

Vitamin C 500 mg Tablets



Product Summary:

Help your immune system fight colds with vitamin C! Vitamin C provides immune system support and promotes wound repair, strong bones and teeth, and healthy gums. As important as it is for so many aspects of health, vitamin C cannot be stored by, or produced within, the body. While many foods contain vitamin C, most people add a vitamin C supplement to their diet to ensure adequate dietary intake.

Properties/Uses:

The claim as approved by the *Natural Health Products Directorate* (NHPD): An antioxidant for the maintenance of good health. Vitamin C is a factor in the normal development and maintenance of healthy bones, cartilage, teeth and gums.



GENERAL HEALTH
& WELLNESS



Pharmacology:

Vitamin C is first remembered as a cold fighter and immune system booster. This is undoubtedly due to the efforts of the late Dr. Linus Pauling, whose book, *Vitamin C and The Common Cold*, altered the public awareness of vitamin C, casting it as a cold remedy. All of the mechanisms by which vitamin C works are not known, but when given the opportunity, immune cells “gobble-up” vitamin C, maintaining 20 to 100 times the concentration of vitamin C that is in the blood stream.¹ Since the 1970s, 20 double-blind clinical studies have demonstrated that vitamin C fights colds by reducing the severity and duration of the cold.²

Vitamin C is used to enhance immune competence¹ and the production of quality collagen.³ It also participates in the antioxidant network;¹ Vitamin C is also used for allergies, cataracts, diabetes, atherosclerosis prevention, and to lower blood pressure.⁴ Its primary function is collagen production – the main protein for body structure.

An epidemiology study published in 1997 further reveals the broader health enhancement role of vitamin C. 12,000 people were followed for over 10 years, looking at the effects on health by different levels of vitamin C intake. The participants were divided into three groups: those who consumed 0-50 mg of vitamin C per day from food, those who consumed 50 mg or more from food per day, and those who regularly supplemented vitamin C in excess of 50 mg per day. The researchers found that those who consumed more than 50 mg of vitamin C per day achieved the greatest health benefit, with the lowest risk of death by heart disease and cancer, and mortality in general. In the analysis of the data, it was found that men who consumed 300 mg of vitamin C daily had a 45 % lower risk of heart disease than those who consumed only 49 milligrams daily.^{1,5}

Vitamin C provides a reduced risk of cardiovascular disease through its antioxidant effect, by lowering total cholesterol and raising HDL, by helping to lower blood pressure, and by inhibiting platelet aggregation.⁶

There is considerable epidemiological evidence that vitamin C plays a significant role in cancer risk reduction. It provides an antioxidant effect, thus protecting cellular structures, and DNA in particular. Vitamin C mitigates many metabolic risk factors for cancer including detoxification of environmental pollution that reduces critical exposure to carcinogens.^{7,8}

Asthmatics and those with allergies can benefit from supplemented vitamin C by virtue of its antioxidant and antihistamine effects. Vitamin C inhibits excessive histamine release from neutrophils and enhances the detoxification of histamine, as well as neutrophil chemotaxis, and thus the removal of offending allergens.^{9,10}

Smokers lose a considerable amount of vitamin C due to oxidative stress in the lungs and else where in the body. Smokers would benefit from 1000 to 3000 mg per day depending on the extent of smoking, to compensate vitamin C losses in the lungs



and other smoke affected tissues. The lungs are endowed with one of the highest concentrations of vitamin C found in the body, thus demonstrating the need to meet atmospheric oxidative stress head on. How much more will be the oxidative stress due to smoking, with its numerous free radicals.

Cataract risk reduction is afforded by vitamin C, preventing photon generated oxidation of lens protein fibers. As early as 1939, Bouton showed that supplementing with 1000 mg per day was able to arrest for 11 years further cataract formation. Some had already had cataract surgery.¹¹

Vitamin C is a major player in lowering the risk of diabetic complications. In diabetes, vitamin C competes with glucose for cellular uptake and glucose usually wins. The net effect is less intracellular vitamin C, which is the principal free-radical modulator. Free-radical damage contributes to insulin resistance, a major perpetuating factor in type II diabetes, and a factor in advanced type I diabetes. Other complication factors of intracellular vitamin C deficiency include increased capillary permeability, poor wound healing, elevations of cholesterol, and depressed immune function. Profound risk of decline stems from intracellular sorbitol build-up, due to the nature of the disease, which accelerates diabetic cataract formation and other tissue declines. In the grand scheme of things, sorbitol is a major driving factor in diabetic complications, and aggressive vitamin C supplementation is paramount to slowing it, unless there are medical reasons to maintain lower vitamin C intake.^{1,2}



Manufactured product information:

Manufacturer:

WN Pharmaceuticals Ltd.

