

Nutrition and the Cancer Survivor



AICR Research Grants (partial listing)

Effects of Folic Acid Metabolism on DNA Repair

Richard Branda, M.D.
University of Vermont

Diet and Exercise Targeting Weight Loss in Public Hospital Breast Cancer Patients

Rowan Chlebowski, M.D., Ph.D.
Harbor-University of California at Los Angeles
Medical Center

Cell Proliferation and Esophageal Carcinogenesis in Zinc Deficient Rats

Louise Fong, Ph.D.
Thomas Jefferson University

Prepubertal Soy Diet and Breast Cancer Risk: Role of Estrogen Receptors and Tumor Suppressor Genes

Leena Hilakivi-Clark, Ph.D.
Lombardi Cancer Center

Iron Increases Breast and Prostate Cancer Cells Invasion

Andre Kajdacsy-Balla, M.D., Ph.D.
Medical College of Wisconsin

Selenium and Prostate Cancer

Arthur Sytowski, M.D.
Harvard Medical School

Anti-Angiogenesis Effects of IP6

Ivana Vucenik, Ph.D.
University of Maryland School of Medicine

Inactivation of CYP1A1 by Flavones – Lung Cancer Prevention

Thomas Walle, Ph.D.
Medical University of South Carolina

Prostaglandin E Receptors and Intracellular Calcium Signaling in Intestinal Tumorigenesis

Jay Whelan, Ph.D.
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Special Populations Series

1 Introduction

Surviving a bout with cancer has a way of changing the way you look at the world. You may find yourself more determined than ever to dive into new experiences, to “seize the day.” You may emerge with a deeper appreciation of family, friends and other quiet comforts that many of us take for granted.

Whatever your individual experience, sooner or later you will face the kind of practical, everyday questions that accompany life as a cancer survivor: *Now what? How should I live?* An estimated 8.5 million Americans face these same questions daily – Americans who, like you, have undergone successful treatment and are now leading vital, cancer-free lives.

Maybe your doctor has recommended some healthy changes to your diet. You probably already know that eating well and staying active can promote overall health and a sense of well being. But did you know that making such adjustments may also help keep your cancer from returning?

Of course, scientific study of the nutritional needs of cancer survivors is just beginning, and there are no guarantees. But research that has been building for years suggests that healthy diets can actually help your body prevent or even halt the development of many cancers.

Scientists suspect that the same dietary changes recommended for cancer *prevention* may also aid in fending off both *recurrence* and *secondary* cancers.

This booklet contains simple advice that has been specifically tailored to the cancer survivor. You will read about the state of the research – what science does and does not yet know. You will learn tips for making small, everyday adjustments in what you eat and how you live. We’ll also help you make sense of confusing and contradictory health claims, so you can make informed choices on your own.

2 Understanding the Diet-Cancer Connection

Many factors influence the development of cancer. During the last 20 years, science has shown that diet is one of them. By following a healthy diet and staying physically active, we can boost our own body’s capacity to resist cancer.

Study after study shows that a healthful diet – one high in a variety of vegetables, fruits, whole grains and beans and low in fat – can fight cancer at several stages. Scientists have known for some time that these foods contain nutrients that help defend the body against disease. And now research is revealing that the vitamins, minerals and other protective substances within these foods can do more than this – much more.

Scientists are now identifying a host of naturally occurring compounds in plant foods that can

actually defuse potential carcinogens. Some of these nutrients and natural *phytochemicals* seek out dangerous substances and usher them from the body before they can cause the kind of cellular damage that may lead to cancer. Others make it easier for the body to make cellular repairs, and still others may help starve new cancer cells before they can reproduce.

Even after a cell begins to become cancerous, diet and lifestyle can still help short-circuit the process. Several nutrients have been shown to delay the progression of cancers from one stage to another; this gives the body more time to defend itself. Maintaining a healthy weight through diet and regular exercise also helps establish a bodily environment that discourages cancer growth.

