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Our October 2022 Newsletter for Healthy Living

The Power of Potassium

According to the Centers for Disease Control and Prevention (CDC), nearly one-half — 47% — of Americans have high blood pressure (hypertension). Hypertension carries a high cost to your health. It is a major risk factor for cardiovascular disease and stroke, which are in the first and fifth position for leading causes of death in the U.S. The financial burden is over \$131 billion each year in direct medical costs and lost work days, but does not include a number of other health conditions worsened by hypertension, including kidney disease and cognitive decline. Unfortunately, while blood pressure monitoring has become commonplace at dentists' and eye doctors' offices, the CDC estimates 1 in 3 people are not aware they have hypertension.

There are several ways to reduce your blood pressure without drugs. Among them is balancing your potassium level, as this electrolyte has a significant effect on muscle contraction and arterial wall relaxation, but most Americans barely get half of the recommended daily allowance. When your physician takes your blood pressure, he uses a sphygmomanometer to measure the amount of pressure your heart exerts to push blood through your arterial system. The top number represents the highest pressure and the bottom number is the lowest pressure needed.

These numbers are related to the elasticity and diameter of your arterial walls. When the pressure required to circulate your blood is high, it places an

abnormal amount of stress on your heart muscle and smaller arteries, and reduces the amount of oxygen delivered to the smallest blood vessels in your body. Both of these consequences account for many of the secondary effects of hypertension. Your blood pressure reading can vary throughout the day, so one high reading is not a concern. It is only when your blood pressure is consistently or chronically higher than normal that sig-

nificant health conditions may occur. than 10 points difference compared to those with greater than 10 point difference between arms suffered a 58% increased risk of death from cardiovascular disease. However, when the difference increased to 15 points, the risk increased to 88%.

Potassium is a naturally occurring mineral that your body uses as an electrolyte, or substance in solution that will conduct electricity, and is vital for

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The validity of your blood pressure reading will be affected by the size of the blood pressure cuff, the position of the cuff on your arm and whether you're nervous. Measuring your blood pressure in both arms at the same office visit may also give your vital information about your circulatory health. A number of studies have revealed that a significant difference between your right and left arm pressure may indicate circulatory problems that raise your risk for stroke, peripheral artery disease or other cardiovascular problems.

While small differences between your arms is normal, researchers found when there is a difference of 5 points in the systolic reading (top number) it doubled the risk of dying from heart disease in the following eight years. The difference suggests the presence of plaque in the artery supplying the arm with the higher pressure. In a meta-analysis evaluating mortality rates of over 17,000 participants with inter-arm systolic blood pressure differences, researchers found participants with less

normal functioning. Diarrhea, vomiting, excessive sweating (such as when using a sauna) and some drugs may deplete or disrupt your potassium balance. But, the most common reason your potassium levels are not within normal limits is due to poor dietary choices. The average reported intake of potassium from food is about half of the 4,700 milligrams (mg) recommended. Research demonstrates that these low levels of potassium may have a significant impact on blood pressure, especially as it relates to the amount of salt normally found in a Western diet.

Dr. Paul Whelton, professor of epidemiology at Tulane School of Public Health and Tropical Medicine, did an analysis in 1997 of over 29 trials that demonstrated low levels of potassium resulted in higher systolic blood pressure readings. Studies performed since then have found similar results. According to Whelton's research: *“The results support the premise that low potassium intake may play an important part in the genesis of high BP. Increased potassium intake should be considered as a*

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What's Inside This Issue

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Nutrition and Anxiety

Your emotions, including anxiety and depression, have a strong connection to your overall health. A recent study published in July 2022 found college students using high-dose vitamin B6 supplementation experienced a reduction in anxiety and a trend toward less depression. The need for strategies to lower the risk of anxiety and depression has risen dramatically as more peo-

delicate balance between the excitatory neurons that carry information around and inhibitory ones, which prevent runaway activity. Recent theories have connected mood disorders and other neuropsychiatric conditions with a disturbance of this balance, often in the direction of raised levels of brain activity."

Gamma-Aminobutyric Acid (GABA) is a chemical known to inhibit

the neural networks and is used to keep the blood-brain barrier healthy. Data have also shown it is essential for learning, concentration and memory, and supports the brain's plasticity, which is its ability to adapt to challenges. Magnesium has such a powerful effect on depression and anxiety that Psychology Today calls it the "original chill pill".

Researchers have demonstrated that magnesium has a beneficial effect on an individual's subjective perception of anxiety, and that magnesium was effective in the treatment of mild to moderate depression in adults without the need for monitoring for toxicity. Roughly 50% of American adults do not get the estimated average requirement for magnesium each day — 400 mg. In fact, most only consume 250 mg per day. This means a substantial percentage of the population is likely deficient and could benefit from supplementation.

Magnesium and vitamin B6 work even better in combination. Animal studies have demonstrated that diets low in magnesium lead to anxiety-related behavior and supplementing with magnesium L-threonate could reduce anxiety. When these two nutrients are taken together, animal studies demonstrate they have a complementary effect on stress reduction. The importance of this was shown in a 2018 study published in PLOS One. The research was a Phase IV, investigator-blinded trial that enrolled healthy adults who scored greater than 18 on the Depression Anxiety Stress Scales and had a serum level of magnesium between 0.45 nanomoles per liter (nmol/L) and 0.85 mmol/L. The participants were randomized to receive either; 300 mg of magnesium and 30 mg of vitamin B6 or 300 mg of magnesium only.

