

# JIVE TURKEY PART I:

## The Ignorance about Blood Pressure

By

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**Jive Turkey:** a quick step dance in Germany in the 1930s; slang word used to refer to someone who was unreliable, made empty promises, or who was full of bluster

Oh the frustration of trying to get through to some people.

Take this hypothetical (of course) situation for example. A young client comes in to workout with the rest of their teammates for a team training session. As the strength coach running this team training, one knows that all athletes need to be monitored, so extra assistant strength coaches are required. Each athlete is instructed on proper exercise technique, instructed to stop and inform the strength coach if any of the exercises feel wrong, or stop if they feel any pain, discomfort or sense of nausea/dizziness. Prior to the session, each athlete is asked what they had for a pre-workout meal, as pre-workout nutrition can have either a positive or negative effect on the outcome of the workout.

As the workout is moving along (it is only a one hour session, in an air-conditioned facility) one out of the sixteen other athletes begins to feel nauseous. So what happens? The strength coaches ask the athlete to stop, lay down with their feet up on a chair, and put a cold towel across the athlete's forehead. When asked what the athlete had for their pre-workout meal, the typical response from that athlete is some sort of grainy carbohydrate such as a bowl of cereal, bagel, sandwich, Chinese food, or a granola bar right before they walked out the door on the way to this workout. The strength coaches previously informed the entire team that having any sort of grainy carbohydrate 1-1.5 hours prior to the workout could induce feelings of nausea. This advice clearly fell on deaf ears. While one of the strength coaches stays with the athlete, the other fifteen athletes are just fine performing the same workout. (Hmm, I wonder if the recommendation about staying away from grainy carbohydrates prior to the

workout had anything to do with the nauseas feeling???) Once the nauseas athlete is feeling better, he/she is instructed not to continue the workout and sit down and drink some fluids.

Once the workout is over is where this gets really interesting. In storms the angry mom, completely enraged by their child getting sick during the team training workout. The mom immediately states to you that she is a medical professional and knows better than you. First, you try to diffuse the situation by asking what the athlete had consumed prior to the workout. The athlete informs you of the (insert the grainy carbohydrate of your choice) they had on the car ride over to the workout. The mom being the medical professional, insists it is not the food, but your fault, because the workout it too intense (even though the other fifteen athletes, whom did not eat grainy carbohydrates prior to the workout were fine). The mom insists that the athlete's blood pressure dropped too low during the workout because the 25lb dumbbell farmer carry walks were too heavy for the high school athlete. This then led to a dramatic vasovagal response, resulting in a drop in blood pressure during the exercise. That is right, you heard me, ***the medical professional informed you that the blood pressure dropped during the weight bearing/strength training exercise!!!!*** She adamantly states to you that the blood pressure actually drops during standing weight bearing exercises, and that her child's blood pressure probably dropped too low during the 25lb dumbbell farmer carry due to this altered vasovagal response phenomenon. She also informed you that it has nothing to do with the consumption of pre-workout grainy carbohydrates.

Figuring you must have misunderstood what she was saying, you reiterated that you were unaware that blood pressure actually drops during strength training and standing load bearing exercises. Though insistent that she is a nurse and knows better than you, you then share with her the leg press studies done on weight training and how there is an increase in blood pressure during weight training. She responds that that is due to the sitting position. OHHHHHHH! Wait a minute, that would describe why they do stress tests in a standing position.

Hold on a second here, isn't the point to stress testing to monitor the athletes stress through heart rate and, yes, you guessed it, blood pressure while performing standing exercise. But as this "medical professional" has stated, that is cardiovascular exercise, and you were doing weight bearing strength training exercises.

And so the saga continues. You ask this person if they have done their research and if they can provide you with the studies on blood pressure dropping during standing weight training exercises.

Guess what the response is, “of course I have done my research, and I have a Master’s degree in (said “medical field”). The mom then goes on to ask about testing to see what the proper weight an athlete should be using in the farmer carry is. Or for that matter, every exercise the athlete will be doing. Hmmm, let me get this straight. There are over a thousand different exercises an athlete could perform and this medical professional wants you to test every conceivable exercise to determine the correct starting weight for their high school athlete.

