



American
Institute for
Cancer
Research®



CancerResource™

LIVING WITH CANCER

- *Navigating Cancer's Challenges, During and After Treatment*
- *How Nutrition and Physical Activity Can Help You*





About AICR

The American Institute for Cancer Research (AICR) is the cancer charity that fosters research on the relationship of nutrition, physical activity and weight management to cancer risk, interprets the scientific literature and educates the public about the results. It has contributed over \$108 million for innovative research conducted at universities, hospitals and research centers across the country. AICR has published three landmark reports that interpret the accumulated research in the field, and is committed to a process of continuous review. AICR also provides a wide range of educational programs to help millions of Americans learn to make dietary changes for lower cancer risk. Its award-winning New American Plate program is presented in brochures, seminars and on its website, www.aicr.org.

AICR is a member of World Cancer Fund International that leads a network of cancer charities consisting of: the American Institute for Cancer Research (AICR); World Cancer Research Fund (UK); World Cancer Research Fund Netherlands (WCRF NL); and World Cancer Research Fund Hong Kong (WCRF HK).

AICR CancerResource Advisory Committee

The **CancerResource** Advisory Committee has provided invaluable expert guidance in the development of this guide, helping to ensure that the resource provides state-of-the-art information to ease the way for those facing cancer and its treatment.

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Looking Forward with Hope

HOW CANCERRESOURCE CAN HELP

1

There has never been a time of greater hope for those with cancer. Today, we know more about identifying and treating this disease than ever before, and patients now have a much better chance to overcome cancer and return to an active and full life.

Many difficult decisions must be made by those facing cancer, both during treatment and afterward, when survivors are focused on improving their quality of life while reducing their chances of recurrence and secondary cancers. **CancerResource** describes the steps that can help you achieve these goals.

How to Use **CancerResource**

Many factors have been shown to affect cancer risk, including diet, physical activity and weight. AICR's mission relates to these issues and **CancerResource** provides specific recommendations about eating and physical activity during and after your cancer treatment.

But **CancerResource** also takes a more comprehensive approach to cancer care decisions. At the end of this booklet, you will find information about cancer, the treatment options available to you and worksheets with questions to ask your health care providers.

For those who want more information, additional sources of information are listed throughout this guide. At the end of this resource, you will find a glossary of medical terms you might encounter during your cancer diagnosis, treatment and recovery.

AICR developed **CancerResource** with the guidance of experts in a variety of medical, research and educational areas. Every effort has been made to ensure that the information is as current and accurate as possible, but the field of cancer research and treatment is constantly evolving.

CANCER SURVIVAL IS INCREASING

The current statistics from the National Cancer Institute show that:

- As of January 2016, it is estimated that there are 15.5 million cancer survivors in the United States.
- The number of cancer survivors is projected to grow to 26.1 million by 2040, an increase of almost 11 million from 2016.
- In 2016, 67% of survivors have survived 5 years or more after diagnosis; 44% have survived 10 years or more; and 17% have survived 20 years or more.
- Sixty-two percent of survivors are currently 65 years of age or older.



We suggest that you read **CancerResource** as a useful starting point. Discuss your health circumstances with your health care providers, who can develop an individual treatment plan for you.

7 KEYS TO MAKING HEALTHY CHANGES THAT LAST

- 1. Focus on individual changes.** As you read **CancerResource**'s advice about eating well and being active during and after treatment, remember you don't need to make drastic changes overnight. Studies show that choosing one or two behaviors to work on helps make those changes stick. For example, start off by resolving to increase the amount of plant foods on your dinner plate tonight or adding five minutes to your daily activity tomorrow.
- 2. Ask for help.** Your doctor can refer you to a registered dietitian (RD) and a certified exercise physiologist. They can help you focus on making those healthy changes that will make the biggest difference in how you are coping with cancer.
- 3. Go public.** Set a specific goal for behavior change and tell others about it. "I am going to take a brisk walk every day in the early afternoon."
- 4. Record** each behavior you are changing so you can track your progress over time and make adjustments in your plan, such as readjusting your goal if it is too high or too low. Again, an RD and a certified exercise specialist can help monitor your progress.
- 5. Reward yourself.** Give yourself something you really enjoy when you reach milestones along the way to your goal.
- 6. Accept setbacks.** When attempting to make healthy changes to your diet or activity level, setbacks will occur. Develop a plan for anticipating and dealing with setbacks so you can work through them. Getting back on track after a setback is one of the most important steps in a behavior change program.
- 7. Be patient with yourself and your progress.** Remember: Changing behavior takes time. By making gradual changes you are much more likely to stay on track in the long run.

