

Dear Functional Medicine Doctors and Practitioners:

At our next Functional Medicine Discussion Group meeting I am very excited that one of my favorite integrative doctors, Dr. Lise Alschuler, one of the true giants in our field on nutrition and cancer, author of **The Definitive Guide to Cancer: An Integrative Approach to Prevention, Treatment, and Healing**, and President of the Oncology Association of Naturopathic Physicians, will be joining us via Skype for a discussion on antioxidants and cancer on Tues December 15 at 6:30. **Please send me an email if you will be able to attend this meeting.** The question we will address is "Do antioxidant supplements, such as vitamin A, vitamin C, the vitamin E group (tocopherols and tocotrienols), beta carotene, selenium, and lycopene prevent cancer and are they safe for cancer patients to take?" A highly respected oncology surgeon, Dr. Richard Essner, will also join us.

There are two distinct issues that we should discuss:

- 1) Do antioxidants prevent cancer (primary prevention) or prevent cancer recurrence (secondary prevention)?
- 2) Are antioxidant supplements helpful when cancer patients are undergoing chemo or radiation treatments?

Of course, this discussion on antioxidants does not address whether diet or other nutritional supplements, like curcumin, resveratrol, quercetin, green tea extract, fish oil, vitamin D, etc. etc. may be beneficial for these purposes.

1) Do Antioxidants Prevent Cancer?

There's an inherent physiological logic to using antioxidant supplements. Research is consistent that eating fruits and vegetables promotes health and reduces the risk of heart disease and cancer and nearly every other chronic disease.(1) So why not concentrate some of the health promoting properties of fruits and vegetables into tablets and use these to prevent cancer? Also, we know that free radical reactions are involved in damage to both our cells and our DNA and antioxidants block free radicals. Therefore, it would be reasonable that consuming additional antioxidants in supplement form would protect our cells and our DNA from damage, much like wearing sun screen protects our skin from damage by the sun. Some research has validated this concept, such as the Linxian General Population Nutrition Intervention Trial which found that taking modest dosages of antioxidants reduced the risk of dying from stomach cancer. This study looked at healthy Chinese men and women at risk of developing esophageal and gastric cancer and randomly assigned them to

take either 15 mg beta carotene, 30 mg alpha-tocopherol, and 50 mcg selenium or placebo for 5 years.(2) A paper was just published this month in the *American Journal of Clinical Nutrition* found that while higher retinol levels in the blood increased prostate cancer risk, higher alpha tocopherol levels reduced prostate cancer risk and both lycopene and alpha tocopherol reduced the risk of aggressive prostate cancer risk.(3) Alpha carotene, beta carotene, lutein, zeaxanthin, canthaxanthin, cryptoxanthin, and gamma tocopherol levels were found to not affect risk of prostate cancer. There is also the Post-diagnosis Supplement use and Breast Cancer Prognosis in the After Breast Cancer Pooling Project paper that showed that vitamin E was associated with a reduced risk of recurrence and vitamin C was associated with a decreased risk of death.(4) Vitamin D was associated with a 46% reduced risk of recurrence with ER positive breast cancer. There was no association between supplements used (vitamins A, B, C, D, E, and multivitamins) and recurrence of breast cancer.

On the other hand, there have been a number of randomized clinical trials and meta-analyses that have found no benefit or even increased risk of cancer with antioxidant supplements. For example, the *Alpha Tocopherol/Beta Carotene Cancer prevention Study* (ATBC), aka, the famous Finnish smoker's study, found that middle aged male smokers who took 20 mg per day of beta-carotene had an increased incidence of lung cancer, though taking 50 mg/day of alpha tocopherol had no effect.(5) Later analyses found that there was no increased risk with either supplement with the incidence of bladder, pancreatic, colorectal, kidney, or digestive tract cancers. The *Physicians' Health Study* found that beta-carotene supplementation 50 mg every other day had no effect on cancer incidence, cancer mortality, or all-cause mortality among US male physicians in both smokers and non-smokers.(6) Likewise, the *Physicians' Health Study II* found that 400 IU vitamin E every other day, 500 mg vitamin C every day or a combination of the two for 7.6 years did not reduce the incidence of prostate cancer or other cancers.(7) A meta-analysis published in *JAMA* in 2007 after reviewing 68 randomized clinical trials on antioxidants and cancer prevention concluded that not only is there no protective effect, but "[t]reatment with beta carotene, vitamin A, and vitamin E may increase mortality. "(8) This led many US physicians to recommend that their patients avoid nutritional supplementation, including even multi-vitamins. And more recently, there was a paper on a study where rats with cancer were given either NAC, alpha tocopherol or both and they found that melanoma metastases were increased. The headlines in the popular and medical press declared afterwards that "Antioxidants Promote Cancer."(paper attached)

2) Are antioxidant supplements helpful when cancer patients are undergoing chemo or radiation treatments?

Many of us integrative practitioners have found that antioxidant and other supplements have been helpful to our patients with cancer to strengthen their immune systems, reduce the side effects of their treatments and improve their overall health, making them more able to fight their cancer. In some cases, studies have actually shown that supplements lead to a better outcome by enhancing the effects of the chemotherapy. Many oncologists are against the use of antioxidant and other supplements during cancer treatment. Why are oncologists so against the use of supplements and are they right?

It is generally understood that chemotherapy and radiation kill cancer cells at least partially with free radicals, so it might be reasonable to conclude that antioxidants that block free radicals would counter these effects. In other words, the antioxidants would protect the cancer cells as well as the normal cells. Dr. Watson of Watson and Crick fame has published several rants on this topic, including this

one: <http://rsob.royalsocietypublishing.org/content/3/1/120144>

But are antioxidant supplements really potent enough to uncouple chemotherapy? Is this negative effect just theoretical? And if eating fruits and vegetables that contain loads of antioxidants don't neutralize chemo, then how could supplements? Dr. Jeanne Wallace said at the 2010 IFM conference on cancer that it makes no sense that a 1000 mg vitamin C tablet with an ORAC value of 500 could counter the effects of a chemo treatment when a cup of wild blueberries with an ORAC value of 13,000 does not. (ORAC is a measure of antioxidant capacity.) Dr. Keith Block, an integrative oncologist, published two large systematic reviews in the *International Journal of Cancer* in 2008 that found that antioxidants (like glutathione, vitamin A, vitamin C, vitamin E, melatonin, NAC, CoQ10, selenium, beta carotene) increase cancer survival rates, improve tumor response, and improve the patients tolerance to their treatments. Dr. Block published a paper in *Breast Journal* showing that his patients treated with both chemo and healthy diet and supplements survived longer.(10)

If you have time, in addition to the papers attached, you should try to listen to the two webinars on the Genova web site with Dr. Alschuler on an integrative approach to breast cancer. They are really excellent:

<https://www.gdx.net/livegdx/integrative-strategies-for-supporting-patients-diagnosed-with-breast-cancer>

<https://www.gdx.net/livegdx/integrative-strategies-for-supporting-patients-diagnosed-with-breast-cancer-2>

Sorry about such a long email. I have attached some of the papers. Most of the rest can be found online and if not, email me and I will send them to you. Hope to see you on the 15th

References:

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"Those who think they have no time for healthy eating will sooner or later have to find time for illness."

- modified from : Edward Stanley (1826-1893) from The Conduct of Life

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