

IMPORTANT DIET AND SUPPLEMENT CONSIDERATIONS IN OUR FIGHT AGAINST PROSTATE CANCER

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DISCLAIMER: This information is not intended to replace the attention or advice of a physician or other health care professional. Anyone who wishes to embark on any dietary, drug, exercise, or other lifestyle change intended to prevent or treat a specific disease or condition should first consult with and seek clearance from a qualified health care professional. The following are just a few among many supplements recommended in literature and on Internet Websites as of possible help in combating prostate cancer. None of the suggested treatment regimens can guarantee a cure for disease.

Regarding Diet and Supplements:

Among the things learned from national/international conferences on Prostate Cancer, reliable information found on internet medical websites, and information saved to files from Stephen B. Strum, M.D., FACP, as well as the review of a paper from a January 2006 Man-to-Man meeting describing recommendations by Charles "Snuffy" Myers, M.D., both renown and highly respected Medical Oncologists who specialize in Prostate Cancer research and treatment:

DIET:

A "Mediterranean Diet" (Italian, Greek, Lebanese, Moroccan, Egyptian) is strongly recommended for all PC patients. No red meat, no dairy products (milk, egg yolk, cheese, etc.). Increase fish intake (decreases metastasis and PC recurrence), vegetables, tomatoes, olive oil (see URL below), almonds, pistachios, hazelnuts (monounsaturated fats). Increasing intake of monounsaturated fats causes progressive drop in PC. If your preference for fish oil is from supplements, then one should try to obtain "Nordic Naturals" on the internet www.nordicnaturals.com since, according to both Myers and Strum, it is important to have quality and this product provides that assurance.

Nordic Naturals is somewhat expensive with a one month container with combination ingredients of just over 1,000mg costing around \$30.00. On days that one of his choice fish products, King Oscar sardines, is consumed, Dr. Myers

skips his Omega-3 supplement (Read more on Omega-3 below). Both see no reasonable reason to be consuming flaxseed in any form as a PC supplement.

Accolades for Olive Oil:

http://www.realage.com/news_features/tip.aspx?v=1&cid=17764

Scientists in China and the USA have teamed up to make an anti-prostate cancer drug from an active ingredient in cruciferous vegetables:

CRUCIFEROUS VEGGIES INTO ANTI-PROSTATE CANCER DRUG

Indole-3-carbinol ... a well known product of the breakdown of a compound found in cruciferous vegetables ... is considered a "promising chemopreventive agent which has shown efficacy against tumors in various tests on animals," the researchers say. However, indole-3-carbinol breaks down rapidly in the human digestive system and is too weak to have much impact on existing tumors.... To make indole-3-carbinol into a more potent antitumor agent with improved chemical stability, the scientists used it to make a chemical called OSU-A9 {[1-(4-chloro-3-nitrobenzenesulfonyl)-1H-indol-3-yl]-methanol}, which is acid-proof. The new compound is 100 times more powerful than the original at causing cancer cells to die off by apoptosis (cell suicide).

<http://psa-rising.com/eatingwell/?p=25>

ANOTHER ARTICLE:

(Ivanhoe Newswire) -- An anti-cancer compound found in broccoli and cabbage works by blocking a key enzyme associated with rapidly advancing cancer.

The compound found in the veggies, indole-3-carbinol, is already in human clinical trials because of its ability to stop breast and prostate cancer growth in mice. The new findings are the first to explain how indole-3-carbinol stops cell growth.

Researchers at the University of California, Berkley, showed that indole-3-carbinol inhibits the enzyme elastase. Elastase at high levels has been linked to a poor prognosis, decreased response to chemotherapy, reduced response to endocrine treatment and a reduced survival rate in patients with breast cancer.

These new findings could lead to the development of an improved version of the chemical that could be used as a drug to work against breast and prostate cancer tumors.

“Humans have co-evolved with cruciferous vegetables like broccoli and Brussels sprouts, so this natural source had a lot fewer side effects,” study coauthor Gary Firestone, UC Berkley professor of molecular and cell biology, was quoted as saying.

Indole-3-carbinol is only one of many plant-derived chemicals that Firestone is investigating in his laboratory as potential anti-cancer agents.

SOURCE: *Proceedings of the National Academy of Sciences*, published online Dec. 5, 2008

SOME CONSIDERATIONS WHEN “DINING OUT:”

6 Best Picks and Skips at the Salad Bar

Salad bars can be diet salvation or junk-food minefields. Here's how to get from one end to the other without detonating an explosion of bad fats, sodium, sugar, and refined carbs.

1. Go dark on greens: Build a vitamin- and fiber-packed foundation by starting with roughly 1 cup of spinach and romaine leaves (for more than half of your daily vitamin A and all of your vitamin K, plus some folate and vitamin C). Skip 'em: Lighter greens tend to offer less nutrition. Iceberg lettuce, for instance, delivers only about 7% of the A you need, some K, and not much else.

2. Go bright on veggies: Next, add about 1 cup of the most colorful cruditéés -- think broccoli, carrots, cherry tomatoes, green and red bell peppers, beets. Ounce for ounce, vibrant veggies give you more fiber, minerals, vitamins, and disease-fighting antioxidants than their paler companions, like celery and cucumbers. Skip 'em: Anything coated in mayo or an indefinable dressing, including carrot-and-raisin mixes, coleslaw, and potato salad.

3. Choose lean proteins: Aim for about 1/2 cup of these. Chickpeas and kidney beans are nifty sources of fat-free protein (6 grams each). Sliced hard-boiled eggs (8 grams) are another smart choice, just limit the yolk to limit the fat. Skip 'em:

Chicken, tuna, or crab salads -- they're usually made with high-fat mayo; three-bean salad, which typically is afloat in a sea of oil; and cottage cheese, which is high in aging (read artery-clogging) saturated fat.

4. Sprinkle on extra flavor and crunch: Like cheese? Add 1 tablespoon of Parmesan (22 calories) to punch up the flavor, or 1 tablespoon of walnuts or sunflower seeds for some healthy crunch. Both have good-for-your-heart fats that help your body absorb the nutrients in all those veggies. Skip 'em: Cheddar cubes - you'll quickly eat more than you need; croutons -- they may look harmless but at 100 calories per 1/4 cup, they're usually high-cal booby traps of refined carbs, sodium, and trans fats. Ditto for crunchy Asian noodles.

