

NUTRITION AND THE CANCER SURVIVOR

CANCER SURVIVOR SERIES



AICR Research Grants 2015 (partial list)

Women's interventional nutrition study (WINS) long-term survival analysis

Rowan Chlebowski, MD, PhD, Harbor-UCLA Medical Center

Gene-environment interactions among circulating vitamin D levels, vitamin D pathway gene polymorphisms, BMI and esophageal adenocarcinoma prognosis

David Christiani, MD, PhD, Harvard University

Targeted disruption of cancer cell metabolism and growth through modification of diet quality

Barbara Gower, PhD, The University of Alabama at Birmingham

A mail- and video-based weight loss trial in breast cancer survivors

Melinda L. Irwin, PhD, Yale University

Effects of fish oil on lipid metabolites in breast cancer

Greg Kucera, PhD, Wake Forest University Health Sciences

Impact of physical activity on tumor gene expression in women with newly diagnosed breast cancer

Jennifer Ligibel, MD, Dana Farber Cancer Institute

Impact of resistance training and protein supplementation on lean muscle mass among childhood cancer survivors

Kirsten Ness, PhD, St. Jude's Children's Research Hospital

Pilot study of a metabolic nutritional therapy for the management of primary brain tumors

Kenneth Schwartz, MD, Michigan State University

Diet composition and weight loss: effect on long-term prognosis in breast cancer survivors

Henry Thompson, PhD, Colorado State University

Diet and insulin resistance in survivors of childhood leukemia

Emily Tonorezos, MD, Sloan-Kettering Institute for Cancer Research

Sugar sweetened beverages, fructose and sucrose, genetic susceptibility, molecular subtypes and colorectal cancer survival

Kana Wu, MD, MPH, PhD, Harvard University School of Public Health

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Introduction

Surviving cancer can change how you see the world. You might find yourself more determined than ever to embrace new experiences. You might emerge with a deeper appreciation of family, friends and other quiet comforts that many of us take for granted.

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? At least 14.5 million Americans confront those questions daily.

You probably already know that eating well and staying active can promote overall health and a sense of wellbeing. Now scientists are finding evidence that making those same changes may also help keep your cancer from returning.

Scientific study of the nutritional needs of cancer survivors is still in an early stage, and there are no guarantees. Yet when experts at AICR reviewed the available science on diet and survivorship, they concluded that—unless advised otherwise by a qualified professional—cancer survivors should aim to follow the recommendations that help prevent cancer in the first place (see page 23).



DIET AND CANCER

Evidence suggests that eating a diet rich in a variety of vegetables, fruits, whole grains and beans, low in red meat and very little processed meat can fight cancer at several stages. This general pattern of eating provides vitamins, minerals and protective plant compounds (see box) that help defend the body against cancer and other diseases.

What Are Phytochemicals?

Scientists have identified naturally occurring substances in vegetables, fruits and other plant foods that may deactivate potential cancer-causing agents. These substances include some vitamins as well as natural phytochemicals (phyto = plant), compounds that are found in all plant foods. Some plant food substances defend the body from toxins before they can cause cell damage that may lead to cancer. Others seem to help stop cancer cells from reproducing.

Even after a cell has been damaged in a way that may lead to cancer, what we eat and how we live can still help prevent cancer.



WEIGHT AND CANCER

Having a healthy body weight helps protect against chronic inflammation and insulin resistance and can help keep hormone levels in balance. All of these benefits discourage cancer growth and progression. While some research shows that there is a link between having a healthy weight, both before and after diagnosis, and surviving cancer, more research is needed in this area.

Once you start eating a healthy, varied diet, watching your portion sizes and being physically active, it becomes much more likely that you will naturally reach and maintain a healthy weight.

PHYSICAL ACTIVITY AND CANCER

Cancer specialists recommend that survivors should avoid inactivity. With every passing year, more studies show that regular physical activity strengthens the body's immune system, lessens fatigue and helps to prevent weight gain. By following a healthy diet and staying physically active, cancer survivors can avoid gaining excess body fat and boost the body's capacity to resist cancer.



Adopting a Healthy Lifestyle

Fill your plate with more plant foods and fewer animal foods.

