

High Blood Pressure

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DEFINITION

Hypertension: a silent killer worth treating.

Over 60 million Americans have abnormally high blood pressure, also known as hypertension. The incidence increases with age and is more common in men and African Americans than in premenopausal women and whites. By definition, high blood pressure is diagnosed when several recordings- preferably not all taken in a provider's office - demonstrate a systolic (top-number) reading of 140 or greater and/or a diastolic (bottom number) reading of 90 or greater. However,

even a diastolic blood pressure of 85 to 89 is considered high normal and deserves at least careful observation.

It is important to be vigilant about hypertension for the following reasons:

- Left untreated, hypertension can lead to stroke, kidney failure, heart failure and coronary heart disease.
- Because few people have symptoms of hypertension early in its course, it has become known as the "silent killer."
- Hypertension remains the leading cause of stroke; in fact, stroke is sometimes the first symptom of the

disease.

- For greater than 90% of individuals with hypertension, no definite cause can be identified, and therefore it is categorized as "essential hypertension." In rare cases hypertension may be due to an adrenal condition called Cushing's disease, an adrenal tumor, renal (kidney) artery stenosis or kidney disease.

Fortunately, treatment for hypertension has been shown to be effective in reducing the incidence of all complications, particularly stroke:

- Many traditional medications such as diuretics, beta blockers, calcium channel blockers, angiotensin converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARB) and alpha blockers have been demonstrated to effectively lower blood pressure. However, these medications are available by prescription only and all have side effects, which must be closely monitored.
- In addition to these medications, a proper diet and exercise are essential to the treatment of hypertension and may be effective alone in treating mild elevations in blood pressure.
- Several other complementary techniques may help reduce blood pressure and

thus decrease the need for prescription medications - or perhaps limit the number and dosage of medications required.

DIET

A healthy diet can make a difference.

Increase your fruits and vegetables. A healthy diet should be part of a plan to lower elevated high blood pressure, because it works. Dr. Thomas Moore at Brigham and Women's Hospital, part of Harvard Medical School, conducted the most well-known study examining diet and high blood pressure (1):

- The DASH (Dietary Approaches to Stop Hypertension) study examined 459 patients eating one of three diets.
- While none of the patients on a high-fat diet lowered their blood pressure, those on a near-vegetarian diet significantly improved their blood pressure.
- The average drop in systolic and diastolic pressure was 6 points and 3 points, respectively.
- Click here for more on the DASH diet.

Complete vegetarian diets are also known to lower blood pressure (2):

- The mechanism for this reduction is believed to

involve increased potassium in the diet, due to an increased consumption of fruits and vegetables (3).

- A second contributing factor may be increased fiber intake, which is also believed to lower blood pressure (4).

Individuals consuming additional fruits and vegetables should exercise caution in taking potassium-sparing diuretics such as spironolactone (Aldactone), as should those with kidney failure. In both instances such a practice could lead to dangerously high levels of potassium.

Reduce sodium and balance other electrolytes.

Balancing the body's electrolytes, which include sodium, potassium and magnesium, is very important. Approximately 20% of Americans with high blood pressure are sensitive to the effects of sodium. Sodium promotes fluid retention, and excessive fluid in the blood vessels of a person who has hypertension leads to additional increases in blood pressure caused by pressure on the vessel walls.

While there is no evidence that people with normal blood pressure need to take special measures to reduce

their risk of acquiring hypertension, a low-sodium diet is recommended for people with elevated blood pressure:

- The National High Blood Pressure Education program, an organization of researchers, recommends no more than 2,000 mg of sodium per day. Unfortunately, most Americans consume about twice this much.

- Foods to avoid include canned soups, chips, pickled products, condiments such as ketchup, mustard, soy sauce, cured meats such as ham, cold cuts, bacon and hot dogs.

- It is also recommended to switch to unsalted butter and margarine.

- Experts recommend tasting food before considering adding salt - and eliminating the salt shaker from the dinner table.

- Experimenting with herbs and spices while cooking can help replace the flavor lost from salt and result in food that tastes delicious.

