

## PF3 TECHNICAL OVERVIEW

**THIS IS AN EDUCATIONAL PUBLICATION PROVIDED TO HELP LICENSED HEALTH CARE PROFESSIONALS UNDERSTAND THE SCIENCE UPON WHICH PF3 IS BASED AND TO SHOW THE NUTRIENT CONTENT AND MECHANISMS OF ACTION OF PF3. THE ONLY CLAIMS THAT CAN BE MADE FOR PF3 ARE THOSE THAT HAVE BEEN APPROVED BY PHARMANEX®, A DIVISION OF NU SKIN ENTERPRISES®.**

### PF3 AND ITS COMPOSITION

---

#### **What is PF3?**

PF3 is a proprietary product, clinically shown to help promote healthy gums and teeth. PF3 supports periodontal tissues by targeting three important aspects of gum health: (1) provides targeted antioxidant protection to gum tissues, (2) supports a healthy immune response at the gum line, and (3) promotes healthy gum structure.\*

#### **What ingredients does PF3 deliver?**

PF3 provides a powerful blend of antioxidants, B-vitamins and the proprietary ingredient Phylox™. PF3's antioxidant blend includes vitamins C and E, green tea, alpha-lipoic acid, quercetin, beta-carotene, copper, zinc and selenium to help protect gum structures against free radicals produced by bacteria and activated immune cells at the gum line. Phylox is a proprietary plant-extract blend that maintains an appropriate balance of enzymes responsible for the production of immune response mediators known to affect gum comfort and health. The B-vitamins—folic acid, B6, and B12 are included to promote healthy gum structure through support of normal gingival epithelial cell turnover.\*

#### **What are the health benefits of PF3?**

Declining gingival function is a normal part of the aging process, but factors other than aging (such as genetic predisposition, infrequent brushing, harsh brushing at the gum line, poor nutrition, and smoking) can also compromise gum function. PF3 helps promote healthy gums and teeth through: (1) targeted antioxidant protection to gum tissues, (2) support of a healthy immune response at the gum line, and (3) promotion of healthy gum structures such as collagen—a major component of gum tissues.\*

#### **What is the recommended adult use?**

Take two (2) tablets twice daily with meals. PF3 delivers the periodontal benefits of green tea extract, and, as with all nutrients, you should not exceed the total optimal daily dose of green tea extract when used in combination with other supplements containing green tea. A daily dose of PF3 delivers 1,000 mg of green tea extract. Do not exceed a total intake of 1,200 mg per day green tea in all supplements combined.

#### **Who should use PF3?**

According to the U.S. Surgeon General's *Oral Health in America* Report, 75 percent of adults over age 35 have reason to be concerned with periodontal function. A complete periodontal maintenance program includes regular dental cleanings, proper brushing and flossing, and targeted nutrition. Individuals most likely to benefit from improved attention to gum health include people over the age of 35, smokers, individuals with a poor diet, and persons with a family history of gum health issues. Indicators to be watch for include prolonged bad breath and tenderness in the gums. Smoking can mask the effects of compromised periodontal function by decreasing blood flow to the gums—therefore smokers should be even more attentive to their gums. PF3 is recommended for adults interested in supporting optimal gum health.

#### **What makes PF3 unique?**

A complete periodontal health maintenance program includes regular dental cleanings, proper oral hygiene, and targeted nutritional support. PF3's unique blend of antioxidants, Phylox™, and B vitamins is one of the first supplements clinically shown to improve normal gum function and the only periodontal

**\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**

Created by: KC Holley; GCheney  
Approved by: DBlackhurst; Doug Burke  
23 Oct 2006

supplement shown to increase skin carotenoid scores—which was found in a recent study to be a highly significant covariate of parameters of gum health.

## **BACKGROUND ON PERIODONTAL FUNCTION**

---

### **What factors can affect periodontal health?**

“Periodontal” literally means “around the tooth.” The structures that surround the teeth include the gums (or gingiva), jaw bone (specifically *alveolar bone*), and tiny fiber-like structures that bind teeth to bone and gums to teeth (periodontal ligaments). There are many factors that can affect the function of these periodontal structures. Collagen is a major component of the fibers that bind teeth to bone and gingival tissue. Normal collagen production declines with age. This can be compounded because bacteria known to inhabit the gum line produce substances such as free radicals, collagenase, and other irritants. Worse still, if bacteria and food are left until they harden into tartar (or calculus), the immune system launches an attack to break down this calcified buildup. Unfortunately the immune response intended to break down tartar can also cause breakdown of collagen in gingival tissue, further compromising the function of periodontal fibers. As gum tissues are affected, the enzymes cyclooxygenase 1 and 2, and 5-lipoxygenase, which are produced by activated immune cells, begin to produce specific immune-mediated metabolites known to affect gum comfort and health.

