

## Natural Approaches to Better Blood Pressure Control



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### DO This

#### If you make big lifestyle changes,

- DO** Check your blood pressure daily.
- DO** Assess your risk of low blood pressure. You are at risk if you take blood pressure medicines and you have pretty low blood pressure already.
- DO** Make an appointment with your doctor to discuss safety and medicines.
- DO** Watch for signs of low blood pressure: tired, light headed, fainting...



## Special Safety Considerations

- ✓ On warfarin? If so, a boost in vegetables can reduce its effectiveness.
- ✓ On insulin or other diabetes medications? A healthy lifestyle can also drop your blood sugar dangerously low.
- ✓ Exercising vigorously? Beware if you have unstable heart disease or are at risk for falls.



## Blood Pressure Categories



BLOOD PRESSURE CATEGORY	SYSTOLIC mm Hg (upper number)		DIASTOLIC mm Hg (lower number)
NORMAL	LESS THAN 120	and	LESS THAN 80
ELEVATED	120 – 129	and	LESS THAN 80
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 1	130 – 139	or	80 – 89
HIGH BLOOD PRESSURE (HYPERTENSION) STAGE 2	140 OR HIGHER	or	90 OR HIGHER
HYPERTENSIVE CRISIS (consult your doctor immediately)	HIGHER THAN 180	and/or	HIGHER THAN 120

# 7 SIMPLE TIPS TO GET AN ACCURATE BLOOD PRESSURE READING

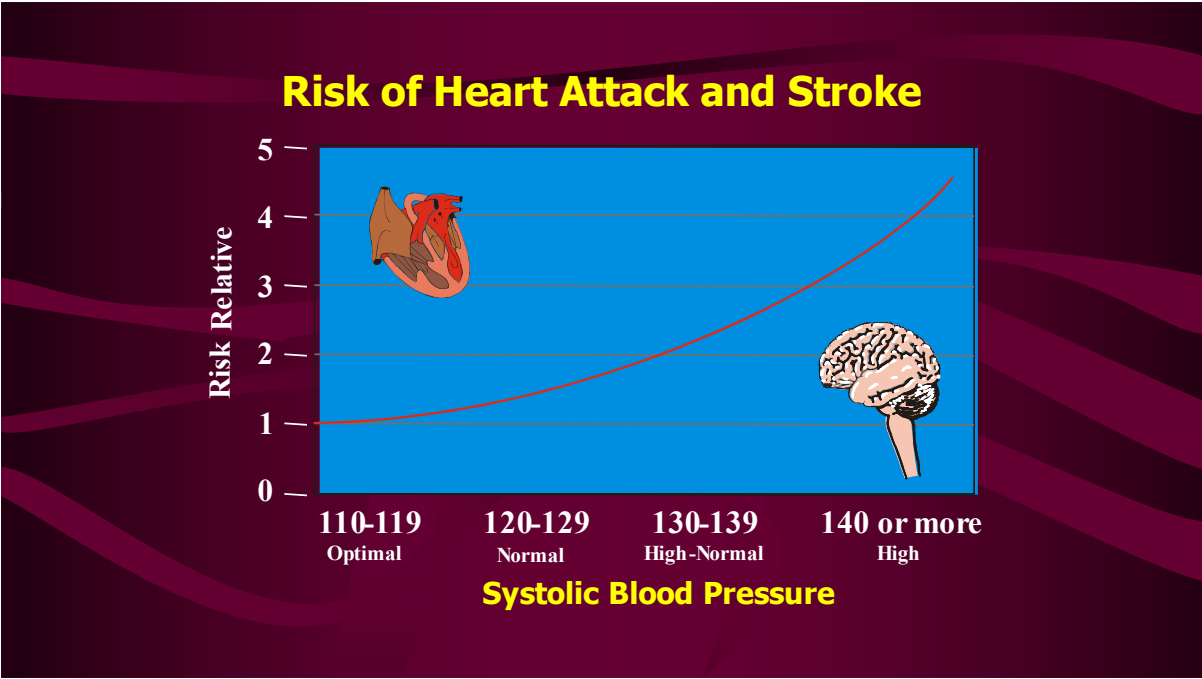
- USE CORRECT CUFF SIZE**  
Cuff too small adds 2-10 mm Hg
- PUT CUFF ON BARE ARM**  
Cuff over clothing adds 5-50 mm Hg
- SUPPORT ARM AT HEART LEVEL**  
Unsupported arm adds 10 mm Hg
- KEEP LEGS UNCROSSED**  
Crossed legs add 2-8 mm Hg
- DON'T HAVE A CONVERSATION**  
Talking or active listening adds 10 mm Hg
- EMPTY BLADDER FIRST**  
Full bladder adds 10 mm Hg
- SUPPORT BACK/FEET**  
Unsupported back and feet adds 6.5 mm Hg

The common positioning errors can result in inaccurate blood pressure measurement. Figures shown are estimates of how improper positioning can potentially impact blood pressure readings.

