Patient education: Low-sodium diet (Beyond the Basics)

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LOW-SODIUM DIET OVERVIEW — Sodium is an element that is found in many foods as well as water. The body requires a small amount of sodium in the diet to control blood pressure and blood volume. However, most people consume many times the amount of sodium needed. A healthy level of sodium in the diet contains fewer than 2.3 grams (2300 milligrams, or about the amount of sodium in one teaspoon) of sodium each day. People with certain medical conditions such as high blood pressure, kidney disease, and heart problems can benefit from a diet that is lower in sodium.

This topic will review how to read food labels, how to choose foods that are lower in sodium, and how to live with less salt.

WHY SHOULD I REDUCE SODIUM IN MY DIET? — Reducing sodium intake lowers blood pressure in people with high and borderline high blood pressure. Reducing sodium can also help to prevent the collection of fluid in the lower legs or abdomen. People with chronic kidney disease and heart failure must control sodium intake to prevent volume overload, which increases blood pressure and causes swelling. (See "Patient education: Chronic kidney disease (Beyond the Basics)" and "Patient education: Heart failure (Beyond the Basics)".)

Switching from a higher-sodium diet to a lower-sodium diet can modestly reduce blood pressure in people who have normal blood pressure. When the sodium intake is lowered from 4000 mg to 2000 mg per day, blood pressure falls by 2 to 3 mmHg. This reduction may be as great as 10 mmHg over several years and can substantially lower the risk of heart disease.

Benefits — In addition to directly reducing blood pressure, a lower sodium intake may also enhance the effectiveness of high blood pressure medications and other non-drug treatments, such as weight loss. A lower sodium intake has also been associated with other health benefits, including a reduced risk of dying from a stroke, reversal of heart enlargement, and a reduced risk of kidney stones and osteoporosis. (See "Patient education: Kidney stones in adults (Beyond the Basics)" and "Patient education: Osteoporosis prevention and treatment (Beyond the Basics)".)

WHERE IS SODIUM FOUND? — The main source of sodium in the diet is the salt added to packaged and processed foods and in foods from restaurants. Processed foods include prepared frozen meals, canned foods,

soups, pickled foods, snack foods, lunch meats, cheese, condiments, sauces, dressings, breads, cereals, and soda (including diet soda) just to name a few. Sodium found in processed food accounts for approximately 80 percent of a person's daily sodium intake in a typical Western diet, and can quickly add up, even without the use of the salt shaker.

Terms like "low sodium" and "reduced sodium" can be confusing. The following table provides a guide to what these terms mean (table 1).

Guidelines — Several professional organizations have issued evidence-based guidelines for reducing sodium intake. Most clinicians agree that people with high blood pressure should consume less than 2300 milligrams (2.3 grams) of sodium per day. People with other conditions may be advised to consume even less (1500 to 1800 mg per day).

The sodium content of packaged, processed, and prepared foods can usually be determined by reading food labels (figure 1) or consulting a reference book. Many web sites provide nutrient data (eg, www.nutrition.gov), and low-sodium cookbooks are also available.

It is important to remember that the amount of sodium listed is for a particular serving size; eating more or less than the listed serving size changes the amount of sodium consumed. In addition, many people add more salt to foods; just one teaspoon of table salt contains approximately 2300 milligrams of sodium, which is more than many people need for the entire day. Most fresh foods, and now some frozen foods, have a low sodium content and can be substituted for foods that are high in sodium. Reading labels, when provided, can be extremely helpful.

HOW DO I CUT DOWN ON SODIUM? — Although it is difficult to cut back on the amount of sodium in the diet, most people find that their taste adjusts quickly to reduced sodium. Salt is an acquired taste, and taste buds can be retrained in less than one to two weeks if people stick with the lower-sodium diet. Fresh herbs, spice blends without sodium, citrus, and flavored vinegar make tasty alternatives to the salt shaker.

It may be helpful to keep a detailed food record and add up sodium intake. Within a short period of time (less than a week), the main sources of sodium can be identified, and daily intake can be calculated.

Suggestions to decrease sodium include the following:

- Put away the salt shaker and reduce or eliminate salt in cooking. Experiment with herbs, spices, garlic, onions, or lemon instead.
- Look for low-sodium products such as spice blends, and read labels for serving size and sodium content on canned, bottled, and frozen foods.
- Make a list of healthy low-sodium foods to substitute. Many grocery stores now supply this information.
- When dining out, request the food be prepared without salt, have dressings or sauces on the side, and avoid bacon bits, cheese, and croutons at the salad bar.
- Do not add salt to food while cooking or before eating. Teach family members to taste food before adding salt.
- Avoid eating at fast food restaurants. If this is not possible, choose restaurants that offer fruits or vegetables without sauces or dressings. Ask that no salt be used to prepare food, when possible.
- Do not use salt substitutes that are high in potassium unless a healthcare provider approves. Herb and spice combinations that are salt free are widely available and can be used to flavor foods.