According to the U.S. Surgeon General's *Oral Health in America* Report, 75 percent of adults over age 35 may be affected by the factors that influence gum function. According to the American Academy of Periodontology, 30 percent of the population has a six-fold increase in susceptibility to the factors that affect gum function due to genetic predisposition. Other factors such as smoking (Tomar, 2000), blood glucose management (Cutler, 1999), obesity (Al-Zahrani, 2003), and stress (Wimmer, 2002), may increase susceptibility to compromised periodontal function. Recently periodontal health has even been shown to impact cardiovascular health (Renvert, 2006).

### **What is the role of the immune system in periodontal function?**

In response to bacteria and plaque at the gum line, immune cells produce free radicals and collagenase (the enzyme that breaks down collagen—a major component in gingival structures). If gum health is not maintained, a normal immune response escalates, producing more free radicals and collagenase. A healthy immune response can be supported when gingival tissues have adequate antioxidants to help protect against immune produced free radicals. If gingival tissue does not have adequate antioxidant support, free radicals and collagenase can affect gum structure leading to the release of immune produced enzymes which are responsible for the production of immune-response mediators. These mediators can act on nerves leading to gingival discomfort and they can affect blood vessel wall health.

## **INGREDIENT INFORMATION**

---

### **What is the role of the nutrients in PF3?**

Declining gingival function is associated with aging, inadequate oral hygiene, and harsh brushing at the gum line. Other factors such as genetics, poor nutrition, and smoking can also play a part. Whichever of these factors initiate compromised gum function, the effects of bacteria and immune-response mediators, can react to affect gingival function. Fortunately, a periodontal maintenance program can support gingival tissues that were once at risk. In addition to proper oral hygiene and professional cleanings, a complete periodontal maintenance program includes supporting a healthy balance of immune response enzymes, targeted antioxidant nutrition to combat free radicals produced by plaque and the immune system's response to plaque, and nutritional support for healthy turnover of gingival epithelial cells.\*

*Phylox™—supports a healthy immune response at the gum line*

**\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**

Created by: KC Holley; GCheney  
Approved by: DBlackhurst; Doug Burke  
23 Oct 2006

Phylox is a patented combination of two standardized herbal extracts (*Acacia catechu* heart wood extract, *Scutellaria baicalensis* root extract) with potent effects on immune response enzymes known to affect collagen structures. *Acacia catechu* is native to central and east Africa, southern Asia, Bhutan, China (Guangdong, Guangxi, Yunnan and southern Zhejiang), India, Myanmar, Nepal and Pakistan. It is a moderate sized deciduous tree with rough, dark gray-brown bark. *Scutellaria baicalensis* is a dark blue to purple flower, most common in China and Japan where it has been used for over 2,000 years.\*

Because certain immune produced enzymes affect periodontal function, Phylox™ nutritionally supports the body's ability to create a healthy balance of these enzymes to help maintain comfort at the gum line (Schmidt, 2003; Safety Evaluation, 2003). Phylox has been shown in multiple in-house studies to effectively exert its affects on immune produced enzymes while maintaining gastrointestinal comfort. The dosage of Phylox in PF3 will help the body keep a healthy balance of immune response enzymes when used in conjunction with a complete periodontal maintenance program (Harpenau, 2006).\*

#### *Phylox™—benefits beyond a healthy gingival immune response*

Beyond its effects on immune response enzymes, Phylox's ingredients have been studied separately showing additional periodontal supporting benefits. One in vitro study investigated the ability of flavonoids from *Scutellaria baicalensis* to increase gingival fibroblast activity thereby promoting normal collagen function of the gums (Chung, 1995).\*

#### *Targeted antioxidant protection to gum tissues*

Because free radicals have been implicated in gingival function (Waddington, 2000; Chapple, 1997), PF3 delivers a powerful blend of antioxidants, including vitamins C and E, beta carotene, green tea extract, citrus bioflavonoids, alpha-lipoic acid, quercetin and the antioxidant cofactors selenium, zinc, and copper. A blend of antioxidants can act in synergy to neutralize a wide variety of free radicals produced by gingival bacteria and by the immune response aimed at plaque and tartar.\*