5. Dress for success: Now swirl on about 1 tablespoon of heart-healthy olive oil, a splash of vinegar, a grating of pepper, and toss, toss, toss. Ask any chef -- it's the secret to a perfect salad. Thorough tossing ensures that all the flavors and textures are evenly distributed and lets you use minimal dressing to maximum effect. Skip 'em: Walk right past those vats of ready-made salad dressings. Even the low-fat or fat-free versions are usually loaded with salt, sugar, and additives. And just 2 tablespoons of regular blue cheese or ranch have about 160 fat-packed calories.

6. Prefer a fruit salad? Easy. Go for whatever's fresh -- melons, berries, pineapple, kiwi -- and top with 1 to 2 tablespoons of chopped walnuts or sunflower seeds for a sprinkling of good fats and crunchy flavor. Then buy a small container of low- or no-fat yogurt or cottage cheese for creamy protein minus the saturated fat in dairy foods. Skip 'em: Syrupy canned peaches, apricots, pears, etc. They have far more calories and fewer nutrients than fresh fruit.

And the list goes on and on regarding the importance of diet and nutrition. Here is even more from the University of California, San Francisco (UCSF):

http://cancer.ucsf.edu/crc/nutrition_prostate.pdf

SUPPLEMENTS:

Important among supplements has become **VITAMIN D3** Cholecalciferol. 95% of men have been found to be deficient in this Vitamin, particularly those over age 70. This vitamin is essential for brain function, lung function, the immune system, lowers the risk for most common cancers as well as their recurrence, lowers the risk for high blood pressure, diabetes and osteoporosis, and reduces oxidative stress to cells. Vitamin D3 converts into 25-hydroxy Vitamin D3 and is stored in

fat. Optimum serum 25 hydroxy Vitamin D3 levels should be at least 65ng/ml. Except for those who spend a great deal of time in the sun, most PC patients need 5,000 to 10,000 IU daily to reach these levels. Once reached a daily intake of 4000 IU will likely maintain. The pill form can be found available in 1,000 IU as well as 5,000 IU form for less than \$10 in U.S. dollars from many manufacturers, and more from others. It is also available in lesser IU levels, but with higher levels you have fewer pills to consume. Since there are those with sufficient Vitamin D from sun exposure, before beginning the addition of a Vitamin D supplement, you should have your 25 hydroxy Vitamin D3 level determined, then, if deficient, have it measured again following a few months of increased Vitamin D3 intake to get to and maintain the recommended at least 65ng/ml level. Regular checks at maintaining within this level are then recommended. Dr. Myers notes that he has found that the IU level of Vitamin D3 provided by many suppliers fail to meet the IU specification noted on the label. If on a Vitamin D3 supplement for a few months and your 25-hydroxy Vitamin D3 levels are not increasing, he recommends the Vitamin D3 sold at www.lef.org has been tested and its IU level is as labeled. The most active form is 1,25 dihydroxy D3 or Calcitriol. For chemotherapy patients, the addition of Calcitriol nearly doubles the effectiveness of Taxotere. **WARNING:** Anyone with pre-existing kidney disease, though often found to be deficient in Vitamin D, SHOULD NOT take higher doses of Vitamin D3 without physician approval. This highlights the importance of visiting with your physician to discuss Vitamin D3 deficiency as well as insure lab records rule out any kidney abnormalities. If none exist, then get tested to determine the 25 hydroxy Vitamin D3 serum blood level, and if deficient and with physician approval, either get more but safe sun exposure or begin a higher daily Vitamin D3 intake to reach a desired 65-70ng/ml before leveling off at around 4,000 IU daily. (Note: See "Food for the Kidneys" further down in these suggestions).

A May 2008 report from the University of Rochester Medical Center in New York makes note that by inducing a specific gene to increase expression of a key enzyme, Vitamin D protects healthy prostate cells from the damage and injuries that can lead to cancer. See:

<http://www.news-medical.net/?id=38320>

Antioxidants that reduce the risk of PC as well as recurring PC include:

Lycopene 15mg twice daily or 10mg three times daily

Selenium 200mcg daily

Vitamin E 200 IU daily (preferably gamma and not alpha)

Soy isoflavones about 200 to 300 mg daily (But use caution as explained in this excerpt from "The Palpable Prostate" (<http://palpable-prostate.blogspot.com>) "In [Soy](#) we added: Even if it were beneficial for preventing prostate cancer or even if it were beneficial in earlier stage disease there remains the possibility that it could be detrimental for later stage disease. Although not a formal study, clinical observations by [Dr. Leibowitz](#), a medical oncologist, were that he was able to reverse PSA rises in some patients by simply removing soy and phytoestrogens from their diet. See [Dr. Leibowitz on soy](#). Also see [Willet Divides Prostate Cancer into Four](#)."

Omega-3 fish oil (both Myers and Strum advocate obtaining Omega-3 fish oils from "Nordic Naturals")

Red wine 4oz. per week has been said to reduce PC by 6%

Pomegranate juice provides polyphenols with an 8oz glass containing 570mg - in trials, daily consumption of pomegranate juice changed PSA doubling time from 15 months, to 54 months -and it is important that the pomegranate juice is deeply red; if its appearance shows any browning, it will likely be less effective to ineffective. Pomegranate in extract form is much less expensive than juice **as well as avoids the sugar content** of juice and can be purchased from the Life Extension Foundation with one capsule of the extract providing the equivalent of 12.3oz of pomegranate juice. I purchase mine from Puritan Pride www.Puritan.com. Dr. Myers has been prescribing two extract gelcaps be taken twice daily to several of his patients. Dr. Strum also recommends the extract rather than the juice because of the sugar content in juice. Good for vascular health, has anti-PC properties, and some patients have noted that their otherwise high systolic blood pressure has dropped. Nuclear factor-kappaB (NF-kappaB) is found to be increasing during the transition from androgen dependent prostate cancer to androgen independent prostate cancer and thus a contributor to this transition. An interesting PubMed article describes pomegranate extract having the effect of inhibition of proliferation of NF-kappaB and induction of apoptosis of prostate cancer cells. This is just one study of many regarding the importance of pomegranate to the prostate cancer patient. This particular study can be reviewed at <http://www.ncbi.nlm.nih.gov/pubmed/18790748>. If you want to order the

extract from LEF, click here:

<http://www.lef.org/newshop/items/item00956.html>

Calcium, as citrate only, 800mg/no more than 1000mg is considered sufficient (it seems we are getting sufficient calcium, and too much calcium reduces the effectiveness of Vitamin D3).

