

The Miracle & Wonder of High Dosage Vitamin C

Vitamin C, also known as ascorbic acid, is a cofactor in multiple enzymatic reactions including collagen synthesis. Humans are unable to produce vitamin C because a gene for this ability has mutated and no longer works properly. Therefore, the only way to get vitamin C into our body is via a food source or a reputable supplement. Vitamin C acts as a reducing agent in free radical-mediated oxidation processes; therefore, it is a potent antioxidant which prevents or reduces damage caused by free radicals.

A free radical is a substance/molecule that has an unpaired electron and is therefore unstable. Since electrons have a very strong tendency to exist in a paired rather than an unpaired state, free radicals indiscriminately pick up electrons from other atoms, converting those other atoms into secondary free radicals. Thus a chain reaction is triggered that can cause substantial biological damage to your body (skin, tissue, organs)

The power of an antioxidant is that it can easily and readily donate electrons to the free radicals, making it stable and repair any damage caused by free radicals. An antioxidant such as vitamin C helps prevent "oxidative stress", which is damage to the DNA in your cells that can leave you vulnerable to many serious degenerative diseases, including cancer.

Deficiency of vitamin C results in the defective formation of collagen and connective tissues in the skin, cartilage, carnitine, catecholamines, dentine, bone, and blood vessels; because vitamin C functions as an essential cofactor in numerous enzymatic reactions. This means that without vitamin C, none of the above will be synthesised within your body.



Vitamin C & Cardiovascular Disease



"I think we can get almost complete control of cardiovascular disease, heart attacks and strokes by the proper use of (vitamin C and lysine) ... even cure it." Linus Pauling.

Dr Linus Pauling was the leading chemist of the last century and, arguably, the greatest ever American scientist. He remains the only person to have won two unshared Nobel Prizes, the first for Chemistry (1954) and the second for peace (1962). In addition to being one of the greatest scientists ever, he was a renowned humanitarian.

He was thirty years ahead of his time when he ushered in the modern era of alternative medicine with his concept of orthomolecular medicine and mega vitamin therapy.

The concept and term **orthomolecular** (meaning "right molecules in the right concentration") characterized an approach to the prevention and treatment of disease and attainment of optimum health that was based on the physiological and enzymatic actions of specific nutrients, such as vitamins, minerals, and amino acids present in the body. In 1970 he wrote the book Vitamin C and the Common Cold, which

became a bestseller and brought wide public attention while creating a huge and continuously increasing demand for vitamin C.

Dr Linus Pauling and his associate Dr Matthias Rath, advocated and published a definitive thesis on the root cause, treatment, and actual cure for all forms of cardiovascular disease (CVD), including congestive heart failure, heart disease, and stroke. Today, cardiovascular related health problems together comprise 50% of all causes of death in the US. The efficacy of what is called Pauling Therapy has been amply proven in thousands of cardiovascular patients who have been so fortunate to discover the remarkable

treatment. The Pauling and Rath heart protocols in lower dosage levels will prevent cardiovascular disease and in higher dosages will reverse arterial plaque buildup and reverse heart disease! Heart patients moving to the Pauling Therapy commonly avoid open-heart surgery and angioplasty. This is accomplished by dealing directly with the root causes of CVD and arterial plaque buildup. Almost without exception patients experience rapid recovery.



Dr. Rath and Dr. Linus Pauling published the revolutionary concept that a chronic insufficiency of vitamin C damages blood vessel walls. This damage triggers a biological “repair” process in which cholesterol-carrying lipoproteins deposit in the artery walls like a biological form of mortar. With time, this “repair” process can lead to a buildup of atherosclerotic plaque. The most effective “repair” molecule is a large, sticky substance known as lipoprotein (a) [Lp(a)]. Due to its unique structure, Lp(a) can act as a surrogate for vitamin C and protect the integrity of the blood vessels during times of vitamin C deficiency and the development of scurvy. However, whilst the significant role of Lp(a) in cardiovascular disease has been recognized, there are no effective pharmaceutical drugs that can lower it. Doctors believe that Lp(a) levels are part of our genetic makeup and focus instead only on artificial reduction of the cholesterol-carrying LDL (“bad” cholesterol).

