



Dietary Sodium, Hypertension and Health

Increased high blood pressure is the leading risk factor for death in the world ¹ and the most common diagnosis for physicians visits in Canada ². High dietary sodium is an important contributor to increased blood pressure. Many national and international health organizations have reviewed the evidence regarding the association between sodium and hypertension and conclude that high dietary sodium increases blood pressure which poses a health risk. (World Health Organization, Institute of Medicine: Dietary Reference Intakes (DRI) for USA and Canada, American Heart Association, American Public Health Association, National and International Hypertension Recommendations Pro, United Kingdom and most European Governments). Animal, epidemiologic and human studies demonstrate that high dietary sodium is a significant cause of hypertension ^{3 4 5 6 7 8 9}.

Reducing dietary sodium is a cost effective strategy to reduce the burden of hypertension and associated cardiovascular disease. It was recently estimated that a lower sodium intake could decrease hypertension by 30% in Canada. This translates into savings of over \$1.7 billion per year for Canada's health care system ¹⁰.

Reducing sodium reduces blood pressure and prevents cardiovascular disease

Approximately one-quarter adult Canadians have hypertension and 90% of adults will develop hypertension if they live to an average lifespan ¹⁰. Sodium reduction shown to lower blood pressure, may also reduce risk of cardiovascular events ¹¹. The Framingham risk study ¹² indicated 91% of people who developed heart failure had hypertension; 84% of those who developed stroke had hypertension and 70% of those who had a heart attack have hypertension. In 2005, 5.7 million adults were diagnosed with hypertension and over 5 million were treated with antihypertensive drugs. Since 2005, the number of Canadian adults diagnosed with hypertension has doubled ².

The risk for stroke, heart attack, kidney disease, and congestive heart failure increases progressively with increased blood pressure ¹³. Notably, as blood pressure increases above 115 mmHg systolic, the risk of dying from stroke and heart disease increases regardless of age ¹⁴.

There is strong evidence that our current consumption of sodium is the major factor increasing blood pressure and thereby cardiovascular disease. Many large epidemiological investigations link high sodium intake and hypertension. A meta-analysis conducted by Cochrane Review ¹⁵ reported that a reduction in dietary sodium for hypertensive subjects resulted in significant decreases in blood pressure. Moreover, significant reductions in blood pressure from a substantive reduction in dietary sodium have been reported not only in adults but also in children and infants ¹⁶. Well conducted clinical trials provide robust evidence on the beneficial impact of sodium reduction on blood pressure. The Dietary Approaches to Stop Hypertension (DASH) sodium trial tested the effects of 3 different sodium intakes (low, intermediate and high) on blood pressure in 2 separate diets: the DASH diet (rich in fruits, vegetables, low fat dairy products) and

a control diet typical of intake in the United States. The low sodium intake significantly lowered blood pressure on both DASH and control diets. The DASH diet was independently associated with lower blood pressure than the control diet at each sodium level; and the lowest blood pressure was seen in the low sodium DASH diet ¹⁷.

Canadian sodium intake is higher than the recommended levels.

The terms salt and sodium are often used synonymously. The chemical name for what we call salt is sodium chloride (NaCl) which is the major source of sodium in our diet. Some countries' dietary recommendations use sodium; some use salt. Canada and USA use sodium. Europe and WHO use salt as the reference.

The daily Adequate Intake (AI) for sodium is 1200 to 1500 mg/day for healthy adults, decreasing with age. The Tolerable Upper Limit (UL) for health for sodium is 2300 mg/day.

Canadian Recommended Dietary Intakes for Sodium

Age	Daily Adequate Intake (mg)	Tolerable Upper Limit (mg)
1 – 3 years	1,000	1,500
4 – 8 years	1,200	1,900
9 - 13 years	1,500	2,200
14 – 50 years	1,500	2,300
51 – 70 years	1,300	2,300
> 70 years	1,200	2,300

There is a large discrepancy between recommended levels of sodium intake and actual sodium intake levels by Canadians. The average sodium consumed is 3100 mg/day, and could increase to 3500 mg/day if sodium is added in cooking and/or at the table. The mean daily sodium intake is higher for men than for women¹⁸.