Scientists have only just begun to investigate how the benefits of a healthy diet may impact cancer survivors. In the meantime, it makes sense to follow a few simple dietary guidelines that can help prevent cancer and possibly guard against its return.



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3 Diet and Lifestyle for Survivors

In 1997, AICR published the landmark report, *Food, Nutrition and the Prevention of Cancer: a global perspective*. A panel of expert scientists evaluated over 4,500 studies on diet and cancer. The report includes their conclusions and their recommendations for cancer prevention. AICR summarizes these points in the following guidelines.

AICR Diet and Health Guidelines for Cancer Prevention

1. Choose a diet rich in a variety of plant-based foods.
2. Eat plenty of vegetables and fruits.
3. Maintain a healthy weight and be physically active.
4. Drink alcohol only in moderation, if at all.
5. Select foods low in fat and salt.
6. Prepare and store food safely.

And always remember...

Do not use tobacco in any form.

Scientists estimate that these guidelines could help prevent at least 30 to 40 percent of all cancers. Avoiding tobacco could prevent an additional 30 percent of cases. The most exciting news is that even small dietary and lifestyle changes can produce large health benefits. Eating one or two more servings of vegetables and fruits, switching from white bread to whole grain bread or increasing the length of your daily walk will all make a positive impact on your health.

Rethink your ratio of plant foods to animal foods

Look at the proportion of plant foods to other foods on your plate. Aim for two-thirds (or more) plant-based foods – vegetables, fruits, whole grains and beans – and one-third (or less) animal protein. This doesn't mean you have to become a vegetarian or give up the foods you love. Instead, gradually make simple changes.

- Use meat as a condiment instead of a main course. Try meatless meals a few times a week – a veggie stir-fry, spinach lasagna or black bean burrito.
- Experiment with “meaty” plant-based foods. Beans and tofu are filling and a good nutritional substitute for meat. Mushrooms and eggplant have a “meaty” texture. Try stuffed eggplant, a bean and pasta soup, some cubes of firm tofu mixed into a salad or a grilled portabello mushroom sandwich.
- Sneak in extra servings of plant-based foods throughout the day. At breakfast, have a glass of 100 percent fruit juice and whole wheat bread. For snacks, munch on raw carrots, dried apricots or fresh berries. End your meal with a tasty baked (or microwaved) apple sprinkled with cinnamon and brown sugar.
- Stock up on canned and frozen vegetables and fruits. Since the produce is packaged right after harvesting, it contains nutrient levels comparable to fresh fruits and vegetables. Make sure to choose canned fruits packed in juice or water, not syrup. Also check labels for added sugar or sodium.
- Try unfamiliar foods in the produce aisle like kiwi, papaya, wild mushrooms or jicama.
- Use seasonings such as garlic, basil, tumeric, paprika, thyme, dill and others to flavor your dishes instead of relying on salt. Herbs and spices also contain protective phytochemicals.

The wider your variety of fruits and vegetables, the more vitamins, minerals, phytochemicals and antioxidants you will consume – along with their disease-fighting powers. Colorful produce is especially high in nutrients, so try dark leafy greens, tomatoes, strawberries, blueberries, carrots and cantaloupe.

Maintain a healthy weight by eating appropriate portion sizes

You may have nutritional challenges caused by certain cancer treatments. Talk to your physician about what would be a healthy weight for you. If you are underweight, you may wish to include a liquid nutritional product in your diet. If you are unable to eat a large meal at one sitting, try having smaller, more frequent meals throughout the day. If you have experienced unintentional weight gain, talk to your doctor. Any attempt to lose extra pounds should not come prior to your recovery from treatment.

- Keep an eye on the portions of food you eat. The Nutrition Facts label on many foods lists the standard serving size. Measure out your typical portion and pour it onto an empty plate. Then measure how many standard servings go into your regular portion size. You may be surprised. Is it enough food to meet your nutritional needs? Is it too much food in relation to your activity level?
- Try not to skip meals, as it may lead to overeating at the next meal.
- Snack wisely. There is no need to avoid eating between meals if you choose healthy snacks. They can boost your fruit and vegetable intake, provide essential nutrients and give you extra energy in the late morning or afternoon.
- Eat only when you are hungry, not in response to boredom or loneliness. Find other enjoyable

activities to keep you busy, like calling a friend or taking a walk.

