

Highlights

- Many nutrition professionals agree that eating different foods rich in nutrients is important to maintain and improve good health.
- Patients who eat well and keep or achieve a healthy weight usually manage treatment side effects better.
- Certain foods may cause a bad reaction with some of the drugs that are used to treat cancer. Members of your treatment team will tell you which foods to avoid.
- You may want to ask your doctor to refer you to a registered dietitian for specific nutrition advice and guidance.
- Cancer research related to nutrition is still in its early stages. It may be hard to find truthful, honest advice because of the myths and misinformation about this subject.

Introduction

Eating well is important for everyone. The types and amounts of foods that we eat affect our energy levels, our moods and how we feel about ourselves. A healthy lifestyle plays a key role in keeping the body strong, supporting the immune system (the cells and proteins that defend the body against infection) and reducing risk for some diseases, such as certain kinds of heart disease and some types of cancer.

Food Safety

Handling food safely is important for everyone. People who are being treated for cancer can have weakened immune systems, which increases their risk for illness caused by food.

Safe food handling includes the following guidelines:

- Keep your hands, counters, dishes, cutting boards, sinks, knives and utensils clean.
- Wash dishtowels often.
- Wash sponges in the dishwasher regularly along with your dishes or boil the sponges for five minutes to remove bacteria.
- Rinse fruits and vegetables well, BEFORE peeling, so dirt and bacteria are not transferred onto the fruit or vegetable. Cut away any damaged or bruised areas before preparing or eating. Throw away the outside leaves of a head of lettuce or cabbage.
- Do not use the same dishes, cutting boards or utensils for preparing raw or cooked meat, fish or poultry. Use separate serving dishes and utensils for meat, fish and poultry after they are cooked.
- Do not rinse raw meat and poultry before cooking because bacteria can spread to the sink or countertops.
- Keep raw eggs, meat, poultry, seafood, and the juices of all food that will be cooked away from foods that won't be cooked.
- Thaw frozen items in the microwave or refrigerator, not on the kitchen counter.
- Marinate food in the refrigerator.
- Use a food thermometer to make sure that meat is fully cooked.
- Read the expiration dates on food products and look for signs of food spoilage. If in doubt, throw it out. Don't taste food that looks or smells "funny" or bad. Leftovers should be used within three to four days.
- Refrigerate or freeze all cooked and perishable food within two hours of purchasing and preparing. Chill ready-to-eat food and leftovers right after you eat.

Here is an easy way to remember food safety basics.

Clean – wash hands and surfaces often

Separate – keep different types of foods apart

Cook to proper temperatures

Chill – refrigerate promptly

The Partnership for Food Safety Education (PFSE) educates the public about safe food-handling practices. The PFSE website offers additional information and also has fun ideas for children regarding food safety.

Partnership for Food Safety Education (PFSE)

(202) 220-0651

www.fightbac.org

Nutrition During and After Cancer Treatment

Eating well helps people living with cancer feel better and stay stronger during and after cancer treatment. If you eat well and keep or achieve a healthy weight, you will usually manage the side effects of treatment better. Good nutrition also helps the body replace blood cells and healthy tissues that are damaged as a result of cancer treatment.

Many nutrition professionals agree that eating different foods rich in nutrients is important to maintain and improve good health.

A healthy diet includes a balance of

- Fruits and vegetables
- Whole grains and legumes
- Low-fat protein foods, such as fish, lean meats and poultry
- Low-fat dairy foods.

Here are some tips for eating fruits and vegetables:

- Aim for 5 to 10 servings of fruits and vegetables each day (a serving is half a cup for most fruits and veggies, one cup for leafy greens, melons and berries).
- Include one or more servings of cruciferous vegetables in your diet almost every day. Cruciferous vegetables include broccoli, cauliflower, cabbage, Brussels sprouts, kale, watercress, radishes and others.

In addition to good nutrition, a healthy lifestyle includes

- Maintaining or achieving a healthy weight
- Drinking enough fluid
- Daily activity, such as walking
- Relaxation (managing stress)
- Getting enough sleep
- Not using tobacco or abusing drugs and limiting or not drinking alcohol.