While reducing sodium, consider increasing potassium intake. A healthy balance of potassium may be beneficial to the control of high blood pressure. Foods high in potassium include bananas, black beans, carrots, oranges, milk, pork, potatoes, prunes, spinach and veal. A healthy diet should

include 2000 to 5000 mg per day of potassium.

Magnesium is important to vascular tone and relaxation, and a healthy diet should contain 300 to 500 mg per day. Foods high in magnesium include beans, halibut, nonfat yogurt, nuts, potatoes and spinach.

Avoid excessive alcohol. Alcohol consumption should be limited to no more than two alcoholic beverages per day. One drink of alcohol equals 12 ounces of beer, 4 ounces of wine or 1 ounce of hard alcohol. Excessive alcohol consumption has been linked to elevated blood pressure as well as a host of other deleterious effects. It is also important to remember that a 5-ounce glass of wine contains approximately 100 calories and, therefore, even modest daily use can lead to gradual weight gain.

Maintain a healthy weight. Overweight individuals are twice as likely to develop hypertension. Unfortunately, over 50% of Americans are overweight, and the percentage is increasing. In 1980, 25% of Americans were overweight, and weight, and the percentage is increasing. In 1980, 25% of Americans were overweight, and the

incidence had risen to 55% by 1999. In the Framingham offspring study, obesity was found to be the major controllable risk factor for hypertension (5). The ability to maintain a healthy weight requires more than self-control and willpower. At least six factors influence your weight-behavior, environment, health status, culture, income level and genetics (6). In order to avoid obesity, first get regular exercise, at least thirty minutes a day of activity equivalent to vigorous walking. You can do it all at once or in divided segments. Second, focus on healthy eating, not deprivation diets. Choose healthy foods such as vegetables, fruits, grains and lean meat. Seek foods for their nutrient value and not for their calories. Third, lose weight slowly. One pound per week is most effective. Even five to ten percent of your body weight can improve your health (6).

Several studies have examined the relationship between hypertension and diet, obesity and weight loss:

- **TONE (Trial of Nonpharmacologic Interventions in the Elderly)** was a multicenter study that examined the benefits of weight loss and/or sodium reduction in the elderly. Most participants were able to lower their medication requirements as a result of adhering to the study's requirements (7).
- **In the Trials of Hypertension Prevention, Phase II (TOHP II)**, reductions in sodium intake and weight loss led to a reduction in blood pressure (8). Over a period of 4 years, study participants did not fully maintain their weight loss nor their reduced sodium intake and, as a result, the effect on their blood pressure was likely decreased. This emphasizes the need to make permanent changes in lifestyle and diet in order to maintain a healthy blood pressure.

In order to avoid obesity

- ***Get regular exercise, at least thirty minutes a day.***
- ***Focus on healthy eating, not deprivation diets.***
- ***Lose weight slowly. One pound per week is most effective.***

SMOKING CESSATION

It's time to quit!

Smoking kills-plain and simple. It doesn't matter if it's cigarettes, cigars or a pipe. It doesn't matter if the product is low tar or not.

Approximately 50 million Americans still smoke, and annually the United States spends 23 billion dollars in related medical costs (9). Smoking, which kills thousands of Americans each year, negatively impacts nearly all organs in the body.

Of its many effects on the cardiovascular system, smoking does raise blood pressure-at least in the short term. This rise in blood pressure is considered secondary to the nicotine-related release of body chemicals such as adrenaline, which causes the blood vessels to constrict. In fact, like hypertension, smoking by itself leads to an increased risk of stroke, due to an acute decrease in blood flow to the brain (10).

While some data have suggested that smoking cessation results in higher diastolic blood pressure, this is believed to be related to the weight gain that frequently accompanies stopping smoking. However, the advantages of quitting far outweigh

any negative effects of continuing.

HERBAL SUPPLEMENTS

Consider a natural addition to your traditional medications.

