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**FILE: ■Antioxidants
■Chemotherapy
■Cancer Treatment**

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RE: Many Antioxidants Found to Benefit Patients Undergoing Conventional Cancer Treatments

Simone CB, Simone NL, Simone V, Simone CB. Antioxidants and other nutrients do not interfere with chemotherapy or radiation therapy and can increase kill and increase survival, part 1. *Altern Therap.* Jan/Feb 2007; 13(1):22-28.

Chemotherapy and radiation therapy are currently the most common conventional medicine cancer treatments. These treatments cause DNA damage that eventually leads to cancer cell death. Radiation therapy and some forms of chemotherapy produce DNA damage by generating free radicals. Both therapies are associated with severe adverse effects. In 1997, Dr. Larry Norton of the Memorial Sloan-Kettering Cancer Center (New York, New York) stated in the *New York Times* that vitamin C could interfere with chemotherapy for breast cancer.¹ According to the *New York Times* article, vitamin C "acted like a growth tonic for cancer cells."¹ In addition, the article's author postulates that large doses of vitamin C may have an "unpredictable effect" when combined with therapies that kill cancer cells by producing free radicals.¹ She also erroneously states that folic acid "can negate the effects of methotrexate, a drug used to treat cancer."¹ In fact, the prescription drug folinic acid, not folic acid, is known to interact with methotrexate. The idea that vitamin C interferes with chemotherapy and radiation therapy has spread to all antioxidants. Many cancer patients are now advised not to take antioxidants and other nutrients while undergoing chemotherapy or radiation therapy.

The current article is the first of a 2-part review of published scientific literature aimed at demonstrating that antioxidants and other nutrients do not interfere with cancer chemotherapy and radiation therapy. The authors searched CANCERLIT and MEDLINE for all studies reporting the concomitant use of "food supplement nutrients" with radiation therapy and/or chemotherapy. Cancer patients often suffer from malnutrition and depleted levels of antioxidants, causing high levels of oxidative stress. Therefore, the authors caution that cancer patients should never take iron supplements, which can be an "intermediate cause of this oxidative stress," unless they have iron-deficiency anemia. The published literature indicates that other vitamin supplements do not interfere with cancer chemotherapy or radiation therapy.

The authors cite 280 peer-reviewed studies, including 50 human studies enrolling a total of 8,521 patients. All of these studies indicate that non-prescription antioxidants and other vitamin

supplements do not interfere with chemotherapy or radiation therapy. In addition, some supplements may actually increase patient survival rates, and 47 out of the 50 human studies indicate that nutrient supplements decrease the severe adverse effects associated with chemotherapy and radiation therapy. Five older studies show that the antioxidant N-acetyl cysteine does not interfere with the "tumor-killing capability of andriamycin" and reduces the cardiotoxicity associated with the drug. In addition, seven in vitro, 22 in vivo, and three clinical studies indicate that beta-carotene, selenium, and vitamins A, E, C, and K protect patients from andriamycin's toxicity and increase its anticancer effects. Similarly, 51 in vitro and 81 in vivo studies indicate that nutrients, including beta-carotene, selenium, cysteine, and vitamins A, B₆, B₁₂, C, D, E, and K, do not interfere with chemotherapy or radiation therapy. In fact, these nutrients have beneficial effects, including "increased protection of normal tissues, increased tumor killing, and, in some studies, increased animal survival."

The authors cite eight clinical studies on vitamin A: two randomized trials and six observational studies. All eight studies indicate that vitamin A (30,000-500,000 IU/day) does not interfere with either radiation therapy or chemotherapy. The studies also show that vitamin A has positive effects: increasing patient survival rates, decreasing adverse effects, and improving patient response rates. The authors found two studies on beta-carotene, one observational and one randomized. The studies indicate that beta-carotene does not interfere with chemotherapy or radiation therapy, and decreases adverse effects, such as severe acute mucosal reactions. The authors also review 10 studies involving vitamin E (alpha-tocopherol) and chemotherapy and/or radiation therapy, including six observational and four randomized studies. All 10 indicate that co-administration of vitamin E (400-2,000 IU/day) does not produce negative interactions. Additionally, several studies show positive effects- reducing toxic adverse effects, improving skin condition, possibly preventing cardiac toxicity, improving response rates, preventing mucositis (when used topically), and preventing hair loss.

This review indicates that vitamin A, beta-carotene, and vitamin E do not have negative interactions with cancer chemotherapy or radiation therapy. Instead, positive effects were observed in most of the studies reviewed, including a decrease in the severe adverse effects associated with both cancer therapies. The second part of this review article will focus on antioxidant combinations and provide a summary and discussion.

—*Marissa Oppel, MS*

References

1. Brody JE. Puzzle in a bottle -- a special report.; in vitamin mania, millions take a gamble on health. *New York Times*. October 26, 1997, <http://query.nytimes.com/gst/fullpage.html?res=9501E1DB1631F935A15753C1A961958260&sec=health&sp on=&partner=permalink&exprod=permalink>

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