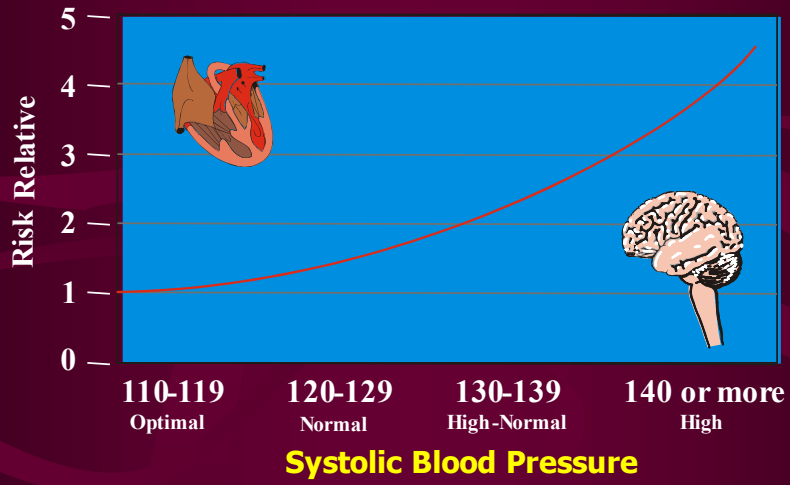
Sources:  
 1. Pickering, et al. Recommendations for Blood Pressure Measurement in Humans and Experimental Animals Part 1: Blood Pressure Measurement in Humans. *Circulation*. 2005;111: 697-716.  
 2. Mendler et al. The importance of accurate blood pressure measurement. *The Permanente Journal*/Summer 2009/Volume 13 No. 3 81

This 7 simple tips to get an accurate blood pressure reading was adapted with permission of the American Medical Association and The Johns Hopkins University. The original copyrighted content can be found at <https://www.ama-assn.org/ama-johns-hopkins-blood-pressure-resources>.

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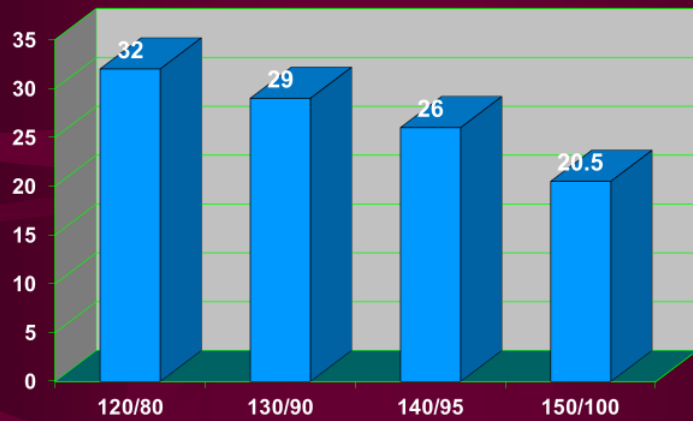


## Risk of Heart Attack and Stroke



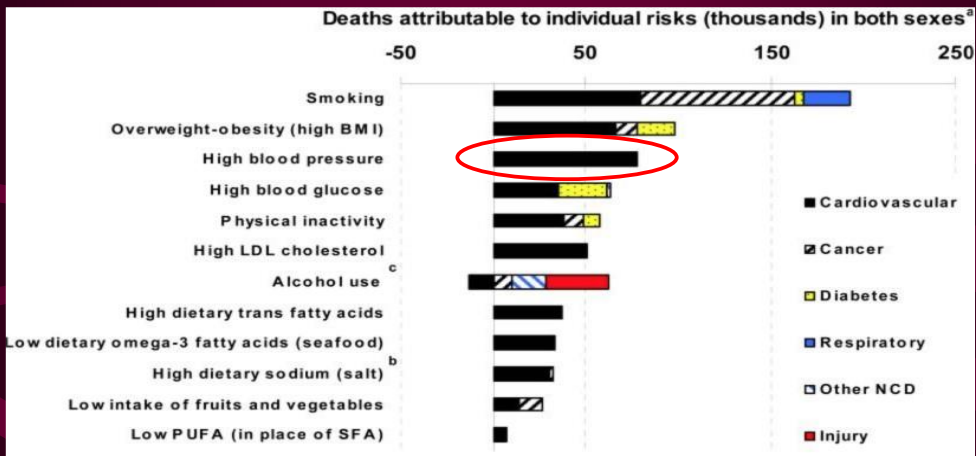
## Longevity

(years of remaining life in 45 year old men)



Metropolitan Life Insurance Company

## A Leading Cause of Death



*PLoS Med.* 2009 Apr; 6(4): *The Preventable Causes of Death in the United States: Comparative Risk Assessment of Dietary, Lifestyle, and Metabolic Risk Factors; Goodarz Danaei, et al*