Potassium: This supplement, commonly found in many fruits and vegetables, is felt to have a positive effect on lowering blood pressure (3). The exact mechanism for this reduction is unknown. However, it has been suggested that daily consumption of 48 to 90 milliequivalents(mEq) of potassium may benefit people with hypertension (11,12). An analysis of 33 studies examining the effect of potassium in lowering blood pressure was conducted at Johns Hopkins Medical School (13). This research found that patients who consumed at least 60 mEq of potassium per day lowered their systolic blood pressure an average of three points and their diastolic blood pressure an average of about two points. While the decline in blood pressure is minimal, there may be select groups of people who benefit more. For instance, African Americans may be one such group. In a study of 87 African Americans randomized to receive either

potassium supplementation or placebo (14). Those who received potassium had a mean decline in their systolic blood pressure of 7 mm Hg and mean decline in their diastolic blood pressure of 3 mm Hg. Before considering a potassium supplement, it is very important to consult your healthcare provider. Excessive potassium can lead to dangerous heart rhythm disorders.

Magnesium: In limited research this supplement has been demonstrated to have an important role in regulating blood pressure and, therefore, potentially in treating mild to moderate hypertension (15-18). Other trials have suggested little benefit to magnesium supplementation (19). It is, however, important to point out that persons with low magnesium levels may not be able to replete low potassium stores (20). As a result, while magnesium may or may not be useful in the treatment of hypertension, its deficiency may contribute to the loss of other electrolytes such as potassium which may play a more meaningful role of this condition.

A dosage of 600 to 1000 mg of elemental magnesium has been used for patients with mild to moderate

hypertension (15,16). However, magnesium supplementation should be avoided in individuals with renal insufficiency.

Calcium: This supplement, better known for building strong and healthy bones, may also play a role in hypertension. It has been noted that some hypertensive people have lower calcium levels in the blood and higher excretion of calcium in the urine (21).

In a review of over 20 studies, individuals given 1 to 2 grams of calcium per day had lower blood pressure as a result (22). Unfortunately, some may also experience a rise. Therefore, the best advice is to maintain a healthy diet that includes calcium from dairy products or supplementation.

If taken as a dietary supplement, 500 mg of elemental calcium is most appropriate. Of note, calcium carbonate contains 400 mg/gram of elemental calcium and should be taken with meals. Calcium citrate contains 211 mg/gram of elemental calcium and does not need to be taken with meals. This may be preferable for people taking medications best known as H2 blockers (23). Examples include

ranitidine (Zantac), famotidine (Pepcid), cimetidine (Tagemet), or proton pump inhibitors that suppress stomach acid such as omeprazole (Prilosec, Losec), rabeprazole (Aciphex), lansoprazole (Prevacid) and pantoprazole (Protonix, Pantoloc).

Coenzyme Q-10: This supplement may play a role in hypertension by decreasing the body's chemical response to the condition, specifically a rise in diastolic blood pressure, which is recorded when the heart is relaxed (11,24).

While several studies have identified a potential benefit for coenzyme Q-10 in the treatment of high blood pressure, the largest study - of 109 patients - found that patients taking coenzyme Q-10 had a substantially reduced need for medications that lower blood pressure:

- 51% of patients taking coenzyme Q-10 were able to discontinue between one and three medications, contributing to a substantial cost savings.
- Patients also exhibited a marked improvement in their quality of life, with fewer symptoms - potentially related to an improvement in cardiac performance - or

perhaps due to fewer side effects from medication.

- Traditional drug therapy for high blood pressure may be supplemented with coenzyme Q-10 in an effort to limit the number and dosage of medications required, but it should never be utilized on its own for this purpose, nor substituted for proven therapies.

- No specific dose has been identified; however, 200 to 300 mg in two or three divided doses is most likely appropriate.

Garlic: This supplement is recommended by many holistic practitioners for the reduction of blood pressure and the promotion of cardiovascular health. In an analysis of eight published and unpublished trials, garlic supplementation for at least 4 weeks led to a modest reduction in blood pressure (25):

- The suggested dosage is 4 mg of the allicin potential, a common measure of the potency of garlic-containing supplements.
- Depending on its percentage of allicin, this may require 200 to 300 mg of garlic 3 times per day.
- It should not be expected that garlic will effectively treat high blood pressure alone; however, it may lower the dosage or number

of medications required to obtain adequate control. Danshen (salvia miltiorrhiza; red sage): This supplement is said to contain properties that promote blood circulation in the small blood vessel beds. Unfortunately, there is little research to support this claim and, therefore, danshen is not yet recommended for the reduction of high blood pressure.

