

# Updates in Specialty Care

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## Dietary Sodium Restriction in Veterans: A Modifiable Risk Factor for Chronic Disease

**T**he VHA has long been an innovator with respect to lifestyle modification and its impact on health care. Current programs on tobacco cessation and weight management (MOVE!) address 2 modifiable risk factors that play a major role in several long-term chronic illnesses. However, the VHA and United States lag behind several other developed countries with respect to another important modifiable risk factor for chronic disease—sodium restriction.

The human kidney is very efficient at retaining sodium and excreting potassium. The average salt intake of our ancestors' diet was 0.25 g/d compared with 9 g/d to 12 g/d today. This ability to retain sodium is now a potential disadvantage in an environment where sodium is plentiful. Increased sodium intake contributes to hypertension, a serious public health concern that increases risk for cardiovascular disease, stroke, and kidney disease.

High sodium intake also has adverse effects independent of blood pressure (BP), including increasing stroke risk and mortality, worsening left ventricular hypertrophy, and increasing proteinuria. The incidence and prevalence of chronic diseases continue to increase, and it is estimated that by 2023 almost 231 mil-

lion Americans will bear the burden of 1 or more chronic diseases. This represents an increase in heart disease of 41%, hypertension of 39%, and stroke of 29% (Figure 1).<sup>1</sup>

### RISK FACTORS

The Prospective Studies Collaboration analyzed data from 61 prospective observational BP studies in 1 million adults with no previous vascular disease and found that risk of cardiovascular and stroke mortality increases linearly in adults above a BP of 115/75 mm Hg.<sup>2</sup> Large epidemiologic studies like INTERSALT showed that over a wide range of sodium intake, populations with low intake have lower BP than those with high intake.<sup>3</sup>

Comparing the U.S. population with isolated populations where sodium intake remains close to ancestral levels, the BP is much higher and increases with age. Blood pressure does not rise with age in populations consuming a diet similar to our ancestors.

A recent meta-analysis showed that reduction of NaCl intake by 6 g/d would reduce BP by 7/4 mm Hg in those with

hypertension and 4/2 mm Hg in those with BP below 140/90 mm Hg,<sup>4</sup> an effect equal to that of a single antihypertensive agent. This reduction would also result in a 24% reduction in stroke and an 18% reduction in coronary artery disease and potentially prevent 2.5 million deaths worldwide per year.<sup>4</sup>

In the world's population, hypertension is the largest cause of death and second largest cause of disability after malnutrition.<sup>5</sup> It was estimated that hypertension, elevated serum cholesterol, and smoking account for more than 80% of cardiovascular disease. Hypertension is responsible for 62% of strokes and 49% of cardiovascular disease.<sup>5</sup> An increase in NaCl intake of 6 g/d (1 teaspoon of salt) over 30 years results in an increase in systolic BP of 9 mm Hg. It is clear that the potential impact of reduced NaCl intake when spread over large populations is profound.

It should be mentioned, however, that some studies suggest that sodium restriction may be harmful. Recently, a population-based prospective study in Belgium examined the relationship

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The VHA's Specialty Care Services includes medical services with a wide range of subspecialties; emergent and urgent care and patient support services, such as nutrition; spiritual care and other specific-purpose programs, such as cancer registry and Centers of Excellence for multiple sclerosis, epilepsy, and Parkinson disease. The Office of Specialty Care Services brings you "Updates in Specialty Care," sharing the latest evidence-based approaches, each column featuring a different topic and providing updates on existing programs, and introducing new programs. Special thanks to Margaret (Maggi) Cary, MD, MBA, MPH, director of the VA's Physician Leadership Development Program, who coordinates and edits the column. Please send suggestions for future columns to [margaret.cary@va.gov](mailto:margaret.cary@va.gov).