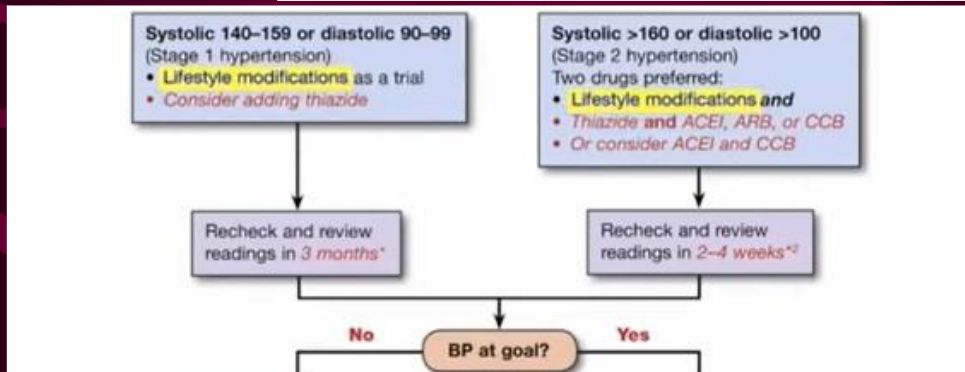
## Treatment Start with Lifestyle

Three drugs are commonly needed to achieve good BP control.

### High Blood Pressure Control<sup>☆</sup>

A Science Advisory From the American Heart Association, the American College of Cardiology, and the Centers for Disease Control and Prevention

Alan S. Go, MD; Mary Ann Bauman, MD; Sallyann M. Coleman King, MD, MSc; Gregg C. Fonarow, MD, FAHA, FACC; Willie Lawrence, MD, FAHA, FACC; Kim A. Williams, MD, FAHA, FACC; Eduardo Sanchez, MD, MPH



## Not all Blood Pressure Drugs are Created Equal



[Am J Med.](#) 2011 Oct;124(10):896 -9

### Better with BP Rx taken at night

- ✓ 59% lower risk of diabetes
- ✓ 67% lower risk of heart attack
- ✓ 73% lower risk of kidney disease

[Curr Pharm Des.](#) 2015;21(6):773-90.

[Diabetologia.](#) 2016 Feb;59(2):255-65. .

[Eur J Clin Invest.](#) 2018 May;48(5):e12909.

[Blood Press Monit.](#) 2013 Aug;18(4):227-31

ACE Inhibitors (**lisinopril**) and Angiotensin Receptor Blockers (**losartan, valsartan**) reduce the risk of diabetes.

Hydrochlorothiazide (**HCTZ**) has high side effects, low efficacy, and increases the risk of diabetes.

Top 3 recommended BP medications are ACE/ARB, Calcium Channel Blockers (**amlodipine**), and a diuretic (**chlorthalidone**).

## Absolute Risk Reduction of Heart and Stroke Prevention Drug Strategies is <5 %

Study	Mean treatment duration	Number of subjects	Outcome	Control untreated event rate (%)	Relative risk reduction with treatment (%)	Absolute risk reduction with treatment (%)
Pravastatin post MI or unstable angina; median cholesterol 5.6 mmol/l <sup>1</sup>	6.1 years	9014	All deaths	14.1	22	3.1
			Any MI	10.3	28	2.9
Primary prevention with pravastatin in men; mean cholesterol 7.0 mmol/l <sup>2</sup>	4.9 years	6595	All deaths	4.1	22	0.9
			Coronary events	7.9	30	2.3
Ramipril in high-risk patients (HOPE study) <sup>3</sup>	5 years	9297	All deaths	12.2	15	1.8
			Any MI	12.3	20	2.4
Enalapril post MI; EF <35% <sup>4</sup>	37 months	4228	All deaths	15.8	6	1.0

**Ramipril & Enalapril** (ACE inhibitor) – **relaxes blood vessels.**  
**Carvedilol** (beta-blocker) – **slows down the heart rate and blood pressure.**  
 5.6 mmol/l = **216 mg/dl.**  
 7.0 mmol/l = **270 mg/dl.**

## Absolute Risk Reduction of Heart and Stroke Prevention Drug Strategies is < 5%

Carvedilol post MI; EF $\leq$ 40% <sup>5</sup>	1.3 years	1959	All deaths	15.0	20	3.0
Aspirin or other anti-platelet drug post MI <sup>6</sup>	27 months	20,006	Any vascular event	17	21	3.5
Aspirin or other anti-platelet drug post stroke <sup>6</sup>	29 months	23,020	Any vascular event	21	17	3.6
Hypertension; diastolic BP 90–109 mm <sup>7</sup>	4.9 years	17354	All deaths	2.9	2	0.06
			Stroke	1.3	45	0.6
Hypertension; diastolic BP 115–129 <sup>8</sup> (Blood pressure medication only helped at a diastolic PB range of 115-129 mg/dl)	18 months	143	Death, stroke or heart failure	39	93	36.3
Warfarin in non-rheumatic atrial fibrillation <sup>9</sup>	1.8 years	571	Cerebral infarction	7.2	78	5.6

EF = ejection fraction; BP = blood pressure.