Research shows that a complete absence of dietary vitamin C intake results in a significant increase in serum Lp(a) levels. Moreover, this is accompanied by increased accumulation of Lp(a) in the arteries at the site of highest mechanical stress near the heart, leading to the appearance of plaques. On the other hand, supplementation of vitamin C effectively decreased the deposition of Lp(a) along the artery walls and consequently decreased Lp(a) blood levels. The study has been published in the April, 2015 issue of the American Journal of Cardiovascular Disease.

A new scientific theory, called the dynamic flow model, explains all the observed responses to vitamin C in research done. This model is described in the book "Ascorbate." by Steve Hickey and Hilary Roberts. According to the model, people should ideally be in a state of dynamic flow, which means they should ingest more vitamin C than they need, in the form of divided dose supplements. The extra Vitamin C flows through the body and is excreted in the urine. It is not wasted, however, as the excess acts as a reservoir when extra vitamin C is required. Dynamic flow is the closest we humans can get to restoring our physiology to how it was before we lost the ability to make vitamin C in our bodies, as most other animals still do.

Stress & Vitamin C



People who have high levels of vitamin C

do not show the expected mental and physical signs of stress when subjected to acute psychological challenges. What's more, they bounce back from stressful situations faster than people with low levels of vitamin C in their blood.

In one study, German researchers subjected 120 people to a sure-fire stressor—a public speaking task combined with math problems. Half of those studied

were given 1,000 mg of vitamin C. Such signs of stress as elevated levels of the stress hormone cortisol and high blood pressure were significantly greater in those who did not get the vitamin supplement. Those who got vitamin C reported that they felt less stressed when they got the vitamin.

Earlier studies showed that vitamin C abolished secretion of cortisol in animals that had been subjected to repeated stress. Cortisol is a hormone released by the adrenal glands in response to stress. Once it gets into the bloodstream, it is responsible for relaying the news of stress to all parts of the body and mind.

Cortisol triggers the "fight or flight" response to stress. That allows us to spring into action when we sense danger. But like many emergency-alert systems, the stress response comes at a considerable cost. Among other effects, frequent exposure to high levels of stress hormones exhausts the body's physical resources, impairs learning and memory, and makes people susceptible to depression.

The highest concentration of vitamin C in the body is stored in the adrenal glands. Vitamin C is utilized by the adrenal glands in the production of all of the adrenal hormones, most notably cortisol. When you are faced with a stressful situation, your vitamin C is rapidly used up in the production of cortisol and related stress-response hormones.

In adrenal fatigue, your adrenal glands "panic" when they don't have enough vitamin C available, and, in what seems like an odd paradox, they release MORE cortisol. This not only increases your immediate

anxiety, but as this state of high cortisol is prolonged, it wreaks havoc on your blood sugar, blood pressure, and contributes to the dreaded accumulation of belly fat.

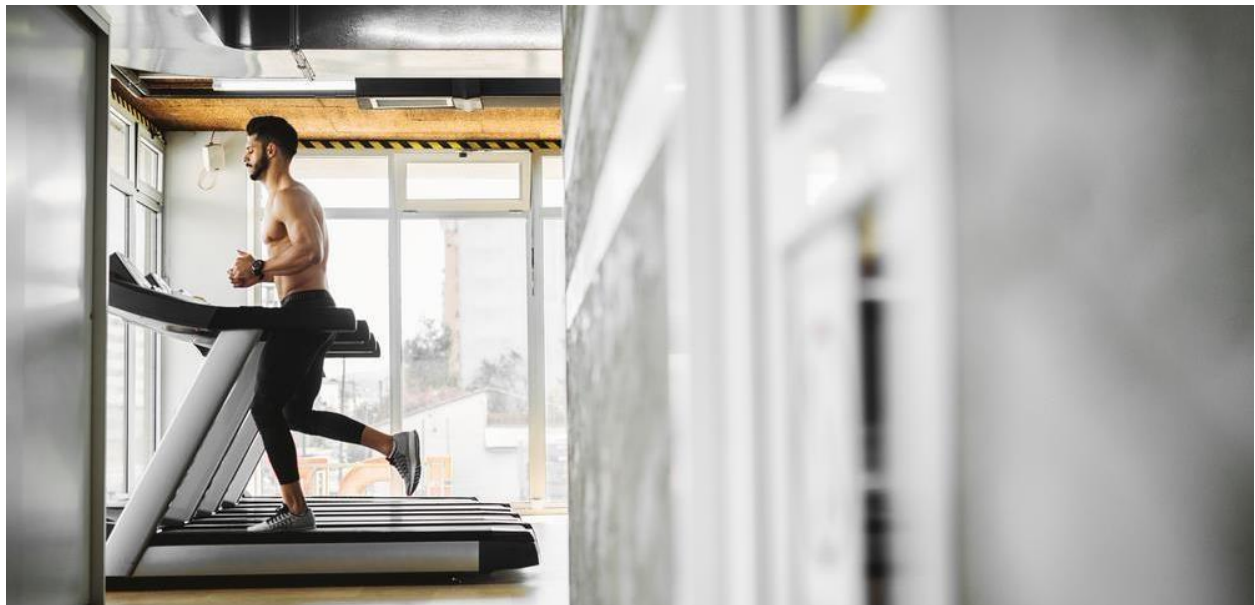
When Vitamin C is readily available in your body, you release less cortisol, which means you feel less stressed and it repairs the damage to your body by cortisol. Cortisol, can age you very quick, resulting in hair loss, grey hair, wrinkled skin, fatigue and weak and painful joints and bones.

