

The Healing Power of Vitamin C

PART ONE OF FOUR

— SECTION ONE —

INTRODUCTION

Vitamin C is literally amazing in the wide variety of functions it performs in healing the body and maintaining body health. This present report was prepared to provide you with a glimpse into this remarkable information.

It is our hope that you, the reader, will begin taking sizeable amounts of vitamin C twice every day. If you will do this, you will have a far happier life and live much longer.

Many people fail to consume enough vitamin C to realize its vast array of health benefits. Most adults wrongly assume that the 75-90 mg of vitamin C recommended by the federal government is an optimal daily dose. In fact, this “recommended dietary allowance” is only enough to prevent vitamin-deficiency disease states such as scurvy—but not nearly enough to support optimal health.

The Nobel prize winning scientist, Dr. Linus Pauling, was among the first to recognize the importance of high-dose vitamin C supplementation more than 30 years ago. Since then, scientists have amassed impressive evidence supporting the numerous benefits of high-dose vitamin C.

But it was Frederick R. Klenner, M.D., who inspired Pauling to continue research. This present report will also include a summary of his lifetime of discoveries in the medical use of vitamin C.

VITAMIN C DOSAGES

Most of us will not have a friendly physician nearby who is willing to give us vitamin C injections when we are sick; so we will have to know how to take it orally. It is important that we properly care for ourselves and our loved ones in times of sickness at home. Here are several suggestions by the editor of this report, gleaned from many years of personal research into medical discoveries and the experiences of himself and others. Bear in mind that he is not a physician. In case of sickness, you are advised to consult your doctor.

It should be mentioned that, later in this report, Dr. Klenner is quoted as saying that, “if the C is taken from the ampoules [used for giving vitamin C injections] and swallowed in some

juice, it will have about the same results as if it had been injected.” This is significant. According to this, the vitamin C can be swallowed in juice with very similar healing results as if it had been injected from an ampoule into a vein or muscle.

You can purchase vitamin C tablets and take them. These do not have to be fruit flavored. But, the lowest-cost way to obtain a sizeable amount of vitamin C every day is to purchase a large container of it in crystalline (powdered) form.

The present writer uses a 3 lb. jar of NOW brand Ascorbic Acid. The last bottle cost \$49.39, but it will last for months; all the while it will supply you with a daily abundance of this remarkable vitamin—which is so protective and so healing.

Here is one way to do this: Place the spoonful of C into half a cup of liquid, stir, swallow. Fill that cup with more liquid (to dilute and thus help you use all the C still in it), and swallow. Follow with another cup of liquid (to help avoid excess acidity in the esophagus and stomach).

Here is an alternative method: Have two cups of fruit juice (if sick, best diluted 50-50 with water), carrot juice, or water ready to drink. Quickly place the spoonful of powder in your mouth, and immediately take a mouthful of water and swallow it all. Quickly follow with one or two cups of the liquid. In this way, you swallow all the C on the spoon, and your teeth are protected from its high acidity.

Normal dosage: Take one level teaspoon of the powder twice a day at the beginning of each of the two largest meals. It will help digest minerals in the meal, increase mental and physical efficiency, and guard the health on a day-by-day basis. (Your third meal, if eaten at all, should always be very light and several hours before bedtime. By following this practice, your entire body will rest better at night; you will live longer; weigh less; and experience better health.)

In time of simple sickness, take a rounded tablespoon of it (approximately equal to about 10,000-12,000 mg of the vitamin) every four hours throughout the day. Continue this until

diarrhea begins. When that happens, you will know that you are beginning to take more C than is needed; so reduce your amount of the dosage.

Remember that even larger doses can be given in time of serious illness with no negative effect. When you take too much C, the excess will be excreted through the large colon. You will experience some diarrhea; and the C will leave the body. For this reason, it is impossible to overdose on vitamin C. Physicians give gravely ill patients massive amounts of C with no ill effects because no harmful buildup of C occurs. It is all used or ejected from the body.

Also keep this in mind: Medical research has discovered that larger doses of vitamin C will eliminate sickness far more quickly and efficiently than small doses given more frequently. Example: 12,000 mg given every four hours is *far more effective* than 1,000 mg given hour after hour.

— SECTION TWO —

**NATURAL REMEDIES
ENCYCLOPEDIA, pp. 92-93**

C-COMPLEX VITAMINS

VITAMIN C (ASCORBIC ACID)—

“Taking it to bowel tolerance”: Whether in sickness or health, **you can always know when you are getting too much vitamin C.** If your body is saturated with it, the extra will be excreted in the bowel. **(You will have temporary diarrhea.)** So you can never take too much. Of course, you need far greater amounts when you have any kind of infection. So, **when you are ill, take vitamin C “to bowel tolerance”** (a phrase frequently used in this *Encyclopedia*); that is, until it produces a mild diarrhea effect. Keep in mind that, **when you are sick, it will only be a few hours and you may need another large dose of vitamin C.** The white blood cells use vitamin C to fight and destroy germs in the system; so do not be skimpy on C when you are ill.

Dosage: RDA 75-90 mg / ODA 1,000-3,000 mg / TDA 10,000 mg. It is best to always **take vitamin C with bioflavonoids**; if the amount of bioflavonoids is equal to or greater than the C, they help its absorption.

The officially recommended amount is 75-90 mg, but far higher amounts are even better. Therapeutically, vitamin C is given in doses of 1,000 to 10,000 mg a day. In acute poisoning, give 1,000-2,000 mg (preferably by injection) every 1½ or 2

hours. **Vitamin C is nontoxic, even in massive doses.**

Recommended: When you are well, take at least 2,000 mg daily. Nobel Prize winner Linus Pauling, an expert on vitamin C, said to take 2-9 grams daily, to maintain good health. Pregnant women should take at least 2,000 mg daily.

When you are sick: It has been proven that, when ill, taking a large dose of vitamin C at one time (say, 10,000-12,000 mg) is far better than taking smaller portions of that total amount over many hours. About 4 hours after taking a large amount, take another large dose. Many chronic conditions require ongoing high C dosage (such as diabetes, cataracts, glaucoma, cancer, Parkinson’s disease, plus many others). Keep in mind that supplements generally do not contain other substances (flavonoids and carotenes) which work to enhance the effects of vitamin C. So it is best that you eat lots of fresh fruits and vegetables.