- Water softeners remove calcium and add sodium to drinking water. Do not drink softened water. When purchasing bottled water, check the label to ensure that it does not contain sodium.
- Look at labels for over-the-counter medications. Avoid products that contain sodium carbonate or sodium bicarbonate. Sodium bicarbonate is baking soda.
- Fresh fruits and vegetables are naturally low in sodium. In addition, a diet rich in fruits and vegetables provides additional benefits in lowering blood pressure. The DASH diet (Dietary Approaches to Stop Hypertension) is a well-known intervention to treat high blood pressure. The DASH diet requires the person to eat four to five servings of fruit, four to five servings of vegetables, and two to three servings of low-fat dairy, and all foods must contain less than 25 percent total fat per serving.

Foods to choose — The following are examples of foods that are generally low in sodium. **Check the label** to determine the amount of sodium, as amounts can vary widely from one brand to another.

- Biscuits – Whole grain breads, English muffins, bagels, corn and flour tortillas, most muffins
- Cereals – Many cooked low-salt (read the label to determine sodium content) hot cereals (not instant) such as oatmeal, cream of wheat, rice, or farina, puffed wheat, puffed rice, shredded wheat
- Crackers and snack foods – All unsalted crackers and snack foods, unsalted peanut butter, unsalted nuts or seeds, unsalted popcorn
- Pasta, rice, and potatoes – Any type of pasta (cooked in unsalted water), potatoes, white or brown rice
- Dried peas and beans – Any cooked dried beans or peas (without seasoning packet), or low-salt canned beans and peas
- Meats and protein – Fresh or frozen beef, poultry, and fish; low-sodium canned tuna and salmon; eggs or egg substitutes
- Fruits and vegetables – Any fresh, frozen, or canned fruit, any fresh or frozen vegetables without sauce, canned vegetables without salt, low-salt tomato sauce/paste
- Dairy products – Milk, cream, sour cream, non-dairy creamer, yogurt, lower-sodium cottage and other cheeses (be sure to read labels for serving size)
- Fats and oils – Plant oils (olive, canola, corn, peanut), unsalted butter or margarine
- Soups – Salt-free soups and low-sodium bouillon cubes, unsalted broth, homemade soup without added salt
- Sweets – Gelatin, sherbet, pudding, ice cream (brands vary widely), salt-free baked goods, sugar, honey, jam, jelly, marmalade, syrup
- Beverages – Coffee, tea, soft drinks, fruit-flavored drinks, low-salt tomato juice, any fruit juice
- Condiments – Fresh and dried herbs; lemon juice; low-salt mustard (not commercially available but can be made at home), vinegar, and Tabasco sauce; low- or no-salt ketchup; seasoning blends that do not contain salt

Foods to avoid — Many foods, especially those that are processed, have a high sodium content. Items that can be substituted for high-sodium foods are listed in the following table (table 2).

- Breads and biscuits – Biscuits, prepared mixes (pancake, muffin, cornbread), instant hot cereals, many boxed cold cereals, self-rising flour

- Crackers and snack foods – Salted crackers and snack items (chips, pretzels, popcorn), regular peanut butter, prepared dips/spreads, salted nuts or seeds
- Pasta, rice, and potatoes (processed or from restaurants) – Macaroni and cheese mix; rice, noodle, or spaghetti mixes; canned spaghetti; frozen lasagna; instant potatoes; seasoned potato mixes
- Beans and peas – Beans or peas prepared with ham, bacon, salt pork, or bacon grease; most canned beans and peas
- Meats and proteins – Salted, smoked, canned, spiced, and cured meat, poultry, or fish; many deli meats and poultry, unless stated to be low salt; bacon; ham; sausage; lunch meats; hot dogs; breaded frozen meat, fish, or poultry; frozen dinners and other frozen meals; pizza
- Fruits and vegetables – Regular canned vegetables and vegetable juices, regular tomato sauce and tomato paste, olives, pickles, relishes, sauerkraut, frozen vegetables in butter or sauces, crystallized and glazed fruit, maraschino cherries, fruit dried with sodium sulfite
- Dairy products – Buttermilk, Dutch-processed chocolate milk, processed cheese slices and spreads, most cottage cheese, aged or natural cheeses
- Fats and oils – Prepared salad dressings, bacon, salt pork, fatback, salted butter or margarine
- Soups – Regular canned or prepared soups, stews, broths, or bouillon; packaged and frozen soups
- Desserts – Packaged baked goods
- Beverages – Softened water; carbonated beverages with sodium or salt added; regular tomato juice (V8); ask about alcoholic beverages
- Condiments – Table salt, lite salt, bouillon cubes, meat extract, taco seasoning, Worcestershire sauce, tartar sauce, ketchup, chili sauce, cooking sherry and wine, onion salt, mustard, garlic salt, soy sauce, tamari, meat flavoring or tenderizer, steak and barbecue sauce, seasoned salt, monosodium glutamate (MSG), Dutch-processed cocoa