Size/UPC:

120's 7 77747 10322 5

NPN:

80003328

Expiry Date:

36 months from date of manufacture

Active Ingredient:

Each tablet contains:

Vitamin C (Ascorbic Acid)500 mg

Non-Medicinal Ingredients (in descending order):

Microcrystalline cellulose, magnesium stearate

Appearance:

White to off white round tablet.

Packaging:

225 cc white round bottle with safety seal under a 45 mm white induction sealed cap with vented interior seal and a label applied to the bottle. Lot number and expiry date are printed on label applied to exterior of bottle.

Storage:

Preserve in tight, light resistant containers at a temperature between 15 – 25°C.





Dose:

The Recommended Dietary Allowance (RDA) values are listed below by age:¹²

Age.....	Milligrams/Day
1-3 years.....	2.2 - 400
4-8 years.....	2.2 - 650
9-13 years.....	2.2 - 1200
14-18 years.....	6 - 1800
Adults.....	6 - 2000

A broad base of nutritionally oriented health care providers generally agree on a recommended range of 250 mg to 1000 mg per day, preferably in divided amounts of no more than 250mg, with meals to enhance absorption.¹³

In adults, the acute phase of an infection can be treated with 1000 mg to 8000 mg per day to shorten the course of the infection. High dose supplementation later in the illness appears to be less productive and the usual daily maintenance amount will suffice.¹³ In children, recommend a body-size proportional amount if that conforms to the physician's guidance.

Diabetics will benefit from 1000mg to 3000 mg per day in divided amounts to overcome a critical intracellular vitamin C deficiency.

Children not only face considerable stress like adults, but also are dynamically growing and are probably immune challenged on a consistent basis so that white blood cells need a goodly supply of vitamin C. Vitamin C needs in growing children is difficult to state, but a rational increase over the RDA can be recommended to parents, and especially for children who do not eat fruits and vegetables well. Furthermore, modern day high sugar intake seen in so many children can suppress immunity, making vitamin C an important compensating factor. It is important to be rational about childhood increases in vitamin C in general, and during infections. Use the child's body size to evaluate a proportional childhood amount of the recommended adult optimal intake range of 250 to 1000 mg per day, with suitable augmentations during infection episodes.

Directions:

(Adults): 1 – 4 tablets daily or as recommended by a physician.





Caution:

The caution as approved by the *Natural Health Products Directorate* (NHPD): KEEP OUT OF THE REACH OF CHILDREN. STORE AT ROOM TEMPERATURE IN A DARK, DRY PLACE. DO NOT USE IF SEAL UNDER CAP IS BROKEN OR MISSING.

Deficiency Symptoms:

Vitamin C deficiency results in connective tissue scorbic pathology (scurvy). However, a concept of optimal daily amounts recognizes a greater daily need in order to cope with the invisible stresses of modern life that can and do lead to vitamin C deficits in terms of the multiplicity of roles performed by vitamin C beyond connective tissue needs. Consuming optimal amounts of vitamin C aggressively perfuses tissues in order to facilitate optimal expression of vitamin C metabolism, as it is required.¹⁴ Low vitamin C levels can result in a reduced immune system efficiency.

Drug Interactions /Contraindications:

There is a possible interaction between vitamin C and aspirin, with increased excretion of vitamin C when dietary vitamin C levels are low in those who regularly use aspirin.¹⁵

Daily vitamin C supplementation (1000 mg) may increase blood levels of estrogen, impacting on birth control and HRT medications, and increasing the risk of estrogen related cancers. Side effects may become more noticeable. This interaction is controversial and may not be significant.¹⁵

Large daily doses (5 grams) of vitamin C may interfere with the effectiveness of blood thinners like coumadin.¹⁵

Stomach acid-lowering drugs may allow bacteria to produce the carcinogen, nitrosamine, from dietary nitrite, which can lead to gastric cancer. Vitamin C is known to block gastric nitrosamine production.¹⁵

Regular large consumption of alcohol effectively reduces vitamin C absorption.¹⁵

Chewable vitamin C may contribute to dental enamel erosion. Vitamin C enhances iron absorption. This may present an added risk for those who suffer hemochromatosis, and for age-related iron overload in men, women with an early hysterectomy, and post-menopausal women. It may be necessary for some individuals to consume their vitamin C between meals to minimize dietary iron uptake.¹⁶





Vitamin C should be supplemented with vitamin E. Vitamin C can be converted into a pro-oxidant due to its interaction capability with tissue free iron or copper, but copper presents a lesser risk. In men, and postmenopausal women, as well as women who have received a hysterectomy, free iron accumulation is an age-related problem. Vitamin E acting as an antioxidant helps to ameliorate this risk.¹⁶

Patients with kidney disease, gout, a history of kidney stones or on hemodialysis, should consult their physician for dosage information on vitamin C.¹⁶

