



HEALTH

Diet and Hypertension

no. 9.318

by J. Anderson, L. Young and E. Long ¹ (Revised 8/08)

Quick Facts...

Calories and body weight go hand in hand. Excess body fat leads to an increased risk of health problems.

Potassium has an important role in blood pressure treatment.

Low calcium intake may increase risk of hypertension.

Excessive sodium intake is linked with high blood pressure or hypertension in some people.

Dietary recommendations suggest avoiding too much sodium. The suggested range is 1,100 to 3,300 mg per day.

Table salt is 40 percent sodium. One teaspoon has about 2,000 mg sodium.

Hypertension (high blood pressure) affects one in four adults in the United States. Another 25 percent of adults have blood pressure readings considered to be on the high end of normal.

Your blood pressure is the force exerted on your artery walls by the blood flowing through your body. A blood pressure reading provides two measures, systolic pressure and diastolic pressure, which are expressed as millimeters of mercury (mm Hg), or how high the pressure of blood would raise a column of mercury. Systolic pressure is measured as the heart pumps. Diastolic pressure is measured between beats, as blood flows back into the heart.

High blood pressure is often called the “silent killer” because it has no symptoms and can go undetected for years. It is important to have your blood pressure checked regularly. Table 1 below shows how to classify blood pressure readings.

Table 1: Know Your Numbers.

	SYSTOLIC (MM HG)		and	DIASTOLIC (MM HG)	
Normal	<120			<80	
Prehypertension	120 – 139		or	80 – 89	
HYPERTENSION					
Stage 1	140 – 159		or	90 – 99	
Stage 2	≥160		or	≥100	

Based on two readings taken 5 minutes apart with a confirmation reading in the contralateral arm.

Hypertension cannot be cured, but it can be controlled through lifestyle changes and prescriptive medication. While medications to treat hypertension are available, research has shown that modest lifestyle and dietary changes can help treat and often delay or prevent high blood pressure.

People trying to control hypertension often are advised to decrease sodium, increase potassium, watch their calories, and maintain a reasonable weight.

For sodium-sensitive people, reducing sodium is a prudent approach to reducing the risk of hypertension. The recommendation for daily sodium intake is 1,500 to 2,300 mg a day.

The amount of potassium in the diet is also important. Potassium works with sodium to regulate the body’s water balance. Research has shown that the more potassium and less sodium a person has in his/her diet, the greater the likelihood that the person will maintain normal blood pressure. However, the evidence does not suggest that people with high blood pressure should take potassium supplements. Instead, potassium rich foods should be eaten every day.

A newer area of interest is the relationship between calcium and high blood pressure. People with a low calcium intake seem to be at increased risk for hypertension. Everyone should meet the Dietary Reference Intake (DRI) for



calcium every day. For adults, this is 1,000 mg per day. For adults over 50, 1,200 mg is recommended.

Maintaining a reasonable weight is important to minimize the risk of several major diseases, including hypertension. For people who are overweight, even a small weight loss can dramatically reduce or even prevent high blood pressure.

Use Table 2 to assess sodium, calorie, calcium and potassium content of foods. Learn to read labels to identify differences between brands of food. Be a wise shopper.

Untreated hypertension causes damage to the blood vessels over time. This can lead to other health complications such as strokes, kidney failure, impaired vision, heart attack, and heart failure.

The DASH Diet

A landmark study called DASH (Dietary Approaches to Stop Hypertension) looked at the effects of an overall eating plan in adults with normal to high blood pressure. Researchers found that in just eight weeks, people following the DASH diet saw their blood pressure decrease. A subsequent study called DASH 2 looked at the effect of following the DASH diet and restricting salt intake to 1500 mg per day. Under the DASH 2 diet, people with Stage 1 hypertension had their blood pressure decrease as much or more than any anti-hypertensive medication had been able to lower it. (See fact sheet, 9.374, *DASHing to Lower Blood Pressure.*)

Recommended by the American Heart Association and the National Cancer Institute, the DASH diet is an overall eating plan that focuses on what people should eat, rather than what not to eat. Rich in fruits, vegetables, complex carbohydrates and low-fat dairy products, the DASH diet is lower in fat, saturated fat, cholesterol, and sodium, and higher in potassium, magnesium, and calcium than the typical American diet. The high levels of potassium, magnesium, and calcium in the DASH diet are thought to be at least partially responsible for its results. Table 3 below outlines the DASH eating plan.

Free copies of the DASH diet are available from the National Heart, Lung and Blood Institute's Information Center, P.O. Box 30105, Bethesda, MD 20082-0105 – ask for fact sheet 4082. For additional information, visit the DASH Web site at www.nhlbi.nih.gov/hbp/prevent/h_eating/h_eating.htm

Table 3: The DASH Diet.