Sources: The very richest sources are acerola, guavas, red sweet peppers, kale leaves, parsley, collard leaves, turnip greens, green sweet peppers, broccoli, Brussels sprouts, and mustard greens. Good sources are all fresh fruits and vegetables (especially green, leafy vegetables). Early explorers learned that, to avoid scurvy, they needed to eat oranges; lemons; limes; berries; or spruce tree needles, as the French explorer Cartier did in 1856.

Functions: Adele Davis said that vitamin C would cure every disease. That may be an overstatement; yet she was a deep student of nutrition as it relates to disease. **Vitamin C is involved in all vital functions of the body.** Needed for **production of collagen (“cell cement”)**, the main protein substance of the body, vitamin C literally holds your body together. This is because it is the basis of connective tissue, cartilage, tendons, etc.

Vitamin C is also **important in the manufacture of certain nerve transmitting substances and hormones, carnitine synthesis, and the absorption and utilization of other nutritional factors.** It is an extremely important antioxidant. It strengthens various immune functions by enhancing white blood-cell function and activity. It increases interferon levels, antibody responses, and secretion of thymic hormones. It also resists chemical stress factors, such as water and air pollutants. **It is needed by adrenal and thyroid glands; and it protects against all types of stress, physical and mental.** It is a

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natural antibiotic. Wonderful in dealing with **fevers and infections**. Used for **gastrointestinal problems** and treating **rattlesnake bites**. Counteracts **poisonous effects of drugs**. Extremely helpful in treating **asthma and other allergies, atherosclerosis, high cholesterol, high blood pressure, cataracts, Parkinson's disease, skin ulcers, wound healing, and pregnancy-related conditions**. It overcomes **cadmium poisoning**. **Cancer** patients should be urged to take lots of vitamin C. A book could be written on what vitamin C is able to do in your body to help you. It is vital in the treatment of a lengthy list of physical disorders and diseases.

Types of supplements. Vitamin C from the health-food store comes in several forms: powders, crystals, capsules, tablets, and time-release tablets. **Ascorbic acid is the most widely used and least expensive form.** It is usually made from corn. **Buffered vitamin C** has sodium, magnesium, calcium, or potassium in it in order to reduce the immediate acidity of the vitamin C in the mouth and stomach. But sodium ascorbate may not be good for you; since it is best to not eat much sodium. Then there is **"corn-free" vitamin C**, made from the sago palm. This also works well, and is for those who have problems eating corn products. **Ester-C** is a new, more expensive product which, it is claimed, absorbs more easily. However, tests reveal that this claim is not correct. Taking supplements containing **vitamin C and bioflavonoids** would be helpful; except that most do not contain enough bioflavonoids to increase absorption of the vitamin. **The level of bioflavonoids needs to be equal to or greater than the C content. For most people, plain ascorbic acid is the best;** by far it is the least expensive and with research-proven effectiveness.

Deficiency symptoms: Soft gums (pyorrhea), tooth decay, skin hemorrhages, anemia, slow healing of sores and wounds, capillary weakness, premature aging, deterioration in collagen, thyroid insufficiency. Also reduced resistance to infections, toxic effects of drugs, and environmental poisons. The classic symptoms of **scurvy** are **bleeding gums, poor wound healing, and extensive bruising;** also there is **susceptibility to infections, hysteria, and depression.**

Interactions: Bioflavonoids, calcium, and

magnesium are needed for vitamin C assimilation. Vitamin C works closely with other nutritional antioxidants, especially **vitamin E, selenium, and beta-carotene.** When a **combination of antioxidants** is given, the patient can more easily deal with cancer. Vitamin C **increases the absorption of iron, decreases the absorption of copper,** and interferes with the blood test for vitamin B₁₂.

Cautions: You cannot get too much vitamin C; the unneeded amount will cause slight diarrhea and be expelled. **Exposure to air destroys vitamin C;** so it is important to eat fresh foods as quickly as possible. Fresh, sliced cucumbers lose 49% of their C content within 3 hours. A sliced, uncovered cantaloupe in the refrigerator loses 35% within 24 hours. **There is the possibility of "rebound scurvy," which are physical problems caused by suddenly stopping high (500 mg or more) daily dosages.** This can especially be a concern to pregnant women; so they should terminate its use slowly. Research does not support the theory that high C intake causes calcium oxalate kidney stones. **Pollutants** (such as cigarette smoke) increase the need for vitamin C intake.

— SECTION THREE —

RECENT RESEARCH FINDINGS ON VITAMIN C

In this report, we will examine recent studies supporting the efficacy of high-dose vitamin C in preventing and fighting infections, improving endothelial function, reducing heart attack risk, promoting longevity, and enhancing cancer survival.

There is now abundant evidence in support of the benefits of high-dose vitamin C for **cardiovascular health**, in addition to its well-documented roles in **boosting immune health and fighting infections.**

Although easily overlooked and long taken for granted, high-dose vitamin C is something of a wonder food.

Definitive new research findings strongly attest to vitamin C's ability to **help prevent coronary heart disease, improve survival following cardiac events, and reduce the complications of heart attack.** Furthermore, vitamin C is a **potent antioxidant** capable of **protecting blood vessels from atherosclerotic damage;**

and substantial levels of vitamin C definitely **affect both survival and cardiovascular health.**

Vitamin C's health-boosting benefits go far beyond fighting the common cold and flu. In fact, nutritional scientists have discovered that this potent antioxidant is crucial in supporting the health of the **cardiovascular system, kidneys, bones, respiratory system,** and more. Vitamin C **suppresses cell damage** and **promotes immune health.**

Dr. Linus Pauling noted that vitamin C is a critically important water-soluble antioxidant because **it protects proteins and lipids from free radical damage associated with infection, intensive exercise, and other stressors that can injure cells** (1-3). These very properties make vitamin C a valuable agent for **improving immune function.** By **suppressing oxidative stress,** vitamin C **increases the life span of immune cells** and **reduces infection-related cellular damage** (4-7). This bolsters the immune system's ability to fend off a broad range of infectious agents.

