

SALT

Shaving Salt, Saving Lives

In 2005, high blood pressure was responsible for one in six deaths in the United States," says a new report from experts at the Institute of Medicine.¹ That's because hypertension boosts your risk of dying of a heart attack or stroke more than smoking, high cholesterol, obesity, or any other risk factor does. And excess salt is a major cause of high blood pressure.

What's more, salt may damage the heart, kidneys, and other organs above and beyond its effect on blood pressure. "Salt is costing us too many lives and too many dollars," says physician Stephen Havas.

Here's why you—and, more importantly, the food industry—should hold the salt.

1 Less salt means lower blood pressure and less disease.

It's no surprise that cutting salt lowers blood pressure. That has been shown in studies that compare higher- versus lower-salt diets in both adults and children.^{2,3}

And a recent meta-analysis of 13 studies found not just lower blood pressures, but a lower risk of heart attacks, strokes, and other cardiovascular events among people who cut their salt intake.⁴

For example, in the Trials of Hypertension Prevention studies, some 2,400 people with pre-hypertension were randomly assigned to either cut their sodium by roughly 750 to 1,000 milligrams a day or to follow general guidelines for healthy eating for 1½ to 4 years.⁵

Ten to 15 years after the studies ended, researchers found a 25 to 30 percent lower risk of heart attacks, strokes, or other cardiovascular events in the group that cut salt.

"A decrease in sodium in the diet, even among those with only modestly elevated blood pressure, lowers risk of cardiovascular disease later in life," says investigator Nancy Cook, an associate professor of medicine at Harvard Medical School.

2 Nearly everyone gets high blood pressure.

Why worry about salt if you haven't been diagnosed with high blood pressure? Odds are, you will be.

"Over time, 90 percent of people in this country develop hypertension," says Havas, a former Vice President of Science, Quality, and Public Health at the American Medical Association.

That's because—unless you live in a society where people eat very little salt—blood pressure rises as you age. In the Atherosclerosis Risk in Communities study, which followed more than 15,000 Americans aged 45 to 64, average systolic blood pressure (the upper number) jumped five points in five years.⁶

"Blood pressures drift upward as people get older and they're exposed to long-term excess sodium," explains Havas. "That's why almost all adults are going to get blood pressures that put them at higher risk for heart disease and stroke."

3 Risk rises before your blood pressure is "high."

Doctors consider prescribing drugs when your blood pressure is high—that is, it's at least 140 over 90 (see "How High Is Too High?"). But it's a threat to your blood vessels before it crosses that line.

"People don't realize that blood pressure higher than 120 over 80 is associated with increased risk," says Havas.

"Between 'normal' and 'hypertension' you have a huge number of heart disease and stroke deaths attributable to excess blood pressure," he explains.

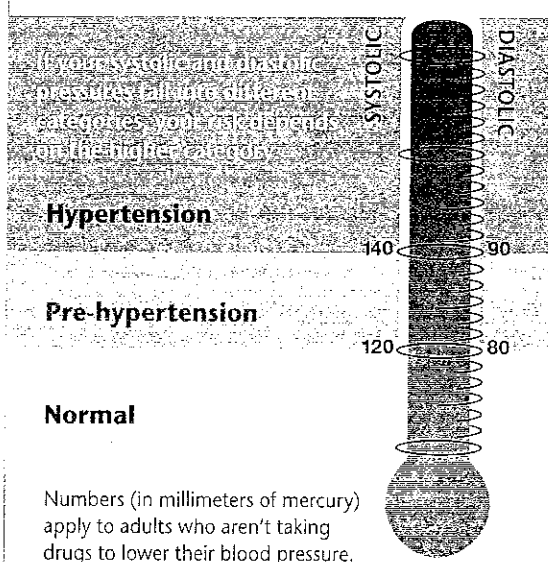
The National Heart, Lung, and Blood Institute (NHLBI) calls those in-between blood pressures "pre-hypertension." Roughly one out of three American adults has it. Another one out of three has hypertension.

Researchers aren't sure *how* elevated blood pressure raises the risk of heart attacks and strokes. One possibility: it may accelerate the clogging of arteries.

"The progression of atherosclerosis is much higher in the face of hypertension," explains hypertension authority Norman Kaplan of the University of Texas Southwestern Medical Center in Dallas.