EXERCISE

Make regular aerobic exercise a part of your life.

Regular exercise is reasonable advice for almost anyone. For the person with high blood pressure, routine aerobic exercise such as walking, swimming or biking has been shown to reduce blood pressure by 5 to 10 mm of mercury (Hg) (26). There are several other benefits to routine exercise that likely indirectly reduce blood pressure, such as weight loss and stress reduction. Exercise releases endorphins, which are body chemicals that can reduce pain and induce mild euphoria. Perhaps it is the euphoric effect that reduces emotional stress and, as a result, lowers blood pressure.

While aerobic exercise is good for the patient with controlled hypertension,

isometric exercise, such as lifting weights, may actually raise a person's blood pressure (27). Therefore, vigorous weight lifting should be avoided. This is not to be confused with mild to moderate weight lifting to improve muscle tone, which likely has little effect on blood pressure. When lifting light weights for simple muscle toning it is important to breathe throughout the exercise and not hold the breath and bear down, which tends to increase blood pressure.

Before beginning an exercise program it is important that blood pressure is being adequately controlled and to consult a health care provider, as well. An exercise prescription can provide useful guidelines for exercise frequency, duration and target heart rate.

YOGA/TAI CHI/QI GONG

Exercise and relaxation are a healthy combination.

Yoga was developed in ancient India as a set of practices intended to integrate the mind, body and spirit. Yoga has long been touted as beneficial to those who have or are at risk for cardiovascular disease.

While there are many forms of yoga, Hatha yoga is the

most commonly practiced form in the United States. There are three basic practices in Hatha yoga.

- Asanas involves a variety of physical postures and exercises.
- Pranayama comes from the Sanskrit word prana, which means "life energy," and ayam, which means "control." Pranayama is similar to the "qi" in ancient Chinese medicine. By utilizing breathing exercises, pranayama attempts to remove the harmful effects of stress, toxins and improper diet.
- Dhyana, or meditation, is felt to have beneficial effects on the autonomic nervous system that regulates excitability within the body, as well as hemodynamic factors such as blood pressure and heart rate.



Several studies have examined the hemodynamic benefits of yoga:

- A study that began in London in 1973 combined yoga with biofeedback and noted that 25% of those studied were able to stop using medications to lower blood pressure as a result (28).
- A second study in 1993 examined physical fitness teachers who practiced yoga for 3 months. The participants showed a significant reduction in blood pressure, heart rate, respiratory rate and body weight (29).

Tai Chi, developed in China in the 1200s, has become the most popular form of exercise in that country. Tai Chi is increasingly popular in the United States as a form of mild to moderate aerobic activity. It combines slow, graceful movements with deep breathing and mental attention. A typical workout lasts only 15 to 20 minutes and ideally is performed twice a day either individually or in a group.

The body's response to Tai Chi has been studied and has been found to lower blood pressure and heart rate (30). In fact, this same study found that Tai Chi conferred the equivalent benefit of brisk walking. However,

not all studies have found similar results.

Qi Gong (pronounced chee gong) also involves movement and deep breathing exercises. It, too, was developed in ancient China and has become increasingly popular in the United States. The qi is a person's vital energy, which circulates within the body in small channels known as meridians. Qi Gong is intended to channel that energy and promote health.



While limited research is available in the United States, a 20-year study completed in China in 1993, found lowered blood pressure and a 50% decrease in death and illness from stroke in persons practicing Qi Gong (31). Further study is still needed, but for now, Qi Gong may offer some benefit in the reduction of

elevated blood pressure while promoting good health through physical fitness and stress relief—a winning combination. While yoga, tai chi and qi gong may have benefits in the general healthy population, all three are especially well suited to the elderly person with decreased mobility or the person with cardiovascular conditions preventing participation in more strenuous aerobic activity. Specifically, it could be especially beneficial to individuals with orthopedic limitations, neurologic disease or peripheral vascular disease.

MIND/BODY

Take time to think.

If healing literally means "to make whole," the body cannot truly be healed without healing the mind. Ancient Chinese medicine considered the mind and body as comprising the whole self. However, modern medicine has segregated these entities and focused on scientific methods providing targeted therapies to the body, without examining the necessary "wellness" process needed to simultaneously treat the mind—the mind/body connection. For example, in cardiovascular disease, medications are provided to lower a person's elevated blood

pressure. These medications certainly do not relieve stressors or address spiritual concerns that may be contributing to, or inhibiting, the healing process.