Sodium is consumed from many sources. It is found naturally in small amounts in virtually all foods. Furthermore, salt can be added at the table or in cooking or can be added as sodium containing additives during the processing of food (NaCl or monosodium glutamate MSG). Eleven percent of the sodium we consume is that found naturally in the fresh foods and water; twelve percent comes from addition at the table or in cooking; and more than three-quarters comes from restaurant, pre-prepared or processed foods ¹⁸.

Restaurant dishes, especially fast food meals may contain a significant amount of sodium ¹⁸. Moreover, in recent years, commercial food portion sizes have increased, and it is thus likely that sodium consumption has also increased.

The addition of sodium to food by food processors accounts for almost 80% of dietary sodium. There have been a few actions to reduce sodium levels in foods by the food industry. Some companies, in Canada, such as Campbell's Soup have already shown leadership in this effort with their lower sodium line of soups.

Policies to reduce population sodium intake are most effective and can make high impact.

Blood Pressure Canada has organized a Sodium Strategic Planning Committee (SSPC) with members from a variety of Canadian health and scientific organizations. A policy statement has been developed for healthcare organizations to advocate to the government and to the food sector around reducing dietary sodium. The policy statement was signed by 17 Canadian health organizations and was the subject of a major media release by the Heart and Stroke Foundation of Canada and the Canadian Stroke Network. The policy statement called for the formation of an inter-sectoral work group lead by Health Canada to oversee a process to reduce dietary sodium in Canada. The inter-sectoral Sodium Work Group was announced in October 2007.

Blood Pressure Canada has also developed a joint committee with the Canadian Hypertension Education Program (CHEP) to develop educational materials for the public and health professionals on dietary sodium. Blood Pressure Canada is developing a Dietary Sodium Initiative to educate health professionals about the health risks of excess dietary sodium, ways to reduce sodium intake within the context of a healthy diet on how to counsel their patients/clients to reduce sodium intake.

The Federal Government-commissioned Dietary Reference Intakes for sodium were updated in 2004. Sodium intake was recently analysed in the Canadian Community Health Nutrition Survey¹⁸. Statistics Canada prioritized the report on dietary sodium with a media release. The Honorable Stephen Fletcher spoke to the importance of reducing high dietary sodium with Senator Wilbert Keon at World Hypertension Day on Parliament Hill in May 2007. The Public Health Agency of Canada has been supporting the healthcare and scientific sector. Several provincial governments are currently examining policies to limit high sodium food in areas that are within their jurisdiction.

Blood Pressure Canada is increasingly involved in the activities with the World Hypertension League for World Hypertension Day in Canada. In conjunction with the World Hypertension League and CHEP, the theme for 2009 was: Salt and High Blood pressure: two silent killers¹⁹.

Health professionals can play a key role regarding dietary sodium intake

There is a need to increase public awareness and understanding of the impact that sodium has on health. For cardiovascular health, the public is much more likely to consider the fat content of foods rather than sodium. In the meantime, sodium content of many manufactured foods is on the rise and Canada has several food products that contain the highest sodium content in the world. Canadians are consuming many of their meals away from home and relying on processed convenience foods, a trend which will make it difficult for Canadians to meet the recommended intakes without significant action by the food sector.

Practice Points for healthcare professionals

- Educate the public about the health risks of excessive sodium intake
- Encourage patients/clients to follow the sodium recommendations for the management of hypertension
- Advocate with policy makers to take action to reduce sodium in the food supply
- Use CHEP Recommendations and Blood Pressure Canada teaching tools to help patients/clients manage their blood pressure

Available resources

www.lowersodium.ca

www.sodium101.ca

www.hypertension.ca/bpc/

www.dialadietitian.org

www.dietitians.ca

<http://www.food.gov.uk/>

<http://www.actiononsalt.org.uk/>

<http://www.worldactiononsalt.com/>

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<http://www.worldhypertensionleague.org/Pages/Home.aspx>