Improve your stamina at the gym

Vitamin C is required for the growth and repair of consumption. The vitamin-C-supplemented tissues in all parts of your body, making it a great group had significantly lower heart rates during idea to keep a bottle in your gym bag pre- and exercise. In addition, perceived exertion and post-workout. One study, from the University of fatigue were both significantly reduced in the Wisconsin, found that 500 mg of vitamin C can vitamin C group. The vitamin has also been shown offset workout fatigue. In one test, participants to lower post-workout cortisol levels and improve performed 60 minutes of exercise at the intensity recovery overall. of 50 percent of predicted maximal oxygen

Vitamin C & Energy

Vitamin C is widely celebrated for its immune boosting functions it is often forgotten that Vitamin C is also required for the synthesis of carnitine. Carnitine is a molecule which is essential for the transport of fatty acids into the mitochondria. It is the mitochondria which convert food sources (such as fats) into energy in the body. Therefore, Vitamin C is also indirectly responsible for this process.



Vitamin C & Diabetes



Vitamin C is one of the most widely used supplements today, but many of us don't realize that it also plays a key role in our blood sugar levels.

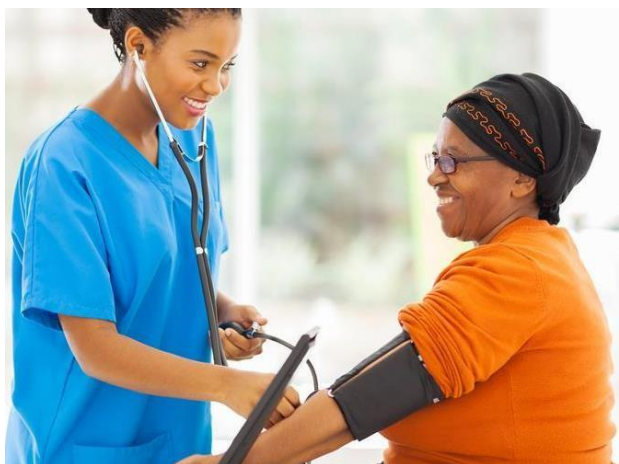
A 2007 study published in the Indian Journal of Medical Research looked at 84 patients with type 2 diabetes who randomly received 500 or 1,000 mg of vitamin C daily for six weeks. The researchers discovered that the group supplementing with 1,000 mg experienced a significant decrease in fasting blood sugar, triglycerides, cholesterol (LDL) and insulin levels. The dosage group with 500 mg did not produce any significant changes.

Vitamin C and glucose have a similar chemical structure. When both are high they compete with one another to enter the cells. If there's more glucose around, less vitamin C will be allowed into the cells, creating a deficiency. Not only is it important to keep your C levels up, it's just as crucial to keep your blood sugar levels stable with a low-glycemic diet.

Reduce your risk of heart disease

Research from University of California Berkeley, adds to the evidence that vitamin C supplements can lower concentrations of C-reactive protein (CRP), a central biomarker of inflammation that has been shown as a powerful predictor of heart disease and diabetes. For healthy, non-smoking adults with an elevated level of CRP, a daily dose of vitamin C lowered levels of the inflammation biomarker after two months. According to the researchers, the improvement is comparable to many other studies of cholesterol-lowering drugs. While further research is needed, it's certainly another good reason to keep up with your vitamin C intake.

