What is Hypertension?

Hypertension, or high blood pressure, is a very common health condition in the adult population. While hypertension may be “common”, it is not a topic to be taken lightly.

According to the Center for Disease Control and Prevention, one third of adults in the United States have high blood pressure, and only 54% of them with hypertension have it under control.

Blood pressure is created by the force of blood pushing against the walls of your arteries and veins as your heart pumps to distribute blood throughout your body. Increased blood pressure occurs when your heart has to work harder to distribute blood to the body. This increase in work is often caused by damage to, or blockages of, the arteries and veins. The harder your heart must work to distribute blood, the greater the odds are of having a heart attack, heart failure, stroke, kidney failure, or vision loss.

Signs, Symptoms, and Diagnosis

On rare occasions, a person may experience headaches characterized by nausea or vomiting when they have high blood pressure. However, hypertension is often known as the “silent killer”, having little or no warning signs or symptoms. Due to its lack of warning, it is important to check your blood pressure regularly.

Blood pressure is measured using two sets of numbers: systolic and diastolic. Systolic is the measurement of the pressure in your blood vessels that is created when the heart pumps blood from its ventricles to the body. Diastolic is the measurement of the amount of pressure...
within your blood vessels while the heart is resting in between beats or ejections. A complete blood pressure value is stated as a ratio of systolic pressure to diastolic pressure.

Increased moments of stress, high caffeine levels, lack of sleep, or other temporary conditions can alter a blood pressure reading. Clinical hypertension occurs when an individual has two or more blood pressure values containing a systolic value over 140 mmHg or a diastolic value over 80 mmHg within the past three blood pressure readings.

The table below illustrates the latest blood pressure guidelines released by the American Heart Association. A normal blood pressure value contains a systolic pressure of less than 120 mmHg and a diastolic pressure of less than 80 mmHg.

### Blood Pressure Levels

<table>
<thead>
<tr>
<th></th>
<th>Systolic</th>
<th>Diastolic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Normal</strong></td>
<td>less than 120 mmHg</td>
<td>less than 80 mmHg</td>
</tr>
<tr>
<td><strong>At risk</strong></td>
<td>120–139 mmHg</td>
<td>80–89 mmHg</td>
</tr>
<tr>
<td><strong>Prehypertension</strong></td>
<td>systolic: 140–159 mmHg</td>
<td>diastolic: 90–99 mmHg</td>
</tr>
<tr>
<td><strong>Hypertension Stage 1</strong></td>
<td>systolic: 160 mmHg or higher</td>
<td>diastolic: 100 mmHg or higher</td>
</tr>
<tr>
<td><strong>Hypertension Stage 2</strong></td>
<td>systolic: 180 mmHg or higher</td>
<td>diastolic: 100 mmHg or higher</td>
</tr>
<tr>
<td><strong>Hypertensive Crisis</strong></td>
<td>systolic: 180 mmHg or higher</td>
<td>diastolic: 100 mmHg or higher</td>
</tr>
</tbody>
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### Why does hypertension develop?

High blood pressure develops for many reasons, and those reasons may not be the same for everyone. Certain genetic markers, such as MTHFR defects, COMT defects, and ApoE4 values, can play a role in this equation, leading to increased levels of homocysteine, catecholamines (stress hormones), or mitochondrial dysfunction. High stress can also cause our blood pressure to sky rocket, as stress causes our body to enter the “fight” response mode. Poor diet, especially the “Standard American Diet” (characterized by elevated levels of salt, sugar, inferior quality fats, low fiber intake, and lots of processed foods), has been strongly linked to increasing blood pressure.

This diet tends to result in increased inflammation within the arteries and veins, as well as malnourished muscle fibers that allow the heart to contract and pump blood. Our heart and its vascular network are a system of muscles, and therefore need proper training and strengthening, just like every other muscle in our bodies. Lack of adequate exercise can also contribute to hypertension for this reason.

### Treating blood pressure in real life.

Sometimes prescription medications are required to get the blood pressure back to safe ranges, but they do not always have to be a long-term solution, if other interventions are put in place. When the body can reduce its systolic pressure, the diastolic pressure decreases with it. Here are some proven ways to reduce hypertension, and decrease the need for lifelong medications.

1. **Weight reduction in clinically overweight individuals**
   - Increased fat distribution throughout the body puts undue stress on the arteries and veins, making it harder to push blood through them.
   - On average, for every 2 pounds of body weight lost, systolic drops by 1 mmHg and results in diastolic drops as well.
   - This means that for every 10 lbs. of fat loss, you can decrease your systolic value by 5 mmHg!