WHERE TO GET MORE INFORMATION — Your healthcare provider is the best source of information for questions and concerns related to your medical problem.

This article will be updated as needed on our web site (www.uptodate.com/patients). Related topics for patients, as well as selected articles written for healthcare professionals, are also available. Some of the most relevant are listed below.

Patient level information — UpToDate offers two types of patient education materials.

The Basics — The Basics patient education pieces answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials.

Patient education: Low-sodium diet (The Basics)
Patient education: Chronic kidney disease (The Basics)
Patient education: Swelling (The Basics)
Patient education: High blood pressure in children (The Basics)
Patient education: Diabetes and diet (The Basics)
Patient education: Medicines for heart failure with reduced ejection fraction (The Basics)
Patient education: Hemodialysis (The Basics)

Patient education: Preparing for hemodialysis (The Basics)
Patient education: Peritoneal dialysis (The Basics)
Patient education: Dialysis and diet (The Basics)
Patient education: High blood pressure emergencies (The Basics)
Patient education: Diabetes insipidus (The Basics)
Patient education: When your lungs fill with fluid (The Basics)
Patient education: Medicines for chronic kidney disease (The Basics)

Beyond the Basics — Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are best for patients who want in-depth information and are comfortable with some medical jargon.

Patient education: Chronic kidney disease (Beyond the Basics)
Patient education: Heart failure (Beyond the Basics)
Patient education: Kidney stones in adults (Beyond the Basics)
Patient education: Osteoporosis prevention and treatment (Beyond the Basics)

Professional level information — Professional level articles are designed to keep doctors and other health professionals up-to-date on the latest medical findings. These articles are thorough, long, and complex, and they contain multiple references to the research on which they are based. Professional level articles are best for people who are comfortable with a lot of medical terminology and who want to read the same materials their doctors are reading.

Diet in the treatment and prevention of hypertension
Salt intake, salt restriction, and primary (essential) hypertension

The following organizations also provide reliable health information.

- Medline Plus

  (www.nlm.nih.gov/medlineplus/ency/article/002415.htm, available in Spanish)

- American Heart Association

 (www.heart.org/HEARTORG/Conditions/HighBloodPressure/PreventionTreatmentofHighBloodPressure/Shaking-the-Salt-Habit_UCM_303241_Article.jsp)

- National Kidney Foundation

  (https://www.kidney.org/news/kidneyCare/spring10/WithoutSalt)

- US Food and Drug Administration (FDA):

  (https://www.fda.gov/Food/ResourcesForYou/Consumers/ucm315393.htm)

- 2015-2020 Dietary Guidelines for Americans

  (https://health.gov/dietaryguidelines/2015/guidelines/)

[1-4]