Even high risk patients have less than a 5% chance of benefiting from a cardioprotective drug taken for 5 years.

*Clinical Medicine Vol 2, No 6, November/December 2002*

## Side Effects of Blood Pressure Medication

**Cardiovascular:** arrhythmia (including ventricular tachycardia and atrial fibrillation), bradycardia, chest pain, hypotension, peripheral ischemia, syncope, tachycardia, postural dizziness, postural hypotension, vasculitis.

**Central and Peripheral Nervous System:** hypoesthesia, neuropathy peripheral, paresthesia, tremor, vertigo.

**Gastrointestinal:** anorexia, constipation, dyspepsia,<sup>1</sup> dysphagia, diarrhea, flatulence, pancreatitis, vomiting, gingival hyperplasia.

**General:** allergic reaction, asthenia,<sup>1</sup> back pain, hot flushes, malaise, pain, rigors, weight gain, weight decrease.

**Musculoskeletal System:** arthralgia, arthrosis, muscle cramps,<sup>1</sup> myalgia.

**Psychiatric:** sexual dysfunction (male<sup>1</sup> and female), insomnia, nervousness, depression, abnormal dreams, anxiety, depersonalization.

*Journal of Hypertension, 2011. 29: 4-16*

## Side Effects of Blood Pressure Medication

**Respiratory System:** dyspnea,<sup>1</sup> epistaxis.

**Skin and Appendages:** angioedema, erythema multiforme, pruritus,<sup>1</sup> rash,<sup>1</sup> rash erythematous, rash maculopapular.

**Special Senses:** abnormal vision, conjunctivitis, diplopia, eye pain, tinnitus.

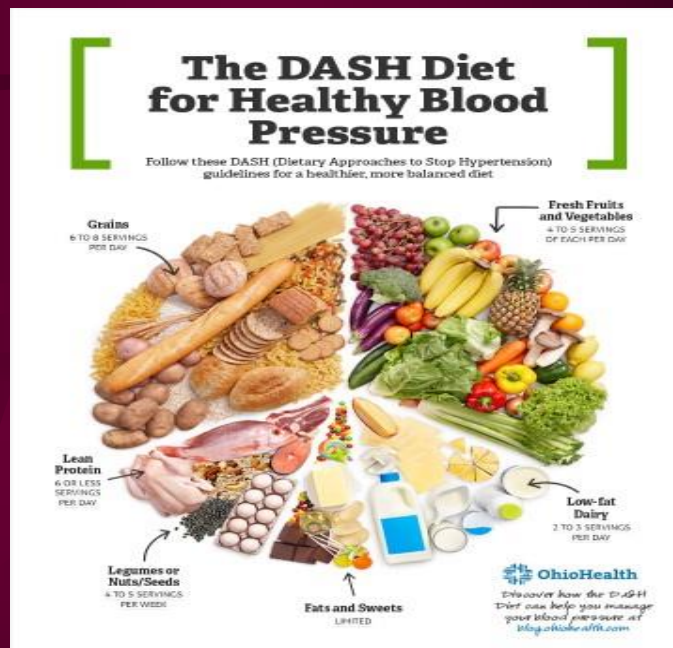
**Urinary System:** micturition frequency, micturition disorder, nocturia.