For info, neither Zinc nor Vitamin C have a role in prevention of PC though they do have a role in other areas.

Copper is to be avoided since new blood vessels appear to have a strong dependence on copper for growth, but low copper levels are unlikely to affect existing vessels. By depriving cancer tumors of the copper they need to form new blood vessels, vascularization is inhibited. *UC Berkeley* and *UC San Francisco* researchers discovered a protein, hephaestin, that appears critical in moving iron to the bloodstream. The protein contains copper and cannot be produced in the absence of copper), I would suspect that the important issue regarding copper is that we do not ingest extra copper in any unusual dosage as a supplement. I would suspect the amount of copper within most multivitamins, as well as that in the Bone Up, is of sufficient low level to not be of extra concern. Anyone overly concerned could order up a "copper" blood serum test to ease that concern.

ADDITIONAL DESCRIPTION OF SUPPLEMENTS:

SELENIUM: Hydrogen Peroxide in the body is an end product of metabolism that causes genetic damage and triggers the development of a range of cancers. The role of Selenium in the body as a free-radical scavenger, is to convert that hydrogen peroxide to water, thus preventing the oxidative damage hydrogen peroxide does to the DNA in the prostate. Selenium is available over the counter in tablet form at 200mcg per tablet. Dr. Stephen B. Strum, M.D., a nationally recognized oncologist specializing in Prostate Cancer, recommends 400 mcg a day, and says Selenium works best in conjunction with Vitamin E, which enhances its activity.

VITAMIN E: Vitamin E is also a free-radical scavenger and also reduces oxidative damage to the prostate. In a recent study of 23,000 people, those taking Vitamin E over a six or seven year period had a 30% reduced death rate from Prostate Cancer over other participants not taking this Vitamin. And, with other

factors, it was possible to prove that Vitamin E was affecting the evolution of pre-existing Prostate Cancer too. Vitamin E is available over the counter in softgel form, usually at 400 IU per softgel, though this is in an acetate form. Dr. Strum comments that Vitamin E succinate (VES), using the succinate salt of Vitamin E, is important. VES is likely available through health stores. Dr. Strum recommends 400 to 1000 IU a day as mixed tocopherols. Mixed tocopherols contain synthetic Vitamin E (d-alpha-tocopherol and di-alpha-tocopherol) (the kind usually sold over the counter) as well as natural Vitamin E. A study by Mark Moyad, a clinical prostate researcher and public health educator in the Urology/Oncology Department of the University of Michigan, et al. (in press, 1999) indicates gamma tocopherol has more anti-Prostate Cancer activity than conventional d-alpha-tocopherol. Dr. Myers recommends only 200 IU daily.

LYCOPENE: Lycopene – the red pigment in tomatoes. When you take lycopene from the test tube and add it to Prostate Cancer cells, it kills them because it initiates a suicide program within the cells. It is an antioxidant, a powerful one, but for some strange reason, its most powerful effect is in causing the Prostate Cancer cells to self-destruct. Lycopene is available over the counter in softgel form at 5 mg and 10 mg per softgel. Dr. Strum suggests 15 mg taken twice a day, Dr. Myers suggests 10mg three times a day. The FDA has recently announced that they have concluded that lycopene serves no purpose regarding prostate cancer; yet, if one searches the internet, there are also multiple studies that suggest that lycopene, in fact, does serve a very useful purpose – for example: <http://highwire.stanford.edu:80/cgi/medline/pmid;15084515> or <http://www.healthcastle.com/lycopene-prostatecancer.shtml>. Interestingly, the following URL also supports lycopene for prostate cancer patients but more so in a natural state than with supplements: http://www.mercola.com/2004/oct/16/synthetic_lycopene.htm .

WARNING FOR CONSIDERATION: Dr. Charles “Snuffy” Myers, M.D., another nationally recognized oncologist specializing in Prostate Cancer, had a word of warning in the use of these previous three antioxidants. If you are undergoing radiation therapy, he proposes you STOP using antioxidants until your radiation therapist tells you it is safe. He says this is important to remember! (The reasoning is that some studies indicate antioxidants inhibit the effectiveness of radiation. **It should be noted**, however, there are other studies that indicate antioxidants enhance the effectiveness of radiation as well as reduce side effects. Best to research, discuss with your radiation therapist, and draw your own conclusions).

FISH OIL/OMEGA-3 FATTY ACIDS: Not flaxseed oil, but Fish Oil. The evidence that the human brain requires Omega-3 is now considerable. It is being touted for dyslexia, schizophrenia, to prevent sudden death due to cardiac arrhythmia, to reduce the risk of hypertension, stroke, diabetes mellitus, multiple sclerosis, and the inflammation of arthritis. Dr. Myers says that the list goes on and on. In a study of patients who had a radical prostatectomy, it was determined that those who had three servings of ocean fish a week (and that means intake of Omega-3) had a 70% reduction in the risk of developing recurrent Prostate Cancer. A 70% reduction just by eating ocean fish! He said that though it is early, it looks like Fish Oil/Omega-3 Fatty Acids is a very powerful factor for your general health that can also have a major impact on the evolution of Prostate Cancer. Fish Oil/Omega-3 Fatty Acids is available over the counter in softgel form, usually at 1000 mg per softgel. Many patients are being prescribed 4000mg per day. Soon-to-be or currently breastfeeding moms need to be especially careful to avoid excess mercury. Still, most people can do their heart and body right by eating one or two servings a week of [omega-3-rich fish](#) that is relatively low in mercury. Unfortunately, most fish contain *some* mercury, thanks to industrial processing. But the less time fish spend simply living in a mercury-laden environment or eating other fish containing mercury, the lower the contamination levels will be. So for low-mercury fish, we're talking small fish that don't eat many other fish (or fish meal) and don't have a long life span. Here are five good choices:

1. Salmon (wild): 1 gram of omega-3 fatty acids per 2 ounces of fish;* 0.014 parts per million mercury concentration
2. Herring: 1 gram of omega-3 fatty acids per 1 ounce of fish;* 0.044 parts per million mercury concentration
3. Sardines: 1 gram of omega-3 fatty acids per 2-3 ounces of fish;* 0.016 parts per million mercury concentration
4. Trout (freshwater): 1 gram of omega-3 fatty acids per 3-4 ounces of fish;* 0.072 parts per million mercury concentration
5. Pollock: 1 gram of omega-3 fatty acids per 6.5 ounces of fish;* 0.041 parts per million mercury concentration

*Oil content varies widely, depending on species, season, environment, diet, and packing and cooking methods. Cooking tip: Cook your seafood with garlic. Garlic has been shown to bind and reduce levels of mercury in the body, making it less toxic.