2. **Adopting a DASH diet or Mediterranean diet**
   - Both diets can reduce blood pressure to levels that can be achieved by drug therapy in patients with mild hypertension.
   - Bottom line: Eat more vegetables, eat some fruit, and return to a whole foods diet. Consume 31 grams of dietary fiber daily, 8-10 servings of vegetables and some fruits each day.

3. **Sodium Reduction**
   - Consume less than 2,000 mg of sodium per day and increase potassium and magnesium in the diet.

4. **Increase Physical activity**
   - The American Heart Association recommends 30-45 minutes of aerobic exercise 3 times per week and 30-45 minutes of resistance or weight lifting 3 times per week.

5. **Moderation of alcohol consumption and caffeine**
   - Both act as diuretics (causing an increase in urine production), resulting in a decrease in blood volume. They can lead to more inflammation within the blood vessels. This means the heart must pump a smaller amount of blood faster and harder through swollen vessels to distribute nutrients throughout the body.

6. **Stop smoking**
   - Smoking leads to lose of oxygen to our tissues due to damaging our small vascular system and leads to excessive inflammation.

7. **Stress reduction**
   - Restructure the way you view stress.
   - Utilize proper, slow belly breathing techniques to calm your body in moments of stress.

In addition to the previously mentioned lifestyle modifications, there are several natural ways to help decrease blood pressure in the body. By incorporating healthy and essential nutrients into our diets, we can strengthen our vasculature and muscles, and therefore decrease blood pressure.

### Diuretics

- **Parsley (root)** – Acts as a mild diuretic and helps us detoxify.
- **Dandelion (leaf)** – Dandelion is potassium-sparing diuretic.
- **Spearmint** – Cooling and soothing, offers some aide in stomach aches and has mild diuretic properties.
- **Fennel** – Common cooking spice in the form of a seed that offers soothing properties such as stomach aide, smooth muscle relaxant, and mild diuretic.
Chicory – A bitter root that is often used to enhance the flavor of coffee as it is very nutritious, cooling, and helps improve the liver and kidneys’ function by improving detoxification, digestion, and diuretic.

Corn Silk – A nourishing and stimulating part of corn that we typically disregard. This can be used as a mild diuretic, but also offers aide in many urinary issues such as kidney stones, interstitial cystitis and prostatitis.

Goldenrod (flowers) – This is helpful to those of us here in Kansas as it grows abundantly, and is a diuretic that does not lead to electrolyte loss.

Vasodilators

L-arginine – An amino acid, which is a precursor to nitric oxide (an extremely potent vasodilator), helps to reduce blood pressure. Food-based sources are nuts and seeds and red beets.

Anti-hypertensives

Alpha lipoic acid – Considered a great “recycler” as it helps us recirculate our blood and tissue levels of vitamins and many of our antioxidants (including glutathione, cysteine, vitamin C and vitamin E).

Coenzyme Q10 – Helps our body run more efficiently in producing energy in our mitochondria. It has been linked to reduction of both systolic and diastolic blood pressures of 11-12% each.

Vitamin E – Studies have shown reduction of blood pressure, this is done by the reduction of lipid peroxides, increase of superoxide dismutase activity and increase of overall antioxidant activity.

Celery – Consuming four stalks of celery per day or eight teaspoons of celery juice three times daily seems to have an antihypertensive effect.

Pine bark (Pinus radiata) – Leads to significant reduction in the means of body weight, percent body fat, systolic blood pressure, and plasma viscosity.

Other Useful Nutrients and Botanicals.

Omega-3 Fatty Acids- Help reduce the amount of oxidative stress on the vascular system by reducing the actions of inflammatory metabolites known as arachidonic acid prostaglandins.

Benefits from this are very dose dependent, as doses of less than 4 grams per day show little to no change on hypertension.

Potassium, Magnesium, Calcium – All crucial minerals to our body's ecosystem. These can help balance our sodium levels in the tissues and help our energy levels. They can also aide in the elimination of toxins or metabolic byproducts in the body.

Vitamin C and Garlic – One study theorized that garlic and vitamin C might lower blood pressure by increasing nitric oxide endothelial cells, which causes muscles surrounding the blood vessels to relax. Using endothelial cells, scientists administered garlic and found a twofold increase in nitric oxide. After administering garlic and vitamin C together, they observed a threefold increase in nitric oxide.