Am I mistaken, but in any exercise don’t you normally begin with a light weight, and if it is too light you gradually move up until you find an appropriate working weight. So you go on to ask the athlete how they determined if the 25lb dumbbells were appropriate and they inform you and the mom that they tried 10lbs first, then 15lbs, and both were too easy, so they jumped up to the 25lbs. You then decide to have the athlete demo a fifteen yard farmer carry walk with those 25lb dumbbells and they make it look easy, explaining to the now completely irrational mom that the weight is actually too light. The mom then decides to perform the exercise herself, as she informs you she works out a lot as she has a high ranking belt in karate. She makes it look easy, but on the way back she tells you that there is some stress on the shoulder and that the weight is inappropriate. You then ask her if the athlete carries groceries into the house. Of course, the answer is yes, but the mom informs you that that is completely different.

Trying one more time to diffuse the situation you ask the mom to just try to give the athlete a healthy protein and healthy fat 1.5hours prior to the next workout and see what might happen to the athlete regarding feelings of nausea. Not only will this protein and fat help to maintain blood sugar levels and keep serotonin levels from rising, but it will also increase acetyl-choline and dopamine levels for workout energy and mental focus. The mom again chimes in and insists that this is not the reason, and her doctor will think it is ludicrous that the grainy carbohydrates prior to the workout are the cause of the nausea. You then recommend high anti-oxidant berries such as blueberries, raspberries, etc... But the mom jumps in and explains again how she is medical professional and her family knows how to eat. If this person (the mom, that is) was even remotely lean you may choose to listen to this and figure out another solution, but....

Finally you do not have time for any more as clearly you are not getting through to this person in any manner, so you end the conversation and walk away. So yes, the next day it is your moment of truth in which you have to decide if it is worth it to have somebody of this nature around your business.

What would you do in this situation? Do you think for a moment that it just might be the poor nutritional habits prior to a workout, or is it easier to blame than take personal accountability?

Let's embark on a discussion about blood pressure. Blood pressure during training as well as elevations in blood pressure that may result from continuous conversation with confrontational, close minded people. A brief scan through the research on blood pressure during standing weight bearing or any weight training exercise may provide some insight.

Leading it off, quite possibly the best Hypertension/Vascular doctor in the world, (voted one of the 10 most influential doctors in the US) Dr. Mark Houston. Dr. Houston has written about physical stress and blood pressure in his book ***What Your Doctor May Not Tell You About Hypertension***.

On page 25 of his book, Dr. Houston states "the physical stress experienced during exercise increases cardiac output and drives up blood pressure. That's necessary and temporary. But moderate exercise can actually help reduce high blood pressure by making the heart pump more efficiently. It also reduces atherosclerosis, decreases blood fats, and lessens vascular resistance. Yet too much of a good thing can be a bad thing. Excessive amounts of activity can increase blood pressure to dangerous levels, especially for those who are usually sedentary or have poorly controlled hypertension (1)." (*At what point besides long term effects does one of the best doctors in the world inform us that stressful exercise actually lowers blood pressure during the exercise*). Let's see what Dr. Houston says about resistance training on page 162.

"there are certain resistance exercises that can drive your blood pressure up, such as heavy weight lifting, isometric exercises, rope climbing, sit-ups, pushups, shoveling snow, or anything that causes you to strain. " Once again, it's the same increase in blood pressure. I am still not finding the decreasing blood pressure during standing load bearing exercises that the confrontational medical professional/mom was talking about.

After doing an extensive search on Pubmed, I failed to find any research at all on blood pressure lowering during resistance training exercise, but did manage to find 127 studies on blood pressure elevating during resistance training. Let's just take a peek at some of them.

1. MacDougall J, Tuxen d, Sale D, Morox J, Sutton J. **Arterial blood pressure response to heavy resistance exercise.** *J Appl Physiol.* 58(3); Pp 785-790. 1985.

*Blood pressure was tested in five experienced subjects during curls, overhead presses, and leg press variations at 80, 90, 95, and 100% max. Every exercise increased the subjects blood pressure, with systolic and diastolic increasing the most during concentric, and decreasing from that concentric peak pressure during the eccentric. The researchers concluded that "when healthy young subjects perform weight lifting exercises the mechanical compression of blood vessels combines with a potent pressor response and a Valsalva response to produce extreme elevations in blood pressure."*

2. Palatini P, Mos L, Munari L, Valle F, Del Torre M, Rossi A, Varotto L, Macor F, Martina S, Pessina, et al. **Blood pressure changes during heavy resistance exercise.** *J Hypertens Suppl.* 7(60); Pp 72-73. 1989.