Here's the list of fish to AVOID:

- King mackerel: 0.73 parts per million mercury concentration

- Shark: 0.99 parts per million mercury concentration
- Swordfish: 0.98 parts per million mercury concentration
- Tilefish (Gulf of Mexico): 1.45 parts per million mercury concentration

So where does the beloved tuna fall? Pretty close to the middle of the road, actually, with mercury concentration ranging from 0.12 to 0.69 parts per million, depending on what kind of tuna you eat. And you'll need to eat anywhere from 3.5-12 ounces to get 1 gram of omega-3 fatty acids, depending on how you take your tuna: Fresh tuna has the most and canned chunk light tuna has the least. But chunk light tuna also has the least mercury.

Keep in mind that oil content estimates can be fairly rough, despite the best research efforts. A [fish-oil supplement](#) is a surefire way to get the omega-3 fatty acids you want and need. But talk to your doctor first. Fish-oil supplements are dangerous for certain people. Dr. Myers recommends a daily total Omega-3 intake of 4000mg. Here is some additional information regarding the importance of fish oil:

Food Fit for Your Kidneys

What heart helper can also keep your kidneys feeling fine? It's fish.

That's right. The omega-3s in fatty fish (like salmon) not only help your heart stay healthy, but they seem to keep kidney cancer away, too. Women in a study who ate fatty fish on a fairly regular basis lowered their risk of kidney cancer by 44 percent.

Mega Omegas

It's no fish tale! Almost 15 years of data show that when salmon and other fatty fish (like sardines and herring) regularly show up on your dinner plate, you could be giving [kidney cancer](#) the big kiss-off.

Researchers suspect that certain omega-3 fats in the fish may change the immune response of cancer cells in a way that thwarts their invasive process. But it's got to be fatty fish; slim swimmers (like cod) can have 20 to 30 times less omega-3s.

Fatty fish are also chock-full of vitamin D, which may play a protective role as well. ([Look up more D sources with this online tool.](#))

Fishing for Smarts

Did you know? [Fish -- as well as these five other foods -- can help keep your mind young, too.](#)

BETA-CAROTENE WARNING! Dr. Myers warned that there is a growing body of evidence that Beta-Carotene, as a supplement, is actually *DANGEROUS* for Prostate Cancer patients. In a trial in which patients were given Vitamin E and Beta-Carotene, or Beta-Carotene alone, there was an increase in the death rate of those patients by 30%. A reviewer of these supplement recommendations made note that all the problematic trials used synthetic all-trans beta-carotene instead of natural mixed 9-cis/all-trans beta-carotene or mixed natural carotenoids. We would suggest if any of you are supplementing your diet with Beta-Carotene, that you look further into these obviously controversial findings.

VITAMIN C: Vitamin E works best in association with Vitamin C. Dr. Strum recommends 1000 mg of Vitamin C be taken after each meal to prevent fatty acid peroxide generation.

THE FOREGOING COMMENTS REGARDING VITAMINS C AND E NOTWITHSTANDING, more recent information provides the following:

CANCER VITAMIN STUDY: Vitamin C or E pills do not help prevent cancer in men, concludes the same big study that last week (November 2008) found these supplements ineffective for warding off heart disease. The public has been whipsawed by good and bad news about vitamins, much of it from test-tube or animal studies and hyped manufacturer claims. Even when researchers compare people's diets and find that a vitamin seems to help, the benefit may not translate when that nutrient is obtained a different way, such as a pill. "Antioxidants, which include vitamin C and vitamin E, have been shown as a group to have potential benefit," but have not been tested individually for a long enough time to know, said Howard Sesso of Harvard-affiliated Brigham and Women's Hospital in Boston." Thus, with the foregoing, I will leave it up to the individual to determine whether or not to include Vitamins C and E in their dietary supplements, as well as Lycopene and Selenium, which have also been more recently reported as having little effect with regards to prostate cancer.

COENZYME Q10 (CoQ10): Coenzyme Q10 is known to work best when given with Vitamins E and C. Since you are likely taking both these vitamins, it is then advantageous to take CoQ10 since it has been shown to prevent oxidation of LDL

cholesterol. In fact, the prevention of fatty acid oxidation may be just as important as decreasing fat consumption. Dr. Strum suggests Coenzyme Q10 be taken at a dose of 200 mg a day. An added benefit of CoQ10 is the improvement in heart function and diabetic control as well as the treatment of periodontal disease. Dr. Myers lists CoQ10 as a supplement he doesn't recommend but doesn't explain why. Yet, take note of the ninth paragraph in the following URL calling COQ10 "A Gentle Cancer Killer:"

<http://www6.miami.edu/ummedicine-magazine/fall2005/fstory4.html>. The second paragraph in the following URL describes the effect of COQ10 on prostate tumors: <http://www.med.miami.edu/news/view.asp?id=519> and gives a more descriptive explanation of the research.

CALCIUM (as a Citrate) with Vitamin D3: Calcium is much better absorbed in citrate form than carbonate. It is best taken at bedtime to lower excessive bone resorption by 20%, and should be taken in conjunction with Vitamin D to lower urinary calcium excretion. Over-the-counter Citracal contains 630 mg Calcium (as Ultradense calcium citrate) and 400 IU Vitamin D3 (as cholecalciferol) comes in caplet form. 2 caplets at bedtime are recommended by the manufacturer. This same combination of Calcium as citrate/Vitamin D3 is often found at lower cost at outlets like Sam's Club or Costco but you should check the label because some contain a calcium combination of citrate and carbonate, and you only want the citrate. Your physician may recommend other dosages and other forms of calcium and/or Vitamin D.