Researchers were looking for changes in the stress scale score and any adverse events. According to the authors, adults with a stress score at or above 25 had a 24% greater improvement with magnesium-vitamin B6 versus magnesium only at Week 8. Those taking magnesium and B6 in combination also experienced fewer side effects. As noted by the authors: *"These findings suggest oral Mg supplementation alleviated stress in healthy adults... With regard to subjects with severe/extremely severe stress, this study provides clinical support for a greater benefit of Mg combined with vitamin B6."*

Reference: *Human Psychopharmacology*, 2022 doi.org/10.1002/hup.2852. WHO March 2, 2022. Asthma and Allergy Foundation of America, *Strong Emotions, Stress and Depression Can Trigger Asthma*. *EurekAlert!* July 19, 2022. *Michigan Medicine*, University of Michigan, March 28, 2018. *Psychology Today*, June 12, 2011. *Nutrients*, 2017; 9(5). PLOS One 2017; doi.org/10.1371. PLOS One 2018; 13(12).

"... nutrition-based interventions produce far fewer unpleasant side effects than drugs."

ple report emotional challenges during the COVID pandemic. Developing strategies to improve resilience is one important step to protecting your health and the health of your family.

In addition to anxiety and depression impacting your productivity, creativity and enjoyment of life, emotions are also linked to your overall health. Anger, anxiety and depression are "predictors of greater disease morbidity and mortality". While these emotions can impact your immune system, people who are stressed or anxious, may also not make good decisions about their health. There is bidirectionality between emotion and disease.



In other words, your emotional health influences your body's ability to be resilient to disease, and disease has a significant impact on your emotional health. Anxiety and depression can create chronic stress, which causes an imbalance in your hormones and brain chemistry. For example, the Asthma and Allergy Foundation of America notes an evidentiary link between asthma, anxiety and depression, which has also been associated with poor asthma control.

The data from the featured study offers one approach to protecting your emotional health. The double-blind study engaged 478 college students over a five-year period. The participants received one of three options: a lactose placebo pill, 1,000 microgram vitamin B12 tablet or 100 milligrams (mg) vitamin B6 tablet for one month. The researchers used several questionnaires to evaluate symptoms of anxiety and depression, as well as specific visual tests that showed evidence of GABAergic inhibitory interactions. In a press release, David Field, lead scientist from the University of Reading, explained: *"The functioning of the brain relies on a*

nerve impulses in the brain and thus lower excitability. Vitamin B6 is a coenzyme in the production of GABA, and in other pathways that help reduce neural excitability, such as co-enzymatic activity in the production of serotonin and dopamine. The participants consumed vitamin B6 or B12 at 50 times higher than the recommended daily dose. However, as the researchers pointed out, recent evidence demonstrates that while the optimum level of vitamin B has not been established, it "certainly exceeds the Recommended Daily Allowance (RDA) and many individuals are borderline deficient." The test results in participants who took vitamin B6 indicated that their GABA levels rose.

Field noted that while there are foods that contain vitamin B6, the trial seemed to indicate that supplementation was necessary to achieve the desired levels of GABA and that vitamin B6 had an effect that was lower than what would be found with medication. However, he believes that: *"... nutrition-based interventions produce far fewer unpleasant side effects than drugs, and so in the future people might prefer them as an intervention. To make this a realistic choice, research is needed to identify other nutrition-based interventions that benefit mental wellbeing, allowing other dietary interventions to be combined in future to provide greater results."*

The researchers found that B6 supplementation also produced a trend toward lower levels of depression, and B12 supplementation also helped lower anxiety. The researchers believe there were potential reasons for B6 showing a positive effect on anxiety but only a trend for depression, and suggest future studies resolve these issues.

Magnesium is the fourth most abundant element in your body and one of the seven essential macrominerals that we cannot live without. Although the brain is just 2% of your body weight, it uses nearly 20% of your oxygen supply. Magnesium facilitates processing in

It's Elderberry Season!

As cold and flu season approaches, many seek to boost their immune function without drugs and turn toward vitamins and herbs. One of the natural alternatives known for its ability to fight influenza and other viruses is the elderberry (*Sambucus nigra*).

"...the common elderberry has a potent direct antiviral effect against the flu virus."

Elderberry contains zinc and antioxidants, including vitamin C and anthocyanin (a flavonoid found in blue and purple fruits and berries), known for their ability to boost immune function and inhibit cold and flu. One 2004 study found taking 15 milliliters (just under 1 table-

spoon) of elderberry syrup four times a day for five days eased symptoms of influenza four days quicker than a placebo. According to the authors, "Elderberry extract seems to offer an efficient, safe and cost-effective treatment for influenza."

Research published in the March 2019 issue of the *Journal of Functional Foods* details the actual

mechanism by which elderberry protects against influenza and other viral attacks.