*More of the same, with squatting leading to the greatest increases in blood pressure. The researchers concluded that the increase in intra-thoracic and intra abdominal pressure had a major effect on elevations in blood pressure during weight lifting.*

3. Linsenbardt S, Thomas T, Madsen R. **Effect of breathing techniques on blood pressure response to resistance exercise.** *Br J Sports Med.* 26(2); Pp 97-100. 1992.

*The researchers had 20 novice weightlifters perform curls and knee extensions utilizing three different types of breathing techniques. Yes, the blood pressure went up in all three breathing techniques, with the Valsalva maneuver causing the greatest elevation and the exhalation during the concentric phase causing the least elevation in blood pressure.*

**Maybe she was confused with blood flow velocity, and not blood pressure??**

4. Dickerman R, McConathy W, Smith G, East J, Rudder L. **Middle cerebral artery blood flow velocity in elite power athletes during maximal weight lifting.** *Neurol Res.* 22(4); Pp 337-340. 2000.

*The researchers concluded that "blood flow velocities are significantly decreased during heavy resistance training."*

**Or just to give her the benefit of the doubt, maybe she was talking about the long-term effects of resistance training as this has been shown to have positive effects on one's blood pressure (but I am still not sure why she**

**insisted on measuring the athletes blood pressure during the workout to monitor if it was dropping too low!!!)**

5. Fagard R. **Exercise is good for your blood pressure: effects of endurance training and resistance training.** *Clin Exp Pharmacol Physiol.* 33(9); Pp 853-856. 2006.

*This meta-analysis demonstrates the longitudinal effects of long term weight training and its positive effects on ones blood pressure, but mentions nothing about blood pressure drops during the actual workouts.*

**Perhaps this is why when asked if she could provide the research information to back up her “theory “ on blood pressure dropping too low during standing resistance training she became very defensive and explained that she did/does plenty of research as she has a Masters in this particular medical field.**

**Oh, and one more study just to be on the safe side.**

6. Benn S, McCartney N, McKelvie R. **Circulatory responses to weight lifting, walking, and stair climbing in older males.** *J Am Geriatr Soc.* 44(2); Pp 121-125. 1996.

*More of the same with weight training causing the greatest elevations in blood pressure, while stair climbing and walking had less significant elevations in blood pressure during the workout.*

**In all there were 127 studies on Pubmed under the search “blood pressure, resistance training”, and not one made any mention of blood pressure dropping too low during a workout.**

On that note, let's delve a little deeper into chronic blood pressure, especially information surrounding the prevention and correction of this deadly problem.

***Does this scenario sound familiar:***

You go to the Doctor's office to get your annual physical. Your blood pressure is up as well as your cholesterol score. Your Doctor then goes over your options. Diet and exercise, but for many that may be too hard, especially when one can just take a pill. Basically, a prescription pharmaceutical for blood pressure (typically a diuretic, ACE inhibitor, or calcium channel blocker depending on the severity) and a statin for your cholesterol after being retested a few weeks later. "Here's the script, let me know if you have any problems and I will check back with you in 1 to 2 months as we have to monitor this". And off you go, with your prescription in hand, ready to take on these two banes of human health (well actually one, as cholesterol levels may not be living up to the hype due to current research on high sensitivity C-reactive proteins, homocysteine levels, and Oxidized LDL cholesterol).

But, what if there was more artillery than just prescription medications. What if there were other methods, rather than synthetic, heavily-marketed, billion dollar profit pharmaceuticals? What about natural, side effect-free, everyday natural methods, that may at times proved even better results than their billion dollar counterparts.

Looking at it from a practical, common sense perspective, high oxidized LDL cholesterol and high blood pressure can be the side effect of dysfunctional physiological functioning. Examples may include vitamin or mineral deficiencies, excessive toxic burden, poor nutrition, lack of exercise, or hormonal imbalances among others. ***Common sense tells us that high oxidized LDL cholesterol is not a deficiency in Lipitor. Common sense also tells us that high blood pressure is not a deficiency in Diuretics or ACE Inhibitors.***

Honestly, have you ever heard of a person being deficient in Lipitor? So understanding that blood pressure issues can be due to something as simple as a magnesium or potassium deficiency, wouldn't it make sense to test for and then try to correct these deficiencies prior to prescribing a synthetic, side effect laden pharmaceutical? On that note did you know that a recent 2010 meta-analysis study found an increased risk of cancer in those using ARB's (Angiotensin-receptor blockers) to control their blood pressure. Funny how this didn't make major headlines. Perhaps the \$25 billion revenue in 2009 would be in jeopardy if more people heard about his study. As a matter of fact did you know that these drugs were prescribed roughly 82 million times in the U.S. alone. Below are the highlights of the study:

Sipahi I, Debanne S, Rowland D, Simon D, Fang J. **Angiotensin-receptor blockade and risk of cancer: meta-analysis of randomized controlled trials.** *Lancet Oncol.* 11(7); Pp 627-636. 2010.