"The heart beating at a higher pressure may lead to damage in the blood vessel wall, and that could allow cholesterol and inflammatory cells to enter."

HOW HIGH IS TOO HIGH?



Source: National Heart, Lung, and Blood Institute.

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4 Hypertension harms the heart, brain, and kidneys.

High blood pressure doesn't just raise the risk of heart attacks and strokes. It also boosts the risk of heart failure, which affects 5.8 million Americans.

"It can mean that the heart's pump has deteriorated and can't push the blood out," says Kaplan, author of *Kaplan's Clinical Hypertension*, a reference for physicians.

And high blood pressure is a leading cause of chronic kidney disease, which strikes one out of nine Americans. Also troubling is the growing evidence that hypertension raises the risk of dementia.

For example, in the Women's Health Initiative Memory Study, which took MRI brain scans of 1,400 women over age 65, those with high blood pressure had more abnormal brain lesions eight years later.⁷

"Even moderately elevated blood pressure is associated with silent vascular disease in the brain that contributes to risk of dementia," conclude the study's authors.

5 Drugs haven't solved the problem.

So what if you get high blood pressure? Can't you just take a drug to lower it?

"You don't want to wait until your blood pressure crosses that magic threshold of 140 over 90 because by that point you've already done a fair amount of damage to your heart, vascular system, kidneys, and brain," says Havas.

What's more, 42 million Americans have uncontrolled hypertension. That's because 28 percent of those who have hypertension don't know it, 11 percent know they have it but aren't being treated, and 26 percent are being treated but not enough to get their blood pressure below 140 over 90. That means 65 percent of Americans with hypertension don't have their blood pressure under control.⁸

Why? "Hypertension is a chronic condition that doesn't make the patient feel anything," explains Kaplan. "If people with, say, rheumatoid arthritis don't take their medication, they hurt. So they'll take that medication. But people with hypertension don't experience anything obvious." So they stop.

"A number of surveys have shown that if you put 100 people on treatment, in a year's time only half will still be taking their medication," Kaplan notes.

Doctors may also share some of the blame. "Some physicians will put patients



Some brands of chicken are pumped up with salt water. This store brand has 550 mg of sodium in a quarter-pound serving.

on anti-hypertensive medication, and then say 'Okay, I'm done,' without monitoring to see if the patients' blood pressure is still elevated," says Kaplan.

But eating less salt would make blood pressure drugs more effective in those who need them. "With lower sodium intakes, you see a greater fall in blood pressure," says Kaplan. "That's particularly true for diuretics, but it's been shown with other drugs as well."

In fact, researchers recently tested the impact of a lower-salt diet on 12 people who had resistant hypertension—that is, their blood pressures were still high even though they were taking an average of 3½ different drugs every day.

When doctors told them to not just take the drugs but to also eat a lower-salt diet (1,050 milligrams a day), their blood pressures were dramatically lower (by an average of 22 over 9 points) than when they were on a high-salt diet (5,750 mg a day).⁹

The authors' conclusion: "High dietary salt ingestion is an important cause of resistant hypertension."

6 Assume that you're sensitive to salt.

"For certain individuals who are salt sensitive, excessive consumption of sodium can increase blood pressure," says the Salt Institute, which represents the salt industry.¹⁰ Certain individuals?

"Some people react to sodium more quickly than others," says Havas. "But 90 percent of people in this country develop hypertension and the principal cause is exposure to excess sodium, so most people over time don't do well with high salt loads."

What's more, "there is no predictor or test of salt sensitivity," he adds. "So one has to assume that almost all of us are sensitive to long-term sodium exposure."

That's why expert panels recommend no more than 1,500 mg of sodium a day if you're middle-aged or older, are black, or already have high blood pressure. Everyone else should shoot for 2,300 mg a day. But "everyone else" turns out to be just 30 percent of U.S. adults.

7 Other factors are no excuse to ignore salt.

Cutting excess salt isn't the only way to lower blood pressure. Getting more potassium also helps, and Americans average far less than the 4,700 mg daily target. Eating a DASH diet—which is rich in fruits,

vegetables, and low-fat dairy foods—knocks down blood pressure (see *Nutrition Action*, Oct. 2009, cover story). So does staying trim, daily exercise, and limiting alcohol to no more than two drinks a day (for men) or one drink a day (for women).¹¹

"All of those factors affect blood pressure," says Havas. "I don't think anyone would argue that you should only work on one front." But cutting salt is still key.

