



Should Cancer Patients Take supplements?

## Description

# Does Supplementation Interfere With Cancer Treatment?

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Supplementation for cancer patients is a controversial topic.

- Dr. Strangelove and his friends promote a variety of herbal ingredients, vitamins, and minerals as a cure for various kinds of cancer.
- Unscrupulous supplement companies hype their cancer “cures”.
- Doctors often tell their patients to avoid all supplements while they are being treated for cancer.
- Nutrition experts and some doctors tell us that a good diet and basic supplementation help normal cells recover from cancer treatment and improve patient outcomes.

## Where is the truth?

For this article I will break it down into three questions:

1) Does supplementation improve outcomes for cancer patients? That is the topic of the study ([AL Shaver et al, Cancers, 13: 6276, 2021](#)) I will review today.

- 2) Does supplementation interfere with cancer treatment? I will provide a perspective and practical advice on this question based on my 40 years of cancer research.
- 3) Does supplementation prevent (reduce the risk of) cancer? I have covered this topic in previous issues of "[Health Tips From the Professor](#)". Just put cancer or breast cancer in the search box to find the relevant articles.

But before I answer these questions, I should cover my favorite topic as a Biochemist, "Metabolism 101". Specifically, "Does Stress Increase Our Need For Supplementation?"

## **Metabolism 101: Does Stress Increase Our Need For Supplementation?**

Let me start out by saying that there are two kinds of stress.

- Psychological stress is our body's response to a hectic day or a stressful work environment.
- Metabolic stress is our body's response to trauma or a major disease.

Dr. Strangelove and his buddies will tell you that psychological stress increases your nutritional needs. And they just happen to have the perfect blend of vitamins and minerals for you. However, this is a myth.

Psychological stress has relatively little effect on your nutritional needs. If you have a nutritional deficiency, supplementation can help you cope with psychological stress, but psychological stress doesn't create nutritional deficiencies.

Metabolic stress, on the other hand, has a major effect on your nutritional needs.

- Trauma and major diseases put you in a catabolic state. Catabolism literally means "breaking down". You are breaking down your body tissues at an alarming rate. This affects every aspect of your health, including your immune system.
- Trauma and major disease also increase your need for certain micronutrients. Plus, there are often loss of appetite and mobility issues that prevent you from getting the nutrients you need.
- Research in the 60s and 70s showed that providing hospitalized patients with protein, energy in the form of healthy fats and carbohydrates, and micronutrients significantly

shortened hospital stays and improved outcomes. Today, nutritional support is the standard of care for severely ill hospital patients.

Cancer is the poster child for metabolic stress.

- It forces the body into a catabolic state to provide nutrients the cancer needs to grow.
- That is why cancer patients often experience dramatic weight loss and weakness from muscle loss.
- Catabolism also weakens the immune system, which is one of the most important tools in our fight against cancer.
- To make matters worse:
  - Cancer treatment destroys normal cells as well as tumor cells. Because of this cancer patients sometimes die from the treatment, not the cancer.
  - Cancer treatment often causes nausea and/or suppresses appetite, which makes it even harder for cancer patients to get the nutrients they need from their diet.

Because of this, you would think that nutritional support would be the standard of care for cancer patients, but it isn't. Because of fears that nutritional support might "feed cancer cells" or interfere with chemotherapy, there have been very few studies of supplementation in cancer patients. That is what makes this study so important.

## **How Was This Study Done?**

This study took advantage of the fact that supplementation is prevalent among cancer patients even though their doctors may not have recommended it.

This study drew on data from the 2011-2012 National Health and Nutritional Examination Survey (NHANES). NHANES is a yearly survey that monitors the health and nutritional status of non-institutionalized adults in the US population.

NHANES participants were asked to respond to a medical condition questionnaire in their homes by a trained interviewer. In one portion of the interview, they were asked if they had ever been told they had cancer, arthritis, diabetes, congestive heart failure, chronic obstructive pulmonary disease (COPD), or hypertension. The participants were also asked

if they had been hospitalized with one of those diseases.