Mind/body therapies actually include a wide array of modalities that center around the mind/body connection in healing. Extensive research has been performed in many of these areas:

- Meditation and relaxation were examined by Cooper in 1978 and found to significantly lower both systolic and diastolic blood pressure (32). Likewise, a 1996 study of African Americans with hypertension found a reduction in blood pressure through use of meditation (33). Meditation is probably the simplest, and perhaps the most rewarding of all holistic therapies. It makes you feel good about yourself and it's good for you.
- Imagery and visualization are therapeutic techniques that lead the participant through a series of images that promote relaxation by calming the body's natural anxiety-provoking chemicals. These "images" may involve several of the body's senses, such as touch, sight, smell, motion and hearing. With proper training, individuals can learn to guide themselves through those states,

which provide a personal calming effect and can reduce heart rate and blood pressure. Studies have demonstrated the ability of humans to control their hemodynamic response to stress (34). The benefits of such therapy endure even after the participant is no longer engaged in the activity.

- Biofeedback utilizes instruments that monitor bodily functions and allows the participant to regulate those functions. For instance, listening to your heartbeat enables you to consciously increase or decrease your heart rate. Such techniques have been utilized to effectively lower blood pressure, as well (35).
- Cognitive behavioral therapy is a mind/body technique that uses short-term psychotherapy to reduce the stress response and induce relaxation. These techniques are particularly useful in chronically ill individuals who must permanently change their behavior - and accept that change. Therefore, the treatment of hypertension is ideally suited to techniques that promote relaxation and stress relief.
- Hypnosis is a state of focused concentration that allows the mind to be highly receptive to suggestion (36).

While not extensively studied for the treatment of hypertension, hypnotherapy has been demonstrated to lower blood pressure and heart rate, at least temporarily. Further studies on the long-term effects of hypnosis on hypertension have yet to be performed.

SPIRITUALITY

There is healing in believing.

Spirituality is the belief in something, not necessarily someone, greater than oneself. This should not be confused with religious belief, for a person can be spiritual without being religious. Unfortunately, the advent of modern scientific medicine brought about a clear separation between spiritual, religious and scientifically founded beliefs. However, with the emergence of holistic therapies, there has been a resurgence of interest in promoting spiritual and religious healing and in studying its effectiveness in a whole host of disorders.

Spirituality includes an array of beliefs such as feelings of love, compassion, empathy, gratitude and a sense of inner peace. There is a diminished focus on self (36). For example, love and social support are part of a person's spirituality that has

been found to influence healing in cardiovascular disease. A study examining individuals who described their parents as providing loving support during their childhood in the 1950s found that these individuals developed less hypertension and heart disease, as well as fewer other noncardiac conditions later in life (37).

Therapeutic touch, which was developed in the United States in the 1970s, draws much of its premise from ancient Chinese medicine, in addition to modern medicine. At the root of therapeutic touch is the belief in a common "life force" or energy field. By interacting with this energy field, it is believed that a person can influence the healing of another. Therapeutic touch does not actually involve touching a person. Providers hold their hands a short distance from the person receiving the care and move their hands throughout the person's perceived energy field. These techniques have been widely embraced by nursing schools and are now being taught throughout the United States. In a 1984 study, therapeutic touch was provided to patients in a cardiovascular unit, and patients receiving such treatments showed a marked reduction in anxiety,

which is important to the reduction of blood pressure and heart rate (38).

Religious belief is a part of the American fabric. In fact, 96 percent of Americans believe in God or a universal spirit (39). These beliefs impact healing. In a study conducted at Georgetown University School of Medicine in 1995, religion was found to be beneficial to healing 81% of the time, neutral 15% of the time and harmful 4% of the time (40). In cardiovascular disease, older religious adults have been shown to have lower blood pressure and lower death rates from coronary heart disease than their nonreligious peers (41). While not specifically identified as treating cardiovascular disease, faith, hope and forgiveness, which are tenets of most religions, have also been identified as important to a person's healing response. Prayer, which is a part of most American religions, also has healing power. A 1986 poll by MD magazine found that one-half of doctors believe that prayer helps patients, and two-thirds reported praying for patients (42). Praying induces a relaxed state in which breathing, heart rate and metabolism slow, blood

pressure drops and brain waves become less active.