*The meta-analysis took place of five published studies with a combined 61,000 subject/patients. Those on the ARB were compared to those on placebo. They found a statistically significant difference in subject cancer rates, with 7.2% of those on blood pressure drugs developing cancer, while only 6% of the placebo group developed cancer. The researchers concluded that ARB blood pressure drugs were associated with a modest increase in risk of cancer development.*

Perhaps it is not common sense that rules our decision making when it comes to our health. One has to wonder if profit plays a role as to why it would not be typical medical protocol to prescribe potassium or magnesium to correct a deficiency. Perhaps because these minerals are not patentable, and therefore unprofitable for billion dollar pharmaceutical companies. Did you know that the U.S. is the only country in which pharmaceutical companies can market directly to the end consumer through television and publication advertisements? This way you can walk into your doctor's office and ask for the medication that may be right for your condition. For more on pharmaceuticals it is highly recommended to read former Editor-In-Chief of the New England Journal of Medicine Marcia Angell's book *The Truth about Pharmaceutical Companies*, or Harvard medical faculty Dr. Jon Abrahamson's book *Overdosed America*. These books are must reads for anybody who cares to take accountability for their own health.

Back to blood pressure, as the subject of elevated blood pressure has hit very close to home to this author. For the past couple of years I have slowly witnessed my own blood pressure slowly creeping up, with my last measurement prior to intervention, being 140/90. Pretty bad for someone whom instructs others on how to eat, train, and decrease stress. That was July 7<sup>th</sup> 2010, exactly one month and 1 week prior to the writing of this article.

Typically when one follow the conventional method of lowering blood pressure "other" health problems may arise. For example, when a patient takes prescription diuretics, they are draining their body of even more of the already deficient magnesium and potassium. And when told to eat more bananas or take a potassium pill, without correcting the magnesium levels, ***the potassium may not work, because without enough magnesium the potassium cannot be properly delivered to the body's cells. SO in essence, the treatment being prescribed to lower the patient's blood pressure is actually***

*making the problem even worse (Altura et al 1981). Ouch. No wonder so many people end up having to take multiple medications to keep their blood pressure under control.*

Back to yours truly. And why did I mention my personal battle against high blood pressure. Because this day, one month and 1 week after being measured at 140/90, I just had my annual check-up and the blood pressure measured in at 119/80. Not bad for 1 month and 1 week, especially without even looking at a single pharmaceutical drug. And how did I do it?

First off, nutrition has to be spot on (or pretty close), as I typically follow a cyclical ketogenic diet with very low carbs during the week and a 12, 18, or 24 hour carb up on weekends. Diet is typically gluten free with loads of coldwater fish (particularly sardines and mackerel) throughout the day, and yes, plenty of grass fed red meat. Workouts are typically 3-6 one hour weight training workouts per week (perhaps one or two of these are modified strongman) depending on time and availability for 2 a day workouts. Since the workout schedule and diet are usually similar year round, I feel the changes in supplement regimen may have had the greatest significance in lowering my blood pressure. The supplement protocol went as follows:

- 300mg CoQ10 per day (200mg at breakfast, 100mg post workout at lunch)
- At least 600mg magnesium blend (magnesium taurate, glycinate, orotate, and fumarate) per day, preferably at night before bed.
- At least 2 grams L-Carnitine per day, with oftentimes over 2-3 grams of Acetyl-L-Carnitine and over 800mg L-Carnitine Tartrate.
- 4 sticks of celery per day or 1500mg celery seed extract per day.
- 2-4 packets daily of zero sugar (well 1g) sugar electrolyte formula consisting of 106mg magnesium (glycinate, aspartate, and Di-magnesium malate), 149mg Potassium (bicarbonate and aspartate), and 375mg sodium chloride.
- Fish Oil: at least percentage bodyfat in grams, preferably with mixed tocopherol vitamin E.