Vitamin C & Hypertension



A side effect of vitamin C deficiency is high or low blood pressure. Hypertension is mainly associated with CVD and caused when the congestion of arteries and the blood vessel constricting effects dominate. Hypotension is mainly due to weakness and loss of elasticity in the veins, leading to PVD. Peripheral vascular disease (PVD) is a blood circulation disorder that causes the blood vessels outside of your heart and brain to narrow, block, or spasm. This can happen in your arteries or veins. PVD typically causes pain and fatigue, often in your legs, and especially during exercise. In PVD triglyceride-rich lipoproteins accumulate in the

plasma as very low-density lipoproteins (VLDL). These are easily oxidised by chlorinated water, smoking, polluted air, and other factors that deplete vitamin C and then form brownish coloured residues in affected tissues. Elevated glucose levels as in diabetes inhibit the cellular uptake of vitamin C, leading to greater degeneration of the blood circulation.

Vitamin C & Collagen

The synthesis of collagen, for which vitamin C is essential, proceeds in the body as one of its major manufacturing enterprises. A person who is dying of scurvy stops making this substance, and his body falls apart. His joints fail, because he can no longer keep the cartilage and tendons strong, his blood vessels break open, his gums ulcerate and his teeth fall out, his immune system deteriorates, and he dies.

Collagen is a protein, one of the thousands of different kinds of proteins in the human body. Most proteins occur in only small amounts: the various enzymes, for example, are so powerful in their ability to cause specific chemical reactions to take place rapidly that only a gram or two or even a few milligrams may be needed in the body. There are a few exceptions. There is a great amount of hemoglobin in red blood cells.

Like other proteins, collagen consists of polypeptide chains; the long chains of this fibrous molecule contain about one thousand amino-acid residues, about sixteen thousand atoms. It differs from almost all other proteins in being substantially composed of but two amino acids, glycine and hydroxyproline. Collagen is a kind of supermolecule, however, in its three-dimensional architecture. The polypeptide chains of the two amino acids, alternating with one another and punctuated by the presence of certain other amino acids, are coiled in a left-handed helix. Three of these helical strands are twisted around on another, like strands of a rope, in a right handed superhelix, to compose the complete molecule.

There is even more collagen in the skin, bones, teeth, blood vessels, eye, heart, and, in fact, essentially all parts of the body. Collagen as strong white fibers, stronger than steel wire of the same weight, and as yellow elastic networks (called elastin), usually together with macropolysaccharides, constitutes the connective tissue that holds our bodies together.



Understandably, the synthesis of this structure proceeds in steps. While it has been known for half a century that vitamin C is essential to the manufacture of collagen, the process is only now yielding to inquiry. It appears that vitamin C is involved at every step.

Vitamin C & Anti-aging

Collagen makes the skin strong and elastic, its degradation leads to wrinkles, loose and ageing skin. Even more important for health is the effect on the blood vessels. Deficiency causes them to lose their elasticity, rigid and calcified arteries drive up the blood pressure and they can more easily break. This is especially a problem with aneurisms - ballooning enlargements of arteries with thin walls that can easily rupture. In the veins vitamin C deficiency causes distension and slack walls so that the valves no longer close properly. The blood stagnates in the lower legs and pools to form varicose veins.

Now we can also understand sagging breasts and enlarged prostates as chronic vitamin C deficiencies rather than just advancing age. DHT (Dihydrotestosterone) can cause of male-pattern baldness. It appears that prostate enlargement is the result of DHT combined with a weak venous system (PVD) while malepattern baldness is due to DHT in a congested arterial system or CVD. Both may, of course, be present simultaneously.

All of these problems - ageing skin, rigid arteries, aneurisms, varicose veins, sagging breasts, enlarging prostates and male-pattern baldness are signs of chronic vitamin C deficiency, commonly in combination with copper deficiency. Copper is also essential in forming connective tissue.

Increased vitamin C can help prevent these and other "signs of aging".

Vitamin C & Oxygen



People with a high amount of Candida, fungi and other myco-microbes have an anaerobic metabolism in parts of the brain and in many muscles and organs. Also cancer cells have an anaerobic metabolism and can become normal with increased oxygen supply so that tumors may just melt away. Anaerobic cells do not produce carbon dioxide, and therefore do not get sufficient oxygen from the normal blood circulation. This makes it understandable why it is highly beneficial with all anaerobic and low-energy conditions to use additional oxygen supply methods that do not require carbon dioxide to release oxygen.