*Ascorbic Acid (Vitamin C)* is a water-soluble antioxidant vitamin known to be a cofactor in collagen synthesis (a structural component of gum tissue). Individuals with adequate levels of dietary vitamin C are more likely to have good periodontal health (Nakamoto, 1984; Shishoo, 1994). Several studies show an inverse relationship between dietary ascorbic acid and gingival comfort (Touyz, 1984; 1997; Shishoo, 1994; Melnick, 1988; Pussinen, 2003; Nishida, 2000; Vaananen, 1993).\*

*Quercetin and Citrus Bioflavonoids (hesperidin, naringenin)* are antioxidant flavonoids which have been shown to support gingival function and microcirculation (Nicolaidis, 2003; Bergan, 2001) and to augment the efficacy of vitamin C (Skaper, 1997). These flavonoids may also exert beneficial activity on immune response enzymes (Della Loggia, 1988; Kim, 1998).\*

*Tegreen 97* is Pharmanex's proprietary decaffeinated green tea extract with an exceptionally high content of active polyphenols and catechins. Green tea catechins have beneficial actions to support gingival health (Rasheed, 1998; Okamoto, 2004; Sakanaka, 2004). Green tea catechins are also potent antioxidants, which protect against normal tissue damage from release of free radicals by activated immune cells (Makimura, 1993; Guarnieri, 1989). Finally, green tea catechins have been shown to support healthy immune response resulting in benefits for gingival comfort. A daily dosage of PF3 provides the same amount of catechins as in about 15 cups of green tea.\*

#### *Antioxidant cofactor minerals*

Beyond their ability to assist with the body's antioxidant defense, selenium, copper, and zinc provide additional benefits to periodontal function. For example, one of selenium's non-antioxidant functions includes support of the immune system—an important factor to gum health (Kiremidjiann-Schumacher, 1996; 1998). Copper and zinc have been shown to act beneficially on periodontal health (copper—Grytten, 1988; 1987, Evans, 1986) ; (zinc—Williams, 1998, Schaeken, 1996; Dobl, 1990; Nossek, 1990, Noack,

**\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**

Created by: KC Holley; GCheney

Approved by: DBlackhurst; Doug Burke

23 Oct 2006

1989; Kuraner, 1991; Harrup, 1984). And zinc plays a role in healthy cell turnover (Andrews, 1999) and supports the immune response (Dardenne, 2002).\*

#### *Promotes healthy gum structure*

Folic acid, vitamin B12 and vitamin B6 are all essential for DNA synthesis and therefore particularly important to the epithelia cells of the gums which have a short lifespan and high turnover rate. One double-blind placebo study showed improved gingival health in participants who received a B-complex supplement that included folate, B12 and B6 (Neiva, 2005). Independent of B12 and B6, folate has been shown to be required for gingival tissue integrity (Dogan, 2001) and may support resistance to certain irritants in the gums, by giving the body the nutrition it needs (Vogel, 1976; Brown, 1991; Pack, 1986).

Vitamin C and flavonoids act as antioxidants, but also have been shown to promote collagen production, and support existing collagen (a major structural component of gingival tissue). In vivo studies confirm the effects of vitamin C on collagen synthesis (Darr, 1993, Chan, 1990, Mahmoodian, 1999). The daily dosage of PF3 delivers 800 milligrams of calcium ascorbate, a form of vitamin C known for its superior bioavailability, and known to be gentler on the digestive system than regular ascorbic acid.

#### **Have any studies been conducted on PF3?**

A double-blind placebo controlled study was conducted to determine the effects of PF3 on several gingival parameters and skin carotenoid antioxidant levels (SCS) in eighty five subjects. Forty subjects were randomly assigned to the test supplement group and the remaining to the placebo group. Subjects took the assigned product twice daily with meals. They were also provided a toothbrush and toothpaste and instructed to brush twice daily using their usual hygiene techniques. Participants were tested at baseline and at eight weeks. The supplement group was found to have a significant increase in Skin Carotenoid Scores and significant improvements in other periodontal parameters (Harpenau, 2006). These findings suggest that PF3 may be beneficial as an adjunct to regular oral hygiene and professional cleanings.

## **SAFETY**

---

#### **Is this product safe?**

PF3 is safe at the recommended dosage. PF3 delivers the periodontal benefits of green tea extract, and as with all nutrients, you should not exceed the total optimal daily dose of green tea extract when used in combination with other supplements containing green tea. A daily dose of PF3 delivers 1,000 mg of green tea extract. Do not exceed a total intake of 1,200 mg per day green tea in all supplements combined.