The study consisted of 14 million people who answered 'yes' to the question, "Have you ever been told you had a cancer or malignancy?" The participants were selected to give an equal number of supplement users and non-users who were closely matched for age, sex, race, and other demographics.

All NHANES participants were asked to fill in two 24-hour dietary recalls separated by 3-10 days. The dietary recalls included supplement use but did not identify the kind of supplements used.

Finally, participants in the NHANES survey were asked to rate their physical and mental health on a scale from 1 (excellent health) to 5 (poor health). Participants were also asked to indicate on how many days in the past 30 days their physical or mental health was not good. A quality-of-life score was calculated from these data.

## **Does Supplementation Improve Outcomes For Cancer Patients?**

The study found that for cancer patients:

- Hospitalization rates were 12% for supplement users versus 21% for non-users.
- This is important because:
  - Cancer patients who have been hospitalized have 6-fold higher odds of all-cause mortality than those who do not require hospitalization.
  - Health care costs the first year after cancer diagnosis average \$60,000 versus an estimated \$350-\$3,500 yearly cost of supplementation.
  - The self-reported quality of life score was significantly higher for supplement users versus non-users.

This study strongly supports the idea that supplementation significantly improves quality of life and health outcomes in cancer patients.

- This finding is consistent with previous studies showing that nutrition support significantly improves health outcomes for hospitalized patients admitted with trauma or other major diseases.
- A major strength of the study is the large sample size (> 14 million US adults).
- A major limitation of this study is that the NHANES survey does not record which supplements people were using.

The authors concluded, “Adequate nutrition provides a cost-effective strategy to achieving potentially optimal health [for cancer patients]. Further studies are needed to determine the effects of specific nutrient doses and supplementation on long-term outcomes for different kinds of cancer...Given the overall cost-effectiveness of dietary supplementation, there is a need for better provider education about how to talk with cancer survivors about their nutrient status and filling nutrient gaps through both food and supplements. Immune-supportive supplementation may prove to be a clinically effective and important tool that is accessible via telemedicine.”

## **Does Supplementation Interfere With Cancer Treatment?**

The reason that supplementation is not more widely recommended for cancer patients is two-fold.

- 1) There is a fear among many doctors that improved nutrition will feed the cancer cells and promote tumor growth.
  - This thinking is like the famous quote from a general during the Vietnamese war that, “It was necessary to destroy the village in order to save it [from the Viet Cong]”.
  - We need healthy normal cells to fight the cancer and for good quality of life while we are fighting the cancer. We need to protect these cells while we are destroying the cancer cells. We cannot afford to destroy the whole “village”.
  - For example, both cancer treatment and the catabolism associated with the cancer weaken the immune system, and a strong immune system is essential to successfully fight the cancer.

2) There is also a fear that supplementation will interfere with cancer treatment. This is a more legitimate fear and deserves a more in-depth analysis.

- There are some instances where supplementation can clearly interfere with treatment. For example,
  - ○ Radiation treatment relies on the production of free radicals. High-dose antioxidants have been shown to interfere with radiation treatment.
  - ○ Some drugs act by suppressing folate levels in cells. High-dose B complex or folic acid supplements would clearly interfere with these drugs. However, high-dose folic acid supplementation is often used before and after drug treatment to “rescue” normal cells.
- There are other cases where supplementation is likely to interfere with treatment.
  - ○ A few drugs depend in part on free radical formation. High-dose antioxidants have the potential to interfere with these drugs.
  - ○ Some herbal supplements activate enzymes involved in the metabolism of certain anti-cancer drugs. While these interactions are rare, they could interfere with the effectiveness of these drugs. [Note: This concern only applies to certain herbal supplements. It does not apply to vitamin-mineral supplements.]
- Most other fears about supplement-drug interactions are theoretical. There are neither potential mechanisms nor evidence to support those fears.