- If you make naturally lowfat vegetables, fruits, whole grains and beans the main part of your diet, you will be less likely to overindulge in fatty meats and sweets.

Exercise regularly

Exercise can help rebuild your strength and agility, relieve stress and help you maintain an optimal weight. Even light physical activity can stimulate the appetite, aid digestion and regulate bowel movements. Consult your physician or physical therapist before starting or increasing physical activity. Ask for advice on creating an individualized exercise program.

- Take it slow. Small, gradual changes will keep you motivated, keep your expectations reasonable and reduce the risk of injury.
- Walking is one of the easiest ways to stay active, and all you need is a good pair of shoes.
- Incorporate physical activity into your daily activities. Try taking the stairs instead of the elevator, parking farther away or doing errands by bicycle or on foot instead of by car.
- Work out in water. The buoyancy of water makes it impossible to fall. Since water supports half of your weight, this type of exercise is also gentler on your joints.



Limit alcohol and tobacco use

Research clearly shows that the disadvantages of drinking alcohol far outweigh any advantages. The health benefits from red wine have been largely attributed to a phytochemical called resveratrol, which can also be found in grapes, grape juice, raisins and peanuts.

- If you currently do not drink alcohol, there is no reason to start.
- If you do choose to drink, the recommended limit is one drink a day for women and two drinks a day for men.
- When celebrating, try non-alcoholic beer or wine. Sip on sparkling water spiked with fruit juice or a wedge of lime.

The research on the dangers of tobacco is even more certain. Tobacco use is the main cause of lung cancer and also contributes to cancers of the mouth, throat, pancreas, cervix and bladder. In fact, if the only change people made was to stop using tobacco, cancer rates would drop by 30 percent. If you currently smoke or use tobacco in any form, ask your physician about ways to quit.

Cook with care

Cooking meat, poultry and fish at very high temperatures, especially over an open flame, can cause cancer-promoting substances to form. This doesn't mean you need to give up the backyard barbecue. Here are suggestions for safer grilling.

- Marinate meats. This can significantly reduce carcinogen formation. Use a marinade with a strong acidic ingredient, like lemon juice or vinegar; a small amount of oil and your favorite seasonings.

4 Evaluating Nutrition Information

Many cancer survivors are highly motivated about health issues. They read widely, ask informed questions and are eager to make healthy changes. Survivor research, however, is still in its early stages. Dependable, science-based advice can be hard to come by.

Many uninformed or even unscrupulous individuals are rushing to fill the gap between what science knows and what cancer survivors want to know. That's why you need to stay alert. News reports can cause confusion by overstating the results of research. Makers of pills, powders and other products may attempt to exploit survivors' desire for information by touting unverified – and unverifiable – health claims. With the advent of the Internet, baseless rumors about diet and cancer can spread around the world in minutes.

Separating fact from fiction is all-important. Here are some things to keep in mind the next time you come across something that sounds too good to be true.

Read closely

Science progresses in a slow and careful fashion. That's why products that use words like “breakthrough” and “miracle” and even “discovery” should send up red flags in your mind. Another warning sign: reliance on anecdotal evidence (“testimonials” or “case histories”) rather than published scientific data based on the results among many patients.

- Don't cook meats directly over the flame. Try cooking on a sheet of foil. You can also pre-cook meat in the oven or microwave and finish on the grill for flavor.
- Avoid eating charred or burnt meat. Cut off any charred pieces.
- Grill marinated vegetables or veggie burgers. Most experts believe that grilled plant foods present a substantially lower cancer risk.

Handle food safely

Food safety is particularly important for many cancer survivors. People who have weakened immune systems are at an increased risk for food-borne illness. There are some simple precautions to take that will help keep your food safe.