Interestingly, research has clearly demonstrated that, **during times of infection, concentrations of vitamin C are rapidly depleted in the blood and in white blood cells.** Scientists have found that supplementation with vitamin C improves several important parameters of immune function. Therefore, supplementing with vitamin C during infection may protect immune cells and strengthen their ability to fight infectious pathogens (8).

Vitamin C helps prevent and fight infections. Vitamin C speeds recovery from infections; but, more important, it may also help to prevent the onset of infections. Study after study has shown that vitamin C can dramatically reduce infection time as well as boost one's resistance to infections. For example, studies of vitamin C supplementation in military personnel and other subjects living in close quarters have shown that **pneumonia** occurred a remarkable 80%-100% less often in subjects taking vitamin C than in those who did not supplement with the vitamin (9).

Similar **protection against the onset of infection has been observed in children** in developing countries who are highly vulnerable to

developing life-threatening infections. In this at-risk population, daily supplementation with up to 1,000 mg of vitamin C and **the mineral, zinc,** greatly reduced the likelihood of developing potentially deadly **pneumonia, malaria, and infection-related diarrhea** (8). In addition, supplementation with vitamin C **improved outcomes even when infections had already occurred.** The authors of this study suggested that vitamin C **helps strengthen children's resistance to infectious organisms.** Based on these findings, it is vital that young children receive appropriate supplementation with vitamin C.

Vitamin C helps to lengthen life span. Vitamin C's multifaceted effects in protecting against cardiovascular disease may be partly responsible for the strong association between optimal vitamin C intake and increased life span. For example, in a major study of more than 19,000 adults aged 45-79, subjects with the lowest plasma levels of vitamin C **were twice as likely to die over the course of four years compared to those with the highest levels** (15). Furthermore, rates of death from all causes and from cardiovascular disease decreased as vitamin C levels increased across the entire range of plasma vitamin C levels. Even controlling for age, blood pressure, cholesterol levels, cigarette smoking, diabetes, and supplement use, a rise in plasma vitamin C concentration equivalent to that of one fruit or vegetable serving daily was associated with about **a 20% reduction in risk of death from all causes.**

Similarly, a 10-year study from UCLA showed that in a population of more than 11,000 U.S. adults aged 25-74, men who took 800 mg of vitamin C daily **lived about six years longer** than men who took only 60 mg of vitamin C daily (16). Even after controlling for smoking, education, race, diseases, and other factors affecting survival, higher vitamin C intake in men still predicted lower mortality. Increased vitamin C intake was likewise associated with greater longevity in women. Higher vitamin C intake **reduced cardiovascular deaths by 42% in men and 25% in women.**

Rupturing of **atherosclerotic plaque (fatty buildup)** in the artery wall can have fatal consequences, including sudden death from a heart

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attack. Animal studies suggest that chronic vitamin C deficiency contributes to the formation of unstable arterial plaque that is more likely to lead to life-threatening cardiovascular events (17). This association suggests yet another example of how vitamin C's cardio-protective benefits may contribute to longer, healthier life spans.

Vitamin C intake has been found to speed resolution of upper respiratory tract infections in young people. Students who supplemented with hourly doses of 1,000 mg of vitamin C for six hours and then three times daily thereafter exhibited an extraordinary 85% decrease in **cold and flu** symptoms compared to those who took pain relievers and decongestants for their infectious symptoms (10).

These benefits of improved healing are not limited to children and young adults. Elderly patients that were hospitalized with **pneumonia or bronchitis** showed substantial improvement following supplementation with vitamin C (11). In a study of women with nonspecific **vaginal infection**, locally administered vitamin C significantly improved symptoms and **led to a reduction in bacterial count** (12).

Vitamin C's strength in countering bacterial infection was further demonstrated in a study of the dangerous breed of bacteria, known as *Helicobacter pylori* or *H. pylori*. Chronic infection of the stomach with *H. pylori* contributes to **gastritis, stomach ulcers, and even deadly gastric cancer** (13). In an epidemiological study, however, high intake of the powerful antioxidants vitamins C and E was associated with an astounding **90% reduction in the risk of developing stomach cancer** (14). Lending additional support to these findings is another study showing that infection with *H. pylori* was a major risk factor for gastric cancer in patients with low vitamin C intake, but not in those with high vitamin C intake (18). By protecting against infection with *H. pylori*, vitamin C may thus help to prevent potentially fatal **stomach cancer** as well as other painful gastrointestinal complications.

Vitamin C may even have an important role to play in the ongoing global battle to contain the ubiquitous **HIV virus** (19-21). For example, laboratory experiments indicate that high concentrations of vitamin C are **preferentially toxic to HIV-infected cells**, thereby promoting their destruction while sparing uninfected immune cells (21). In other laboratory studies of human immune cells, vitamin C helped suppress the HIV virus (19). Moreover, in a clinical study of HIV-infected patients, subjects with advanced immune deficiency who supplemented with high doses of vitamin C and the potent antioxidant *N-acetylcysteine* exhibited significant improvements in several measures of **immune system function** (20).

Vitamin C helps prevent and fight infection by **strengthening the body's natural defenses against disease-causing pathogens**. This is uncontested. Less recognized—but perhaps equally important—are the many other ways in which vitamin C supports optimal health.

Vitamin C protects the heart. There is increased research showing that higher vitamin C levels protect against **cardiovascular disease, America's leading cause of premature death**. Vitamin C may help support the **heart and vascular system** by protecting against **endothelial dysfunction, preventing heart attacks, and countering the dangerous oxidation of blood lipids**.

Scientists now know that one of the instigating factors in cardiovascular disease is the insidious process known as **endothelial dysfunction**, in which blood vessel walls become stiffer and less able to dilate in response to the body's need for increased blood flow.

While elevated levels of the amino acid homocysteine hasten endothelial dysfunction, scientists have discovered that pretreatment with vitamin C (**1,000 mg daily for one week**) **reduces oxidative stress and thus protects the delicate vascular endothelium from the damaging effects of elevated homocysteine** (22).