**Autonomic Nervous System:** dry mouth, sweating increased.

**Metabolic and Nutritional:** hyperglycemia, thirst.

**Hemopoietic:** leukopenia, purpura, thrombocytopenia.

- **Weight loss**
- **Sodium restriction**
- **Exercise**
- **DASH Diet**





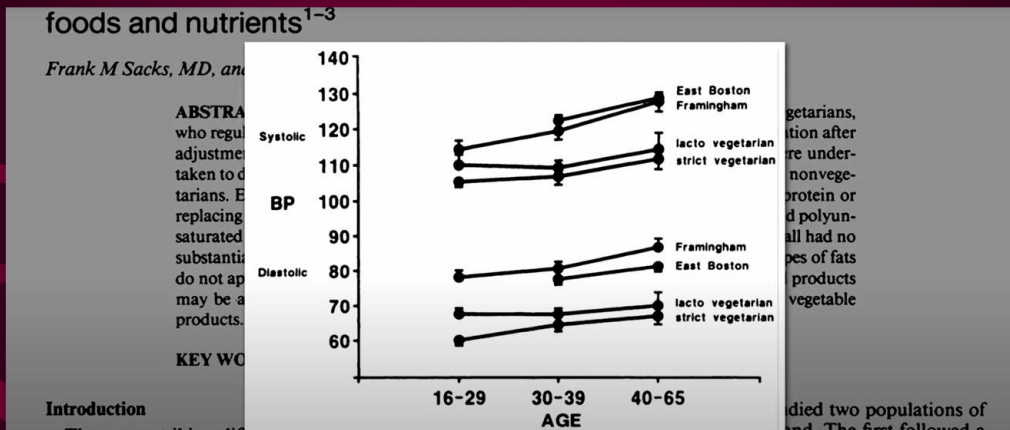
## Nutrition

In the **1920s**, researchers measured the blood pressures of a thousand native **Kenyans who had a diet centered on** whole grains, beans, fruits, and dark leafy greens.



Country	Up until age 40	By age 60
Kenyans	<b>125/80 mg/dl</b>	<b>110/70 mg/dl</b>
Westerners Europeans American	<b>125/80 mg/dl</b>	<b>140/90 mg/dl</b>

## Recent Research on Diet and High Blood Pressure



In conclusion, fruit and vegetables were the food groups of the DASH diet associated with reduced BP values

### Hypertension Trial (DASH)

A Multicenter Controlled-Feeding Study of Dietary Patterns to Lower Blood Pressure

FRANK M. SACKS, MD, EVA OBARZANEK, PhD, MARLENE M. WINDHAUSER, PhD, LAURA B. SVETKEY, MD, WILLIAM M. VOLLMER, PhD, MARIOPIE M. GULLONE, PhD

The diet design goals were to create patterns that would (a) have the blood pressure-lowering benefits of a vegetarian diet, yet contain enough animal products to make them palatable to nonvegetarians

**TABLE 3**  
Relationship in lactovegetarians between consumption of dairy products and blood pressure adjusted for the effects of age, sex, and weight

Intake of dairy products*	Number of subjects	Systolic BP	Diastolic BP
<1	19	105.9	66.4
1-2.9	18	110.8	66.6
3-4.9	9	108.8	68.0
≥5	7	112.6	71.2
r	53	0.37 ( $p = 0.009$ )	0.27 ( $p = 0.055$ )

## The Adventist Health Study

### from the Adventist Cohorts

Vegetarian diets confer protection against cardiovascular diseases, cardiometabolic risk factors, some cancers and total mortality. Compared to lacto-ovo-vegetarian diets, vegan diets seem to offer additional protection for obesity, hypertension, type-2 diabetes, and cardiovascular mortality.

### from the Adventist Cohorts

**Table 6.** Cardiometabolic-related factors among vegan and lacto-ovo-vegetarian Adventists.

Cardio-Metabolic Factors	Person at-Risk	Parameter Estimates	Lacto-ovo-Vegetarian	Vegan
			Mean, RR, or OR (95% CI)	
Hypertension	89,224	RR	0.45 (0.44, 0.47)	0.25 (0.22, 0.28)

## Nutrition

On a low-fat whole plant food diet, **500 participants** on the live-in McDougall with baseline blood pressure reading **>140/90 mmHg** experienced an average blood pressure reduction of **-17/-13 mm/Hg** after only 11 day.

In a 6 weeks study, **2 bananas, 3 ounces of raisins and 2 cups of orange juice** were added to the regular daily diet. At the end of the study the blood pressure dropped by **-13/-7 mmHg** in the experimental group.

*Dr Leonard Gibbons, Research Study, 2000*



## Sodium



- US RDA: 2300 mg/day
- Average American: 3400 mg/day
- **Lowering the sodium intake by 2,300 mg/day lowers the BP by 3-6 mmHg.**

*Am J Clin Nutr 1997 Nov; 66(5): 1297*

## Processed foods

They provide more than 70% of the sodium in the diet.

- Breads and rolls
- Pizza and sandwiches
- Cold cuts and cured meats (these are also carcinogens)
- Soups, burritos and tacos
- Savory snacks - chips, pretzels, popcorn, snack mixes, crackers
- Cheese, chicken, eggs and omelets



U.S. Department of Health and Human Services, U.S. Department of Agriculture. [What We Eat in America](#) [PDF-64K]. NHANES 2013-2014. Agricultural Research Service Website

## Sodium: How much is too much?

Sodium: No more than 1 mg sodium per 1 calorie .