Since vitamin C enhances iron absorption, its supplementation should be provisionally contraindicated in hemochromatosis until the user has been guided by their physician on how much and how to use vitamin C.¹⁶

Toxicity/Adverse Reactions:

Vitamin C has consistently been found to be a safe nutritional supplement when used within the recommended optimal dosage range stated above. When absorption capacity is exceeded or tissues are saturated, diarrhea and intestinal gas and/or distention usually result, if the unabsorbed dose exceeds ones capacity to accommodate acidic vitamin C in the intestinal tract.^{2,13} If high doses are deemed to be essential, they should be introduced more gradually and taken with food. High doses of vitamin C appear to be better tolerated at times of acute sickness or when under increased stress loads, when tissue levels are being expended.

Even with high amounts, the blood levels of vitamin C do not exceed 1.5 to 2.0 mg/dl because of decreased absorption and increased kidney excretion.¹³ The primary medical concern with high amounts of vitamin C (> 10 grams per day) is the possible development of calcium oxalate kidney stones. This is a particular concern for those already suffering recurrent kidney stones, those on hemodialysis, and in those suffering from kidney disease, or even gout. However, vitamin C up to 10 grams per day has been shown not to increase urinary oxalate levels.^{17,18}

In children, large amounts of vitamin C disproportional to body size may cause nausea and diarrhea, and lead to red blood cell hemolysis and reduced white blood cell bactericidal activity.¹³



Allergen Content/Ingredient Sensitivity:

NO	YES
Artificial Colors	
Artificial Flavors	
Artificial Sweeteners	
Corn Products	
Egg Products	
Fish	
Gluten	
Hydrolyzed Plant Protein	
Lecithin	
Milk Products	
Peanuts	
Preservatives	
Sesame Products	
Shellfish	
Soy Products	
Starch/Modified Starch	
Sulphites (<10 ppm)	
Tartrazine	
Tree Nuts	
Wheat Products	
Yeast	

ACCEPTABLE FOR THE FOLLOWING DIETARY RESTRICTION:

Free of Animal Products

NOT ACCEPTABLE FOR THE FOLLOWING DIETARY RESTRICTION:

Kosher





References

1. Packer, Lester & Colman, Carol, *The Antioxidant Miracle*, John Wiley & Sons, New York, 1999.
2. Murray, Michael T. *The Encyclopedia of Nutritional Supplements*, Prima Publishing, Rocklin, CA, 1996.
3. Levine M. New concepts in the biology and biochemistry of ascorbic acid, *New Engl J Med*. 1986; 314:892-902.
4. Murray, Michael, *The Pill Book Guide to Natural Medicines*, Bantam, Toronto, 2002.
5. Enstrom JE. Vitamin C in prospective epidemiological studies, in: *Vitamin C In Health And Disease*, edited by L. Packer and J. Fuchs, Marcel Dekker, New York, 1997.
6. National Research Council (NRC), *Diet and Health: Implications for Reducing Chronic Disease Risk*, National Academy Press, Washington, DC, 1989.
7. Block G. Vitamin C and cancer prevention: The epidemiological evidence, *Amer J Clin Nutr*. 1991; 53(suppl): 270s-280s.
8. Howe GR, et al. Dietary factors and risk of breast cancer: Combined analysis of 12 case control studies, *J National Cancer Institute*. 1990; 82: 561-569.
9. Bielory L, et al. Asthma and vitamin C, *Annals of Allergy*. 1994; 73: 89-96.
10. Johnston CS, et al. Antihistamine effect of supplemental ascorbic acid and neutrophil chemotaxis, *J Amer Coll Nutr*. 1992; 11:172-176.
11. Bouton S. Vitamin C and the aging eye, *Arch Int Med*. 1939; 63: 930-945.
12. Health Canada, *Vitamin C Monograph*, Accessed February 2012 [Available from: <http://www.hc-sc.gc.ca>]
13. Garrison Jr, Robert, Somer, Elizabeth, *The Nutrition Desk Reference*, Keats Publishing, New Canaan, CT, 1995.
14. Ginter E. Optimal intake of vitamin C for the human organism, *Nutr Health*. 1982; 1: 66-77.
15. Graedon, Joe, Graedon, Teresa, *Deadly Drug Interactions*, St. Martin's Griffin, New York, 1995.
16. Natural Medicine Comprehensive Database (NMCD), *Vitamin C Monograph*, Accessed December 2010 [Available from: <http://www.naturaldatabase.com/>]
17. Rivers JM. Safety of high level vitamin C ingestion, *Int J Vitamin Nutr Res*. 1989; 30 (Suppl): 95-102.
18. Wanzilak TR, et al. Effect of high dose vitamin C on urinary oxalate levels, *J Urology*. 1994; 151: 834-837.