Similarly, researchers have found that while **eating a meal high in fat temporarily impairs endothelial function for up to four hours** in healthy individuals, pretreatment with the anti-

oxidant vitamins C and E prevent this impairment (23). Scientists have also shown that vitamin C may reduce **oxidative stress and subsequent endothelial dysfunctions** (24).

In a study of patients with coronary heart disease, vitamin C enhances the ability of **coronary arteries** to expand in response to a naturally occurring vasodilator (25).

Smokers often have a drastically impaired endothelium. Vitamin C has likewise demonstrated powerful effects against endothelial dysfunction caused by smoking. In one trial, subjects who received pretreatment with 2,000 mg of vitamin C had an impressive 59% reduction in a clinical measure with endothelial dysfunction (26). In a similar study, German researchers found that either short-term vitamin C infusion or long-term vitamin C treatment markedly increased blood flow to the heart muscle in smokers. In this same trial, long-term supplementation with vitamin C also **increased blood flow to the heart muscle in patients with high blood pressure** (27).

How does vitamin C protect endothelial cells? Although its precise mechanisms of action are not yet fully understood, researchers have discovered that vitamin C, at high doses, activates an enzyme that may be involved in reducing the oxidative stress that can contribute to endothelial dysfunction (28).

Several recent studies confirm vitamin C's strong protective effects against **cardiovascular disease**. In one trial, men in the highest third of vitamin C intake had **a remarkable 66% lower risk of coronary heart disease** than men in the lowest third—even after controlling for various cardiovascular risk factors (29). This result is all the more striking because many of the men studied were smokers.

In a meta-analysis of studies that followed subjects for more than 10 years, the use of **vitamin C supplements containing at least 700 mg of ascorbic acid reduced risk of coronary artery disease by 25%** (30). And in the largest, longest study to examine the association between vitamin C intake and heart disease risk, women who used vitamin C supplements had a **28% reduction in coronary heart disease** compared to women who did not supplement with the vitamin (31). In this massive Harvard Medical School study, which followed more than 85,000 female nurses for 16 years, higher vita-

min C intake predicted **lower heart disease risk**—even after adjusting for age, smoking, and other risk factors. A particularly striking finding from this study is that **women who did not use vitamin C supplements but instead obtained vitamin C exclusively from dietary sources did not experience significant protection against heart disease**. This led the Harvard scientists to conclude that **vitamin C supplements alone appeared to decrease the risk of coronary heart disease**.

Several recent studies suggest that ensuring optimal vitamin C status not only protects against cardiovascular disease, but also **greatly lessens the risk of suffering a life-threatening heart attack**.

For example, in a Finnish study of middle-aged men without evidence of pre-existing heart disease, men who were deficient in vitamin C were **3.5 times more likely to suffer heart attacks** compared to those who were not deficient in the vitamin, even adjusting for smoking and other pertinent risk factors. This led the researchers to propose that vitamin C deficiency, as assessed by low plasma concentration, is a risk factor for heart attack (32).

In another study, subjects in the highest quartile of vitamin C intake had a stunning **80% lower risk of heart attack** compared to those in the lowest quartile (33). Moreover, a British study found that **plasma vitamin C concentrations were dramatically lower in men who had just suffered their first acute heart attack** than in apparently healthy volunteers (34).

Maintaining optimal vitamin C levels may thus provide powerful protection against potentially fatal heart attacks.

In addition to helping prevent heart attacks, vitamin C may also **reduce damage to the crucial heart muscle following a heart attack** and decrease the incidence of further cardiovascular events.

For example, **in a large study of patients who had suffered an acute heart attack, supplementing with high doses of vitamins C (1200 mg daily) and E (600 mg daily for one month) significantly reduced the combined rate of death, new heart attack, and other severe complications by about 20%**. The researchers speculated that these potent antioxidants may have **helped to mitigate oxidative damage to the heart muscle caused by the heart attack**

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(35).

After an acute heart attack, the heart muscle's failure to pump blood effectively may cause dangerously low blood pressure, a condition known as cardiogenic shock. Blood concentrations of vitamin C and other critical antioxidants are diminished in patients with cardiogenic shock, suggesting that the heart muscle uses these antioxidants to counteract oxidative damage (36). **Depletion of antioxidants (including vitamin C) is also associated with failure to restore coronary blood flow following an acute heart attack** (37).

Several studies suggest that treatment with vitamin C, given alone or in combination with vitamin E, **may reduce complications and improve outcome after an acute heart attack**. Vitamin C may provide several benefits in this setting, such as **improving electrical conduction throughout the heart muscle** (38), **lowering levels of clotting factors that increase risk for stroke** (39), **reducing oxidative stress and inflammation**, and **preventing detrimental changes in heart shape and function** (40).

Research shows that vitamin C also **helps increase exercise tolerance after an acute heart attack** (41). In one study, taking 2,000 mg of supplemental vitamin C before exercise **helped improve exercise capability**. Scientists believe that vitamin C helps **relieve oxidative stress-related damage to the sympathetic nervous system** following a heart attack.

One type of damage that occurs after an acute heart attack is **ischemia-reperfusion injury**, in which areas of the heart muscle with blood supply being cut off are damaged when blood flow is restored. This type of injury is also associated with **angina chest pain** caused by coronary heart disease, and may contribute to aging and vascular disease (42). Because this type of cellular injury is thought to be caused by **free radical damage, antioxidants such as vitamin C may be protective**, as demonstrated in a score of animal studies (43-46).

Clinical and experimental research suggests that vitamin C may protect against other diseases of the heart and blood vessels, including atrial fibrillation (**irregular heart beat** that increases the risk of stroke), dilated cardiomyopathy (an **enlarged, weakened heart**), **congestive heart failure**, and **impaired blood flow**

regulation (54-57). Vitamin C may confer other additional benefits to heart disease patients through **its effects in supporting healthy body weight** (58-61).