Sometimes, he adds, other factors are "a smokescreen that the food industry throws out to confuse everybody." In fact, it may be easier to change the population's salt intake than anything else.

"We can't get people to lose weight and maintain the weight loss over time, though we should try because some people will do it," notes Havas. "We can't get people to exercise regularly and maintain it over time, though it's worth trying because some people will do it."

And it's not easy to get people to eat more fruits and vegetables. "Consumption has been going up very gradually," says Havas. "If the average American eats 3 or 4 servings a day and we need to get to 8 or 9 or more, it's going to take a long time."

In contrast, the government can stop companies from dumping so much salt into packaged and restaurant foods. "Getting sodium out of the food supply is the easiest because you can engineer that," explains Havas. "You can't engineer more fruits and vegetables, greater weight loss, and more exercise."

8 Salt's harm goes beyond blood pressure.

Salt appears to damage the heart and blood vessels above and beyond its impact on blood pressure.

"With most animals, if you give them a high intake of salt, their blood pressure

HOW TO DEFUSE A SALT MINE

will go up, they develop cardiovascular disease, and they die prematurely," explains researcher Norm Campbell of the University of Calgary in Canada.

"But if you genetically breed animals so you can feed them salt and they have no increase in blood pressure, they *still* develop cardiovascular disease prematurely. That suggests that salt has direct toxic effects on the heart and blood vessels."

And there's evidence that salt is toxic to humans. "By and large, these human studies show increased cardiovascular event rates on typical high-salt diets independent of blood pressure," notes Campbell.

How might salt harm the body beyond its impact on blood pressure?

■ **Left ventricular hypertrophy.** High blood pressure can thicken the muscle in the chamber of the heart that pumps blood throughout the body.

"The presence of left ventricular thickening is a very-high-risk situation because it contributes to most cases of heart failure," explains Kaplan.

But some studies suggest that a high-salt diet worsens the damage caused by high blood pressure.¹² And cutting back on salt may reverse the muscle thickening, he adds.

■ **Stiff arteries.** Stiff arteries are often an early sign of heart disease. When researchers put overweight or obese people with normal blood pressure on a diet with a typical sodium intake (about 3,500 mg a day), their arteries were stiffer than when they ate a lower-salt diet (1,150 mg a day).¹³

"These findings suggest additional cardioprotective effects of salt reduction beyond blood pressure reduction," conclude the researchers.

■ **Kidney disease.** High blood pressure damages the kidneys. But salt may make it worse. In some studies, people who consume more salt excrete more protein in their urine.¹⁴ That's a sign that their kidneys are under stress.

"The presence of protein in the filtering surfaces of the kidneys is associated with inflammation and damage," notes Kaplan. For people who have kidney disease, "a reduction in sodium can reduce protein in the urine."

■ **Osteoporosis.** High-salt diets increase calcium losses in urine. "When there's excess salt in the kidney's tubules, it draws out the calcium," explains Kaplan. But only a few studies have looked at salt's impact on bone.¹⁵ Stay tuned.

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As long as the food supply stays salt-laden, the easiest way to reach target sodium levels is to make your own.

Okay, it's not easy to bake your own raisin bran, but you can easily whip up your own salad dressing and season your own rice, couscous, or pasta. You can also buy no-salt-added canned beans (try Eden), tuna (try Bumble Bee), and tomatoes (try Pomi). And you can dust off your old copies of *Nutrition Action* and rediscover Kate Sherwood's amazing Healthy Cook recipes, which trim sodium but not taste.

But on days when there's no way you're going to make your own, try this: add salt-free vegetables, beans, or grains to high-sodium packaged or restaurant foods.

You not only cut the salt in each serving, you boost the potassium. What's more, you save money by stretching costlier packaged foods or restaurant take-out. It's a win-win. Here are a few examples:

Take-Out

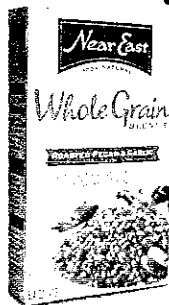


ADD: 1 lb. of steamed broccoli to an order of Kung Pao chicken.