***\*\*\*Besides the dramatic drop in blood pressure, a side benefit was the drop in 12 site measurement bodyfat from 9.1% at 183lbs to 6.6% at 180lbs as measured by one of our Biosignature Modulation practitioners. Must have been all the Sardines and electrolyte packets.\*\*\****

Let's look at what the research says about some of these and other natural methods of lowering one's blood pressure.

## **Magnesium:**

1. Nelson F. **Magnesium, inflammation, and obesity in chronic disease.** *Nutr Rev.* 68(6); Pp 333-340. 2010.

*Believe it or not, this one comes out of the US Department of Agriculture. The researcher links inflammation and oxidative stress to depleted magnesium levels. In fact the author concludes “marginal to moderate magnesium deficiency through exacerbating chronic inflammatory stress may be contributing significantly to the occurrence of chronic diseases such as atherosclerosis, hypertension, osteoporosis, diabetes mellitus, and cancer.”*

2. Hatzstavri L, Sarafidis P, Georgianos P, Tziolas I, Aroditis C, Zebekakis P, Pikilidou M, Lasaridis A. **Oral magnesium supplementation reduces ambulatory blood pressure in patients with mild hypertension.** *Am J Hypertension.* 22(10); Pp 1070-1075. 2009.

*Over a 12 week period, 24 subjects were given oral magnesium, while the other 24 subjects in the control group were given lifestyle recommendations only. After the 12 week period, only the magnesium supplementing group had significant reductions in their blood pressure.*

3. Hadjistavri L, Sarafidis P, Georgianos P, Tziolos L, Aroditis C, Hitoglou-Makedou A, Zebekakis P, Pikilidou M, Lasaridis A. **Beneficial effects of oral magnesium supplementation on insulin sensitivity and serum lipid profile.** *Med Sci Monit.* 16(6); Pp 13-18. 2010.

*Not only did the magnesium group with moderately high blood pressure have better improvements in insulin sensitivity than did the lifestyle modification group, but they also saw much better overall improvements in cardiovascular risk factors, including blood lipid profile and you guessed it, blood pressure.*

## Potassium:

1. Patki P, Singh J, Gokhale S, Bulakh P, Shrotri D, Patwardhan B. **Efficacy of potassium and magnesium in essential hypertension: a double-blind, placebo controlled, crossover study.** *BMJ.* 301(6751); Pp 521-523. 1990.

*37 hypertensive subjects were given potassium, potassium and magnesium, or a placebo over a period of 32 weeks. The potassium and potassium/magnesium groups both saw significant reductions in blood pressure as well as serum cholesterol levels.*

## CoQ10

Did you know that in other countries including Europe and Japan, millions suffering from cardiovascular disease are recommended to take CoQ10 as a first line of defense against this deadly

disease? According to Dr. Jonny Bowden, in his outstanding book *The 150 Most Effective Natural Cures on Earth*, “people with essential hypertension are more likely to have a CoQ10 deficiency than those without hypertension. It’s been an approved treatment for congestive heart failure in Japan since 1974.” That’s right, Coenzyme Q10. Once again, when one has high blood pressure, is the body deficient in a synthetic ACE inhibitor prescription drug, or possibly in CoQ10? CoQ10 is an oil soluble substance found in the majority of human mitochondria in the heart, liver, and kidneys, and responsible for ATP energy production. Yet, you go to your doctor and walk out the door with a prescription for diuretics or ACE inhibitors rather than an education on the benefits of a substance used as a primary line of defense against hypertension in many other countries. Let’s look at what the research says about CoQ10.

1. Rosenfeldt F, Haas S, Krum H, Hadi A, Ng K, Leong J, Watts G. **Coenzyme Q10 in the treatment of hypertension: a meta analysis of the clinical trials.** *J Hum Hypertens.* 21(4); Pp 297-306. 2007.

*Meta analysis was performed on 12 clinical trials, consisting of 362 patients. The researchers concluded that **systolic blood pressure could be lowered by up to 17mm Hg and diastolic could be lowered by up to 10mm Hg with the inclusion of Coenzyme Q10 in one’s treatment for hypertension.***

2. Langsjoen P, Langsjoen P, Willis R, Folkers K. **Treatment of essential hypertension with Coenzyme Q10.** *Mol Aspects Med.* 15; Pp 265-272. 1994.