Vitamin B6 - Treatment of hypertensive patients with pyridoxine significantly reduced systolic and diastolic blood pressure, plasma norepinephrine, and epinephrine within 4 weeks.

Basil – Adaptogenic herb, meaning it helps us adapt to many things in life, particularly helping us calm down from stress. It also has properties of being an antioxidant and is a reliable source for vitamins A, and C, and provides calcium, iron, zinc and chlorophyll.

Cinnamon – Aids in lowering blood sugar by increasing our cells’ sensitivity to insulin, which can help lead to the lowering of cholesterols such as LDL and triglycerides.

Ginger - A potent blood thinner and anti-inflammatory agent.

Cayenne - Capsaicin is also an antioxidant known to reduce lipid oxidation and decrease platelet stickiness.

Hawthorn - A very strong cardio-protective plant that aides in strengthening collagen fibers, vasodilating and improving heart function by means of high antioxidants.

Hypertension is nothing to overlook. If left untreated, it can lead to long-term complications. The natural approaches here are listed as an educational resource only and should not be considered as medical advice. Please feel free to ask your doctor about these therapies as individual or adjunctive treatments for high blood pressure. As always, we here at the Riordan clinic are here for you.

“references available online at [link]
Jack Challem - In Memorium

1951 - 2017

Jack was my good friend. Our professional relationship was based on a mutual love for the power of good nutrition. That’s how I met Jack. Jack was a friend of Hugh Riordan. Hugh was one of the several great orthomolecular psychiatrists who opened up the frontier of molecular nutrition as a way of helping people with chronic mental illness. Jack was an internationally recognized health and nutrition author, also known as “The Nutrition Reporter.” He wrote more than 20 books on nutrition and health.

There’s little I can add to the excerpts that follow, taken from Jack’s autobiographical essay in The Fountain, which is a tremendous compendium of essays written by Jack and his special friends and nutritional associates, co-learners, and mentors. (The Fountain is available on Amazon.com/books.) My essay in The Fountain is entitled “Healthy Relationships and Longevity.”

I wrote on this topic because I always had a gnawing feeling that unhealthy relationships were the Achilles heel in Jack’s personal life, and a danger to his otherwise good health status. I had hoped that he would see that one cannot simply “nutrition away” toxic relationships. I prepare this article with a deep sense of gratitude for the solid friendship that Jack and I shared for over two decades prior to his passing.

I will always remember Jack for his tremendous curiosity and knowledge, his amazing artistic capabilities (he leaves a wonderful legacy of photography), his sincere interest in people, his scientific understanding of nutrition (in spite of having no specific degree in that area), and finally his ability to have touched so many people through his power to communicate complex ideas in an understandable way. His many books, his articles, and his newsletters are a tremendous gift to humanity.

--Ron Hunninghake
Jack’s Introduction to The Fountain

“In our own way, each and every one of us would like to find the fountain of youth. The reason is simple. We’d like to live as long as we can, erase our illnesses and age-related debilities, and enjoy as much as we can in life. In this book, we bring together twenty-five experts from medicine and natural health to relate their own personal experiences and to share their recommendations for achieving a long and healthy life.

Throughout history, people have sought a fountain of youth, and uncovering the secret to eternal youth has been a frequent theme in myths, legends, and even science fiction. Medieval herbs, such as lemon balm, and various concoctions created by alchemists were once thought to be elixirs of life. These nostrums evolved into the patent medicines of the nineteenth and early twentieth centuries and can still be seen in the panacea-like claims proffered by modern pharmaceutical companies.

The contributors to The Fountain have based most of their recommendations on solid science and, to a great extent, on nutritional medicine and clinical practice. Most are physicians, researchers, nutritionists, and health experts of other types. Their recommendations focus primarily on the importance of nutrition and supplements, rather than on medical technologies or pharmaceuticals.

The reason is very simple: We are biochemical creatures (at least in our physical makeup), and nutrients form the building blocks of all the body’s biochemistry, including genes. That said, some of the contributors address the roles of healthy emotions, relationships, physical activity, and control of stress in promoting health and longevity. All these aspects of life figure in our lives and, directly or indirectly, influence our biochemistry.”

We hope this book leads you to your own fountain of youth. (Challem, 2009, p. 1-3)

My Personal and Professional Journey in Nutrition

“I am a best-selling author of nutrition and health books and I write for many different magazines. I also lecture consumer and medical groups on nutrition topics, and I coach people one-on-one to help them develop better eating habits. But most of what I do in this field and the nutrition recommendations I make are based on what I have learned from other people. Many events and individuals have shaped my perspectives on nutrition and health.