Take a look at the food that's on your current plate. Make sure that plant foods like vegetables, fruits, whole grains and beans always take up at least 2/3 of the plate. Fish, poultry, lean red meat, cheese and other animal foods should take up 1/3 or less. (As for processed meats like cold cuts, bacon, sausage and ham, AICR recommends eating them rarely, if at all.)

You do not have to become a vegetarian or give up the foods you love, but adopting an eating pattern that includes many different plant foods and is low in animal foods is protective against cancer.

Remember, it's your overall pattern of eating that counts. An occasional trip to the deli or a slice of ham on a holiday won't undo the other healthy changes you make in your everyday routine.

TIPS FOR HEALTHY EATING

Use meat as a condiment instead of a main course. Try meatless meals several times a week—a veggie stir-fry, spinach lasagna or black bean burritos.

Experiment with “meaty” plant-based foods. Beans and tofu are filling and a nutritious substitute for meat. Mushrooms and eggplant have a “meaty” texture that can add appeal to low-meat or meatless dishes, although they are not a source of protein like beans or meat.

Try a bean and pasta soup or some cubes of firm tofu mixed into a salad, stir-fry or casserole.

Soy Foods in Moderation Are Safe for Survivors

Health experts once thought that soy might be harmful for breast cancer survivors. Soy isoflavones have weak estrogen-like properties, and estrogen (a hormone) can fuel the growth of breast cancer. Now, however, the body of research shows that consuming moderate amounts of soy foods does not increase risk for recurrence or earlier death and may even be beneficial. A moderate amount is 1–2 standard half-cup servings daily of whole soy foods, such as half a cup of tofu or edamame (green soybeans) or 1 cup of soymilk.

Eat a rainbow of vegetables and fruits.


To maximize the variety of protective phytochemicals in your diet, choose colorful produce. Deep colors often indicate high levels of nutrients and phytochemicals. Some examples are dark leafy greens, tomatoes, strawberries, blueberries, carrots and cantaloupe.

Stock up on frozen vegetables and fruits.

Since the produce is frozen right after harvesting, its nutrient levels are comparable to fresh vegetables and fruits. Choose frozen or jarred produce over canned most of the time. When you do choose canned, make sure fruits are packed in unsweetened juice or water, not syrup; and choose low-sodium canned vegetables. Check labels to find no-sugar-added or no-salt-added products.

Include plant-based foods throughout the day.

At breakfast, eat fresh fruits and whole-wheat bread. For snacks, munch on raw carrots, fresh berries or a few dried apricots. End your meal with a tasty microwaved apple sprinkled with cinnamon and raisins.



Salt. The body requires salt to live, but most of us get far more than we need, and 75 percent of it comes from eating processed foods and foods at restaurants and other food vendors. AICR recommends that everyone cut their sodium intake to no more than 2,400 milligrams per day to reduce cancer risk (and even lower limits are recommended for heart health).

Helpful hints to cut salt:

- Use seasonings such as garlic, basil, turmeric, paprika, thyme and dill to flavor your dishes. Herbs and spices also contain protective phytochemicals.
- Read food labels, and look for low-sodium broths, mixes and other packaged foods.
- When eating out, ask for your food to be prepared with little or no salt. Request dressings and sauces to be served on the side so that you can control the amount that goes on your food.



For tips on eating a cancer-preventive diet, visit www.aicr.org.

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. To keep your food safe:

Wash hands and surfaces often. Bacteria can spread throughout the kitchen and get onto cutting boards, utensils, countertops and food. Thoroughly wash fruits and vegetables. Change sponges and dishtowels often.

Separate, don't cross-contaminate. Take steps to prevent bacteria from spreading. When handling raw meat, poultry, seafood and eggs, keep these foods—and their juices—away from ready-to-eat foods.

Cook thoroughly and to proper temperatures.

Use a food thermometer, inserted into the center part of the food, to check when food is safely cooked. Food must be heated to USDA-recommended safe minimum internal temperatures:

- Fish (145°F)
- Egg Dishes (160°F)
- Chicken Breast (165°F)
- Whole Poultry (165°F)
- Leftovers and Casseroles (165°F)
- Steaks and Roasts (145°F)
- Ground Beef (160°F)
- Pork (145°F)

Refrigerate food promptly. Refrigerate or freeze leftover foods within 1 hour. Cold temperatures slow the growth of harmful bacteria. To reduce risk of food-borne illness, use an appliance thermometer to be sure the refrigerator temperature is consistently 40°F or below and the freezer temperature is 0°F or below.