*The researchers added 225mg/day CoQ10 to the existing drug regimen of 109 patients with hypertension. **After an average of 4.4 months, 51% of the patients came completely off of between one and three of their hypertensive drugs.***

3. Soja A, Mortenson S. **Treatment of congestive heart failure with coenzyme Q10 illuminated by meta-analyses of clinical trials.** *Mol Aspects Med.* 18; Pp 159-168. 1997.

*“the possibility remains that CoQ10 will receive a well-documented role as an adjunctive treatment for CHF”*

## Omega 3 fatty Acids

1. Cicero A, Derosa G, Di Gregori V, Boce M, Gaddi A, Borghi C. **Omega 3 polyunsaturated fatty acids supplementation and blood pressure levels in hypertriglyceridemic patients with untreated normal-high blood pressure and with or without metabolic syndrome: a retrospective study.** *Clin Exp Hypertens.* 32(2); Pp 137-144. 2010.

*Over a period of 12 months, 111 subjects with normal high blood pressure were given 2 grams of polyunsaturated fatty acids. After the 12 months, the researchers saw a significant reduction in both systolic and diastolic blood pressure.*

2. Mori T, Bao D, Burke V, Puddey I, Beilin L. **Decosahaexaenoic acid but not eicosapentaenoic acid lowers ambulatory blood pressure and heart rate in humans.** *Hypertension*. 34(2); Pp 253-260. 1999.

*In this double blind, placebo controlled trial, the researchers found significant reductions in blood pressure in the group receiving the purified DHA compared to those in the placebo and EPA groups.*

3. Holm T, Andreassen A, Aukrust P, Anderson K, Geiran O, Kiekshus J, Sinonsen S, Gullestad L. **Omega 3 fatty acids improve blood pressure control and preserve renal function in hypertensive heart transplant recipients.** *Eur Heart J*. 22(5); Pp 428-436. 2001.

*In this yearlong study, the researchers separated 45 hypertensive transplant patients into omega 3 supplementation and placebo groups. Set up as a randomized double blind study, the researchers concluded that “**treatment with omega 3 fatty acids may reduce the long term continuous rise in blood pressure after heart transplantation and may offer a renoprotective effect.**”*

## Carnitine

1. Ruggenenti P, Cattaneo D, Loriga G, Ledda F, Motterlini N, Gherardi G, Orisio S, Remuzzi G. **Ameliorating hypertension and insulin resistance in subjects at increased cardiovascular risk: effects of acetyl-L-carnitine therapy.** *Hypertension*. 54(3); Pp 567-574. 2009.

*Over a 24 week period, subjects were given 1g of oral acetyl-L-carnitine two times per day. At the end of the 24 weeks, systolic blood pressure dropped from an average of 144mm Hg to 135 mm Hg in one group and 130mm Hg to 123mm Hg in the other group. The researchers concluded that **Acetyl-L-Carnitine “ameliorated arterial hypertension, insulin resistance, impaired glucose tolerance, and hypoadiponectinemia in subject with increased cardiovascular risk.”***

2. Miguel Carraso J, Mate A, Monserrat M, Arias J, Aramburu O, Vasquez C. **The role of inflammatory markers in the cardioprotective effect of L-carnitine in L-NAME induced hypertension.** *Am J Hypertens*. 21(11); Pp 1231-1237. 2008.

*Yes, I know, this study was done on rats, but so were most of the initial studies on many of the billion dollar pharmaceuticals we are prescribed and take without question of their safety or effectiveness. The researchers found that the hypertensive rats lowered their blood pressure and inflammation when given L-carnitine.*

3. Davis P, Mormino P, Savica V, Calo L. **L-carnitine, inflammation, and hypertension.** *Nephrology (Carlton)*. 14(2); Pp 264-265. 2009.

*This research paper is a great description of how L-Carnitine exerts its effects on inflammation and hypertension in both human and animal models. The authors state “together, these effects of L-Carnitine alongside those reported on blood pressure and inflammatory markers in an animal model of L-NAME induced hypertension upon its chronic administration strongly suggest that L-Carnitine is able to modulate rennin-angiotensin system and contribute via induction of HO-1 (haem oxygenase) and endothelial subunit of nitric oxide synthase and a modulation of oxidative stress.” Ok, in English please. When it comes to blood pressure and inflammation, Carnitine works.*

## Arginine

1. Neri I, Jasonni V, Gori G, Blasi I, Facchinetti F. **Effect of L-arginine on blood pressure in pregnancy induced hypertension: a randomized placebo controlled trial.** *J Matern Fetal Neonatal Med.* 19(5); Pp 277-281. 2006.