Foods cannot be used to treat cancer, but some things you eat or drink and some actions you avoid can make a difference in your health and how you feel. For example, it's important to know if what you eat is causing a bad reaction with your medication. It's also important to know how much you should eat to achieve or maintain a healthy weight and also be aware of how much water you are drinking.

Cancer Drug Treatment and Nutrition

Certain foods may cause a bad reaction with some of the drugs that are used to treat cancer. Members of your treatment team will tell you which foods to avoid.

When you begin a new treatment or start using a new drug, it is a good idea to tell your doctor about any food allergies you have and all vitamin and herbal supplements you are taking.

You should also ask the following questions:

- Will I have any special nutritional needs while taking this medication?
- Do I need to take this medication with food or should I take it without food?
- Are there any known foods that I shouldn't eat during this treatment?
- Are there any known vitamins or drug supplements that I shouldn't take while undergoing this treatment?
- Are there any foods or beverages I should avoid when taking this medication?
- Do I need to drink extra water or other fluids while in treatment or while taking this medication?
- Can I drink alcoholic beverages, including beer and wine, while in treatment or while taking this medication?
- What if I vomit immediately after taking my medication?

For other questions to ask your doctor about side effects, see the free LLS publication *Understanding Side Effects of Drug Therapy*.

Your Appetite

People living with cancer may have different nutrition goals and challenges, depending on their

- Age
- Type of cancer
- Stage of cancer
- Type of treatment
- Other medical conditions such as high blood pressure, heart disease, diabetes or depression.

Your cancer and the treatment for it may increase your body's need for calories and protein. Chemotherapy, certain other drug therapies and radiation therapy create a need for more calories and protein. Side effects of your treatment may also make it a challenge for you to take in enough calories and protein.

Decreased appetite can be very challenging and distressing especially when it results in weight loss. It can be difficult for patients and families to cope with changes in food likes and dislikes and eating behavior that is caused by decreased or changed appetite. If appetite continues to be poor, your doctor may wish to try an appetite stimulant.

The following nutrition tips can help you to get the most nutrition out of each bite of food when decreased appetite is a problem:

- Eat small meals or snacks frequently throughout the day.
- Keep prepared snacks or small meals on hand and be sure to take them with you when you will be away from home.
- Try high calorie liquids such as juices, soups or shakes if eating solid foods is a problem.
- For extra calories, add gravy, milk, butter or cream to your food whenever possible.
- Choose soft foods or foods that can be cooked until tender.
- Try new foods and recipes to accommodate changes in taste or smell.
- When possible, take a walk before meals to improve appetite.
- Eat with friends or family members when possible.
- Make a list of your favorite foods and be sure to have these foods on hand.
- Try an iced coffee or smoothie with added protein powder.
- Keep snacks and dessert handy and visible.

- Keep a bottle of water with you and sip it throughout the day to prevent dehydration.
- Accept help with food shopping and meal preparation.
- Sign up for cooking classes for people with cancer, which are offered in many areas. Your LLS chapter may know of classes that you can attend if you are interested.

Weight Gain

For some patients, weight gain may occur as a result of increased appetite or fluid retention (“bloatiness”) associated with certain drug therapies. Weight-loss diets are not recommended without proper medical guidance. For help, ask your oncologist to refer you to a dietitian who can design an appropriate diet for you.

Recent research studies have found that obesity may cause an increased risk of being diagnosed with certain blood cancers. However, further studies need to be done to better understand the connection.

Get Enough to Drink

Certain cancer therapies, including chemotherapy, other drug therapies and radiation therapy can increase risk for dehydration. Some side effects of treatment, such as diarrhea and vomiting, increase the need for more fluids.

If you are taking medications by mouth, drink plenty of fluids throughout the day. Sipping even small amounts of liquids at regular intervals will help if that is all you can manage. Fluid requirements are based on several factors such as age, activity level, climate and medical treatment. Check with your treatment team for guidance on the amount of fluid you should have each day.