- Keep your hands, counters, dishes, cutting boards and utensils clean. Change sponges and dishtowels often.
- Thoroughly wash fruits and vegetables.
- Avoid “cross-contamination” by using separate dishes, cutting boards and utensils for preparing raw meat, fish or poultry.
- Thaw frozen items in the microwave or refrigerator. Do not thaw food on the kitchen counter.
- Use a food thermometer to ensure that meat is fully cooked.
- Read expiration dates on food products and look for signs of food spoilage. Some food, however, may be unsafe to eat although it looks and smells fine. If in doubt, throw it out.

Get the whole story

Reports about science that appear on television or radio are too short to include many important details. Look to magazines or newspapers for more complete information, including where the report was published, who paid for it, how many people were studied and (especially) how it relates to previous research in the same field. Remember – rely on scientific consensus, not simply a single study.

Promises, promises

Be skeptical of easy answers. It's human nature to look for quick fixes or “magic bullets” that solve health problems. But cancer is a complex disease with no single cause or cure. The human body is composed of many intricate systems that work together. Even the foods we eat contain hundreds, perhaps thousands, of protective components. The most healthful strategy will always be one that addresses the overall diet, not single foods or supplements.

Go to a reputable source

These days, everyone's got something to say about nutrition and health. Survivors are barraged with ideas for staying healthy from television, the Internet, magazines and word-of-mouth. Things can easily get confusing. Before trying any new strategy for yourself, tell your doctor about it. Health professionals work hard to keep up with new developments, and their years of training and experience come in handy. Your doctor can be a helpful resource in your efforts to remain cancer-free, but only if he or she is kept informed about what you are taking. There are some practical reasons for this: certain herbal supplements, for example, can interact with other medications you may be taking with potentially dangerous results.

Maintaining a healthy skepticism is perhaps the most useful thing to do. That doesn't mean you have to spend the rest of your life in a

research library, cross-checking each and every scientific study that comes along. Luckily, you've already got the most important thing you'll need: common sense.

Because if something sounds too good to be true, it probably isn't true.



Separating **fact** from fiction is
all-important. Maintain a
healthy **skepticism**.

5 Common Questions

Supplements

Although we have the largest food supply in the world, many Americans are still lured by dietary supplements. Cancer survivors are no less attracted to these products, and marketing efforts may even target them.

As you probably became aware during cancer treatment, there is much controversy concerning the use of supplements – especially antioxidants. Some research shows that large doses of nutrients *from supplements* can actually protect the cancer cell from being destroyed. Other studies show the opposite. The majority of research, however, indicates that protective nutrients *in food* are far preferable to pills.

Get your nutrients by eating a wide variety of plant-based foods, including at least five servings per day of vegetables and fruits. Supplements should never replace conventional food in the diet.

Before taking any supplement, you should speak with your physician. A standard 100% RDA multivitamin may be a good idea, especially once treatment is completed.

Phytochemical supplements

The discovery of phytochemicals – protective substances in plant foods – is relatively new in cancer research. Each phytochemical seems to have a unique role in cancer protection, such as detoxifying carcinogens, protecting body cells from damage or affecting hormones that can influence the development of cancer.

Scientists have identified hundreds of phytochemicals in foods, and they believe there are thousands more. That is one reason why phytochemical supplements cannot be a substitute for whole fruits and vegetables.

Each individual vegetable and fruit has its own profile of phytochemicals. Thus, the substances in broccoli are different from those found in cherries or leeks or zucchini. Each time you eat a tossed salad with a large variety of vegetables – such as spinach leaves, cucumbers, grated carrots, cauliflower, chopped onions, red cabbage and tomato wedges – you are eating an arsenal of cancer protection. So, fill your plate with healthful plant-based foods.

Soy

Experts currently caution against *large* amounts of soy for women who have, have had or are at high risk for estrogen receptor-positive breast cancer. Eating a few servings of soy foods per week as part of a mostly plant-based diet, however, does not appear to be a problem. Some researchers suggest that women who do not already eat soy on a regular basis should not do so *solely* for the purpose of breast cancer prevention.