However, there is a strategy for minimizing the potential for supplement-drug interactions based on the science of pharmacokinetics. Simply put:

- Most cases of supplement-drug interactions can be avoided by assuring that high doses of anti-cancer drugs and nutrients that might interfere with those drugs are not present in the bloodstream at the same time.
- Pharmacokinetic studies tell us that most anticancer drugs and nutrients are cleared from the bloodstream in 24-48 hours.
- So, my standard recommendation is to avoid supplementation for a day or two prior to cancer treatment and wait to resume supplementation for a day or two after cancer treatment. This recommendation does not apply to radiation treatment since it is done on a daily basis.

However, there are a few drugs that are cleared from the bloodstream more slowly, so it is

always best to check with your pharmacist or doctor before deciding on the appropriate window to avoid supplementation. The goal is always to protect normal cells without interfering with the drug's ability to kill cancer cells.

## Should Cancer Patients Take Supplements?

With the information I have shared above in mind, I am now ready to answer the question I posed at the beginning of this article, "Should cancer patients take supplements?" The answer is a qualified, "Yes".

Let me start with the yes, and then talk about the qualifications.

- This study makes clear that cancer is like every other major disease that can land you in the hospital. Nutritional support, including protein supplements, vitamins, and minerals, can reduce your risk of hospitalization, get you out of the hospital quicker, and improve your quality of life.
- A strong immune system is important for fighting cancer, so immune-supporting supplements may also be important for cancer patients.
- Note I did not say that supplementation can cure cancer. There is little evidence to support that claim.
- The role of supplementation in preventing cancer is complex. I have covered this in previous issues of "[Health Tips From the Professor](#)". Let me summarize by saying that supplementation can play a role in preventing cancer when nutrient levels are suboptimal. However, the evidence that megadoses of nutrients can prevent cancer is scant.

The qualifications mostly revolve around taking supplements while undergoing cancer treatment. To summarize what I said above:

- There are a few cases in which supplements clearly interfere with cancer treatment.
- There are other cases in which supplements are likely to interfere with cancer treatment.
- However, in most cases supplement-treatment interactions are only theoretical.
- In most cases any interaction between supplements and anti-cancer drugs can be minimized by avoiding supplementation for a day or two prior to cancer treatment and waiting to resume supplementation for a day or two after cancer treatment.
- However, there are exceptions to this rule, so it is always best to consult your

pharmacist or doctor if in doubt.

## The Bottom Line

A recent study looked at the effect of supplementation for patients with cancer. The study found that for cancer patients:

- Hospitalization rates were 12% for supplement users versus 21% for non-users.
- This is important because:
  - Cancer patients who have been hospitalized have 6-fold higher odds of all-cause mortality than those who do not require hospitalization.
  - Health care costs the first year after cancer diagnosis average \$60,000 versus an estimated \$350-\$3,500 yearly cost of supplementation.
  - The self-reported quality of life was significantly higher for supplement users versus non-users.

This study strongly supports the idea that supplementation significantly improves quality of life and health outcomes in cancer patients.

- This finding is consistent with previous studies showing that nutrition support significantly improves health outcomes for hospitalized patients admitted with trauma or other major diseases.

The authors concluded, “Adequate nutrition provides a cost-effective strategy to achieving potentially optimal health [for cancer patients]. Further studies are needed to determine the effects of specific nutrient doses and supplementation on long-term outcomes for different kinds of cancer...Given the overall cost-effectiveness of dietary supplementation, there is a need for better provider education about how to talk with cancer survivors about their nutrient status and filling nutrient gaps through both food and supplements. Immune-supportive supplementation may prove to be a clinically effective and important tool that is accessible via telemedicine.”

For more details, a discussion on the effect of supplementation on cancer treatment, and a summary of what this study means for you, read the article above.

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

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