Vitamin C increases cancer survival. In battling cancer, some patients invariably exhaust all available treatment options—such as drugs, surgery, and radiation. Scientists are now investigating nutritional remedies that may benefit such patients. Researchers recently reported that administering high-dose, intravenous vitamin C to **several patients with advanced terminal-stage cancer led to unexpectedly long survival times**. While further studies are needed, these findings support earlier reports showing that high-dose vitamin C, administered either orally or intravenously, **helped improve symptoms and prolong life in cancer patients** (47).

Avoids kidney damage. Kidney impairment is exceedingly common, often undetected, and may lead to permanent damage of the kidneys' filtering apparatus. Nutritional scientists report that vitamin C may help **prevent or halt the progression of kidney impairment related to scarring of the kidneys' blood vessels**. This finding may be **particularly important for diabetics** who are especially prone to this type of kidney damage (48).

Helps asthmatics. Cases of asthma have dramatically increased in recent years. Scientists have observed that adults with chronic asthma are frequently deficient in vitamin C; **asthma-free subjects, by contrast, demonstrate healthy levels of vitamin C**. Optimizing vitamin C status in those prone to asthma could thus be crucial to supporting their freedom from this debilitating condition (49).

Helps build healthy bones. Yet another benefit of vitamin C appears to be **its ability to increase bone density**. Scientists recently correlated increased dietary intake of fruit rich in vitamin C with greater bone mineral density in both younger and older people (50). This finding lends support to earlier reports, that vitamin C intake is associated with markers of increased bone formation and that its intake from adolescence onward may play an important role in **helping to prevent osteoporosis** (51).

Fights herpes simplex infection. The herpes simplex virus can lead to recurring, painful lesions of the skin and mucous membranes.

Researchers have reported that nutritional therapies, including vitamin C, may **help to speed the resolution of herpes simplex lesions and prevent their recurrence** (52).

Prevents abnormal heart rhythm. Many people are affected by **atrial fibrillation**, a heart rhythm abnormality that increases the risk of stroke. Researchers have proposed that oxidative stress may play a part in this abnormality, thus suggesting a therapeutic role for antioxidants. Exciting preliminary studies suggest that vitamin C **may help avert atrial fibrillation, possibly through its ability to help quench oxidative stress** (53).

Reduces dangers of blood lipids. Scientists long ago discovered that **high levels of low-density lipoprotein (LDL) are important predictors of coronary heart disease risk.** The chemical state of these lipids, however, also affects risk. For example, a recent report showed that **LDL oxidation increased risk for coronary heart disease by an astonishing 14-fold**, especially in patients 60 years of age or younger (62). Chemical testing indicates that high doses of **vitamin C can block dangerous blood lipid oxidation by about 75%** (63).

Research findings show that daily supplementation with a mixture of vitamin C and other antioxidant nutrients **can reduce lipid peroxidation following a heart attack**, suggesting that antioxidant supplements may be valuable for patients with a history of cardiovascular disease (64). One analysis suggests that **vitamin C may in fact be even more beneficial than other commonly used antioxidants in protecting against lipid oxidation** (65).

In animal studies, **vitamin C deficiency has been linked to high cholesterol; and high doses of vitamin C have been shown to promote the breakdown of cholesterol.** Thus, in animals, vitamin C helps to lower blood cholesterol. While further studies are needed to assess whether these intriguing effects may hold true in humans (66-68), a study from 2005 showed that, like cholesterol-lowering statin drugs, vitamin C reduced the activation of receptors that are involved in arterial wall inflammation, a crucial step in triggering the formation of atherosclerotic plaque. This finding led the scientists

to note that vitamin C may share some common mechanisms of action with statin drugs, and deserves further investigation of its role in treating coronary heart disease (69).

Additional research suggests that administering **an extract of citrus fruit along with vitamin C may boost vitamin C's ability to combat lipid oxidation and promote healthy blood lipid levels.** While rich in vitamin C, citrus extract also contains health-promoting compounds, known as flavonoids; and **the combination of vitamin C and citrus flavonoids may be more beneficial than either agent alone in supporting cardiovascular health** (70).

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— SECTION FOUR —

THE RESEARCH FINDINGS OF FREDERICK R. KLENNER

INTRODUCTION

Frederick Robert Klenner (October 22,

1907 – May 20, 1984) was an American medical researcher and doctor in general practice in Reidsville, North Carolina. From the 1940s on he experimented with the use of vitamin C megadosage as a therapy for a wide range of illnesses, most notably polio. He authored 27 research papers during his career. He was one of the originators of orthomolecular medicine, but his work remains largely unaddressed by established medicine. Klenner is the subject mentioned or referred to in a number of orthomolecular medicine related papers and articles.

Born in Pennsylvania, Klenner graduated from Duke University, School of Medicine in 1936. After three years of hospital training, he entered private medical practice in Reidsville, North Carolina. He continued to work there all his life.

In 1946, in Reidsville, North Carolina, he delivered the "Fultz Quadruplets," the world's first recorded set of identical black quadruplets and the first quadruplets to survive in the Southern United States. He subsequently brokered a 'corporate adoption' by Pet Milk, a Saint Louis dairy, which provided a foster home, foster care, living expenses, a 147-acre (0.59 km²) farm, clothes, medical and dental care in return for promotional rights. All were born under Klenner's noteworthy high vitamin C maternity regimen for over 300 births.

His main subspecialty was diseases of the chest; but **he became interested in the use of very large doses of vitamin C in the treatment of a wide range of illnesses. Many of his experiments were performed on himself. In 1948, he published his first paper on the use of large doses of vitamin C in the treatment of virus diseases.**

In 1949, Klenner published and presented a paper to the American Medical Association, that detailed the complete cure of 60 out of 60 of his patients with polio, using intravenous sodium ascorbate injections. Galloway and Seifert cited Klenner's presentation to the AMA in a paper of theirs. **Generally, he gave 350 to 700 mg per kilogram body weight per day.**

He described giving up to 300,000 milligrams (mg) per day of neutral pH sodium ascorbate. This is a form of vitamin C which is not acid. Klenner published 27 medical papers. Most of these were about **vitamin C applications for over 30 diseases; two were about treatment of severe neuropathies, including multiple sclerosis,** using aggressive supplementation (8). He wrote a 27th paper approximately

in 1980, an unpublished update about **MS treatment**. It was posthumously summarized by Lendon Smith in the *Clinical Guide to the Use of Vitamin C*.