GENISTEIN: Cancer cells use the enzyme tyrosine kinase as a growth factor. Soy genistein is a potent inhibitor of tyrosine kinase activity. Its use is suggested to decrease cell adhesion, slow proliferation and decrease metastatic potential. Dr. Strum recommends Mega Soy Extract. Each 700-mg capsule of Mega Soy Extract contains 134 mg of genistein, 122 mg of daidzein, and 24 mg of glycitein, and he advises two of these capsules a day. Mega Soy Extract can be purchased from Life Extension telephone 1-800-544-4440. A little side note regarding Genistein and Broccoli: Eating foods like broccoli and soy has been linked to lower cancer rates, and California researchers say that they may have discovered what underlies this protective effect. Using cells in a lab dish, a team led by Erin Hsu, a graduate student in molecular toxicology at the University of California, Los Angeles has found that genistein, an isoflavone in soy, and diindolymethane (DIM), a compound made in the gut during digestion of broccoli, cabbage, kale and other cruciferous vegetables, reduce the production of two proteins needed for cancers to spread. Previous research has suggested that risk of prostate cancer may be

reduced by dietary intake of DIM from broccoli and genistein from soy but this is the first study to find a clue to the value of dishes in which broccoli or other cruciferous vegetables are served with soy foods like tofu and edamame beans. To read more:

<http://psa-rising.com/nutri/index.php/?p=50>

SAW PALMETTO? NO! This URL explains that purchasing saw-palmetto as a 5AR inhibitor is a waste of money:

http://www.youngagain.org/tnpc_chapter5.htm

Among the remarks:

"A typical analysis of saw palmetto shows that it contains a variety of fatty acids (capric, lauric, myristic, palmitic, palmitoleic, stearic, oleic, linoleic, linolenic, arachic, and eicosenoic), and minute traces of sterols and other plant chemicals that are biologically insignificant. Obviously, these herbal formulas just do not contain any effective amounts of active ingredients. That means you would have to eat about a pound of saw palmetto berries to get a basic dose of 330 mg of beta-sitosterol. Even with the most expensive "10x" (ten times) extracts of these herbs, one would still have to eat about two-hundred 500 mg capsules to get the 330 mg of beta-sitosterol! So, it is obvious that these herbs are ineffective, despite their continual promotion by the so-called natural health industry. Please understand that saw palmetto, Pygeum africanum, and other herbs and their extracts are simply biologically irrelevant, because they do not contain enough active ingredient. Even when the label says "85 percent fatty acids and sterols," you can be sure that it really means "nearly all fatty acids and almost no sterols." The saw palmetto products sold in America simply have no value, no matter how much advertising you have read. You won't see any saw palmetto or other herbal prostate product with any significant amount of beta-sitosterol in it."

BORON: Promotes healthy bone density. Shrinks prostate tumor size. Lowers PSA. May help prevent Prostate Cancer. Alleviates joint discomfort. In an Email to a patient, Dr. Strum recommended 9 to 12 mg daily

MODIFIED CITRUS PECTIN (MCP): Also known as fractionated pectin, is a complex sugar (polysaccharide) obtained from the peel and pulp of citrus fruits. MCP is rich in short, non-branched, galactose-rich carbohydrate chains. These shorter chains dissolve more readily in water and are better absorbed and utilized by the body than ordinary long-chain pectins. MCP alters the natural history of PC

and appears to reduce the risk of metastasis – the spread of cancerous cells from one tumor to other sites in the body. For metastasis to occur, cancer cells must first clump together. Protein molecules called galectins appear on the surface of cancer cells. The more galectins present, the easier it is for the cancer cells to clump together and metastasize. According to preliminary research, MCP binds to the galectins. By doing so, it blocks the cancer cell's ability to clump and spread. Although MCP has no significant direct anticancer effect, it is felt that it can be an important natural anticancer strategy. Studies suggest that MCP is best used in preventing the metastasis of breast cancer, prostate cancer, lung cancer, and melanoma. There is not a lot of human data available yet. In one of the few human studies, MCP was shown to decrease the cancer growth rate in 4 of 7 men with prostate cancer as measured by a reduced rate of increase in PSA levels. The typical dosage recommended for adults ranges between 6 and 30g daily in divided doses (e.g., 6g one to five times daily). Medical Oncologist Stephen Strum recommends 5g three times daily. The MCP powder is usually dissolved by blending in water or juice. See more at <http://tinyurl.com/3c77j9>. And here is a University of Georgia study: <http://www.medicalnewstoday.com/articles/80268.php>.

Interesting supplement remarks in a post to a patient by renowned Medical Oncologist specializing in prostate cancer research and treatment Stephen B. Strum:

Vitamin D, at a dosage of 800 international units per day is almost never sufficient to obtain optimal blood levels of 25 hydroxy D-3. The average dose required to achieve this is 8000 international units of vitamin D-3 per day. It is important to confirm this by obtaining 25 hydroxy D-3 levels as a dose of vitamin D is adjusted. This is called titration. It is also important to realize that the use of other supplements such as genistein will increase the production of 25 hydroxy D-3 by stimulating the hydroxylase enzyme that converts vitamin D3 to 25 hydroxy D-3. Interestingly and importantly, genistein also inhibits the enzyme that breaks down the most potent form of vitamin D known as 1, 25 dihydroxy cholecalciferol. Therefore, the combination of vitamin D3 and genistein may be a potent combination to use in the prevention of prostate cancer as well as in the active therapeutic approach to prostate cancer; or for that matter any disorder in which vitamin D appears to be a crucial element, e.g. breast cancer, colon cancer, multiple sclerosis, Alzheimer's disease, colon polyps, psoriasis and others.

Statin compounds deplete the body of CoQ10. If you are prescribed statins you need to take a CoQ10 supplement in the order of 200 mg per day minimally. CoQ10 may also have anti-prostate cancer activity.

Persaud I, Narain NR, Woan KV, et al: Coenzyme Q10 induces apoptosis in human prostate and osteosarcoma cells.

Prostate cancer is the second leading cause of cancer deaths in men in the United States and often metastasizes to bone. Androgen-independent prostate cancer is highly resistant to the current standard of care and presents a challenge to quality of life. We have discovered a novel in vitro protocol that facilitates the solubilization of the lipophilic molecule Coenzyme Q10 (Q10). Q10 is naturally resident in mitochondria and has been described as a potent antioxidant and crucial in the production of ATP. We previously demonstrated a pharmacologic dose of Q10 (50uM) selectively induces apoptosis in human melanoma, while being supportive to normal keratinocytes and fibroblasts in vitro. In the present study, we tested the effect of Q10 on an androgen-independent prostate cancer model, PC3 and osteosarcoma 143b cells using proliferation assays. In addition, the effect of Q10 on mitochondrial polarity was investigated using JC-1 stain in the presence of Q10. At 200 μ M Q10, results show a reduction of $69.57\% \pm 7.56$ and $74.51\% \pm 4.51$ in PC-3 and 143b cells, respectively. Moreover, uptake and aggregation level of JC-1 in PC-3 mitochondria analyzed by flow cytometry revealed a significant increase in green fluorescence in Q10 treated cells, indicating mitochondrial depolarization, a hallmark of apoptosis. Taken together, the data suggest that Coenzyme Q10 is a viable anti-tumor agent with minimal normal tissue toxicity and may be useful in controlling disease progression of prostate cancer.