#### **Are there any side effects?**

There are no known side effects at the recommended dosage.

#### **Are there any contraindications?**

People who are pregnant or lactating or taking a prescription medication should consult a physician prior to use.

#### **Are there any known drug interactions?**

People on high-dose aspirin therapy or those taking anticoagulant drugs or other medications should consult a physician before taking this or other dietary supplements. Discontinue use of this product two weeks prior to and after surgery.

## **REFERENCES**

---

Andrews, M. and Gallagher-Allred, C. The role of zinc in wound healing. *Advanced Wound Care* 1999;12 (3):137-138.

<p><b>*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.</b></p>
---

Created by: KC Holley; GCheney  
Approved by: DBlackhurst; Doug Burke  
23 Oct 2006

Al-Zahrani, M., Bissada, Nabil, Barawski, E. Obesity and Periodontal Disease in Young, Middle-Aged, and Older Adults. *Journal of Periodontology* 2003;74:610-615.

Amar S, Gokce N, Morgan S, Loukideli M, Van Dyke TE, Vita JA. Periodontal disease is associated with brachial artery endothelial dysfunction and systemic inflammation. *Arterioscler Thromb Vasc Biol* 2003;23:1245-9.

Bergan JJ, Schmid-Schonbein GW, Takase S. Therapeutic approach to chronic venous insufficiency and its complications: place of Daflon 500 mg. *Angiology* 2001;52 Suppl 1:S43-S47.

Brown RS, Di Stanislao PT, Beaver WT, Bottomley WK. The administration of folic acid to institutionalized epileptic adults with phenytoin-induced gingival hyperplasia. A double-blind, randomized, placebo-controlled, parallel study. *Oral Surg Oral Med Oral Pathol* 1991;71:565-8.

Chapple IL. Reactive oxygen species and antioxidants in inflammatory diseases. *J Clin Periodontol*. 1997 May;24(5):287-96.

Chung CP, Park JB, Bae KH. Pharmacological effects of methanolic extract from the root of *Scutellaria baicalensis* and its flavonoids on human gingival fibroblast. *Planta Med* 1995;61:150-3.

Clark DT, Gazi MI, Cox SW, Eley BM, Tinsley GF. The effects of *Acacia arabica* gum on the in vitro growth and protease activities of periodontopathic bacteria. *J Clin Periodontol* 1993;20:238-43.

Cutler, C., Machen, R., Jotwani, R., and Iacopino, A. Heightened Gingival Inflammation and Attachment Loss in Type 2 Diabetics with Hyperlipidemia. *Journal of Periodontology*:1999:1313-1321.

Dardenne, M. Zinc and immune function. *European Journal of Clinical Nutrition* 2002;56(3):20-23.

Darr D; Combs S; Pinnell Si. "Ascorbic acid and collagen synthesis: rethinking a role for lipid peroxidation." *Arch Biochem Biophys*; Dec 1993, **307** (2) pp. 331-335

Della Loggia R, Ragazzi E, Tubaro A, et al. Anti-inflammatory activity of benzopyrones that are inhibitors of cyclo- and lipo-oxygenase. *Pharmacol Res Commun* 1988;20:S91-S94.

Dobl P, Nossek H. [The effect of zinc chloride mouthwashes on caries-inducing plaque streptococci. 2. In vivo studies of the antibacterial effect of zinc chloride on the total streptococcal flora of the dental plaque]. *Zahn Mund Kieferheilkd Zentralbl* 1990;78:393-6.

Dogan A, Tunca Y, Ozdemir A, Sengul A, Imirzalioglu N. The effects of folic acid application on IL-1beta levels of human gingival fibroblasts stimulated by phenytoin and TNFalpha in vitro: a preliminary study. *J Oral Sci* 2001;43:255-60.

Evans SL, Tolbert C, Arceneaux JE, Byers BR. Enhanced toxicity of copper for *Streptococcus mutans* under anaerobic conditions. *Antimicrob Agents Chemother* 1986;29:342-3.

Grytten J, Scheie AA, Giertsen E. Synergistic antibacterial effects of copper and hexetidine against *Streptococcus sobrinus* and *Streptococcus sanguis*. *Acta Odontol Scand* 1988;46:181-3.

Grytten J, Tollefsen T, Afseth J. The effect of a combination of copper and hexetidine on plaque formation and the amount of copper retained by dental plaque bacteria. *Acta Odontol Scand* 1987;45:429-33.