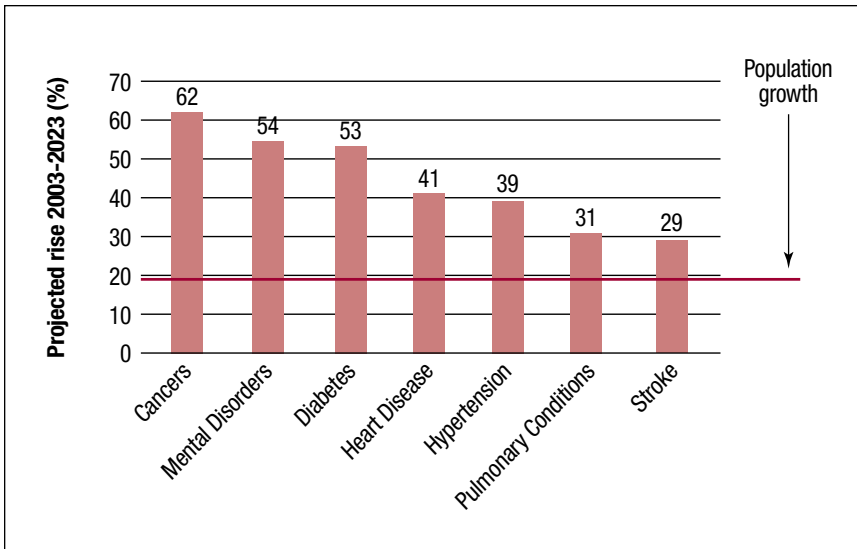


Figure 1. Projected rise in chronic disease, 2003-2023. Adapted with permission from the Milken Institute. DeVol R, Bedroussian A. <http://www.milkeninstitute.org>.<sup>1</sup>

between 24-hour urinary sodium excretion and the incidence of cardiovascular mortality over a median of 7.9 years, as well as its association with changes in BP.<sup>6</sup> Although systolic BP fell slightly with decreasing urinary sodium excretion, lower urinary sodium excretion was associated with higher cardiovascular mortality.

**REDUCTION INITIATIVES**

*Dietary Guidelines for Americans 2010*, recommends 1,500 mg/d of sodium (equivalent to 3,750 mg or ~¾ teaspoon of salt) for individuals with hypertension, African Americans, as well as middle-aged and older adults. For all other adults, recommended sodium intake is less than 2,300 mg/d (approximately 6,000 mg of salt or ~1 teaspoon).<sup>7</sup>

The Centers for Disease Control and Prevention recently analyzed data from the 2005-2006 National Health and Nutritional Examination Survey that showed only 9.6% of all participants met the recommended goal and U.S. adults consumed an average of 3,466 mg/d of sodium.<sup>8</sup> Other coun-

tries are far ahead of the United States in public health initiatives to lower sodium intake.

Great Britain has taken the lead with programs to reduce salt intake to below 6 g/d. They found that the average salt intake in 2001 was 9.5 g/d. Of that total, 15% was added in the home, either at the table or with cooking. Only 5% was present natively in food, while 80% was added by industry. A United Kingdom action group, Consensus Action on Salt and Health, succeeded in working with the food industry and British government, to adopt a policy of gradually reducing the sodium content of their food products. They also initiated a government-funded campaign to raise awareness of sodium's effects on health.

In Northern Japan, a reduction of salt intake from 18 g/d to 14 g/d resulted in a marked reduction in stroke mortality. In Finland, a reduction of salt intake by one-third resulted in a lowering of systolic BP by 10 mm Hg with a dramatic fall in incidence of stroke and coronary artery disease and increased life expectancy by 5 to 6 years. Similar

efforts are now underway in many European Union countries.<sup>5</sup>

In the United States in 2007, the American Medical Association called for a major reduction in sodium content of processed and restaurant foods and also petitioned the FDA to change its rule that allows sodium to be treated as “generally recognized as safe.”<sup>9</sup> To date this effort has not been successful.