## Nitrate Rich Vegetables

**1 cup beet juice**  
after 3 hour  
reduced BP by  
**-10.4/-8 mm/Hg.**



**1 cup beet juice**  
after 4 week  
reduced BP by  
**-8/-4 mm/Hg.**



Plants rich in dietary nitrates open up blood vessels and reduce blood pressure

## Nitrate Rich Vegetables

Vegetables Rich in Dietary Nitrates		
Dietary nitrates in mg/100 gram		
<b>3/4 cup beets, 110 mg</b>	<b>Basil, 183 mg</b>	<b>Rhubarb, 281 mg</b>
<b>Mustard greens, 120mg</b>	<b>Spring green, 188 mg</b>	<b>Collards, 320 mg *</b>
<b>Swiss chard, 151 mg</b>	<b>Butter leaf lettuce, 200 mg</b>	<b>arugula , 480 mg *</b>
<b>Oak leaf lettuce 155 mg</b>	<b>Cilantro, 247 mg</b>	<b>spinach , 740 mg *</b>
<b>Beat greens 177 mg</b>	<b>Beet juice, 279 mg</b> <b>1 cup beet juice = 250 mg</b> <b>-8/4 mg/dl</b>	<b>100 grams of greens = 5 cups greens</b> <b>Goal: 3-4 cups of greens * per day</b>

## CoQ10

Coenzyme Q10 is a **potent** chain breaking lipid - soluble **antioxidant** with the ability to **counteract** the production of the **superoxide radicals**. These free radicals **impair Nitric Oxide-mediated relaxation of underlying smooth muscles** with resultant constriction of blood pressure and increased blood pressure.



In a meta analysis of clinical trials using **CoQ10 at a dosages range from 35 to 225 mg/day** (taken with meals), blood pressure levels were lowered by up to **-17/-10 mg/dl.**

*Journal of Hypertension (2007) 21, 297-306*

## L-arginine

**L-arginine at 5-10 grams per day or 1-2 cup** of chickpeas, lentils, red beans or soy beans or **1/2 cup pumpkin seeds** per day may lower blood pressure by up to **-6/-7 mg/dl.**



## Flaxseed

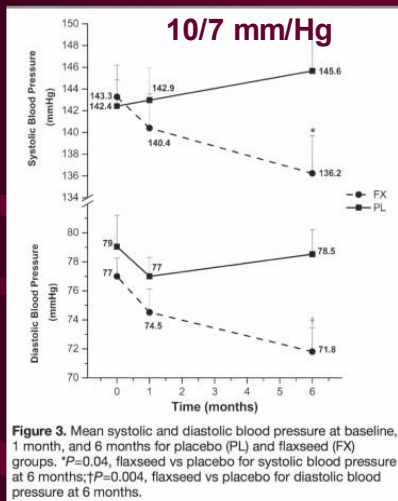
30 grams (4 Tbs.) of ground flaxseed daily for a 6 month period resulted in a blood pressure drop of **-15/-7 mm/Hg** in patients with SBP  $\geq$  140 mm/Hg. Heart attack and stroke risk was also cut in half.



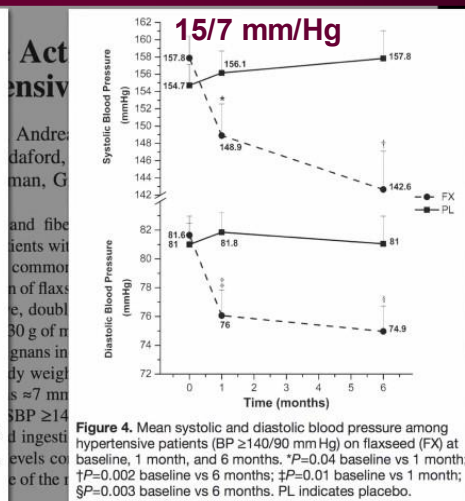
Comparisons of blood pressure-lowering regimens against placebo	
	SBP/DBP Difference
ACE-I vs. placebo	-5.0/-2.1
CA vs. placebo	-8.4/-3.2

Rodriguez-Leyva d, et al. Hypertension. 2013

## Flaxseed



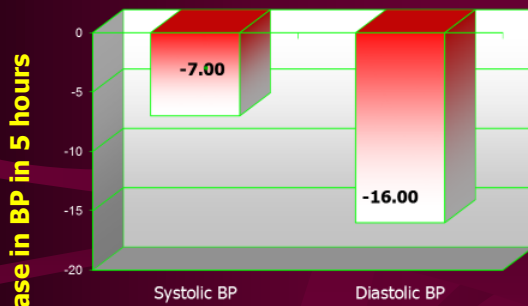
**Figure 3.** Mean systolic and diastolic blood pressure at baseline, 1 month, and 6 months for placebo (PL) and flaxseed (FX) groups. \* $P=0.04$ , flaxseed vs placebo for systolic blood pressure at 6 months; † $P=0.004$ , flaxseed vs placebo for diastolic blood pressure at 6 months.



**Figure 4.** Mean systolic and diastolic blood pressure among hypertensive patients (BP  $\geq$ 140/90 mmHg) on flaxseed (FX) at baseline, 1 month, and 6 months. \* $P=0.04$  baseline vs 1 month; † $P=0.002$  baseline vs 6 months; ‡ $P=0.01$  baseline vs 1 month; § $P=0.003$  baseline vs 6 months. PL indicates placebo.