Lendon Smith's summary, which reviews all 27 research papers on vitamin C by Dr. Klenner, immediately follows this introductory biography.

Dr. Klenner's maxim: The patient should "get large doses of vitamin C in all pathological conditions while the physician ponders the diagnosis."

He inspired Linus Pauling and Irwin Stone to expand the research on the wider benefits of vitamin C. In the foreword of the *Clinical Guide*, Linus Pauling wrote: "The early papers by Dr. Fred R. Klenner provide **much information about the use of large doses of vitamin C in preventing and treating many diseases**. These papers are still important."

SOME OF KLENNER'S PUBLICATIONS

Fred R. Klenner, M.D. (1948): *Virus Pneumonia and Its Treatment with Vitamin C*.

Klenner, Frederick Robert, MD. (1949): *The Treatment of Poliomyelitis and Other Virus Diseases with Vitamin C*.

Fred R. Klenner, M.D. (1953): *The Use of Vitamin C as an Antibiotic*.

Klenner, F. (1971): *Significance of High Daily Intake of Ascorbic Acid in Preventive Medicine*. Journal of the International Academy of Preventive Medicine, Spring 1974. Volume 1, Number 1, pp. 45-69.

Klenner, Frederick Robert, MD, F.C.C.P. (winter 1971): *Observations on the Dose and Administration of Ascorbic Acid When Employed Beyond the Range of a Vitamin*. Human Pathology Journal of Applied Nutrition. Vol. 23, Nos. 3 & 4.

Klenner F. (1973): *Response of Peripheral and Central Nerve Pathology to Megadoses of the Vitamin B Complex and Other Metabolites*. Journ. of Applied Nutrition. pp. 16-40.

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Robert Landwehr: *The Origin of the 42-Year Stonewall of Vitamin C*. J Orthomolecular Med, 2002. Vol. 6, No. 2, pp. 99-103.

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— SECTION FIVE —

THE CLINICAL EXPERIENCES OF FREDERICK R. KLENNER, M.D., ABBREVIATED, SUMMARIZED, AND ANNOTATED BY LENDON H. SMITH, M.D.

[The present editor has placed key points in bold type and added some bracketed material for additional clarification. vj]

PREFACE BY DR. SMITH

After Frederick Klenner died in 1984, his friend (and mine), Arthur Rybeck, a nutritionally oriented dentist practicing in Wheeling, West Virginia, asked if I would be interested in going over the 27 papers Klenner had written from the early 1940s to the early 1970s. The whole idea would be to let the world know how thoughtful and careful a researcher he was, and to encourage others to continue his work. **If a compendium of vitamin C and other nutritional therapies could be compiled from the published work of Dr. Klenner, maybe we could get more traditional medicine-oriented doctors to use his methods for the relief of sickness and suffering.**

Standard doctors tend to believe studies and reports if published, but tend to disbelieve hearsay stories about treatments that patients have read in a "health" newsletter.

I have used Dr. Klenner's methods on hundreds of patients. He is right. It helps almost every condition and situation; and my failures were due to inadequate amounts.

The timing of such a paper might be most appropriate. Doctors are suffering from low public esteem because they are perceived to be money-grabbing and mistake-laden. This would be a scientifically documented therapy (from the medical literature) for **a variety of conditions: cardiovascular, allergies, infections, malabsorption, and even AIDS, for which prescription drugs may be hazardous.** Now the doctors can say, "We have a safe, reasonably natural way of treating your condition that is fairly cheap. We might just keep you out of the hospital."

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Continued from the preceding tract in this series

That last part might make the insurance carriers perk up their ears. The patients might dash back to the doctors' offices because the word is getting out that doctors are helping people without side effects. Also notice the dates on these articles and references. These things were known decades ago.

Take this booklet to your M.D. and suggest that he read about these documented studies. Take Dr. E. Cheraskin's "Vitamin C Connection" along for further documentation. If your doctor doesn't know, how can he help you?

FOREWORD BY LINUS PAULING, PH.D.

The early papers by Dr. Fred R. Klenner provide **much information about the use of large doses of vitamin C in preventing and treating many diseases.** These papers are still important. Dr. Lendon Smith has done a valuable service in making the work of Dr. Klenner available to the public.

INTRODUCTION

I have before me the published words of Frederick Robert Klenner, B.S., M.S., M.D., F.C.C.P., F.A.A.F.P. He graduated from Duke University, School of Medicine back in 1936. After three years of hospital training, he entered the private practice of medicine in Reidsville, North Carolina. His main subspecialty was diseases of the chest; but **he became interested in the use of massive doses of vitamin C in the treatment of virus diseases and other illnesses** as well. He inspired Linus Pauling and Irwin Stone to expand the research on the great benefits of vitamin C. Dr. Klenner died in 1984.

What follows is a review, an abbreviation, a summary, and a critique of the 27 scientific papers he wrote. In the light of the recent developments and research in the use of vitamin C, it is essential that the roots of its usage be reviewed. Briefly, **vitamin C does attenuate most virus infections by aiding the production of interferon. It controls many cancers, relieves some depression, modifies much pain, and changes the course of many diseases (like multiple sclerosis and amyotrophic lateral sclerosis), spider bites, the bites of poisonous insects and reptiles. The watchword is, "If in doubt, give**

vitamin C."

GENERAL REMARKS

Dr. Klenner believed in the healing power of nature; he believed that natural remedies could enhance that power and were safer and usually more effective than drugs. Hippocrates said, "Of several remedies the physician should choose the least sensational." Vitamin C fills that criterion.

In 1948, he published his first paper on the use of large doses of vitamin C in the treatment of virus diseases. In 1960, he realized, **"Every head cold must be considered as a probable source of brain pathology." Hold on to this thought; it is significant for the understanding of diseases like multiple sclerosis.** He also felt—as do Archie Kalikarinos and Glen Dettman of Australia—that **the dreaded Sudden Infant Death Syndrome was basically a vitamin C deficiency.**

His maxim: The patient should "get large doses of vitamin C in all pathological conditions while the physician ponders the diagnosis."