*Groups were broken down into 20g L-Arginine or placebo. The researchers found that not only was the L-Arginine well tolerated by the pregnant subjects, but it also displayed strong anti-hypertensive properties in pregnant subjects.*

2. Siasos G, Tousoulis D, Antoniadis C, Stefanadi E, Stefanadis C. **L-Arginine, the substrate for NO synthesis: an alternative treatment for premature atherosclerosis?** *Int J Cardiol.* 116(3); Pp 300-308. 2007.

*This research paper explains the benefits of L-Arginine in the endothelial function of individuals with elevated cardiovascular risk factors. From its anti-hypertensive properties to its role in hypercholesterolemia, L-Arginine can be an effective tool in the battle against atherosclerosis according to the authors.*

3. Gokce N. **L-Arginine and hypertension.** *J Nutr.* 134(10); Pp 2807-2811. 2004.

*This paper discusses the benefits of L-Arginine supplementation for those (roughly) 50 million individuals in the U.S. suffering from hypertension. From its role and actions in Nitric Oxide production, to a review of the studies on L-Arginine and hypertension and insulin sensitivity, the research points out L-Arginine as a promising supplement in the battle against hypertension.*

## Celery

According to Dr. Jonny Bowden, “for centuries, traditional Chinese medicine doctors have recommended celery for those suffering from high blood pressure. It makes sense for anyone with this serious condition to include celery in their diet on a daily basis (2).”

Celery contains a unique ingredient called 3-n-butylphthalide, better known as a Phthalide. Back in the 1990's the research team of William Elliot and Quang Le discovered this compound, noting its effects on the body's catecholamine (fight or flight hormones) production and blood pressure. Basically, it would relax the smooth muscles located in the walls of the blood vessels, allowing them to dilate, thus increasing the ability for the blood to flow unobstructed. But that is not all. Besides the phthalides, celery also contains sodium and potassium, so it acts as a natural diuretic. Rather than taking the first line of defense pharmaceutical diuretic typically prescribed, why not try celery first? Perhaps it is a deficiency in common sense that allows us overlook a simple solution such as 4 sticks of celery a day, instead choosing the prescription pill.

1. Tsi D, Das N, Tan B. **Effects of aqueous celery (*Apium graveolens*) extract on lipid parameters of rats fed a high fat diet.** *Planta Med.* 61(1); Pp 18-21. 1995.
2. Tsi D, Tan B. **Effects of celery extract and 3-N-butylphthalide on lipid levels in genetically hypercholesterolaemic (RICO) rats.** *Clin Exp Pharmacol Physiol.* 23(3); Pp 214-217. 1996.

## Diet and Exercise

This should be a no-brainer, buuuut, it seems to be the least adhered to. Yes, I know, it is easier to just take a pill than actually accept accountability and change one's lifestyle habits. So when we are told to change our diets to improve our cardiovascular risk factors, what exactly does that mean? Low fat, high fat, high carb, low carb??? Which one?? Well, when it comes to Hypertension, the person who wrote the book is Dr. Mark Houston. He is the director of the Hypertension Institute ([www.hypertensioninstitute.com](http://www.hypertensioninstitute.com)), a world renowned medical facility known for treating high blood pressure. Take a peek at their website, as nutritional intervention plays a big role in their protocols for treating various illnesses, including hypertension.

Let's look at some of the research out there on nutrition intervention and blood pressure regulation. And you thought it was just from daily stress. Enter the DASH diet.

1. Savica V, Bellinghieri G, Kopple J. **The effect of nutrition on blood pressure.** *Annu Rev Nutr.* 30; Pp 365-401. 2010.
  - High sodium chloride may predispose one to hypertension
  - Increased alcohol consumption may elevate blood pressure.
  - Exercise and high intakes of potassium, polyunsaturated fatty acids (e.g.; fish oil), protein, and possibly vitamin D may reduce blood pressure.