Thaw frozen meat and poultry in the refrigerator, microwave or cold water, not by leaving out on the kitchen counter.

Read expiration dates on food products and look for signs of spoilage. Some food may be unsafe to eat although it looks and smells fine. If in doubt, throw it out.

Limit Alcohol. Despite evidence linking moderate consumption of alcohol to lower risk for heart disease, the research links alcohol to higher cancer risk. If you drink alcoholic beverages at all, limit your consumption to no more than two drinks a day for men and one drink a day for women. Alcohol's impact on breast cancer recurrence is still being studied, so breast cancer survivors may want to limit alcohol to less than 1 standard drink per day if they drink at all.

Avoid Tobacco. The evidence is clear that tobacco in any form is a major cause of cancer and should be completely avoided. If you currently smoke or use tobacco in any form, ask your physician about ways to quit. If you currently do not use tobacco products, don't start.

WATCH YOUR WAIST

Talk to your doctor or dietitian about what would be a healthy weight for you.

- **If you are underweight,** you may wish to include liquid nutritional products in your diet. A registered dietitian (RD or RDN) can help you develop strategies to include more high calorie foods in a healthy way. Also, try eating healthy calorie-dense foods, such as nuts, hummus, avocados, sweet potatoes, dried fruit and healthy plant-based oils.

- **Choose foods that have calorie density to match your needs.** By making protective low calorie-dense foods like vegetables, fruits, whole grains and beans the main part of your diet, it is easier to avoid weight gain. If you need more calories because you are underweight, try the healthy calorie-dense foods listed above.
- **If you are unable to eat a large enough meal at one sitting,** try having smaller, more frequent meals throughout the day.
- **If you have experienced unintentional weight gain or loss,** talk to your doctor or dietitian.

Did you know...?

Calorie-dense foods pack a lot of calories into small amounts of food. Examples are chips, fries, cookies and other highly processed foods. Choices like these are also low in cancer-fighting fiber and high in fat.

Most plant foods, on the other hand, contain relatively few calories per ounce. With vegetables, fruits, whole grains and beans, it's not fat that provides the substance that fills you up. It's calorie-free fiber and water.

That's why eating a plant-based diet allows you to eat more while you are consuming fewer calories. Over time, this pattern of eating helps you manage your weight for cancer protection.

Snack wisely. Between meals, 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. Try foods that may be unfamiliar to you such as kiwifruit, papaya or jicama.

What Does a Healthy Portion Look Like?

Chopped Vegetables	1 cup	1 baseball or rounded handful for average adult
Raw Leafy Vegetables	2 cups	2 baseballs or 2 fists for average adult (such as lettuce or baby spinach)
Sweet Potato	1 cup cooked	1 medium = 1 baseball
Fresh Fruit	½ cup	1 small piece (such as small apple or 6-inch banana) = ½ baseball or rounded handful for average adult
Dried Fruit	¼ cup	scant handful for average adult
Pasta, Rice, Cooked Cereal	½ cup	½ baseball or rounded handful for average adult
Ready-to-eat Cereal	¼ cup to 1 ¼ cups	1 oz., varies (check labels)
Bread	1 oz.	about 1 small slice
Dried Beans	½ cup cooked	½ baseball or rounded handful for average adult
Nuts and Seeds	¼ cup	½ golf ball = scant handful for average adult
Meat, Poultry, Seafood	3 oz. (boneless cooked weight from 4 oz. raw)	deck of cards or a checkbook
Milk and Yogurt	1 cup (8 oz.)	for fewer calories, choose low-fat dairy products

Put soup first. Broth-based soups tend to be low in calorie density and can fill you up. However check the sodium content; read food labels or add less salt if you are making it yourself. Note that creamy soups can have a high calorie content.

Choose plain water instead of sugary drinks such as sodas, fruit punches and high-sugar tea or coffee drinks that provide lots of calories.

BE PHYSICALLY ACTIVE

Physical activity can help rebuild your strength and agility, relieve stress and help you maintain a healthy weight. Even if you have limited mobility after cancer treatment, getting some light physical activity can stimulate a reduced appetite, aid digestion and regulate bowel movements.