Rodriguez-Leyva d, et al. Hypertension. 2013

## Garlic



Decrease in BP in 5 hours

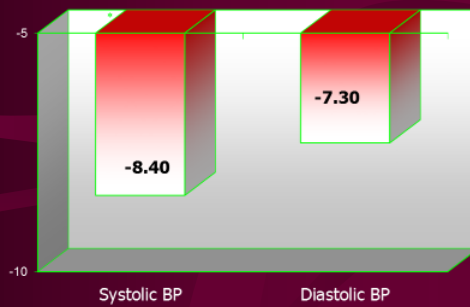
n=9 patients with sever hypertension  
Dosage: **1.3% allicin 2400 mg**



Garlic ↓ platelet aggregation,  
↓ plasma viscosity by 3.2%,  
and ↑ fibrinolytic activity  
(breaks up fibrin clots).  
Elevated fibrinogen levels are  
stronger risk factor for CAD.

*Pharmacotherapy 1993; 13(4):406-7*

## Garlic



n=11 studies, meta  
analysis,  
Hypertensive group  
**-8/-7 mmHg**

**600-900 mg/day**

BMC Cardiovascular Disorders 2008, 8:13  
doi:10.1186/1471-2261-8-13



## Hibiscus and Weight loss

Hibiscus flowers reduced blood pressure by **17/12 mmHg** in study that included 193 participants. In 10 trials, the average drop in blood pressure was **-13/-8 mmHg.**

**Estimated dosage: 3 to 4 tea bags** of dried hibiscus flowers per day.



## Grape Seed Extract

**300 mg of grape seed extract** reduced blood pressure by **-37/-9 mmHg** in a study arm of 37 participants. **93%** of these participant **achieved normal blood pressure** measurments in this 4 month study.

A meta analysis of **16 grape seed extract trials** including 802 participants reported an average drop in blood pressure of **-6/-3 mmHg.**



*Evidence-Based Complementary and Alternative Medicine Volume 2013, Article ID 313142, 5 pages  
<http://dx.doi.org/10.1155/2013/313142>  
Medicine (Baltimore) 2016;95:e4247.*

## Weight Loss

Weight loss reduces blood pressure by **-1.5/-1 mmHg** for every **2 pounds of weight loss**.



## Exercise

A study conclusion involving 39,742 participants concluded that **exercise is just as effective as most blood pressure medication** in lowering elevated blood pressure levels.

Combining endurance exercise with dynamic resistance training **is effective in reducing systolic blood pressure**.

*British Journal of Sports Medicine. Volume 53, Issue 14, 2019*



## Exercise

Regular physical exercise **makes the heart stronger** and a stronger heart can **pump more blood with less effort**. This will lower the force on the arteries and reduce the blood pressure. In fact, the calf muscles act like a second pump.



**Exercise 5 to 7 days a week** at 50-75% of maximal heart rate for 30 to 45 minutes per session, may reduce the blood pressure by **-11/-8 mg/dl**.

## Water

When **not enough water is consumed**, the body attempts to secure its fluid supply by **retaining sodium**. At the same time, **dehydration forces the body to** gradually and systematically **close down some of its small blood vessels**, which can put more pressure in the arteries and elevate the blood pressure.



## Sunlight

Research shows that **sunlight** alters the level of the small messenger molecule **nitric oxide (NO) in the skin and blood**. This resulting effect, **reduces the blood pressure level**.

<https://www.sciencedaily.com > releases > 2014/01>



## Temperance

**Tea or coffee** contain **caffeine**, a vasoconstrictor. It narrows the blood vessels and can thereby increase the blood pressure temporarily.



**Diets high in fat and salt** constrict the blood vessels and increase the blood pressure.

Fructose **sugar** elevates uric acid levels which drives up **blood pressure** by **inhibiting nitric oxide** from widening the blood vessels.



## Deep Breathing Exercise

Deep breathing exercises **stimulate blood pressure receptors in the chest wall** and **activate nerve reflexes** that lower **high blood pressure** and slow the heart rate.



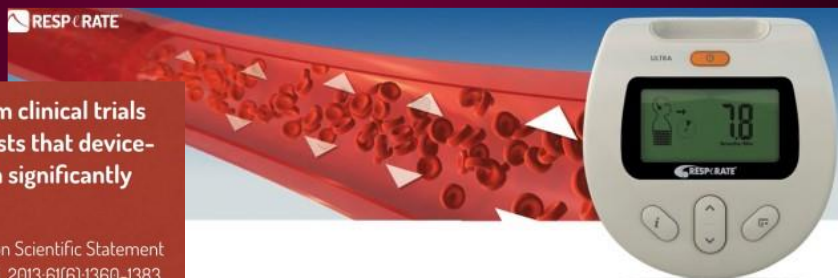
In a 12 week study involving deep breathing exercise, the experimental groups blood pressure dropped by **-15/-11 mmHg**

DOI: 10.9790/08531602045962 [www.iosrjournals.org](http://www.iosrjournals.org)

## RESPeRATE Deep Breathing Machine

"The overall evidence from clinical trials and meta-analyses suggests that device-guided slow breathing can significantly lower blood pressure."