**\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**

Created by: KC Holley; GCheney  
Approved by: DBlackhurst; Doug Burke  
23 Oct 2006

Guarnieri C, Zucchelli G, Bernardi F, Scheda M. [Periodontal disease and crevicular neutrophils. Role of superoxide radicals]. *Dent Cadmos* 1989;57:44-52.

Harrap GJ, Best JS, Saxton CA. Human oral retention of zinc from mouthwashes containing zinc salts and its relevance to dental plaque control. *Arch Oral Biol* 1984;29:87-91.

Harpenau, L., Abida, C., Zingale, J. Chambers, D., Lundergan, W. Effects of Nutritional Supplementation on Periodontal Parameters and C-Reactive Protein. Submitted for Publication 2006.

Harpenau, L., Lundergan, W., Cheerma, A., Chambers, D. W., and Zingale, J. The Effects of a Nutritional Supplement on Periodontal Condition, Antioxidant Levels, and C-Reactive Proteins. 2006. 8-1-0006.  
Ref Type: Unpublished Work

Hirasawa M, Takada K, Makimura M, Otake S. Improvement of periodontal status by green tea catechin using a local delivery system: a clinical pilot study. *J Periodontal Res* 2002;37:433-8.

Kim HP, Mani I, Ziboh VA. Effects of naturally-occurring flavonoids and biflavonoids on epidermal cyclooxygenase from guinea pigs. *Prostaglandins Leukot Essent Fatty Acids* 1998;58:17-24.

Kiremidjian-Schumacher L, Roy M. Selenium and immune function. *Z Ernährungswiss* 1998;37 Suppl 1:50-6.

Kiremidjian-Schumacher L, Roy M, Wishe HI, Cohen MW, Stotzky G. Supplementation with selenium augments the functions of natural killer and lymphokine-activated killer cells. *Biol Trace Elem Res* 1996;52:227-39.

Kuraner T, Beksac MS, Kayakirilmaz K, Caglayan F, Onderoglu LS, Ozgunes H. Serum and parotid saliva testosterone, calcium, magnesium, and zinc levels in males, with and without periodontitis. *Biol Trace Elem Res* 1991;31:43-9.

Mahmoodian F; Peterkofsky B. "Vitamin c deficiency in guinea pigs differentially affects the expression of type IV collagen, laminin, and elastin in blood vessels." *J Nutr*; Jan 1999, **129** (1) pp. 83-91.

Makimura M, Hirasawa M, Kobayashi K et al. Inhibitory effect of tea catechins on collagenase activity. *J Periodontol* 1993;64:630-6.

Melnick SL, Alvarez JO, Navia JM, Cogen RB, Roseman JM. A case-control study of plasma ascorbate and acute necrotizing ulcerative gingivitis. *J Dent Res* 1988;67:855-60.

Nakamoto T, McCroskey M, Mallek HM. The role of ascorbic acid deficiency in human gingivitis--a new hypothesis. *J Theor Biol* 1984;108:163-71.

Neiva RF, Al-Shammari K, Nociti FH Jr, Soehren S, Wang HL. Effects of vitamin-B complex supplementation on periodontal wound healing. *Journal of Periodontol.* 2005 Jul;76(7):1084-91.

Nicolaidis AN. From symptoms to leg edema: efficacy of Daflon 500 mg. *Angiology* 2003;54 Suppl 1:S33-S44.

Nishida M, Grossi SG, Dunford RG, Ho AW, Trevisan M, Genco RJ. Dietary vitamin C and the risk for periodontal disease. *J Periodontol* 2000;71:1215-23.

**\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**

Created by: KC Holley; GCheney  
Approved by: DBlackhurst; Doug Burke  
23 Oct 2006

Noack B, Nossek H. [The effectiveness of zinc chloride mouthwashes on leukocyte activity in sulcus fluid and on the clinical parameters in experimentally induced gingivitis]. Zahn Mund Kieferheilkd Zentralbl 1989;77:256-61.

Nossek H, Dobl P. [The effect of zinc chloride mouthwashes on caries-inducing plaque streptococci. 3. The antibacterial effect of zinc chloride on the species *Str. mutans*, *Str. sanguis* and *Str. salivarius* in dental plaque]. Zahn Mund Kieferheilkd Zentralbl 1990;78:501-5.