- Certain Amino Acids, green coffee bean extract, and foods high in nitrates may also reduce blood pressure.
  - The DASH diet, low in sodium, may be the best diet for alleviating high blood pressure.
2. Blumenthal J, Babyak M, Hinderliter A, Watkins L, Craighead L, Lin P, Caccia C, Johnson J, Wough R, Sherwood. **Effects of the DASH diet alone and in combination with exercise and weight loss on blood pressure and cardiovascular biomarkers in men and women with high blood pressure: the ENCORE study.** *Arch Intern Med.* 170(2); Pp 126-135. 2010.
    - BP was reduced 16.1mm Hg plus weight management group
    - BP was reduced 11.2 mm Hg in DASH diet alone group
    - Though low salt DASH diet had a significant effect on decreasing blood pressure, when combined with exercise and weight loss, the results were nothing short of remarkable. When was the last time your doctor told you about the DASH diet?
  3. Semel M. **Dietary pattern and hypertension: the DASH study. Dietary Approaches to Stop Hypertension.** *Nutr Rev.* 55(8); Pp 303-305. 1997.
  4. Obarzanek E et al. **Effects on blood lipids of a blood pressure lowering diet: the Dietary Approaches to Stop Hypertension (DASH) trial.** *Am J Clin Nutr.* 74(1); Pp 80-89. 2001.
    - DASH diet resulted in lower total cholesterol, LDL cholesterol, and HDL cholesterol.
    - The researchers concluded that “the DASH diet is likely to reduce coronary heart risk.”
  5. Azadbakht L, Mirmiran P, Esmailzadeh A, Azizi T, Azizi F. **Beneficial effects of a Dietary Approaches to Stop Hypertension eating plan on features of the metabolic syndrome.** *Diabetes Care.* 28(12); Pp 2823-2831. 2005.
    - The DASH diet resulted in higher good cholesterol (HDL) lower triglycerides, lower fasting glucose, and you guessed it, lower diastolic and systolic blood pressure.
    - As a side benefit, the DASH diet group also had the greatest reduction in bodyweight.
    - Once again, these authors concluded “the DASH diet can likely reduce most of the metabolic risks.”
  6. Kolasa K. **Dietary Approaches to Stop Hypertension (DASH) in clinical practice: a primary care experience.** *Clin Cardiol.* 22(7); Pp 16-22. 1999.
    - Patients with high blood pressure had an average decrease in systolic blood pressure by 11mm Hg, while diastolic blood pressure dropped an average of 6mm Hg.

- The best part of this study: These drops in blood pressure occurred within 2 week of starting the DASH diet plan!!!
7. Sacks F et al. **A dietary approach to prevent hypertension; a review of the Dietary Approaches to Stop Hypertension (DASH) Study.** *Clin Cardiol.* 22(7); Pp 6-10. 1999.
- After 8 weeks the systolic blood pressure of the hypertensives on the DASH diet was lowered by 11.6mm HG.
  - The researcher concluded “the DASH diet may offer an alternative to drug therapy in hypertensives, and as a population approach, may even prevent hypertension.”

So what does the DASH diet look like?

- High in fruits, vegetables, nuts, beans, seeds, and low fat dairy products.
- Small amounts of red meat, but lots of cold water fish and poultry
- Low in sugar
- Very low to no refined carbohydrates. In other words, NO REFINED CARBOHYDRATES. Kiss the bagels, cereal, granola bars, chips, chips ahoy cookies, ring dings, etc... goodbye. The best sources of grainy carbohydrates are Quinoa, Steel Cut Oatmeal, and Brown Rice.
- Polyunsaturated and monounsaturated fats. **NO TRANS FATS.**
- Plenty of fiber.

There are many other factors (toxic burden, caffeine interactions, mercury toxicity, etc.) and functional preventative methods (far-infrared sauna therapy, hot yoga, acupuncture, etc...) not discussed in this short introduction. If you would like to learn more about blood pressure it is highly recommended that you read:

- *The High Blood Pressure Hoax* by **Dr. Sherry Rogers**
- *What Your Doctor May Not Tell You About Hypertension* by **Dr. Mark Houston**
- *The DASH Diet for Hypertension* by **Thomas Moore and Mark Jenkins**

Enjoy, work, and .....Succeed! Stay tuned for our next installment of the Jive Turkey Series, in which we cover the controversy surrounding the supposed toxicity with increased dosages of vitamin D.

#### References

1. Houston M, Fox B, Taylor N. *What your Doctor May not Tell You About Hypertension*. Grand Central Publishing. 2003.
2. Bowden J. *The 150 Healthiest Foods On Earth*. Fair Winds Press. 2007.