

Linus Pauling and Vitamin C Therapy for Breast Cancer

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Several vitamins and minerals called antioxidants protect the body against a form of cellular damage linked with cancer. Each of these vitamin and mineral antioxidants, including vitamin C, appears to provide some protection against Cancer. Vitamin C is also known to protect animals from cancer.^{40, 41, 42} It is now relatively well accepted that vitamin C protects humans from stomach cancer.^{43,44,45} Many researchers believe Other cancer risks are also reduced by higher-than-normal vitamin C intake.⁴⁶

Vitamin C affects the immune system, which must be functioning well to combat cancer. White blood cells (WBCs), the immune system's primary fighting force, contain the vitamin. Reviews of the research show that WBCs taken from cancer patients have less vitamin C than do WBCs from healthy people.^{47,48}

Treating cancer with vitamin C has been a controversial issue since Linus Pauling, the Nobel Prize-winning scientist, began to advocate it years ago. Working with a Scottish surgeon. Ewan Cameron, Pauling decided to investigate the possibility that vitamin C might help patients who already have cancer.⁴⁹ hundred terminal cancer patients were given 10 grams of vitamin C daily (2.5 grams four times per day) and followed until death. They lived an average of 210 days, compared with hospital records of 1,000 "matched controls" (similar patients) who aver aged only 50 days. A follow-up showed an even wider gap between the vitamin C and control groups.⁵⁰

The rest of the research community was concerned about these results, in part because the 1,000 control patients received no placebo.⁵¹ In other words, the patients taking the vitamin might have lived longer because they believed the therapy might have helped them.* Ironically, while conventional medicine has very little interest in psychological intervention in cancer treatment, medical doctors feel no qualms about using the argument that placebo effect, a psychological intervention, might extend life significantly.

*In a placebo-controlled trial, all patients know they might be receiving a treatment or they might be getting an inert placebo. The function of such a control is to remove the psychological advantage of getting something from the purely physical effects of the treatment. Because patients don't know whether they received the real treatment or the placebo, the real treatment group has no psychological advantage over the placebo group. Otherwise there would be a bias; it is well known that people who merely think they have received a real treatment often do better physically. The Mayo Clinic attempted to test Cameron and Pauling's results. The Mayo Clinic paper, which did have a placebo-control group, reported that vitamin C did not help.⁵² Linus Pauling protested that the two trials weren't equivalent because most of the Mayo Clinic patients had had chemotherapy, while his patients had not. This distinction might be important because chemotherapy impairs the immune system; and, as mentioned earlier, one way in which vitamin C might help cancer patients is by boosting immune function. Theoretically, a damaged immune system might not be able to take advantage of supplemental vitamin C.

In response, the Mayo Clinic proceeded to do another study testing vitamin C. This time they used patients who had had no chemotherapy.⁵³ The researchers said that this trial was ethical because "there is no known form of chemotherapy for colorectal cancer that has been demonstrated to produce substantive palliative benefit or extension of survival."⁵⁴ For this reason, the second Mayo Clinic study was limited to colon cancer patients. Once again, the researchers claimed that vitamin C was useless.

But careful examination of the second Mayo clinic study shows that Pauling's hypothesis was never tested. Pauling said that terminal cancer patients fed vitamin C until death would live substantially longer. In the Mayo study, as soon as the cancer progressed, patients were taken off vitamin C. The researchers claimed that it was unethical to keep them on the therapy because it wasn't working. In fact, there was no way to know whether the vitamin C was "working" unless patients were kept on it until they died. Keep in mind that these were terminal patients to begin with. Pauling

and Cameron had never said that the vitamin was curative (though a couple of their patients actually lived for many years); rather, they claimed only that terminal patients taking C until they died lived longer on average.

There was another irony in the stance taken by the Mayo Clinic team. While it was "inhumane" to keep patients on vitamin C, an inexpensive and harmless supplement, many of these patients were subsequently given fluorouracil, the very form of chemotherapy that had been proven repeatedly to be ineffectual and toxic in the treatment of colon cancer. Recall that the uselessness of chemo was the initial ethical justification for putting terminal colon cancer patients on a regimen that did not include chemo. Although the transparency of the clinic researchers' bias has been discussed in relatively obscure alternative sources,⁵⁶ it has not been picked up in journals.