POMEGRANATE:

Pomegranate extract is an agent that alters the natural history of PC.

< Stephen Strum, MD >

Literature involving human trials indicates that pomegranate will increase the PSA doubling time (PSADT) but I have no literature that it will alter the frequency of PSA recurrence (PSAR) post seed implant. Pomegranate is a good antioxidant showing value in heart disease. I see no harm in using it. There is a lot of literature on pomegranate having anti-PC effects ... such as:

Malik A, Afaq F, Sarfaraz S, et al: Pomegranate fruit juice for chemoprevention and chemotherapy of prostate cancer. *Proc Natl Acad Sci* 102:14813-8, 2005

Prostate cancer is the most common invasive malignancy and the second leading cause of cancer-related deaths among U.S. males, with a similar trend in many Western countries. One approach to control this malignancy is its prevention through the use of agents present in diet consumed by humans. Pomegranate from the tree *Punica granatum* possesses strong antioxidant and antiinflammatory properties. We recently showed that pomegranate fruit extract (PFE) possesses remarkable antitumor-promoting effects in mouse skin. In this study, employing human prostate cancer cells, we evaluated the antiproliferative and proapoptotic properties of PFE. PFE (10-100 µg/ml; 48 h) treatment of highly aggressive human prostate cancer PC3 cells resulted in a dose-dependent inhibition of cell growth/cell viability and induction of apoptosis. Immunoblot analysis revealed that PFE treatment of PC3 cells resulted in (i) induction of Bax and Bak (proapoptotic); (ii) down-regulation of Bcl-X(L) and Bcl-2 (antiapoptotic); (iii) induction of WAF1/p21 and KIP1/p27; (iv) a decrease in cyclins D1, D2, and E; and (v) a decrease in cyclin-dependent kinase (cdk) 2, cdk4, and cdk6 expression. These data establish the involvement of the cyclin kinase inhibitor-cyclin-cdk network during the antiproliferative effects of PFE. Oral administration of PFE (0.1% and 0.2%, wt/vol) to athymic nude mice implanted with androgen-sensitive CWR22Rnu1 cells resulted in a significant inhibition in tumor growth concomitant with a significant decrease in serum prostate-specific antigen levels. We suggest that pomegranate juice may have cancer-chemopreventive as well as cancer-chemotherapeutic effects against prostate cancer in humans.

Pantuck AJ, Leppert JT, Zomorodian N, et al: Phase II study of pomegranate juice for men with rising PSA following surgery or radiation for prostate cancer. *J Urol* 173:225A, 2005. PMID

Abstract 831

INTRODUCTION AND OBJECTIVE: Phytochemicals in edible plants can have cancer preventive benefits through antioxidation and via gene-nutrient interactions. Pomegranate juice has been shown to be a rich source of polyphenolic flavonoids. Pre-clinical data suggested the ability of

pomegranate juice to modulate the growth and progression of prostate cancer. To determine the clinical effects of pomegranate juice on patients with prostate cancer, a clinical trial was performed.

METHODS: A 2 year, single center, phase II, Simon two stage clinical trial for men with rising PSA after surgery or radiotherapy was designed based on a 20% response rate, an alpha of 5%, and 90% power. Eligible patients had a detectable PSA greater than 0.2 ng/ml and less than 5 ng/ml, and a Gleason score of 7 or less. Serial PSA measurements determined a baseline PSA doubling time. Patients were treated with 8 ounces of pomegranate juice by mouth daily (wonderful variety, equivalent to 1.5 mmol of total polyphenols per day) until disease progression. Clinical endpoints included safety, effect on serum PSA, and exploratory laboratory studies. Patients were followed in 3 month intervals for serum PSA, and blood and urine were collected for laboratory studies.

RESULTS: The study was fully accrued to 48 participants in two stages after efficacy criteria were met. There were no serious adverse events reported and the treatment was well tolerated. No patients developed metastatic disease on study. Mean PSA doubling time significantly increased with treatment, from a mean of 14 to 26 months ($p < 0.048$). The slope of the mean log PSA decreased from 0.08 to 0.04 on treatment ($p < 0.019$). In vitro assays using pre and post treatment patient serum on the growth of LNCaP showed decreased cell proliferation and increased apoptosis ($p < 0.07$). Pomegranate polyphenols were detected in the urine of all participants by LC-MS.

CONCLUSIONS: We report the first clinical trial of pomegranate juice in patients with recurrent prostate cancer. The positive and significant beneficial effects on PSA parameters achieved, coupled with corresponding laboratory effects on prostate cancer in vitro cell growth and apoptosis warrant further testing in a randomized, placebo controlled phase III study.

Pantuck AJ, Zomorodian N, Beldegrun AS: Phase-II study of pomegranate juice for men with prostate cancer and increasing PSA. *Curr Urol Rep* 7:7, 2006. [PMID:16480662]

Introduction: There have been a number of reports recently on the preclinical, in vitro, and in vivo antiproliferative and apoptotic activities of pomegranate polyphenols in prostate cancer, including demonstration of a dose-dependent inhibition of cell growth/cell viability and induction of apoptosis in human prostate cancer PC3 cells associated with induction of Bax and Bak (proapoptotic); downregulation of Bcl-X(L) and

Bcl-2 (antiapoptotic); induction of WAF1/p21 and KIP1/p27; a decrease in cyclins D1, 02, and E; and a decrease in cyclin-dependent kinase (cdk) 2, cdk4, and cdk6 expression [I]. Aims: To determine the clinical and laboratory effects of pomegranate juice on patients with prostate cancer. Methods: An open-label, single-arm, 2-year, phase-2, Simon two-stage clinical trial for men with increasing prostate-specific antigen (PSA) after surgery or radiotherapy was performed. Eligible patients had a detectable PSA greater than 0.2 ng/mL and less than 5 ng/mL that was documented as increasing, enough pre-treatment PSA time points to calculate a baseline PSA doubling time, no hormonal therapy prior to entering the study, no evidence of metastatic disease, and a Gleason score of 7 or less. Patients were treated with 8 oz of pomegranate juice by mouth daily until meeting disease progression endpoints. Patients were followed in 3-month intervals for serum PSA and blood and urine were collected for laboratory studies. Results: The study was fully accrued after efficacy criteria were met. There were no serious adverse events reported. None of the patients developed metastatic disease on study. Mean PSA doubling time significantly increased with treatment, from a mean of 15 to 37 months ($P < 0.048$). In vitro assays using pre- and post-treatment patient serum on the growth of LNCaP showed a 12% decrease in cell proliferation and a 17% increase in apoptosis ($P = 0.0048$ and 0.0004, respectively).