The American College of Sports Medicine (ACSM) Physical Activity Guidelines for Cancer Patients and Survivors encourage all survivors to avoid inactivity. So finding ways to get some movement into your life is important. Many hospitals now offer programs specifically designed for cancer survivors, led by cancer exercise specialists certified by ACSM. Consult your health care provider or a physical therapist about creating an individualized exercise program.

Take it slow. Small, gradual changes will keep you motivated, reduce the risk of injury and will be more likely to become a permanent part of your lifestyle.

- Walking is one of the easiest ways for most people to stay active. All you need is a good pair of shoes.
- Work out in water. The buoyancy of water makes it impossible to fall. Since water supports half of your weight, exercising in water is also gentler on your joints.

Incorporate physical activity into your daily activities. Try taking the stairs instead of the elevator, parking farther away from your destination or doing errands by bicycle or on foot instead of driving.

See page 19 to order a free copy of the AICR brochure, *Physical Activity and the Cancer Survivor*, or visit www.aicr.org for physical activity ideas.

Evaluating Nutrition Information

Cancer survivors tend to be highly motivated about health issues. They read widely, ask informed questions and are eager to make healthy changes. Yet dependable, science-based advice can be hard to find.

Be wary of uninformed or unscrupulous individuals who are rushing to fill the gap between what science shows and what cancer survivors want to know:

- Media reports can cause confusion by overstating the results of research.
- Makers of pills, powders and other products may take advantage of survivors' desire for information by touting unverified—and unverifiable—health claims.
- On the Internet, baseless rumors about diet and cancer can spread around the world in minutes.



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. So should reliance on anecdotal evidence ("testimonials" or "case histories") rather than published scientific data based on results among many patients. Don't assume that the results of research in animals or isolated cells can be interpreted into advice about eating or supplements for people.

Get the whole story. Reports about science that appear on television or radio are too short to include many important details. Look to magazines, newspapers or trusted websites (such as government sources or nationally reputable health facilities) for more complete information, including where the study 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.

Beware 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 components. The most healthful strategy will always be one that addresses the overall diet, not single foods or supplements.

Go to a reputable source. Before trying any new strategy, tell your doctor about it. Health professionals work hard to keep up with new developments, and their years of training and experience are invaluable.

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. Certain herbal supplements, for example, can interact with other medications and have potentially dangerous results.

Use common sense. If something sounds too good to be true, it probably isn't true.



Should I take supplements?

Cancer survivors are often a target for supplement marketing. However, the majority of research indicates that protective nutrients and fiber in whole foods are far preferable to pills. Whole foods contain a variety of protective nutrients and phytochemicals that work together and cannot be reproduced in a pill.

It's easy to assume that if a nutrient or plant compound is shown to be protective, then the more we get the better. But research shows that in high doses, benefits do not necessarily increase and may even pose risk. To get adequate fiber, turn first to enjoyable meals containing plenty of vegetables, whole grains, beans and fruits, adding fiber supplements only as needed to meet your requirements.



Moreover, because production and labeling of supplements is not regulated as drugs are, the ingredients in supplements may not actually be what you expect. Get your nutrients by eating a wide variety of plant-based foods, including at least 2 ½ cups per day of non-starchy vegetables and fruits.

Supplements should not replace real food. Each individual vegetable and fruit has its own set of phytochemicals. The combination of substances in broccoli is different from those found in cherries, leeks or zucchini. Each time you eat a salad with a wide 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.

Will a vegetarian diet protect me?

A vegetarian diet can be a healthier alternative to Western diets (high in meat, refined grains and sweets), but there is no clear evidence that a vegetarian diet is more protective against cancer than a mostly plant-based diet with small amounts of meat and dairy foods.

A vegetarian diet should include a variety of foods, including many different vegetables and fruits, whole grains and protein alternatives to meat (such as beans, tofu, nuts and seeds, as well as fish, eggs and moderate portions of low-fat dairy products for those who choose to include these options).

What about eating only organic foods?

Organic foods are produced following specific environmentally supportive regulations. There are many reasons you may wish to choose organic foods, but it is not known whether organic foods help to reduce cancer risk or improve survival more than their non-organic counterparts. If you do opt for organic, remember that organic cookies, chips and other snacks are just as low in nutrients and high in calories, fat and sugar as non-organic brands.

Are macrobiotic diets advisable?