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Topic 4411 Version 17.0

GRAPHICS

A guide to common nutrient claims and what they mean

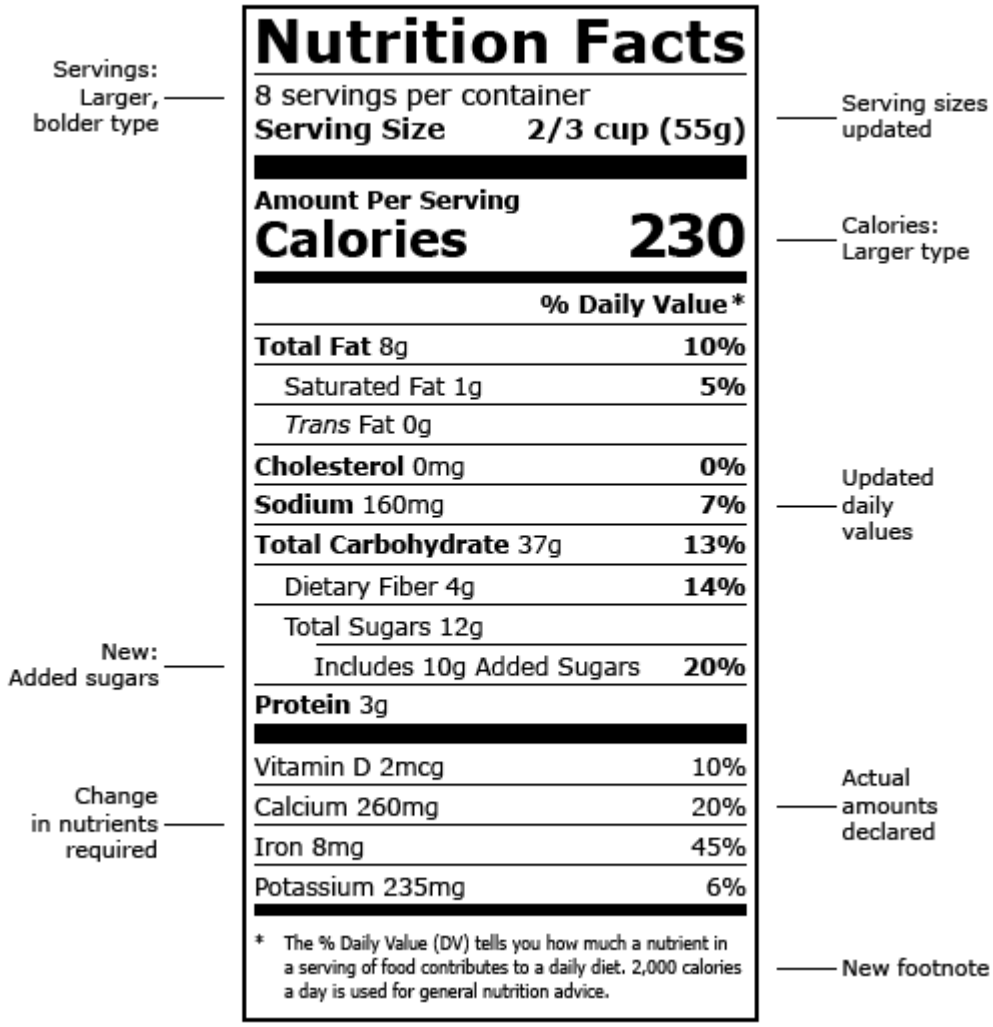
Salt/sodium free	Less than 5 mg of sodium per serving
Very low sodium	35 mg or less of sodium per serving
Low sodium	140 mg or less of sodium per serving
Reduced sodium	At least 25% less sodium than the regular product
Light or lite in sodium	At least 50% less sodium than the regular product
No salt added or unsalted	No salt is added during processing, but these products may not be salt/sodium free unless stated

mg: milligram; %: percent.

Data from: Understanding Food Terms. American Cancer Society. Available at: https://www.cancer.org/healthy/eat-healthy-get-active/take-control-your-weight/understanding-food-labels.html (Accessed on January 8, 2018.)

Graphic 61514 Version 5.0

2018 US food label: What's different?



%: percent.

Reproduced from: U.S. Food and Drug Administration. Changes to the Nutrition Facts Label. Available at: https://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/LabelingNutrition/ucm385663.htm (Accessed on January 8, 2018).

Graphic 56605 Version 7.0

Ways to cut down on salt (sodium)

Avoid these foods	Try these foods instead
Cured and smoked foods such as bacon, sausage, hot dogs, ham, lunch meats, and corn beef	Fresh turkey, chicken, and lean beef
Canned fish (such as sardines)	Unsalted tuna
Canned meats	Fresh unprocessed meats, vegetable protein, and fish; or frozen and canned meats, vegetable protein, and fish that are labeled "low sodium"
Salted pretzels, crackers, potato chips, and nuts	Low-sodium and unsalted versions of these foods
Most cheeses	Low-sodium cheeses
Sauces (tomato and cream etc), tomato juices	Low-sodium versions of these foods, such as low-sodium tomato juice
Processed, instant, and convenience foods such as frozen dinners, packaged meals, canned soups, and boxed pasta blends	Cook and freeze your own low-sodium meals, soups, and broths ▪ If you must use convenience or processed foods, read the labels and choose items with 140-200 mg of sodium per serving per food, or ▪ For an entire convenience meal (frozen dinner), try to stay under 500-600 mg sodium. ▪ If you do used canned foods, use "sodium free" varieties or rinse the canned food under water. This reduces the sodium content by about 40 percent.

Graphic 74448 Version 6.0

Contributor Disclosures

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Conflict of interest policy