POM wonderful is the pomegranate product used in the above studies. Many patients (myself included) have decided to use various pomegranate extracts and both Drs. Myers and Strum recommend extracts to avoid the sugar content in juice.

Shown below is the URL for Pom wonderful

www.pomwonderful.com

http://www.pomwonderful.com/100_percent_juice.html

Supposedly available at

7-Eleven

Albertsons

QFC

Safeway

WinCo

Pomegranate as an extract can be purchased from Life Extension Foundation at much less expense than in juice form. 1 capsule contains the equivalent of 12.3oz

of pomegranate juice. Info: <http://www.lef.org/newshop/items/item00956.html>. I purchase mine from “Puritan Pride” and take two capsules daily.

WHEN IT COMES TO CONSIDERING DIET AND SUPPLEMENTS, here is startling information about the IMPORTANCE of diet and, particularly, supplement use:

Supplement use could save U.S. \$24 billion

A report released this month by the Dietary Supplement Education Alliance (DSEA) concluded that the use of dietary supplements by specific American populations could result in a savings of at least 24 billion in health care costs over a five year period. The current report updates a similar report commissioned by DSEA in 2005 which estimated 5.6 billion dollars in savings over five years.

The report re-emphasizes that supplementing select groups with calcium and vitamin D, folic acid, omega-3 essential fatty acids (EFAs), and lutein with zeaxanthin could have a tremendous impact on health care expenditure. In the summary of the findings, the report states that the use of calcium and vitamin D by postmenopausal women could potentially avoid approximately 776,000 hospitalizations for hip fractures and a significant number of extended nursing facility stays for this group, resulting in a savings of 16.1 billion dollars.

If folic acid were used by the 44 million American women of childbearing age, 600 fewer infants would be born with neural tube defects, resulting in a savings of 1.4 billion dollars over five years. Omega-3 fatty acid supplementation in the amount of 1800 milligrams per day among those over the age of 65 would result in a 3.2 billion dollar savings, and avoidance of 374,301 hospitalizations over the next five years. And just 6 to 10 milligrams lutein with zeaxanthin per day is estimated to save \$3.6 billion by preventing 190,927 individuals from losing their independence due to loss of central vision resulting from macular degeneration.

“Rapidly escalating health care costs in the U.S. have severe implications for our society as a whole,” DSEA president Jon Benninger stated. “This study provides valuable data that may lead to preventative health care solutions and address the budgetary problems facing federal and state health insurance programs, corporate health cost managers and individual families.”

According to the US Department of Health and Human Services and Department of Agriculture, "The Nutrition and Your Health: Dietary Guidelines for Americans acknowledges that some Americans may need a vitamin and/or mineral supplement to meet specific nutrient needs." In view of the potential savings for an overburdened health care system alone, not to mention the prevention of a significant amount of suffering and disability, the consistent use of nutritional supplements by at-risk groups could greatly benefit these populations, as well as our society as a whole.

MORE TO EXPLAIN VITAMIN D:

Understanding 1,25 dihydroxy Vitamin D and 25-hydroxy Vitamin D.

1,25 dihydroxy Vitamin D (range 15.9-55.6pg/mL) is increased in sarcoidosis and hyperparathyroidism. It may be elevated in cases of hypercalcemia associated with malignant lymphoma. It is decreased in rickets, type I vitamin D-resistant rickets, hypoparathyroidism, pseudohypoparathyroidism, and renal osteodystrophy and psoriasis. Because of the complex, multifactorial control of calcium balance, it is often useful to measure parathyroid hormone in conjunction with vitamin D. This is NOT the assay to determine vitamin D deficiency. The 1,25-dihydroxy Vitamin D assay should never be used for detecting Vitamin D deficiency because levels will be normal or even elevated as a result of secondary hyperparathyroidism. Rather, 25-hydroxy Vitamin D is the appropriate assay.

25-hydroxy Vitamin D (range 32-100ng/ml) deficiency leads to the mobilization of calcium from bone. Individuals with more severe vitamin D deficiency can develop osteomalacia and/or osteoporosis. Osteomalacia in children, also referred to as rickets, results in well described skeletal malformations since their bones are actively growing. Recent clinical and edpidemological studies suggest that vitamin D deficiency may play a role in several conditions related to bone including prostate cancer, breast cancer, colon cancer, heart disease, hypertension, multiple sclerosis, and type 1 diabetes. A number of studies have shown that vitamin D deficiency is very common, especially in certain high-risk populations. This situation has occurred, in part, because the foods in the typical American diet are very low in vitamin D. Fatty fish, such as mackeral and salmon and fish liver oils, are some of the few natural dietary sources of vitamin D. Most people do not eat

enough of these foods to maintain adequate vitamin D levels or do not spend enough time in the sun. In the United States, vitamin D is added to milk in order to prevent the occurrence of rickets in the pediatric population. Unfortunately, too many children do not drink enough milk to raise their vitamin D levels to the optimum range. Also, recent studies have shown that the level of vitamin D in fortified milk is frequently much lower than that recommended by the FDA. Human milk contains very little vitamin D because many mothers are deficient, so children of mothers who choose to breast-feed are at risk of developing rickets if they are not given supplemental vitamin D. The American Academy of Pediatrics recommends that infants who are exclusively breast-feeding should be given a supplement of vitamin D. Several factors are associated with an increased risk of developing vitamin D deficiency. At risk populations include:

- Individuals with low dietary vitamin D levels: Infants fed only mother's milk and children who do not drink fortified milk are at risk.
- Individuals with malabsorption syndromes: Patients with pancreatic enzyme deficiency, Crohn disease, cystic fibrosis, celiac disease, and surgical resection of stomach or intestines are at risk.
- Individuals with severe liver disease: Hepatic disease can reduce the conversion of vitamin D to 25-D and can lead to malabsorption of vitamin D.
- Individuals with kidney disease: Nephrotic syndrome can increase the urinary loss of vitamin D.
- Individuals taking certain drugs: Several medications, including phenytoin, phenobarbital, and rifampin accelerate the breakdown of vitamin D by the liver.
- Individuals who live at higher latitudes: Individuals who live in northern climates are at increased risk of deficiency, especially in winter months due to diminished exposure to UVB radiation.
- Individuals who spend little time outside: Individuals who are home-bound or simply choose to remain inside are at increased risk.
- Older adults: The skin becomes less efficient at producing vitamin D as one ages because of diminished levels of vitamin D precursors in the skin.
- Individuals with decreased sun exposure for cultural reasons. Women in some societies are required to cover themselves with heavy clothing, reducing exposure to the sun's rays.
- Races with high melanin levels: Increased skin pigmentation can reduce the efficiency of vitamin D conversion in the skin as much as 50-fold. Individuals with dark complexions living at higher latitudes are at increased risk.