Food Group	Daily Servings	Significance to the DASH Diet
Grains and grain products	7 – 8	Carbohydrates and fiber
Vegetables	4 – 5	Potassium, magnesium and fiber
Fruits	4 – 5	Potassium, magnesium and fiber
Low-fat or fat free milk or milk products	2 – 3	Calcium, protein, potassium and magnesium
Meats, poultry and fish	2 or less	Protein and magnesium
Nuts, seeds and beans	4 –5 a week	Magnesium, potassium, protein and fiber

Source: "A Clinical Trial of the Effects of Dietary Patterns on Blood Pressure." New England Journal of Medicine. 1997.336:1117-1124.

Table 2: Sodium, calorie, calcium and potassium content of foods.

Food	Amount	Food energy Kcalories	Sodium (Na) mg	Potassium (K) mg	Calcium (Ca) mg
BEVERAGES					
Fruit drinks, dehydrated, reconstituted:					
Lemonade	1 cup	102	13	33	71
Orange	1 cup	115	12	49	61
Fruit juices, unsweetened:					
Apple cider or juice	1 cup	117	5	250	15
Grapefruit juice	1 cup	75	4	360	32
Orange juice	1 cup	120	5	498	25
Grape juice, bottled	1 cup	159	8	279	27
Prune juice	1 cup	192	5	588	35
Cocoa mix, water added (Carnation)	1 cup	110	232	176	107
Coffee, freeze-dried (using 2 tsp.)	1 cup	6	2	166	6
DAIRY PRODUCTS					
Natural cheese:					
Cheddar	1 ounce	112	176	23	211
Colby	1 ounce	110	171	35	192
Cottage, 4 1/2% milk fat	1/2 cup	120	457	260	108
Cream	1 ounce	99	84	34	23
Monterey Jack	1 ounce	105	152	23	209
Mozzarella, part skim milk	1 ounce	72	132	24	183
Cream, sour	1 tablespoon	26	6	17	14
Milk:					
Skim	1 cup	89	126	406	296
Whole	1 cup	149	120	370	290
Ice Cream:					
Vanilla	1 cup	290	112	193	208
Yogurt:					
Regular plain	1 cup	152	105	323	272
Fruit flavored with nonfat milk solids	1 cup	231	133	442	345
EGGS, FISH, MEAT, POULTRY AND RELATED PRODUCTS					
Eggs, whole (boiled)	1	78	59	62	26
Fish:					
Salmon, broiled	3 ounces	156	99	378	127
Sardines, canned	3 ounces	174	552	501	372
Trout, brook, raw	3 ounces	86	67	319	12
Tuna, canned in water	3 ounces	108	288	237	14
Shellfish:					
Clams, raw, hard	3 ounces	68	174	264	58
Crab, canned	3 ounces	86	425	94	38
Lobster, boiled (northern)	3 ounces	80	212	153	55
Scallops, steamed	3 ounces	95	225	405	98
Shrimp, canned	3 ounces	324	1,955	122	9
Meat:					
Beef, lean hamburger, cooked	1 patty	140	55	480	14
Pork:					
Bacon, cooked	2 strips	96	274	34	2
Ham	3 ounces	298	1,114	284	4
Poultry:					
Chicken, roasted, breast without skin	1/2 breast	142	63	220	13
Turkey, roasted, breast with skin	3 1/2 ounces	189	67	289	21
FRUITS					
Apples, medium (2 1/2 inches in diameter)	1 apple	87	2	165	10
Apricots	3 apricots	51	1	281	17
Avocado, raw, peeled	1	167	22	604	10
Banana, raw, medium	1	127	2	550	12
Strawberries, raw	1 cup	55	2	244	31
Cherries, raw, sweet	1 cup	82	150	223	26
Grapefruit, pink, raw, medium	1/2	40	1	135	16
Oranges, raw	1	71	1	311	65
Grapes	10	31	1	72	7