As reported by Science Daily: "...the study showed that compounds from elderberries can directly inhibit the virus's entry and replication in human cells, and can help strengthen a person's

immune response to the virus. Although elderberry's flu-fighting properties have long been observed, the group performed a comprehensive examination of the mechanism by which phytochemicals from elderberries combat influenza infections. What our study has shown is that the common elderberry has a potent direct antiviral effect against the flu virus. It inhibits the early stages of an infection by blocking key viral proteins responsible for both the viral attachment and entry into the host cells."

Interestingly, the elderberry juice not only was able to prevent the virus from entering and infecting the cells in the first place, but it also inhibited late-stage propagation of the virus in cells that had already been infected. What's more, this late-stage inhibition

was even stronger than its action during the initial infection stage. According to the researchers: "This observation was quite surprising and rather significant because blocking the viral cycle at several stages has a higher chance of inhibiting the viral infection."

The elderberry also promoted the release of certain cytokines (chemical messengers), which allow your immune system to mount a more efficient response. All of these antiviral activities were attributed to the anthocyanidin compounds in the berries. Similarly, a 2019 meta-analysis of four randomized, controlled clinical trials concluded that: "Supplementation with elderberry was found to substantially reduce upper respiratory symptoms. The quantitative synthesis of the effects yielded a large mean effect size. These findings present an alternative to antibiotic misuse for upper respiratory symptoms due to viral infections, and a potentially safer alternative to prescription drugs for routine cases of the common cold and influenza."

Reference: *Nutraingredients.usa.com* October 2, 2019. *Journal of Internal Medicine Research* 2004 March-April; 32(2):132-40. *Journal of Functional Foods* March 2019; 54:353-60. *Science Daily* April 23, 2019. *Complementary Therapies in Medicine* February 2019; 42:361-65.

Potassium *continued from page one*

recommendation for prevention and treatment of hypertension, especially in those who are unable to reduce their intake of sodium." Potassium works in your body to relax the walls of your arteries, keep your muscles from cramping, and lowers your blood pressure.

The reduction in blood pressure with added potassium has also been associated in studies with a reduced risk of stroke. Research has found that women without hypertension who consumed the most potassium (nearly 3,200 mg/day) had a 21% reduced risk of stroke. Further, women who consumed the most potassium were 12% less likely to die during the study period than those who consumed the least. According to the study's lead researcher: "Potassium may play a role in improving blood vessel function in our brains. This could allow better oxygenation of our brain tissue, and prevent tissue death that occurs from lack of oxygen to the brain ... The effect of potassium consumption on reduced stroke risk could also be due to a better diet overall, though we did not investigate this in our study."

Unfortunately, 20% of people who suffer with high blood pressure are unaware of the condition, significantly

increasing their potential risk of health problems. With uncontrolled or poorly controlled hypertension, you increase the risk of significant health effects that reduce your quality of life and have a negative effect on the length of your life. Hypertension increases risk of stroke as it can cause blood vessels in your brain to rupture or clog more easily.

In both instances, oxygen supply to a portion of the brain ceases and a stroke results. The increased workload on the heart muscle may result in heart failure, and damage to the arteries supplying the heart muscle with oxygen may result in a heart attack. Hypertension may damage the smaller arteries, reducing the amount of oxygen delivered and severely impacting the ability of organs to function, such as your kidneys and eyes. This may result in kidney failure and vision loss. The damage to smaller blood vessels is called microvascular disease and may lead to angina, or chest pain when the heart muscle doesn't get enough oxygen.

The key to relaxing your arterial walls and reducing your blood pressure is the sodium to potassium ratio. According to research presented at last year's American Heart Association

meeting, excessive salt consumption contributed to 2.3 million heart-related deaths worldwide in 2010. However, most Americans get the majority of their sodium from table salt and processed foods — not from natural unprocessed salt. So, the ratio between potassium and sodium important, as is the type of sodium consumed. If you eat a lot of processed foods and not many vegetables, there's a good chance your sodium-to-potassium ratio is unbalanced. It's generally recommended that you consume five times more potassium than sodium, but most Americans get the opposite ratio, eating two times more sodium than potassium. A potential strategy to promote health would be to focus on a high-quality diet rich in potassium, as this nutrient helps offset the hypertensive effects of sodium. Imbalance in this ratio can not only lead to hypertension (high blood pressure) but also contribute to a number of other diseases.

Reference: CDC, *Facts About Hypertension*, July 12, 2022. CDC, *Heart Disease and Stroke*, September 8, 2022. CDC, *Leading Causes of Death*. CDC, *Five Surprising Facts About High Blood Pressure*, November 9, 2020. Harvard Medical School, *Potassium Lowers Blood Pressure*. *Daily Mail*, May 23, 2016. *Harvard Health Publications*, March 5, 2014. *Clinical and Experimental Hypertension* 2016; 28(3):317. *Journal of the American Medical Association* 1997; 277(20):1624. *Journal of Human Hypertension* 2003; 17(7):471. *BMJ* 2013; 346:f1378. *Stroke* 2014; 45(10):2874. *MedicineNet*, September 4, 2014. *Bloomberg* March 21, 2013.