Best suited for supplementation is vitamin C. The principle of action is as follows: In an oxygen deficient environment such as a cell with anaerobic metabolism a redox pair changes from their oxidized state to their reduced form by giving off one atom of highly reactive oxygen. When vitamin C returns to the circulation and flow with the blood through the lungs they are again being converted to their oxidized forms. In this way the redox cycle can repeat several times until the chemicals are gradually being excreted through the kidneys, and an oxidative energy metabolism can be restored in anaerobic tissue where this is not possible with the oxygen in red blood cells.

Vitamin C cannot enter directly in its reduced form, it only gets inside cells as DHA. Inside the cell it is then reduced by liberating oxygen. With the normal intake levels of vitamin C the released amount of oxygen is so low that it does not make a difference, and especially not in cells that produce carbon dioxide and get their oxygen from haemoglobin. But it can make a world of difference in anaerobic tissue, and with high intakes of vitamin C. The oxygen released in this way is initially highly reactive and kills the microbes inside the cells that caused this blockage, and then re-starts the blocked oxidative energy metabolism. This is how vitamin C protects us against cancer and infections if we use enough of it.

Vitamin C and Immunity



Vitamin C is the 'muscle' of the immune system. But why is vitamin C the key to powerful immunity?

Red blood cells have roughly the same concentration of vitamin C as the surrounding plasma. Heart cells and kidney cells, which are very metabolically active cells, have about 13-fold more vitamin C than the plasma, an impressive concentration difference. This is certainly consistent with the continual need for electrons in such active cells.

Phagocytic white blood cells (granulocytes) have 25-fold more vitamin C than the plasma. Since these cells need an abundance of energy to consume and digest pathogens and cellular "debris," this concentration of vitamin C makes a lot of sense as well.

The king of the vitamin C concentrators, however, is the circulating monocyte, which becomes known as a macrophage, another cell with phagocytic functions, when it settles into the tissues. This cell has more than an 80-fold increased concentration of vitamin C inside it relative to the plasma. Few, if any, other examples of a circulating nutrient/vitamin being so selectively concentrated in a given cell type exist.

Vitamin C is a highly effective antioxidant that protects the body's cells against reactive oxygen species that are generated by immune cells to kill pathogens. Primarily through this role, the vitamin affects several components of innate and adaptive immunity; for example, vitamin C has been shown to stimulate both the production and function of leukocytes (white blood cells), especially neutrophils, lymphocytes, and phagocytes. Specific measures of functions stimulated by vitamin C include cellular motility, chemotaxis, and phagocytosis. Neutrophils, which attack foreign bacteria and viruses, seem to be the

primary cell type stimulated by vitamin C, but lymphocytes and other phagocytes are also affected. In support of vitamin C's effect on neutrophil function, supplementation with vitamin C-rich SunGold Kiwifruit (2 kiwifruit/day, providing approximately 259 mg/day of vitamin C, for four weeks) increased plasma and neutrophil vitamin C concentration and improved neutrophil chemotaxis and oxidant generation in 14 young men considered to have suboptimal vitamin C status ($<50 \mu\text{mol/L}$) at baseline.

Oxidative Inflammatory Disease

Oxidative stress is a state in which toxic reactive oxygen species (ROS) overcomes the endogenous antioxidant defence of the body. This state results in an excess of free radicals, which can react with cellular lipids, proteins, and nucleic acids, leading to cellular injury and eventual organ dysfunction.

During inflammation, phagocytic cells such as macrophages and neutrophils produce microbicidal oxidants whose formation is accompanied by a transient episode of oxidative metabolism known as the respiratory burst. Reactive oxygen species, such as superoxide anion, hydrogen peroxide, the hydroxyl radical, and hypochlorous acid, together with microbicidal peptides and proteases, constitute their antimicrobial arsenal.

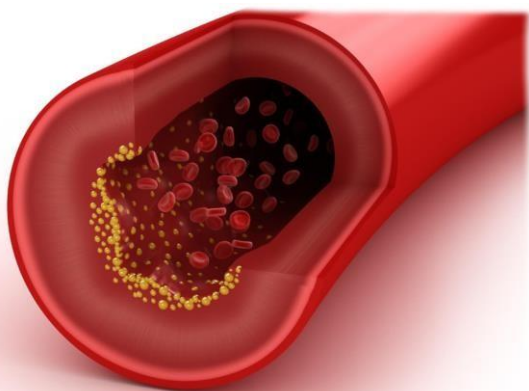
Like an apple turns brown when exposed to air, our cells can "rust" when we breathe due to oxidative stress, a process caused by free radicals.