A separate criticism of the second Mayo Clinic trial also has some merit: The control group may also have been taking vitamin C. All of the colon cancer patients were told that vitamin C was being tested to see if it would help them. They were also told that they might not be getting the real vitamin C; their pill might be just a placebo. Under these circumstances, who would be so compliant as to not sneak a little vitamin C on the side? Such a surreptitious change would obviously invalidate the outcome. A very limited investigation was made to rule out this possibility (only six placebo-taking patients were checked, and they were checked at only one point in time). Vitamin C excreted in urine reflects oral intake; patients were considered not to be taking clandestine vitamin C if their urine contained 550 milligrams of vitamin C per day or less—vastly more than the average person will excrete under normal circumstances. It seems inconceivable that the Mayo researchers didn't know that fact. Even at the 550 milligram level, one of the six patients exceeded the limit, strongly suggesting that he or she was "cheating," as most thinking people would do under the circumstances. To restate the implications, patients in the placebo group could have been taking vitamin C; and the test the researchers used to rule that out was faulty.

The Mayo Clinic's bias is revealed in other ways as well. In their *New England Journal* report, the researchers state, "It is very clear that this study fails to show a benefit for high-dose vitamin C therapy of advanced cancer."⁵⁷ The study doesn't deal with "advanced cancer" as stated—only with colon cancer. This might seem to be a minor detail, but it's the very kind of technicality that researchers are extremely careful of in order to protect themselves from future criticism. It's uncommon for researchers to overstate their case in the *New England Journal of Medicine*; it seems plausible that this exaggeration was included to affect the press more than to inform scientists and doctors.

Normally, scientists work together in an environment of collegiality. Typically, those working in the same field are in close touch and usually know how colleagues' efforts are proceeding even before work is published. To purposely keep a scientist of the caliber of Linus Pauling in the dark is both unusual and very poor form, to say the least; yet this is apparently what the Mayo Clinic did. In a press release, Pauling

expressed his concern about the behaviour of the Mayo Clinic physicians in taking positive steps to prevent him and Dr. Cameron from learning about the nature of the Mayo Clinic work until it had been published. The principal investigator in the Mayo Clinic work had promised Dr. Pauling that he would provide a copy of the paper to Dr. Pauling and Dr. Cameron before the date of publication, but then he did not do so.⁵⁸

Frequently unmentioned in the ongoing debate between Linus Pauling and the Mayo Clinic is the fact that Pauling's work has already been independently verified by Japanese researchers. Murata and Morishige's high doses of vitamin C (five grams or more per day) extended patients' lives from an average of 43 to 246 days,⁵⁹ a change remarkably similar to that reported by Cameron and Pauling.

While the issue has not been resolved (the Japanese study also lacked a placebo control), the characterization that "vitamin C goes down for the count" that appeared in the medical press⁶⁰ is more wish than fact.

If we focus on what effect vitamin C had on breast cancer patients in the Pauling study, we find survival times of more than 487 days versus 52 days.⁶¹ Keep in mind that these patients were terminal. These figures tell us very little about using vitamin C to treat early-stage disease. Although we may speculate that a substance that extends life in late-stage cancer patients might do better at an earlier point in time, especially because there is much evidence that vitamin C prevents cancer,⁶² we have no facts to back up this assumption. A study exploring this possibility would take years and require considerable funding—money that's currently unavailable for this kind of research.

As you might expect, Cathy takes 12 grams of vitamin every day "just in case." The only common side effect, diarrhea can be controlled by simply lowering the dose. Possible links between large doses of vitamin C and kidney stones have been suggested; but in the absence of a history of such stones, vitamin C appears to be relatively safe. Avoid the chewable form of vitamin C. It usually contains sugar, and the combination of the acid in the vitamin and the added sugar can cause tooth decay. If you're considering taking vitamin C and have had problems with diarrhea or a history of kidney stones, it's particularly important to talk with a nutrition-oriented doctor. Graduates of some Chiropractic colleges (such as Western States or Los Angeles Chiropractic College) or any licensed naturopathic physician should be well-versed in vitamin C supplementation.