Your treatment team may recommend liquids, such as broths or sports drinks—these can restore the body's electrolyte balance. Electrolytes, such as sodium and potassium, have many important functions in the body. Vomiting and diarrhea increase your body's loss of electrolytes. Check with your treatment team to see if you need extra help in keeping your body's fluid in balance by drinking liquids that contain electrolytes.

If water does not appeal to you, flavored fluids are fine. It is best to avoid alcohol as this can increase your body's fluid loss.

Dental Health

Dental care is an important part of overall cancer care. Good nutrition also plays a big role in dental health. Problems with the teeth, gums or mouth can interfere with eating well. And poor nutrition can lead to dental problems. Visit the dentist before treatment begins if possible, and

- Maintain good dental and oral hygiene to help prevent gum disease and infection.
- Use a mouthwash prescribed by your dentist and avoid alcohol-based mouthwashes.
- Inspect your mouth daily to detect any problems with sores, ulcers or infection.
- Speak with your oncologist and dentist as soon as possible if you have any mouth, tooth or jaw pain—or any other symptom of possible dental problems.
- If needed, your oncologist may refer you to a dental oncologist (a dentist who is specially trained to treat people with cancer).
- Ask your healthcare team for tips on how to keep your teeth and mouth clean, and for their suggestions on how to reduce dental discomfort.

When you go to the dentist, update your medical history records to include your cancer diagnosis and treatments, and provide your dentist and your oncologist with each other's name and telephone number so they can consult with each other. You may be advised to have any necessary major dental procedures completed before beginning therapy, if possible.

Diet Guidelines for Immunosuppressed Patients

Diet guidelines published by institutions or doctors about handling food safely recommend avoidance of foods that are more frequently associated with illness that is carried by food. Some common foods that should always be avoided are: unpasteurized dairy products, raw oysters, raw eggs, raw fish and alfalfa sprouts. It is also recommended that you cook poultry and hamburger meat until it is well done. If you have a well for your water source, a water filter should be installed on the tap or where the water enters the house. You can get your water tested at no cost. If a filter is needed and cannot be afforded, you can boil your drinking water.

In your search for a diet that is designed for people who have weakened immune systems, you may come across one that is called the “neutropenic diet.” This was supposed to help individuals with lower-than-normal neutrophil counts (neutropenia) learn how to decrease exposure to bacteria and other harmful organisms found in some foods. However, a universally-accepted definition of what foods should be included in this diet was never developed. In a

review of studies, the neutropenic diet was never proven to decrease exposure to bacteria in foods. This diet does not seem to benefit patients in any way.

Patient education regarding food safety is important. For specific instructions about your diet, consult your treatment team.

Evaluating Nutrition and Supplement Information

Nutrition and cancer research is still in its early stages. It may be hard to sort out dependable, science-based advice from misinformation and myth.

If you are interested in understanding more about nutrition news that you have seen on the Internet, read about in a magazine or newspaper, or heard on the news or from a friend or relative, it is important to speak to a member of your oncology team. Don't try a vitamin or herbal supplement on your own, because it could interfere with your cancer treatment. For example:

- St. John's wort, an herbal product used to treat depression, reduces the effectiveness of imatinib (Gleevec®), a drug used to treat chronic myeloid leukemia and Philadelphia-positive acute lymphoblastic leukemia.
- Green tea supplements can interfere with the effectiveness of bortezomib (Velcade®).

Patients who are experiencing depression should talk to their doctors about safe treatment options and be sure to tell their doctors about any medications or supplements they are taking.

Dietitians and Nutritionists

You may want to ask your doctor to refer you to a registered dietitian for specific nutrition advice and guidance. The terms “nutritionist” and “dietitian” are often used to mean the same thing, but they're not the same. Dietitians may refer to themselves as nutritionists, but not all nutritionists are dietitians. The registered dietitian (RD) credential signifies that a clinician has completed academic and accredited internship experience, has successfully passed the national credentialing exam, and maintains ongoing continuing education and professional development in accordance with the Commission on Dietetic Registration. Dietitians who are board certified specialists in oncology also have the CSO credential (Certified Specialist in Oncology) in addition to being an RD. You can find an RD through www.eatright.org and an RD-CSO through www.oncologynutrition.org.