American Heart Association Scientific Statement  
Brook RC et al. 2013;61(6):1360-1383.



**A Proven Non-Drug Hypertension Treatment**  
Highlights of Clinical Studies



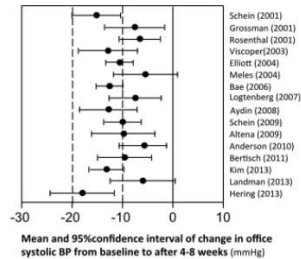
**\$349.95**

## RESPeRATE Deep Breathing Machine

### RESPeRATE<sup>®</sup> : Proven Effective in 16 Peer-Reviewed Studies

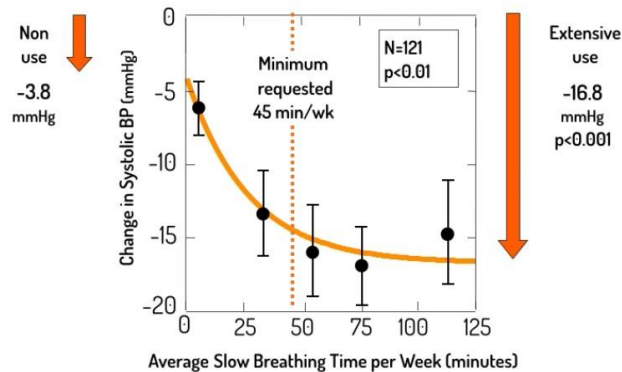
Found safe & effective in wide range of patients<sup>1-16</sup>

- 14/8 mmHg sustained average reduction in blood pressure.
- Effective in both medicated and non-medicated patients
- Tested in US, Europe, Middle East, and Asia
- No observed adverse reactions.



## RESPeRATE Deep Breathing Machine

### BP Reduction Increases with Therapeutic Breathing Time



## Rest

It's thought that **sleep helps your blood regulate stress hormones** and helps your nervous system remain healthy. Over time, **a lack of sleep could hurt your body's ability to regulate stress hormones**, leading to high blood pressure levels.



## Trust in Divine Power

**Chronic stress** and particularly the **non-adaptive response to stress**, are more likely to cause a **sustained elevation of blood pressure by way of our stress hormones.**

*Journal of Human Hypertension*  
volume 23, pages12–19 (2009)



## Blood Pressure Quiz

1. If you make big lifestyle changes and you are on blood pressure medication, it is important to check your blood pressure reading every day. T F
2. When you are taking your blood pressure reading, it is okay to cross your legs and put the blood pressure cuff over clothing instead of directly on the skin. T F
3. A normal blood pressure reading is less than 120 systolic and less than 80 diastolic. T F

4. An optimal range for a systolic blood pressure reading for preventing a stroke or heart attack is 120 to 129 mmHg. T F
5. Risk of kidney failure is highest for a blood pressure reading greater than 159/99 mmHg. T F
6. High blood pressure is a leading cause of death. T F
7. Two drugs are commonly needed to achieve good blood pressure control in individuals with high blood pressure. T F
8. The best time to take most blood pressure medications is in the morning. T F
9. Based on a major research study, the heart and stroke prevention drug strategies are very effective. T F
10. The side effects of blood pressure medications as a group are minimal and nothing to be concerned about. T F
11. Weight loss, sodium restriction, exercise and the DASH Diet are the commonly prescribed lifestyle options for improving blood pressure control. T F
12. The DASH Diet is superior to a whole plant food diet for improving blood pressure control. T F
13. Lowering the sodium intake by 2,300 mg per day lowers the blood pressure by 3-6 mmHg. T F
14. A reduction in blood pressure of -10.4/-8 mm/Hg was achieved in 3 hours after consuming 1 cup beet juice in one study. T F
15. CoQ10, flaxseed and bananas have all been proven effective at lowering elevated blood pressure levels in clinical studies. T F
16. Based on clinical studies, about 3 to 4 cups (3-4 tea bags) of dried hibiscus flowers teas per day is an effective dosage for lowering elevated blood pressure levels. T F
17. Losing body weight reduces blood pressure by -1.5/-1 mmHg for every 2 pounds of weight loss. T F
18. Exercise is not as effective as most blood pressure medications in lowering elevated blood pressure levels. T F
19. Nitric Oxide is an important chemical in the body for relaxing the blood vessels and maintaining a healthy blood pressure level. T F
20. Rest, balance, sunlight, deep breathing exercises and trust in God can all help to normalize elevated blood pressure readings. T F