You may see stories of individuals who attribute their recovery from cancer to a macrobiotic diet, but there is no scientific evidence that a macrobiotic diet can cure or prevent disease.

Because a macrobiotic diet is based on grains, vegetables, seaweed and beans, it requires care and planning. Because of the food restrictions, many physicians recommend patients who follow these diets take a complete multi-vitamin including vitamins B12 and D to ensure their patients obtain all the nutrients they need. Macrobiotic diets also avoid alcohol, caffeine and processed foods.



Need More Help?

■ American Institute for Cancer Research

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

Call the Nutrition Hotline toll-free at 1-800-843-8114. Leave a message for a registered dietitian (who will return your call), Monday-Friday, 9 a.m.-5 p.m. Eastern Time. Or visit the Nutrition Hotline online at www.aicr.org.

Request additional brochures (up to 3 individual copies free):

- *Physical Activity and the Cancer Survivor*
- *The New American Plate*
- *More Food, Fewer Calories*
- *The Cancer Fighters in Your Food*

■ Diana Dyer, MS, RD

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 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.

■ MEDLINEplus

www.nlm.nih.gov/medlineplus

This website provides links to current, trustworthy health care information. 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 315
Silver Spring, MD 20910
1-877-NCCS-YES (1-877-633-7937)
email: info@canceradvocacy.org
www.canceradvocacy.org

The coalition provides information on services and materials for survivors; advocates the rights and interests of cancer survivors, including help with insurance or employment discrimination; and encourages the study of survivorship.

■ 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 Materials

Food for the Fight DVD

This two-part DVD for cancer survivors features experts and practical strategies to help patients through diagnosis, treatment and living for good health after cancer. It features advice from experts, plus cooking demonstrations and testimonials from patients and survivors.

Part I: During Treatment (Running Time 32:14)

Part II: After Treatment (Running Time 24:55)

\$9.95 includes shipping.

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

Diana Dyer, MS, RD

This 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 \$12.25 plus \$4.00 for shipping. To order, call AICR at 1-800-843-8114 or send a check payable to AICR. When ordering by mail, write to Attn: DCS book.

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.

ABOUT AICR

OUR VISION: We want to live in a world where no one develops a preventable cancer.

OUR MISSION: We champion the latest and most authoritative scientific research from around the world on cancer prevention and survival through diet, weight and physical activity, so that we can help people make informed lifestyle choices to reduce their cancer risk.

We have contributed over \$105 million for innovative research conducted at universities, hospitals and research centers across the country. Find evidence-based tools and information for lowering cancer risk, including AICR's Recommendations for Cancer Prevention, at www.aicr.org.

ABOUT THE CONTINUOUS UPDATE PROJECT

As the U.S. charity in the World Cancer Research Fund network, we contribute to the Continuous Update Project (CUP), an ongoing analysis of global scientific research into the link between diet, physical activity, weight and cancer.

The CUP produces periodic reports on the state of the evidence linking various lifestyle factors to risk of specific cancers. These reports will inform a major update of our Recommendations for Cancer Prevention scheduled for 2017.



AICR RECOMMENDATIONS FOR CANCER PREVENTION

1. Be as lean as possible without becoming underweight.
2. Be physically active for at least 30 minutes every day. Limit sedentary habits, like watching television.
3. Avoid sugary drinks. Limit consumption of energy-dense foods (particularly processed foods high in added sugar, or low in fiber, or high in fat).
4. Eat more of a variety of vegetables, fruits, whole grains and legumes such as beans.
5. Limit consumption of red meats (such as beef, pork and lamb) and avoid processed meats.
6. If consumed at all, limit alcoholic drinks to two for men and one for women a day.
7. Limit consumption of salty foods and foods processed with salt (sodium).
8. Don't use supplements to protect against cancer.

Special Population Recommendations

9. It is best for mothers to breastfeed exclusively for up to six months and then add other liquids and foods.
10. After treatment, cancer survivors should follow the recommendations for cancer prevention.

And always remember—do not smoke or chew tobacco.

HOW YOU CAN HELP

You can support AICR's life-saving research and education efforts in a variety of ways:

- make a donation online at www.aicr.org;
- write to AICR, 1759 R Street, NW, P.O. Box 97167, Washington, DC 20090-7167; or
- include a bequest in your will.

For more information, contact our Gift Planning Department at 1-800-843-8114.

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