A dietitian can

- Develop an individualized eating plan for you that meets your needs
- Help you manage changes in appetite and weight
- Help you deal with side effects of treatment
- Advise you about foods, vitamins, herbs and supplements
- Develop a personalized cancer survivorship wellness plan.

Patients who cannot eat and drink enough for extended periods of time may be referred by their oncologists to a dietitian to help determine whether a feeding tube should be used for nutrition during treatment, and the best type of formula to use. Some patients may need to receive their nutrition through an IV. These forms of therapy may be needed to keep you as healthy and strong as possible during treatment.

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We're Here to Help

LLS is the world's largest voluntary health organization dedicated to funding blood cancer research, education and patient services. LLS has chapters throughout the country and in Canada. To find the chapter nearest you, enter your ZIP code into "Find Your Chapter" at www.LLS.org, or contact

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Callers may speak directly with an Information Specialist Monday through Friday, from 9 a.m. to 6 p.m. ET. You may also contact an Information Specialist between 10 a.m. and 5 p.m. ET by clicking on "Live Chat" at www.LLS.org or by sending an email to infocenter@LLS.org. Information Specialists can answer general questions about diagnosis and treatment options, offer guidance and support and assist with clinical-trial searches for leukemia, lymphoma, myeloma, myelodysplastic syndromes and myeloproliferative neoplasms. The LLS website, www.LLS.org/clinicaltrials, has information about how to find a clinical trial, including a link to our free online clinical-trial search service.

LLS also provides free publications that can be ordered via the 800-955-4572 number or through the "Free Education Materials" option at www.LLS.org/resourcecenter.

Resources

Academy of Nutrition and Dietetics

www.eatright.org/public
The Academy of Nutrition and Dietetics provides reliable nutrition information and other resources. You can search for a registered dietitian.

American Society of Clinical Oncology (ASCO)

(888) 651-3038
www.cancer.net
ASCO provides nutrition recommendations for during and after treatment.

Caring4Cancer

www.caring4cancer.com
Caring4Cancer provides comprehensive and science-based information about nutrition and cancer.

Food and Nutrition Information Center (FNIC)

(301) 504-5414
<http://fnic.nal.usda.gov>
FNIC, part of the US Department of Agriculture, provides information on dietary supplements, food safety and the nutritional composition of foods.

FoodSafety.gov

www.foodsafety.gov
FoodSafety.gov includes information about keeping food safe and posts food recalls.

MedlinePlus

www.nlm.nih.gov/medlineplus
MedlinePlus provides links to current healthcare information. It is compiled by the National Library of Medicine at the National Institutes of Health (NIH).

Nutrition.gov

www.nutrition.gov
Nutrition.gov provides information about healthy eating, physical activity and food safety.

Oncology Nutrition

www.oncologynutrition.org
Oncology Nutrition provides a search tool to find a registered oncology dietitian in your area.

Partnership for Food Safety Education (PFSE)

(202) 220-0651
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PFSE is an organization dedicated to educating the public about safe food handling practices. The website is a resource for food-safety information.

PubMed

www.pubmed.gov
PubMed is a service of the National Library of Medicine that enables searches for science-based information. It includes more than 21 million citations for biomedical literature from MEDLINE, life science journals, and online books.

References

Fox N, Freifeld AG. The neutropenic diet reviewed: moving toward a safe food handling approach. *Oncology*. 2012 June;26(6):572-575.

Jubelirer SJ. The benefit of the neutropenic diet: fact or fiction? *The Oncologist*. 2011;16(5):704-707.

Lichtman MA. Obesity and the risk for a hematological malignancy: leukemia, lymphoma, or myeloma. *The Oncologist*. 2010;15:1083–1101.

Food. United States Food and Drug Administration. www.fda.gov/Food/default.htm. Accessed July 29, 2013.

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