THE FIRST AND PERHAPS MOST PIVOTAL EVENT WAS THE DEATH OF MY OLDER BROTHER. WHEN I WAS FIFTEEN YEARS OLD, I SAW HIM WASTE AWAY FROM CANCER, LIVING IN GREAT PAIN FOR NINE MONTHS. MUCH OF HIS PAIN WAS THE CONSEQUENCE OF MEDICAL TREATMENTS.

The lasting effect of that experience on me has been the firm belief that no one should ever die that way. Looking back, my brother’s death fundamentally influenced much of my personal and professional journey in life.
By that time I was also interested in becoming a writer. A high school English teacher, Harold Miller, taught me to think critically—that is, not to take anything at face value—and he also helped sharpen my writing skills. Several years later, in college, Dr. Dewitt Garrett, a biology professor, made an offhand remark about “suppressed treatments” for heart disease and cancer. After class, I asked for more information about those treatments, and we talked about nutrition and vitamins. Within a couple of weeks, I started taking vitamin C and E supplements, and I had a very dramatic response to the vitamins.

I had recently been diagnosed with a pilonidal cyst—a particular type of chronic, draining cyst or abscess. One week after starting the vitamins, the cyst burst, completely drained, and healed. That was around forty years ago. Most people who have a pilonidal cyst suffer with it throughout their life. Needless to say, I became convinced about the benefits of nutritional therapies.

The Experts I’ve Learned From

After graduating from college, I was lucky enough to start writing for some of the health magazines and, perhaps more importantly, meeting and becoming friends with the physicians who pioneered nutritional therapies. They included Evan Shute, MD, and his brother Wilfrid Shute, MD, the first doctors to use vitamin E to treat coronary heart disease.

I got to know Abram Hoffer, MD, PhD, who was the first doctor to use high doses of vitamins B3 and C to treat schizophrenic patients—and to enable them to experience the same reality that you and I see. Dr. Hoffer, still sharp at age ninety-one, has a rare appreciation of medical history and incredible clarity in thought, and I have learned much from him over the years.

Carl Pfeiffer, MD, and Hugh Riordan, MD, were pioneers as well, and Dr. Riordan was eclectic in his thinking and a particularly strong influence. I am also indebted to Ron Hunninghake, MD, who has become a close friend and the best person for me to brainstorm with on nutrition issues. I also learned a great deal from researchers, including Denham Harman, MD, PhD, who developed the free-radical theory of aging and disease; Lester Packer, PhD, who explained a great deal about antioxidant biochemistry to me; Bruce Ames, PhD, who did the same in terms of energy production in mitochondria; and Loren Cordain, PhD, who helped me make sense of the Paleolithic diet and many other important aspects of nutrition, such as acid-alkaline balance. I met Nobel laureate Linus Pauling, PhD, and talked with him several times on the telephone. Dr. Pauling was a true genius and, like Dr. Hoffer, he had exceptional clarity in thought (not surprisingly, they frequently collaborated). They and many others over the years have been my teachers—not in classes, mind you, but in explaining everything from the minutiae of nutritional biochemistry to the bigger real-life implications of orthomolecular medicine.

I am also very self-directed. I thrive on learning, and am an avid reader of newspapers, magazines, and medical and scientific journals. Years ago, I learned the advantage of living near a medical library, where I could retrieve full-text journal articles—after all, not everything is available for free on the Internet. This is part of the story of how I became interested in natural therapies and wellness. But there is another important aspect of my journey to relate before I discuss my recommendations for a healthy, fully functional life.

Four Dietary Recommendations

Sometimes people ask me why nutrition is so important. The answer is relatively simple: Our entire biochemistry, including the synthesis, repair, and regulation of our genes, depends on nutrients. Here’s a useful analogy: Think of building a house with either shoddy or quality materials. If you use cheap construction materials, the house will not be structurally sound. Similarly, if you opt for poor-quality nutrition, your body will not be structurally sound. Conversely, if you build a house with sturdy components, it will resist damage from earthquakes and hurricanes.

![Upcoming Events](riordanclinic.org/food-as-medicine)
Likewise, if you eat healthy foods, you will better weather life’s inevitable stresses. So, what do I recommend in terms of healthy foods? It has taken me about thirty years of nutrition writing to distill almost everything into four simple recommendations.