The National Salt Reduction Initiative, a public-private partnership created as a coalition of cities, states, and health organizations, has worked to help food manufacturers and restaurants voluntarily reduce sodium in their products with a goal to reduce American's sodium intake by 20% over 5 years. In addition, the Institute of Medicine recently released a report stressing the immediate need for sodium reduction in the American diet. It recommends that the FDA set mandatory national standards for sodium content of foods, but also notes that a public-private initiative could achieve a meaningful reduction prior to implementation of mandatory national standards.<sup>10</sup>

Asaria and colleagues estimated the costs and effects of reducing salt intake and control of tobacco use in 23 countries that account for most chronic disease burden in the developing world. They found that over a 10-year period, a 15% reduction in salt intake would avert more cardiovascular deaths than a 20% reduction in smoking. Furthermore, the cost for implementation of these measures is only 9¢ per person annually for salt restriction and 26¢ per person annually for tobacco control (Figure 2).<sup>5,11</sup>

**PATIENT ALIGNED CARE TEAMS**

To achieve a meaningful reduction of sodium intake and meet newly recommended sodium intake levels requires a team effort. The VHA implemented a patient-centered medical

home model, now known as PACT (Patient Aligned Care Teams) in 2010. Its goal is to provide excellent access to primary care, coordination of care between VA and non-VA providers, and foster a patient-centered culture through redesign of primary care practices and team roles. PACT can be instrumental in creating a positive impact on veterans' health and should take a lead role by providing basic education about new dietary guidelines. Nutrition education should be centered on best practice guidelines.

The model for sodium restriction education includes the following objectives: patient-centered care that incorporates basic nutritional education tools provided by team members; nutritional expertise of registered dietitians to enhance concepts taught by other team members; and advanced complex nutrition patient education and tools provided by registered dietitians.

Registered dietitians can educate PACT members on evidence-based nutrition principles, provide appropriate educational materials, and assist team members in identifying strategies to help veterans change their sodium consumption patterns at PACT team huddles and meetings.

Dietitians can also enhance the use of sodium guidelines in PACT by providing group education classes or individualized nutritional therapy specific to each veteran's situation.

The ability to buy, store, cook, and choose appropriate food is important in following a low-sodium diet. Many veterans are on a tight budget and may feel that healthier options are not within their means. However, there are ways to shop successfully within a budget, including planning weekly menus and making a grocery list based on these menus; purchasing only what is on the list to avoid extra unwanted spending; comparing name and generic brand food la-

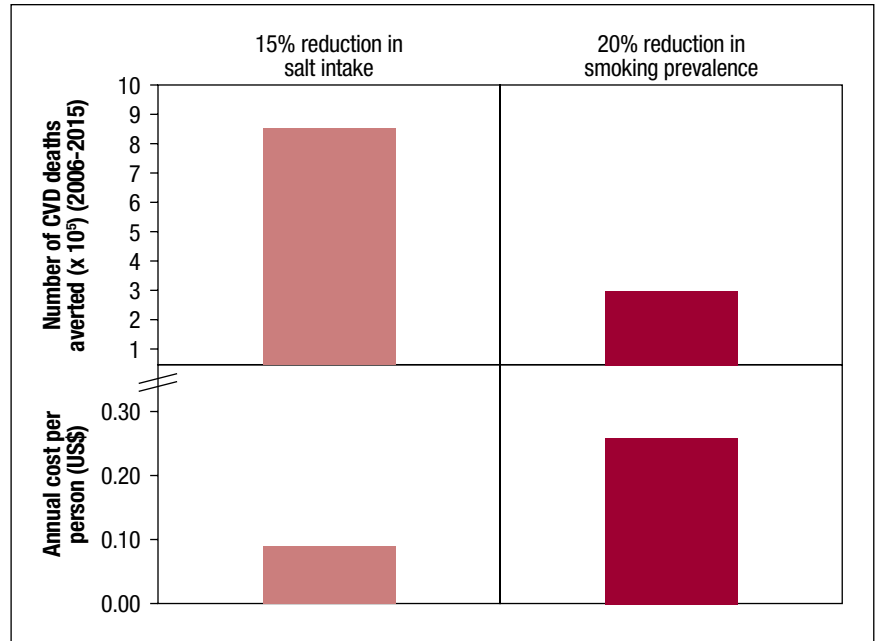


Figure 2. Number of cardiovascular disease (CVD) deaths averted and the financial costs associated with implementation of salt reduction and tobacco control in 23 low- and middle-income countries. Adapted with permission from Nature Publishing Group, He FJ, MacGregor GA.<sup>5</sup>