Free radicals are unstable molecules that damage or "oxidize" cells throughout the body in a process called oxidative stress. Over time, oxidative stress can leave our cells and tissues unable to function properly. According to anti-aging specialist Dr. Catherine Waller, this means that free radicals can have serious consequences for our health. "They damage tissue, they damage our DNA, they damage our cell membrane," Dr. Waller says. "They're the underpinnings of almost all of our chronic diseases."

Because free radicals contribute to disease, hardened arteries and wrinkles, they're often intertwined with the health problems we experience with age. Avoiding the causes of free radicals and adopting a lifestyle that helps you fight back against them can help you safeguard your health by preventing oxidative stress.



Vitamin C & Blood Flow



Japanese scientists report that regular consumption of the powerful antioxidant vitamin C may help reverse vasoconstriction, or narrowing of the arteries, in smokers, specifically by targeting the impaired endothelial function that causes this condition.

Smoking boosts oxidative stress and produces vasoconstriction, which may increase the risk of related conditions such as coronary heart disease, heart attack, aortic aneurysm, and stroke. The endothelium, a layer of cells lining the

interior of blood vessels, produces coronary-related compounds that regulate vascular tone, such as nitric oxide. To test vitamin C's effects on coronary health, researchers at Chiba University, Japan, recruited 25 patients, 13 of whom were otherwise healthy smokers and 12 who were nonsmokers. Using a monitoring test known as transthoracic Doppler echocardiography, the team evaluated coronary blood flow in each patient, both while at rest and during moments of increased blood flow. Blood flow and levels of vitamin C were measured at baseline and then at two and four hours following intake of vitamin C. At the study's onset, blood flow was greatly increased in nonsmokers compared to smokers. However, at the study's end, the smokers' blood flow rates had increased significantly, while the nonsmokers' blood flow was unchanged. The study authors concluded that vitamin C helps relieve the vasoconstriction that can occur in chronic smokers.

Vitamin C Bowel Flush

Health begins in the gut – the intestines; and, thanks to antibiotics, chlorinated water, bad diet, food allergens, and vaccinations, almost everyone has a major problem in their gut. Chronic gut inflammation, raging like an out-of-control forest fire, causes digestion issues, skin eruptions, weak immunity, allergies, autoimmune illness and a host of other health issues. The Vitamin C Flush is the fire hose needed to subdue the flames so the gut can begin to heal itself.

Although the Flush results in an evacuation of the bowel, and will certainly solve any immediate constipation problems, it isn't the same as "colon cleansing." Colon cleansing involves taking specific agents that remove gunk from the colon. The Flush is different; its primary purpose is getting vitamin C into the tissues.

A vitamin C flush delivers very high doses of vitamin C in order to achieve tissue saturation – and in the process, supports the immune system and rapid healing. A vitamin C flush can be done anytime you might be feeling run down, recovering from illness or trauma/surgery, or your immune system simply needs a boost.

Can taking too much Vitamin C be Toxic?

A number of possible problems with very large doses of vitamin C have been suggested including genetic mutations, birth defects, atherosclerosis, kidney stones, "rebound scurvy," increased oxidative stress, excess iron absorption, vitamin B12 deficiency, and erosion of dental enamel. However, none of these alleged adverse health effects have been confirmed, and there is no reliable scientific evidence that large amounts of vitamin C are toxic or detrimental to health. Vitamin C is a water-soluble vitamin. Therefore, the body will use what it needs of the vitamin and gets rid of the excess if it needs too.

Because oxalate is a metabolite of vitamin C, there is some concern that high vitamin C intake could increase the risk of calcium oxalate kidney stones. Whether any increase in oxalate levels would translate to an elevation in risk for kidney stones has been examined in several epidemiological studies. The results of these studies have conflicting with one group saying that it does not increase the risk of kidney stones and the other saying that it may there is a 40% chance of developing kidney stones. Despite conflicting results, it may be prudent for individuals predisposed to oxalate kidney stone formation to avoid high-dose vitamin C supplementation.





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