Okamoto M, Sugimoto A, Leung KP, Nakayama K, Kamaguchi A, Maeda N. Inhibitory effect of green tea catechins on cysteine proteinases in *Porphyromonas gingivalis*. Oral Microbiol Immunol. 2004;19:118-20.

Pack AR. Effects of folate mouthwash on experimental gingivitis in man. J Clin Periodontol 1986;13:671-6.

Pussinen PJ, Laatikainen T, Alfthan G, Asikainen S, Jousilahti P. Periodontitis is associated with a low concentration of vitamin C in plasma. Clin Diagn Lab Immunol 2003;10:897-902.

Rasheed A, Haider M. Antibacterial activity of *Camellia sinensis* extracts against dental caries. Arch Pharm Res 1998;21:348-52.

Renvert, S., Pettersson, T., Ohlsson, O. and Persson, G. Bacterial Profile and Burden of Periodontal Infection in Subjects with a Diagnosis of Acute Coronary Syndrome. Journal of Periodontology 2006;77:1110-1119.

Safety Evaluation. Safety and efficacy of a proprietary plant-derived anti-inflammatory in humans: A randomized, double-blind, placebo-controlled trial--Safety evaluation. 8-28-2003.

Ref Type: Unpublished Work

Sakanaka S, Okada Y. Inhibitory effects of green tea polyphenols on the production of a virulence factor of the periodontal-disease-causing anaerobic bacterium *Porphyromonas gingivalis*. J Agric Food Chem 2004;52:1688-92.

Schaeken MJ, Van der Hoeven JS, Saxton CA, Cummins D. The effect of mouthrinses containing zinc and triclosan on plaque accumulation, development of gingivitis and formation of calculus in a 28-week clinical test. J Clin Periodontol 1996;23:465-70.

Schmidt, M. and Sampalis, J. S. Safety and efficacy of a proprietary plant-derived anti-inflammatory in humans: a randomized, double-blind, placebo-controlled trial. Clinical report. 6-19-2003.

Ref Type: Unpublished Work

Shishoo DM, Shah RC, Desai CA, Joshi KF. Dental chairside test for the diagnosis of ascorbic acid deficiency. Indian J Dent Res 1994;5:19-24.

Skaper SD, Fabris M, Ferrari V, Dalle CM, Leon A. Quercetin protects cutaneous tissue-associated cell types including sensory neurons from oxidative stress induced by glutathione depletion: cooperative effects of ascorbic acid. Free Radic Biol Med 1997;22:669-78.

Tomar, S. Smoking-Attributable Periodontitis in the United States: Findings from NHANESIII. Journal of Periodontology; 2000; 71:743-751.

Touyz LZ. Vitamin C, oral scurvy and periodontal disease. South African Medical Journal; 1984; 65:838-42.

**\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**

Created by: KC Holley; GCheney

Approved by: DBlackhurst; Doug Burke

23 Oct 2006

Touyz LZ. Oral scurvy and periodontal disease. *Journal of the Canadian Dental Association*; 1997; 63:837-45.

U.S. Department of Health and Human Services. *Oral Health in America: A Report of the Surgeon General* Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000.

Vaananen MK, Markkanen HA, Tuovinen VJ, Kullaa AM, Karinpaal AM, Kumpusalo EA. Periodontal health related to plasma ascorbic acid. *Proc Finn Dent Soc* 1993;89:51-9.

Vogel RI, Fink RA, Schneider LC, Frank O, Baker H. The effect of folic acid on gingival health. *J Periodontol* 1976;47:667-8.

Wu T, Trevisan M, Genco RJ, Dorn JP, Falkner KL, Sempos CT. Periodontal disease and risk of cerebrovascular disease: the first national health and nutrition examination survey and its follow-up study. *Arch Intern Med* 2000;160:2749-55.

Waddington RJ, Moseley R, Embery G. Reactive oxygen species: a potential role in the pathogenesis of periodontal diseases. *Oral Dis* 2000;6:138-51.

Williams C, McBride S, Mostler K et al. Efficacy of a dentifrice containing zinc citrate for the control of plaque and gingivitis: a 6-month clinical study in adults. *Compend Contin Educ Dent* 1998;19:4-15.

Wimmer, G., Janda, M., Wieselmann-Penkner, K., Jakse, N., Polansky, R., Perti, C. Coping with Stress: Its Influence on Periodontal Disease. *Journal of Periodontology*;73:1343-1351.

**\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**

Created by: KC Holley; GCheney  
Approved by: DBlackhurst; Doug Burke  
23 Oct 2006