We have misled ourselves with the mistaken notion that all C was supposed to do was keep us from **scurvy. If, however, we base our needs on the amounts other mammals manufacture with their intact enzyme systems, it comes to 2-4 grams daily in the unstressed condition. Under stress, 70 kg of rats make 15 grams of vitamin C** [Burns, Salomon, Conney].

We are willing to accept the premise that some of us are born with genetic defects that lead to problems that can be somewhat controlled with diet and supplements (*i.e.* phenylketonuria, galactosemia, alkaptonuria, and pernicious anemia). Can't we accept the fact that we all have a genetic deficiency of the enzyme, l-gulonolactone oxidase, and have to take vitamin C for health, even for life? [Burns, 1959].

Irwin Stone calls this human genetic lack, this inability, *hypoascorbemia*.

The point that Dr. Klenner is making: **"The physiological requirements in man are no different from other mammals capable of carrying out this syntheses."** If one is anemic due to poor iron intake, is it cheating to swallow iron tablets for a while? If you are hypoascorbemic because

you cannot manufacture vitamin C from sugar, extra glucose in your diet will not help; you need to take vitamin C.

He reports that one of the Pilgrim Fathers wrote to a friend in England in 1621: **“Bring juice of lemon, and take it fasting. It is of good use.”**

Folklore has revealed to us what natural remedies have been helpful and even curative. We have been lured into the trap of modern medicine which prescribes a drug for every condition. But consider **acerola**: Puerto Rican legend has it that if the tree bearing this fruit is in one’s backyard, colds will not enter the front door. This fruit bears 30 times the amount of C in oranges. Dr. Klenner credits [the herb] **Boneset** with the health of the Klenner family during the great influenza pandemic of 1918. This plant was made into a tea, bitter but curative. He assayed the tea for vitamin C; they were getting 10-30 grams at a time!

The small amount of vitamin C recommended by the RDA (75 mg-90 mg) is not the amount needed to maintain good health. Dr. Klenner quotes Kline and Eheart, who in 1944 realized **there are wide variations in the need for vitamin C in otherwise “normal” individuals.** In 1945, Jolliffe suggested that **the optimum requirements might be more than 10 times the small doses recommended.**

Scurvy develops slowly. Crandon, in 1940, found that the vitamin C level of the blood plasma fell to zero for 90 days before there was obvious clinical evidence; this was as long as 132 days before the first signs appeared.

HOW IT WORKS

How does vitamin C work?

As an oxidizing agent, massive amounts (*i.e.*, **5-150 grams, intravenously, for certain pathological conditions**), if allowed to run in rapidly (20 gauge needle), act as a “Flash Oxidizer” and may correct the condition in minutes. It can be a reducing agent. **It neutralizes toxins, viruses, and histamine.** The more serious the condition, the more C is required.

It appears that **vitamin C acts as a reducing agent, an oxidizing agent, an anticlotting agent, an antihistamine, and as an anti-infective agent.**

Klenner summarized the function of C in poliomyelitis:

- **Ascorbic acid (vitamin C) destroys the polio virus.**

- It dehydrates the brain and the spinal cord safely.

- It supports and normalizes the stressed adrenal glands.

- It preserves the lining of the central canal, and maintains more regular spacing and less crowding of ependymal cells (surface cells of the spinal cord).

- Ascorbic acid enters all cells. **It “proceeds to take up the protein coats being manufactured by the virus nucleic acid, thus preventing the assembly of new virus units.”** Cells expand, rupture, and die; but **there are no virus particles available to enter and infect new cells. If a virus has invaded a cell, the vitamin C contributes to its breakdown** to adenosine deaminase, which converts adenosine to inosine. **Purines are formed which are catabolized (broken down) and cannot be used to make more virus nucleic acid.**

Viral nucleic acid has a protein coat which protects this parasite as it rides the blood or lymph highway to gain specific cell entry. It is possible that, if the ascorbic acid can remove that protective protein coat in the bloodstream or in the cells, the white cell phagocytes and immune globulin could then neutralize these vulnerable virus particles.

I like this from Dr. Klenner: “Ascorbic acid also joins with the available virus protein, making a new macromolecule which acts as the repressor factor.” Multiplication of new virus bodies are inhibited.

He summarizes the study of *Lojkin (1937)*, who discovered the inactivation of one virus was due to a specific intermediate product formed in the course of the oxidation of C but needed the stimulation of copper ions. It is a peroxide; and it is decomposed as rapidly as it is formed. This study indicates why vitamin C works better in the body and not the test tube. **Every function of the body requires enzymes, some vitamins, and some minerals to act as coenzymes. If enough vitamin C is supplied, the enzyme system that breaks down, invading viruses and bacteria, will be able to do its job properly.**

Quote by Dr. Klenner: **“Unless the white blood cells are saturated with ascorbic acid, they are like soldiers without bullets.”**

Vitamin C *in vitro* at body temperature inactivates certain toxins at an unbelievable rate. Back in 1938 some researchers [Klegler] placed vitamin C in test tubes with toxins. After

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incubation for 48 hours, the toxins were not lethal to mice when injected. **The more toxin in the tube, the faster the C disappears.**

“The rate of disappearance of the C in toxin and ordinary broth was more striking the greater the concentration of vitamin C.” Dr. Klenner concluded: “The degree of neutralization in a virus infection will be in proportion to **the concentration of the vitamin and the length of time which it is employed.**”

This has been Dr. Klenner’s main complaint: **Failure to benefit from vitamin C use is usually due to inadequate amounts being used for too short a period of time.**

Vitamin C combines directly with the toxin/virus [toxic substance or virus, whichever it may be]. **This new compound is oxidized by vitamin C. As a result, the toxin/virus and the vitamin C are destroyed. This must be why C has to be continued after the apparent cure.**

It acts as a respiratory catalyst, **aiding cellular respiration** by acting as a hydrogen transport. **The liver has a better chance of detoxifying the bloodstream of poisons, toxins, viruses, and bacteria if the plasma is saturated with vitamin C.**

Fever, toxins, and bacteria reduce the level of C. Therefore, Dr. Klenner theorizes, **if a high level of C is maintained, all tissues return to normal despite the fever and the bacteria;** and, because of its action “as a respiratory catalyst, **it enables the body to build up adequate resistance to the invader.**”

The anaerobic condition in the tissue [lack of oxygen] is relieved. Acidity is decreased and large amounts of Adrenaline disappear. **The constriction of the blood vessels ceases; and the liver and pancreas can receive the proper nutrients to function.**

Properly calculated doses of C on a continuing basis will restore the normal physiology of the body.