PET THERAPY

Perhaps a pet is what you need?

Pet therapy could have been included in the Mind/Body or Spirituality sections, because it encompasses so many facets of holistic therapy. Pets are loved by their human companions and in return can be powerful stimulators of health:

- In a study at the University of Pennsylvania School of Veterinary Medicine, pet owners had significantly lower blood pressure when they were greeting their pet than when they were reading neutral text (43).
- A study of the therapeutic benefit of pet therapy on the elderly was conducted by the Visiting Nurses Association of Eastern Montgomery County in Pennsylvania (44). Retirement home residents demonstrated a significant reduction in blood pressure and pulse rate following a visit from a pet, a reduction which did not occur following a visit from a human.

NATUROPATHY

The body and nature as healing partners.

Naturopathy focuses on the body's ability to heal itself.

Practitioners of naturopathy rely on a variety of techniques founded in ancient Indian, Chinese and Greek medicine. These include relaxation therapy, counseling and psychotherapy, herbal medicine, nutrition counseling, physical therapy and homeopathy, which is discussed below. While the various components of naturopathy have been studied for their beneficial effects in the treatment of cardiovascular disease and hypertension, there is little research on naturopathy as a whole in treating these conditions.

HOMEOPATHY

Can a little do a lot?

Homeopathy is relatively new compared to many of the holistic approaches discussed already. Founded in 1790 by Dr. Samuel Hahnemann, homeopathy is founded on the belief that "like cures like."

Homeopathic therapies involve administering very dilute solutions of herbal substances felt to stimulate the body's own "vital force." By so doing, a person is believed to be able to heal himself or herself rather than relying on pharmaceutical agents. To date, there is little research on homeopathic medicine for the treatment of cardiovascular disease and, specifically, hypertension.

Therefore, its use for these conditions remains to be established.

AYURVEDA

Balancing the forces in and around you.

Ayurvedic medicine was founded in ancient India around 3500 B.C. It is known in Hindu texts as the Vedas, meaning "science of life." In ayurvedic medicine, practitioners prescribe treatment and preventative therapy consisting of diet, herbal supplements, exercise and yoga, as well as other treatments, in order to maintain a person's balance in life. Little research is available with regard to the healing power of ayurvedic medicine for cardiovascular disease or, specifically, for hypertension. However, several of its components, such as yoga, have had demonstrated benefits in lowering blood pressure (see above).

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Caution! Grapefruit juice may interfere with an increasing list of medications.

Grapefruit juice is certainly one of the most popular, and perhaps healthiest, breakfast drinks in America. Yet for almost 10 years now we have known that consuming this popular drink or eating the fruit may alter the effectiveness of several heart-related medications, as well as several others. First discovered when researchers used grapefruit juice to mask the taste of alcohol, grapefruit juice appeared to increase the effects of felodipine (Plendil), a common blood pressure lowering medication.

Why grapefruit juice and no other fruit juices? It appears that a chemical specific to grapefruit juice inhibits a common enzyme in the intestine. This enzyme typically breaks down medications and therefore decreases the amount of drug available in the body to exert its effects. With this enzyme inhibited, a drug can exhibit a greater effect on the organ's system(s) that it is designed to treat such as the liver, heart, vascular system, or brain. Despite extensive research in this area, the exact chemical in grapefruit that causes this enzyme inhibition remains

unknown and it appears to be specific to grapefruit and does not occur with other fruits and fruit juices.

The common blood pressure medications amlodipine (Norvasc) and nifedipine (Procardia;Adalat) have shown 20-30% increased drug levels in the blood when consumed with grapefruit juice, while the antidepressant buspirone(Buspar) has shown several fold increases in the breakdown products of the drug in the urine. Common "statin" cholesterol-lowering drugs remain a concern as well. The most recent data suggests that consuming one glass of grapefruit juice daily along with the common statin lovastatin(Mevacor) raises the concentration of the active ingredient by 36%. It appears prudent to avoid consuming any statin with grapefruit juice, particularly if taken in high doses or when first initiating a statin medication.