1. **Eat Nutrient-Dense Foods**
These are foods that provide the greatest amount of high-quality nutrition in every bite or calorie. Two broad food groups meet this criterion. One is quality protein—in my mind, fish, chicken, turkey, eggs, and lean meats (preferably grass-fed, not corn-fed). The other food group consists of high-fiber (nonstarchy) vegetables and fruits. These include salads, broccoli, cauliflower, raspberries, blueberries, cherries, kiwi, and most other vegetables and fruits.

Meanwhile, avoid or limit your intake of low-nutrient-density foods, which include most starchy grain-based foods, including breads, cereals, bagels, muffins, and pastas; as well as sugary foods, such as candies and most types of energy bars. Potatoes, rice, and bananas are high in sugar-like starches, and people with prediabetes or weight issues should strictly limit their consumption of sugar-like starches. Although many people tout the health benefits of whole grains, they are nutritionally weak compared with vegetables.

2. **Eat Fresh Foods**
The healthiest foods are almost always fresh foods, and the unhealthiest foods are almost always packaged foods. Fresh foods are higher in nutrients because they have not undergone industrial processing and refining. By contrast, packaged foods have usually been processed, refined, or tampered with in some way. Packaged foods come in boxes, cans, jars, bottles, tubs, and bags. Nearly all packaged foods have added salt, sugars, junk oils, or trans fats—or all of them. There are a few exceptions that are healthy, such as olive oil and frozen vegetables and fruits, as long as nothing else has been added to them. Fresh foods mean you have to prepare your meals from scratch. That will take a little extra time, but you can find that time (perhaps by checking e-mail less each day). When someone complains that cooking from scratch takes too much time, I tell him that he can either make the time to cook today or make the time to be sick and disabled in a few years.

3. **Eat Foods That Look Like They Did in Nature**
Excuse me if this sounds a little folksy, but I believe that foods should have some resemblance to what they looked like in nature. A piece of chicken should look like it was once part of an animal, and a piece of fish should look like it came from a fish. Most fresh foods do look something like they did in nature. Chicken nuggets don’t look like anything that was grown or raised, and neither does fish and chips (French fries).

4. **Hydrate Yourself—Mostly with Water**
Our bodies consist mostly of water, and aging is often characterized by a shrinking of cells other than fat cells. The oxygen and hydrogen atoms that form water are needed for myriad biochemical reactions in the body, and many physicians have told me that they have seen improvements in their patients after doing nothing other than drinking more water. Although many people have

Continued on page 8
At this very moment there are trillions of bacteria that are living in you and on you. Bacterial cells outnumber our own cells ten to one. In the average adult, this can constitute up to six pounds of your body weight! These bacteria play an important role in supporting good human health.

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The relationship that humans have had with bacteria has always been a delicate one. Our ancestors did not have access to refrigeration, and foraged for foods that were fermenting on the forest floor. Therefore, they had constant exposure to bacteria. Because of this, infections were among the leading causes of death for humans prior to the introduction of antibiotics. However, not all bacteria are harmful. Humans developed a mutually beneficial, or commensal, relationship with a variety of strains of bacteria. We are the host, but the bacteria play an important role in key metabolic processes.

The majority of bacteria reside within the digestive tract. Some conditions that correlate with altered patterns of bacteria are:
- obesity and metabolic syndrome
- autism spectrum disorders
- inflammatory bowel disease
- cancer
- chronic fatigue
- anxiety and depression

To build a healthy population of bacteria in your gut, you are going to want to eat a variety of foods that are fermented, meaning they contain the beneficial bacterial strains. Some great options are yogurt (unsweetened), kefir, fermented sauerkraut and pickles, kombucha, and apple cider vinegar. Though it is very important to consume probiotic foods, it is also just as important to consume prebiotic fiber. This is the fiber that is in fruits and vegetables. It feeds and sustains the good bacteria. Some foods that are high in prebiotic fibers are onions, artichokes, asparagus, dandelion greens, and leeks.

Cultivate the soil of your digestive tract with good bacteria and you will see positive changes in your health and well-being!

Email me at newseditor@riordanclinic.org to let me know about your progress, and to get your name entered in our monthly random giveaways for those participating in the challenge.

Don’t treat nutrition as a rigid doctrine—that’s the problem with old-school dietitians and physicians who think in terms of 1950s Betty Crocker nutrition. Instead, keep up with the latest findings—a new discovery tomorrow could change much of what you currently know and take for granted. Above all else, remember that good nutrition should be part of a balanced approach to life in general.” (Challem, 2009, excerpts from p. 29-38)