The adrenals and vitamin C are interrelated. **During an infection, vitamin C is absent from the urine and is decreased or absent in the blood,** even when moderate amounts are being given intravenously. Vitamin C in the adrenal glands was greatly reduced in animals succumbing to polio. (*Dr. Klenner cites the literature of 1934-1935 to document this.*) Hans Selye knew how the adrenals would show damage with stress. He found that all patients ill with a vi-

rus would show petechial hemorrhages (small leaks of blood into the skin [because the capillary walls become thinner]) when a tourniquet was applied in order to increase venous back-pressure. **Capillary weakness is a sign of low levels of vitamin C. Sugar in the urine,** associated with the petechiae, **disappeared when adequate serum levels of vitamin C were obtained.**

It is known that **vitamin C regulates the inter-cellular substance of the capillary wall. The collagen of all fibrous tissue structures is dependent on an adequate level of vitamin C.** Increased capillary fragility is observed in individuals when the blood level of C drops to 1 mg per liter. These weak capillary walls may allow a simple virus to invade the brain.

In addition, **vitamin C acts as catalyst in the assimilation of iron.**

(Ascorbic acid is a necessary coenzyme in the metabolic oxidation of tyrosine. The latter is necessary to break down protein to a useable amino acid.)

Dr. Klenner states, “The importance of vitamin C as an antibiotic and as the precursor of antibody formation lack scientific appreciation because of its simplicity.” [Dr. Klenner is being kind. The medical community rejects vitamin C as a healing agent because it would heavily reduce the sale of medical drugs.] The reluctance of the medical profession to employ it in massive doses like antibiotics has allowed the appearance of **allergies** as a major problem. [When vitamin C is given in sufficient amounts daily (for example, a level teaspoonful of vitamin C powder twice a day), allergies will disappear.]

Vitamin C is known to be essential for life. Dr. Klenner quotes the studies showing that, when vitamin C is given intravenously to patients with a deficiency, **fibroblasts begin to form connective tissue and capillary buds invade blood clots within just a few hours.** In a similar time frame **when used as an antibiotic, fever falls and the white blood-cell count climbs.**

Dr. Klenner points out that the standard treatment of colds was based on the alkalinizing effect of forcing juices down the patient’s throat. Highly alkaline urine has less vitamin C. The vitamin C would be thus retained in the tissues, helping to guard against the viruses and bacteria. [Dr. Smith is trying to say that, **when diluted fruit juice is given with vitamin C,**

the C will remain in the body longer without being excreted as quickly.] When vitamin C levels drop, glycogen in the liver is converted to glucose, a response to stress.

Dr. Klenner is convinced that **C will work in any problem; but the negative results reported are only because an insufficient amount was used.** A tragic error in judgment has been made by the *National Academy of Science* and the *National Research Council* in the minimum daily requirement for C which they specify as needed for proper health. **All of us need more vitamin C; some need a lot more.**

The following factors indicate the need for an increased amount of vitamin C:

- age / • habits, alcohol, drugs, tobacco
- sleep, especially if drugged / • trauma of infection, of physical injury, of work, of emotions, of surgery / • kidney threshold / • environment / • physiological stress / • climate changes / • loss of C in stools / • absorption / • binders in tablets / • individual difference in body chemistry / • drugs, pesticides, carbon monoxide exposure / • weight / • poor storage.

Klenner quotes the *Food and Life Year Book, 1939*, published by the U.S. Department of Agriculture (surely as conservative and orthodox a group as one could ever find):

“Even when there is not a single outward symptom of trouble, a person may be in a state of vitamin C deficiency more dangerous than

scurvy itself. When such a condition is not detected, and continues uncorrected, **the teeth and bones will be damaged.** And, what may be even more serious, **the bloodstream is weakened to the point where it can no longer resist or fight infections** not so easily cured as scurvy. Five grains of aspirin will not relieve kidney colic; **don’t expect control of a virus with [only] 100 to 400 mg of C.”**

The remainder of this report on Dr. Klenner’s research findings is included in a book reprint of this research report, *The Healing Power of Vitamin C*, published by Harvestime Books.

The rest of Dr. Lendon Smith’s analysis of the findings of Dr. Frederick R. Klenner’s vitamin C research is primarily about injected dosages of vitamin C for various diseases. Physicians will find this information of special interest. Yet much information of value to the layman will be found there.

It should be kept in mind that (in the portion omitted from this present tract set) Dr. Klenner, himself, said, **“If the C is taken from the ampoules and swallowed in some juice, it will have about the same results as if it had been injected.”** According to this, the vitamin C can be swallowed in juice with very similar healing results as if it had been injected from an ampoule into a vein or muscle.

“Since the laws of nature are the laws of God, it is plainly our duty to give these laws careful study. We should study their requirements in regard to our own bodies.”—6 *Testimonies*, 369.

“To keep the body in a healthy condition, in order that all parts of the living machinery may act harmoniously, should be a study of our life.”—EGW, *Christian Temperance and Bible Hygiene*, 53.

“God has formed laws which govern our constitutions, and these laws which He has placed in our being are divine, and for every transgression there is affixed a penalty, which must sooner or later be realized. The majority of diseases which the human family have been and still are suffering under, they have created by ignorance of their own organic laws. They seem indifferent in regard to the matter of health, and work perseveringly to tear themselves to pieces, and when broken down and debilitated in body and mind, send for the doctor and drug themselves to death.”—EGW, *Health Reformer*, 1866.