

Phone: 905-546-2424, Ext. 1578
Fax: 905-628-6465
Email: ephpp@hamilton.ca
Website: <http://www.hamilton.ca/ephpp>



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