bels to get the best nutrition and most value; avoiding shopping on an empty stomach; checking weekly supermarket ads for specials and coupons; and home growing fresh fruits, vegetables, and herbs.

Identifying economic needs involves all PACT members. If a veteran has limited funds, a dietitian and social worker can work together to explore creative ways for decreasing dietary sodium consumption without increasing cost of foods or meals.

### GROCERY SHOPPING AND FOOD PREPARATION

The number of grocery store food choices available can be confusing and overwhelming. The general rule of thumb when it comes to low-sodium food shopping is: the fresher, the better. Fresh meats and produce can be found in the outside supermarket aisles and fresh herbs in the produce section. Herbs add flavor to

meals without adding sodium. Generally, the more processed a food, the higher its sodium content. Avoid processed, convenience foods such as soups, frozen dinners, and high-sodium sauces.

Choose fresh cuts of meat over processed meats such as luncheon meats, ham, sausage, bacon, and hot dogs. Look for foods labeled “low sodium” or “no added salt” near regular food items. It is very important to read and understand food labels for sodium content. Dietitians can help improve veteran health literacy through detailed instruction in the interpretation of food labels.

Dietitians can also instruct veterans in the preparation of healthier grocery lists and flavorful, reduced-sodium meals. Seasoning with “salt” in the name (such as garlic salt, onion salt, season salt) are high in sodium and should be avoided. Garlic, garlic powder, onions, onion flakes, pepper, chili

**Table. Dietary advice for sodium restriction**

Use This	Instead of
Garlic/powder, onion/powder, black pepper, lemon juice, lime juice, herb blends, vinegar	Salt, seasoned salt, garlic salt, onion salt, celery salt, lemon pepper, meat tenderizer, bouillon cubes
Fresh beef, pork, poultry, fish, eggs, low-sodium lunch meats	Ham, bacon, sausage, lunch meats, hot dogs
Homemade or low-sodium soups, canned foods without added salt, homemade casseroles/dishes	Frozen dinners, canned chili/soups/pasta
Unsalted popcorn, pretzels, chips, crackers, nuts/seeds	Salted popcorn, pretzels, chips, crackers, nuts/seeds

powder, lemon or lime juice, vinegar, or low-sodium herb blends can alternatively be added to flavor low-sodium soups, stews, and casseroles. If snacks include popcorn, chips, pretzels, nuts, or seeds, they should be unsalted. Helpful dietary advice is summarized in the Table.

Restaurant dining is often a challenge to the veteran who desires to eat healthy. The veteran should be advised to consume as little sodium as possible prior to arriving at the restaurant and, if possible, to assess menu selection options ahead of time. Salads should exclude bacon bits, cheese, and pickled items, and include instead fresh fruits, vegetables, dried beans, and light dressing. Main dishes should be grilled, baked, or broiled. Gravies, sauces, and dressings should be served on the side.

Half portions or children's menus may be available, which, based on the smaller portion, will contain less sodium, calories, and fat, and are less costly. Veterans may request "no extra

salt" from the kitchen because of a restricted diet for health reasons.

In summary, the VHA is an innovator in promoting healthful lifestyle choices and as a large health care institution is positioned to advocate for and benefit from efforts to reduce sodium intake among veterans. Excessive sodium intake via its elevation of BP is a major determinant of cardiovascular, neurological, and renal morbidity and mortality. Other developed countries have implemented successful programs in sodium restriction. The VHA can lead such an effort in the United States. ●

**Author disclosures**

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