Also, you should consume soy from foods rather than soy protein powders or isoflavone supplements. Although we know soy protein may help to control cholesterol levels, we do not know all the effects of supplemental amounts of isoflavones on cancer. There is just not enough research data available yet to make recommendations.

It may be wise to discuss soy with your doctor.

Vegetarian diets

A vegetarian diet is often considered a healthier alternative to what many cancer survivors ate before their diagnosis. Studies have shown that diets high in vegetables, fruits, whole grains, beans, nuts and seeds – and lower in meats – are cancer protective.

There is no evidence, however, that a vegetarian diet provides any more protection than a mostly plant-based diet with small amounts of meat. If you choose a vegetarian meal plan, be sure to eat a

variety of foods, including many different vegetables and fruits, whole grains and protein alternatives to meat (such as beans, eggs, tofu, small amounts of cheese or fish).

Macrobiotic diets

There is no clear evidence that a macrobiotic diet can cure or prevent disease. This diet is based on a few types of grains, with lesser amounts of specific vegetables, seaweed, beans and various soups. Nutrients and calories may be quite limited. And since the diet is also limited in food choices, it should include a complete multivitamin that contains vitamin B12.

Since a macrobiotic diet is not based on a large variety of plant-based foods and has not been found to be cancer protective, special care should be taken to obtain the nutrients needed for optimal health.

6 A Final Word

Many questions remain about the best diet for cancer survivors. Scientists around the world are working to find answers, and many more researchers will join this quest in the years to come.

In the meantime, existing science shows that a diet high in vegetables, fruits, whole grains and beans – along with regular physical activity – can increase the body's ability to resist cancer. Since this type of lifestyle also helps protect against serious illnesses like heart disease, stroke and adult-onset diabetes, making the changes recommended in this brochure can only enhance your health – and most importantly, add pleasure to your life.

7 Additional Resources

American Dietetic Association

216 West Jackson Boulevard
Chicago, IL 60606-6995
Nutrition Information Hotline: 1-800-366-1655
www.eatright.org

If you feel the need for individual nutrition counseling, call ADA's Nutrition Information Hotline Monday through Friday, from 9:00 a.m. to 4:00 p.m. Central Time. You will receive a referral to a registered dietitian (RD) in your area.

American Institute for Cancer Research

1759 R Street, NW
Washington, DC 20009
1-800-843-8114 or 202-328-7744
www.aicr.org

Contact AICR for practical, reliable information on healthy eating for lower cancer risk.

- *AICR Newsletter*: This free, quarterly publication provides tips on eating well, exercise, great-tasting recipes and the latest information on nutrition and cancer research.
- *Educational brochures*: AICR brochures provide reliable nutrition information, practical advice and healthful recipes. Single copies are free. To order *Moving Toward a Plant-Based Diet*, *Veggies*, *One-Pot Meals* and more, call or write for a publications catalogue or visit AICR online.
- *Nutrition Hotline*: Call 1-800-843-8114 and leave any questions you may have about diet, health, cooking, cancer and more. A registered dietitian will return your call and discuss your questions free of charge. The hotline is available Monday through Friday, 9:00 a.m. to 5:00 p.m. Eastern Time.

Diana Dyer, MS, RD

Cancer and Nutrition Specialist
www.CancerRD.com

Diana Dyer is a three-time cancer survivor and registered dietitian. Her website provides nutritional and general information of importance to cancer survivors.

Food and Nutrition Information Center

National Agricultural Library
USDA, Room 304
10301 Baltimore Avenue
Beltsville, MD 20705-2351
301-504-5719
www.nal.usda.gov/fnic

The Food and Nutrition Information Center (FNIC) is part of the U.S. Department of Agriculture. It provides access to information on topics like dietary supplements, food safety and the nutritional composition of foods. The “Consumer Corner” on the website answers questions frequently asked by the public.