Can you still drink grapefruit juice and avoid the potential interaction? Well maybe. Thirty percent of enzyme inhibition is still present 24 hours after drinking the juice and one glass of juice appears to have the same effect

as several. However, daily ingestion of grapefruit and its juice over a few weeks may lessen its effects, and individuals who regularly drink grapefruit juice without difficulty may never develop a problem with these medications. So far there have been no major problems reported despite the many drugs that appear to be effected by grapefruit. Regardless, it is still best to consult a doctor if planning to eat grapefruit or drink the juice and while taking any of the medications listed below.

The best advice is to be aware of the potential interaction and avoid grapefruit juice if an interaction is at all possible.

Below is a list of medications that have been identified as interacting with grapefruit juice.

Drug-Grapefruit juice interactions*

Calcium channel blockers	Antihistamines
Felodipine (Plendil)	Ebastine
Nimodipine (Nimotop)	Terfenadine (Seldane))
Nisoldipine (Sular)	Psychiatric medications
Nitrendipine	Buspirone (Buspar)
Pranidipine	Carbamazepine (Tegretol)
Immunosuppressants	Diazepam (Valium)
Cyclosporine (Sandimmune)	Midazolam (Versed)
Tacrolimus (Prograf)	Triazolam (Halcion)
HMG-CoA reductase inhibitors	Prokinetics
Atorvastatin (Lipitor)	Cisapride (Propulsid)
Lovastatin (Mevacor)	Others
Simvastatin (Zocor)	Methadone
	Sildenafil (Viagra)

* generic name (trade name); some may have multiple trade names not listed

Title: Drug-Grapefruit Juice Interactions

Authors: Garvan C. Kane, MD and James J. Lipsky, MD

Source: Mayo Clinic Proceedings 2000;75:933-942

Lifestyle Changes May Reduce Your Need for Antihypertensive Medications.

High blood pressure, also known as hypertension, is a major risk factor for cardiovascular disease. This silent killer frequently has no symptoms until a devastating event such as stroke or heart attack occurs.

Approximately 10% of people in Western countries take medication to control their blood pressure. If simple steps are taken to reduce the need for drug therapy, perhaps some medications may not be required. In a recently published article in the American Journal of Hypertension, Dr. Mark Nelson analyzed the results of 12 studies that examined the effects of withdrawal of high blood pressure medications over at least a one-year period. He and his colleagues identified several predictors of successful withdrawal of medication with continued maintenance of normal blood pressure.

The risk of return to elevated levels was greatest in the

In the present study, 42% of individuals were able to maintain normal blood pressure for one year following the supervised withdrawal of medication.

first 6 months following withdrawal of medication, but some individuals had return of hypertension even after 6 months. It is important to keep in mind that blood pressure may rapidly escalate following discontinuation of therapy, so called "rebound hypertension."

As noted by the researchers, lifestyle modifications play an important role in reducing the need for medications and perhaps facilitating their withdrawal. Previous studies have demonstrated that lifestyle interventions can double the success rate of maintaining a normal blood pressure after withdrawal of medication. Weight loss and sodium restriction were important predictors of success in this study. Reducing alcohol intake and increasing physical activity have also been shown to be beneficial.

This article concludes that appropriate individuals for consideration of withdrawal of antihypertensive medication are those people who are on only one medication and have been well controlled for a long period of time. It is important to never stop taking medications without the consent of a doctor.

Lifestyle changes which may reduce your need for blood pressure medications include:

- Losing weight
- Decreasing sodium intake
- Reducing alcohol consumption
- Increasing physical activity

Title: A Systematic Review of Predictors of Maintenance of Normotension After Withdrawal of Antihypertensive Drugs
Authors: Mark Nelson, Christopher Reid, Henry Krum and John McNeil
Source: American Journal of Hypertension. 2001;14:98-105

Those factors most associated with successful withdrawal of high blood pressure medications included:

- Mild blood pressure elevation before drug therapy was begun
- Few drugs required for effective treatment (preferably one)
- Lifestyle intervention