ALTERNATIVES: Add steamed or sautéed veggies to any take-out Chinese dish with a Szechuan, Hunan, garlic, black bean, or other strong-flavored sauce.

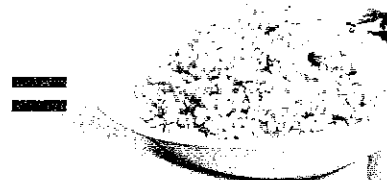


Packaged Grains



ADD: 1 cup of bulgur (parboiled whole wheat).

ALTERNATIVES: Add any quick-cooking brown rice or whole wheat couscous or orzo. Add whole-grain pasta to any seasoned pasta dish.



Frozen Dishes

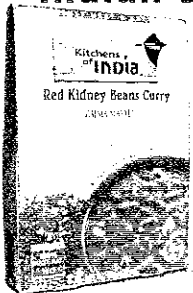


ADD: 1 lb. of asparagus and 1 pint of grape tomatoes.

ALTERNATIVES: Add fresh (or frozen) vegetables to any dish. (Most packaged foods have too few veggies.)



Indian Dishes



ADD: 1 can of unsalted canned kidney beans (drained & rinsed).

ALTERNATIVES: Add unsalted cooked or canned beans, lentils (red lentils cook quickly), or frozen peas to any curry.



9 Cuts in salt can save lives and dollars.

The average American woman consumes roughly 3,000 milligrams of sodium a day. The average man consumes more than 4,000 mg. What would we save by cutting those intakes by 1,200 mg? That's what the University of California's Kirsten Bibbins-Domingo and colleagues estimated.¹⁶

"We modeled small reductions in salt across the whole U.S. population—not getting everyone to recommended levels, but to eat just slightly less salt," she explains. Recommended levels are less than 1,500 mg a day for most people.

"We found that lowering salt would result in many fewer heart attacks, strokes, new cases of heart disease, and deaths each year. Even small changes in blood pressure across the whole population would have very dramatic health benefits."

Cutting salt by 1,200 mg a day "would save more lives than lowering the body weight of all obese people by 5 percent, which is difficult to achieve and maintain," notes Bibbins-Domingo. Trimming salt would save about as many lives, heart attacks, and strokes as "treating everybody who's already hypertensive with blood-pressure medications."

Cutting salt would also cut costs "because of money not spent on hospitalizations for heart attacks and strokes," notes Bibbins-Domingo. "We would save lives *and* health care costs."

And the true savings may be even greater. "If salt raises the risk of heart attacks and strokes above and beyond its effect on blood pressure, it could have a gigantic impact," says Havas. "It's a double whammy."

10 It's tough to cut salt on your own.

"I'm a physician," says Bibbins-Domingo, "and it's always striking to me how hard it is for my patients to cut salt."

That's because 75 to 80 percent of the sodium we consume is added to food before we open a package or walk into a restaurant. So unless you make everything—including breads, crackers, cereals, soup, pizza, spaghetti sauce, salad dressing—from scratch, you can't easily avoid the salt.

"You can take all the salty snacks out of your diet—the nuts and the chips and everything else, but much still remains," says Bibbins-Domingo. "So many patients come to me thinking they've made healthier choices and they're oftentimes consuming the same, if not more, salt."

And restaurants make supermarket salt levels look low (see "Salt on the Menu"). "People eat more and more in restaurants," says Havas. "They have no idea how much sodium is in those foods."

Like the governments of the United Kingdom and Finland, Washington could pressure—and, if necessary, require—companies to cut salt and could require warning labels on high-salt foods.

The food industry isn't going to trim salt on its own, says Havas. "It's been eight years since the American Public Health Association called on food companies and restaurants to cut sodium levels in half. If they had, we could have saved 150,000 lives a year—that's at least 1.2 million lives since 2002.

"We can't just keep saying, 'Let's try a voluntary approach.' Too many people are dying or becoming disabled." ❖

Most of these typical restaurant dishes have more than a day's worth of sodium (1,500 mg). Only a few have less than 500 mg. Solution: ask the chef to cook yours without salt or check the chain's Web site for lower-sodium options.