MEDLINEplus

www.nlm.nih.gov/medlineplus

This website provides links to current, trustworthy health care information. Links are compiled by the National Library of Medicine at the National Institutes of Health (NIH). Topics include health and nutrition, drug information, dictionaries of medical terms, directories of doctors and hospitals and other resources.

National Coalition for Cancer Survivorship

1010 Wayne Avenue, Suite 505
Silver Spring, MD 20910
301-650-9127
www.cansearch.org

The coalition is a network of organizations and individuals concerned with the support of cancer survivors and their families. Its objectives are to

serve as a clearinghouse for information on services and materials for survivors; advocate the rights and interests of cancer survivors, including help with insurance or employment discrimination; encourage the study of survivorship; and promote the development of cancer support activities.

NUTRITION.GOV

www.nutrition.gov

This website provides easy access to all online nutrition information from the U.S. government. You will find reliable advice on healthy eating, physical activity and food safety.

AICR Publications

Nutrition After Cancer

(When ordering by mail, write to Attn: NAC book.)

Selections from two day-long conferences held to address the state of the science on diet for the cancer survivor. Read what well-respected researchers have to say about soy, flaxseed, weight management, exercise and overall diet.

A Dietitian’s Cancer Story: Information and Inspiration for Recovery and Healing From a 3-Time Cancer Survivor

Diana Dyer, MS, RD

(When ordering by mail, write to Attn: DCS book.)

Offers practical, carefully researched nutrition advice and guidelines for evaluating complementary and alternative therapies. Proceeds go to The Diana Dyer Cancer Survivors’ Nutrition and Cancer Research Endowment, which Dyer established at AICR to raise money for research studies relevant to survivor issues.

Each book costs \$12 plus \$3.95 for shipping. To order, call AICR at 1-800-843-8114 or mail a check payable to AICR.

Other Publications

Facing Forward: A Guide for Cancer Survivors

National Institutes of Health
National Cancer Institute
1-800-4-CANCER (1-800-422-6237)

This booklet gives a concise overview of some of the most important survivor issues and practical ideas to help cancer survivors look ahead. If you are just finishing cancer treatment, the information may prepare you for situations you have not yet experienced. Call for a free copy.

How to Find Medical Information

National Institutes of Health
National Institute of Arthritis and
Musculoskeletal and Skin Diseases
301-495-4484

Published by the National Institute of Arthritis and Musculoskeletal and Skin Diseases, this brochure gives tips on judging the credibility and trustworthiness of any type of health information. Call for a free copy.

How You Can Support Cancer Research and Education Through Your Will

You can help provide for future cancer research and education through a simple bequest in your will. Consult with your attorney when first writing your will or when adding a simple paragraph to your existing will.

Your bequest to help in the war against cancer can be a cash amount, a gift of the remainder of your estate or a portion of the remainder, after obligations to your family and loved ones are met.

Your attorney can easily help you make a bequest to the American Institute for Cancer Research (AICR). To do so, your attorney will need to know:

AICR's official name:

American Institute for Cancer Research

AICR's mailing address:

1759 R Street NW, Washington, DC 20009

AICR's telephone number:

202-328-7744

AICR's identification:

A not-for-profit organization under Section 501(c)(3) of the Internal Revenue Code

AICR's tax-exempt IRS number:

52-1238026

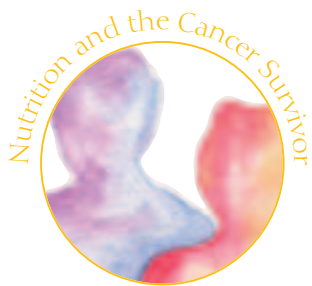
For further information, contact AICR's Gift Planning Department at the number below.

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The American Institute for Cancer Research supports research and provides public education in the area of diet, nutrition and cancer. AICR is a member of the World Cancer Research Fund International. For free publications, to reach the Institute's Nutrition Hotline or to make a memorial donation, call toll-free or write:

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PO Box 97167
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American
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Research

Stopping cancer before it starts