Serum concentrations of 25-D are known to vary with age, sex, race, season, and geographic location. This has led to establish seasonal expected ranges for the geographic location and local population. This approach provides a "reference interval," but does not adequately determine health status with regard to vitamin D levels if a significant portion of the reference population is, in fact, deficient. A more useful parameter in clinical practice would be a nutritional threshold, below which an individual could be characterized as vitamin D deficient. Several investigators have approached this problem by assessing the correlation of plasma 25-D concentration with various biological markers. For example, plasma 25-D levels have been shown to have an inverse relationship to serum parathyroid hormone levels. Secondary hyperparathyroidism can be corrected with 25-D levels increased to >32ng/mL (80nmol/L). Serum concentrations <32ng/mL are associated with impaired insulin resistance and beta-cell function. Together these data suggest that 32ng/mL represents the appropriate threshold for identifying individuals with clinical vitamin D deficiency.

Interesting to note these remarks by John Cannell, M.D., of The Vitamin D Council:

"You see, the question is not "Should men with prostate cancer be treated with vitamin D?" The question is, "Should men with prostate cancer be allowed to die vitamin D deficient?" The evidence based medicine folks say they should. We say they shouldn't. All patients with prostate cancer should have their vitamin D deficiency aggressively and immediately corrected and that requires up to 4,000 units of cholecalciferol every day. Physicians, researchers, or scientists who say 4,000 units may be toxic are simply admitting their ignorance of current scientific literature.

Physicians who have read the recent scientific literature and who understand the physiology and pharmacology of cholecalciferol would be comfortable using up to 10,000 units of cholecalciferol a day while following the patient's PSA, urine and serum calcium, and 25(OH)D. Thanks to the Toronto group, scientific evidence now exists that suggests such an approach may help prostate cancer patients; only time will tell.

Many patients with prostate cancer are on the long hopeless road towards death. Not only may plain old vitamin D help men with prostate cancer, it is likely to give them back their hope. Physicians have many rights, but the right to take away hope is not among them."

Medical Oncologist Charles "Snuffy" Myers provides this information regarding appropriate Vitamin D3 level:

"We use a broad goal of 50-100ng/ml. Most of what has been reported as Vitamin D toxicity is really toxicity from excessive calcium intake. From what I have seen, 25-hydroxyvitamin D appears to be very safe by itself. Clearly the literature is evolving rapidly and the direction is toward higher levels being also safe. In certain settings, hypercalcemia is quite unlikely. For example, in men on Zometa, it is hard to keep the calcium in the normal range - it all too easily slips into an abnormally low range, triggering hyperparathyroidism."

Note that Dr. Myers specifically remarks that the Vitamin D3 level should be within a "broad range" of 50-100ng/ml. That's his "broad range" spread. He assigns his patients specific goals, and for most that goal is in the 65ng/ml-75ng/ml range with total Vitamin D3 intake of up to 10,000 IU daily to reach that range. Increased Vitamin D3 intake should be accompanied by regular monitoring of blood serum 25-hydroxy Vitamin D, blood serum and urine calcium levels, and parathyroid hormone level.

AND THIS FROM JOHNS HOPKINS:

[Can Vitamin D Prevent Prostate Cancer?](#)

If you thought vitamin D's main role was preventing rickets and strengthening bone, think again. Many researchers now believe that the "sunshine vitamin" may one day play a key role in preventing the growth of prostate cancer, and in killing rogue prostate cancer cells that have escaped into the body. The data are quite suggestive and vitamin D is a most promising area for prostate cancer research.

During the past decade, there's been a surge in research into the association between vitamin D and prostate cancer. Multiple studies have reported a link between sub-optimal levels of vitamin D and an increased risk of developing various cancers including prostate cancer, although not all studies have been confirmatory. While these findings are encouraging and could eventually lead to widespread screening for and treatment of vitamin D deficiencies, we still need a large, randomized, placebo-controlled trial to demonstrate whether vitamin D supplementation can actually prevent prostate cancer.

Vitamin D was first isolated by Adolf Windaus, who was awarded the Nobel Prize in 1928 for his work. Vitamin D is not actually a vitamin; it's a hormone. A vitamin is a substance you have to get from food. Vitamin D, however, is manufactured in the body -- the definition of a hormone. While researchers are still working to determine the effects of vitamin D on the prostate, here are some of the heart benefits of this vitamin:

- **Blood pressure regulation.** While there is no direct evidence that vitamin D supplementation will lower blood pressure, people with high blood pressure generally have low blood levels of vitamin D.
- **Heart attack, stroke, heart failure reduction.** A recent study in *Circulation* reported that events such as heart attacks, strokes, and heart failure were anywhere from 53% to 80% higher in people with low levels of vitamin D in their blood. That risk increased even more in people with high blood pressure.

Low blood levels of vitamin D may increase the risk of heart disease and stroke, especially for people with high blood pressure, according to researchers with the Framingham Heart Study. The scientists followed 1,739 men and women for more than five years and reported that participants with low blood levels of vitamin D were 62% more likely to develop cardiovascular disease than those with higher levels. For those with low vitamin D levels and high blood pressure, cardiovascular risk doubled.

- **Helps reduce inflammation.** Researchers speculate that more vitamin D could lead to less inflammation in the arteries. Until recently, most researchers believed that heart disease was essentially a "plumbing" problem caused by an accumulation of hardened fat and cholesterol in the coronary arteries, known as plaque. However, an increasing body of evidence now shows that this accumulation of plaque is actually the result of chronic, low-grade inflammation in the coronary arteries. Researchers also believe that in the battle against heart disease, damping down this inflammation is nearly as important as lowering cholesterol.