Food	Amount	Food energy Kcalories	Sodium (Na) mg	Potassium (K) mg	Calcium (Ca) mg
FRUITS, continued					
Cantaloupe	1/2 melon	60	24	502	28
Peaches, raw	1	38	1	202	9
Pears, raw	1	122	1	260	16
Pineapple, raw	1 cup	69	1	195	23
Plums, raw	1	33	1	150	9
Raisins	1 cup	462	17	1,221	99
Watermelon	1/16 melon	152	10	560	38
GRAIN PRODUCTS					
Bread:					
White	1 slice	62	114	24	20
Whole wheat	1 slice	56	132	63	23
Cereals:					
Cream of Wheat, regular	3/4 cup	100	3	17	10
Oatmeal	3/4 cup	111	1	98	16
Crackers:					
Graham	1	27	48	27	3
Saltine	2	28	70	7	1
Whole wheat	1	16	30	120	1
Macaroni, cooked, no salt	1 cup	151	2	85	11
Muffin, English (Wonder)	1 medium	131	293	N.L.	80
Noodles, egg, cooked, no salt	1 cup	200	2	70	16
Rice, brown, cooked, no salt	1 cup	178	10	105	18
Snacks:					
Corn chips, Fritos	1 ounce	154	231	23	35
Popcorn with oil and salt	1 cup	41	175	256	1
Potato chips	10	114	200	226	8
Pretzel sticks (Frito Lay)	3	324	17	99	21
DESSERTS AND SWEETS					
Cookies:					
Brownies, iced, frozen	1	126	69	54	12
Chocolate chip (commercial)	2 cookies	104	69	30	8
Oatmeal and raisins	2	126	55	104	6
Sandwich type (round)	2	99	96	8	5
Sugar	1	89	108	15	16
Doughnut, cake (plain)	1	125	160	29	13
Cakes, from mix:					
Angel	1/12	121	134	40	4
White	1/12	187	238	38	31
Pies, frozen:					
Apple	1/8 of pie	160	208	76	13
Cherry	1/8 of pie	100	169	82	12
LEGUMES AND NUTS					
Almonds, roasted and salted	1 cup	984	311	1,214	369
Beans, baked, no pork	1 cup	236	606	832	100
Beans and peas, dry, cooked:					
Northern	1 cup	118	5	416	50
Blackeye, cooked	1 cup	178	12	625	40
Pinto, calico, raw	1/2 cup	349	4	984	135
Split, cooked	1 cup	208	5	536	20
Kidney, canned	1 cup	225	844	660	72
Cashews, roasted	1 cup	561	1,200	464	38
Peanuts:					
Dry, roasted, salted	1 cup	838	986	1,009	104
Unsalted	1 cup	838	8	1,009	104
Peanut butter	1 tablespoon	86	81	123	11
Pecans	1 cup	696	1	420	74
Pistachios	1 cup	594	6	972	131
Walnuts, English	1 cup	781	3	540	119

Food	Amount	Food energy Kcalories	Sodium (Na) mg	Potassium (K) mg	Calcium (Ca) mg
VEGETABLES					
Asparagus, canned	4 spears	14	298	127	14
Snap beans, canned	1 cup	43	326	227	81
Beets, cooked, fresh	1 cup	54	73	344	24
Broccoli, raw	1 stalk	32	23	382	103
Cabbage, green, raw	1 cup	24	8	233	49
Carrots, raw, grated	1 cup	46	34	375	41
Cauliflower, raw, flower pieces	1 cup	27	17	295	25
Celery, raw	1 stalk (outer)	8	25	170	20
Corn:					
Cooked, fresh	1 ear	70	1	151	2
Frozen	1 cup	130	7	304	5
Cream style, regular, canned	1 cup	210	671	248	8
Cucumber	7 slices	4	2	45	7
Lettuce, iceberg, chopped	1 cup	7	4	96	11
Mushrooms, raw	1 cup	20	7	290	4
Onions	1 medium	38	10	157	27
Peas:					
Cooked	1 cup	106	2	294	34
Frozen, regular	3 ounces	58	80	116	16
Potatoes:					
Baked or boiled without skin	1 medium	139	5	755	14
French fried	10 strips	137	15	427	8
Mashed with milk and salt	1 cup	137	632	548	50
Pumpkin, canned	1 cup	76	12	552	58
Spinach:					
Raw, chopped	1 cup	14	49	259	51
Frozen, chopped, cooked	1/2 cup	23	65	333	113
Squash, summer, cooked	1 cup	28	5	282	50
Squash, winter, baked, mashed	1 cup	126	2	922	56
Sweet potatoes:					
Baked or boiled	1 sm. potato	141	20	300	40
Canned, solid packed	1 sm. potato	108	48	200	25
Tomatoes:					
Raw	1 med. tomato	33	14	366	20
Canned, whole	1 cup	42	584	434	12
Tomato paste	1 cup	215	77	2,237	71
Tomato sauce	1 cup	97	1,498	1,060	32
CONDIMENTS, FATS AND OILS					
Catsup	1 tablespoon	16	156	55	3
Mustard, prepared, yellow	1 teaspoon	4	65	7	4
Olives, green, large	4 olives	18	323	8	10
Pickles, dill	1 lg. pickle	11	928	200	26
Sauces:					
A-1	1 tablespoon	12	275	51	3
Barbecue	1 tablespoon	15	130	28	3
Worcestershire	1 tablespoon	12	206	120	15
Butter, regular	1 tablespoon	108	116	4	4
Margarine	1 tablespoon	108	140	3	3
Salad dressing:					
Blue cheese	1 tablespoon	71	153	5	11
French, bottled	1 tablespoon	57	214	11	2
Italian, bottled	1 tablespoon	77	116	2	2
Mayonnaise	1 tablespoon	61	78	1	2
Thousand Island	1 tablespoon	70	109	16	2

¹ J. Anderson, Colorado State University
 Extension food and nutrition specialist and
 professor; L. Young, M.S., former graduate
 student; and E. Long, graduate student, food
 science and human nutrition.

Colorado State University, U.S. Department of Agriculture and Colorado counties cooperating.
 Extension programs are available to all without discrimination. No endorsement of products
 mentioned is intended nor is criticism implied of products not mentioned.