Food	Calories	Sodium
Panera Full Classic Cafe Salad with balsamic vinaigrette	170	270
Starbucks Couscous Salad with Curried Chicken	360	270
Olive Garden Herb-Grilled Salmon & seasoned broccoli	510	760
Olive Garden Linguine alla Marinara	430	900
Romano's Macaroni Grill Mushroom Ravioli	790	990
Panera Low-Fat Chicken Noodle Soup (8 oz.)	80	1,020
Panera Broccoli Cheddar Soup (8 oz.)	190	1,020
McDonald's Big Mac	540	1,040
Panera Full Tuna Salad Sandwich on honey wheat	750	1,130
Outback Steakhouse Prime Rib (14 oz.)	1,040	1,130
McDonald's Premium Grilled Chicken Classic Sandwich	420	1,190
McDonald's Quarter Pounder with Cheese	510	1,190
Romano's Macaroni Grill Eggplant Parmigiana & pasta	800	1,450
Outback Steakhouse Chicken Caesar Salad	910	1,540
Panera French Onion Soup (10 oz.)	200	1,560
Panera Full Greek Salad with Greek dressing	380	1,670
Red Lobster Broiled Seafood Platter & broccoli	330	1,810
Olive Garden Garden-Fresh Salad with Italian dressing	350	1,930
Panera Full Smoked Turkey Breast Sandwich on country	560	1,960
Chipotle Chicken Burrito	970	2,120
Olive Garden Spaghetti & Meatballs	1,110	2,180
Chili's Wings Over Buffalo with bleu cheese dressing	1,320	2,240
Denny's All-American Slam (3 eggs with cheese, 2 bacon strips, 2 sausage links, hash browns, 2 slices toast)	1,290	2,280
Outback Steakhouse Baked Potato (salt-rolled)	330	2,300
Panera Full Smoked Ham & Swiss Sandwich on rye	700	2,350
California Pizza Kitchen Chinese Chicken Salad with sesame dressing	710	2,460
On the Border Mesquite-Grilled Chicken Fajitas (with 3 tortillas, sour cream, guacamole)	760	2,460
California Pizza Kitchen The Original BBQ Chicken Pizza	1,140	2,570
Outback Steakhouse Baby Back Ribs (full rack)	2,010	2,600
Uno Chicago Grill Cheese & Tomato Deep Dish Pizza	1,740	2,760
P.F. Chang's Kung Pao Chicken & rice	1,370	2,820
Olive Garden Lasagna Classico	850	2,830
P.F. Chang's Chicken Lo Mein	800	2,990
P.F. Chang's Sesame Chicken & rice	1,250	3,060
Olive Garden Chicken Parmigiana & spaghetti	1,090	3,380
California Pizza Kitchen The Meat Cravers Pizza	1,530	4,130
Uno Chicago Grill Chicago Classic Deep Dish Pizza	2,310	4,920
Outback Steakhouse Bloomin' Onion with sauce	1,570	5,510
Chili's Texas Cheese Fries with jalapeño ranch dressing	1,930	5,530

Source: restaurant chains. Chart compiled by Melissa Pryputniewicz.

¹ books.nap.edu/openbook.php?record_id=12819.

² *J. Human Hypertens.* 16: 761, 2002.

³ *Hypertension* 48: 861, 2006.

⁴ *BMJ* 339: b4567, 2009.

⁵ *BMJ* 334: 885, 2007.

⁶ *Circulation* 106: 703, 2002.

⁷ *J. Clin. Hypertens.* 12: 203, 2010.

⁸ *N. Engl. J. Med.* 361: 878, 2009.

⁹ *Hypertension* 54: 475, 2009.

¹⁰ saltinstitute.org/issues-in-focus/Food-salt-health/How-the-body-handles-salt.

¹¹ *JAMA* 288: 1882, 2002.

¹² *Circulation* 87: 476, 1993.

¹³ *Am. J. Clin. Nutr.* 89: 485, 2009.

¹⁴ *J. Intern. Med.* 256: 324, 2004.

¹⁵ *J. Bone Miner. Res.* 23: 1477, 2008.

¹⁶ *N. Engl. J. Med.* 362: 590, 2010.