The general information in **CancerResource** may not apply to your individual situation, and AICR is not responsible for any misinterpretation or misapplication of included information.

CancerResource is an information resource, not a substitute for medical care.

During Treatment

HEALTHY EATING

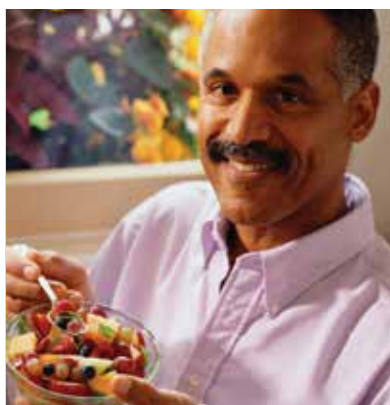
2

For someone facing the demands of cancer treatment, eating healthy provides nutrients that can fuel the body and aid in healing and also help in maintaining a healthy weight.

Special nutritional challenges are bound to arise throughout treatment because the side effects of therapies can result in changes in your eating habits and differences in the way your body uses nutrients. Nutritional needs and eating habits are affected differently depending on the type of cancer and its treatment.

This section focuses on suggestions for managing common eating difficulties during cancer—specifically, reduced appetite, weight loss and undernutrition; weight gain; fluid retention; nausea; vomiting; diarrhea; constipation; feeling full quickly; taste changes; milk or lactose intolerance; food aversion; sore mouth, tongue and throat; dry mouth; difficult swallowing; stricture (narrowing of the esophagus); fatigue; and tooth decay. Sources for more detailed information from AICR and other trustworthy organizations are also listed.

Many of the tips and food suggestions in this section are based on the fact that the side effects listed above may make it difficult to eat a healthy, balanced diet sufficient to maintain weight. As a result, some of the suggested foods are higher in calories and are recommended temporarily to keep up your energy and prevent weight loss during treatment. Note, however, that if you are a woman with breast cancer (or are taking certain medications), unwanted weight gain can occur during treatment (see page 7). If this is a concern for you, it may help to adjust your calorie intake to maintain a healthy weight.



5 TIPS FOR HEALTHY EATING ON A BUDGET

1. Make a shopping list and stick to it. Utilize grocery store circulars for sale items, clip coupons or participate in free grocery store pick-up programs to minimize impulse buys.
2. Opt for water, tea and coffee over expensive soda and fruit punch.
3. Eat more meatless meals that feature beans and other plant proteins.
4. Ditch snack bars and candy bars for a piece of your favorite fruit.
5. Turn leftovers into hearty soups you can enjoy over several days.

These tips and resources are not substitutes for speaking with your health practitioner. He or she can address your individual eating challenges and may refer you to a registered dietitian who specializes in nutritional care during cancer treatment.

Dealing with the Common Side Effects of Cancer Treatments

Fatigue

Fatigue is the most common side effect in those undergoing cancer treatment. For some, fatigue may continue after treatment ends. It can significantly affect your quality of life and make it difficult to prepare and eat nourishing meals.

These steps may help

- **Make meal preparation easier:**
 - Participate in free grocery store pick-up programs to eliminate the need to grocery shop or get a membership to a grocery store home delivery service.
 - **Temporarily rely on convenience products** like ready-to-eat foods; frozen dinners; frozen or canned fruits and vegetables; prepared pasta sauces; and instant rice. Check labels for healthful choices—low in sodium and high in protein and fiber.
 - Keep healthy snacks on hand. Examples are dried fruits, cheese on whole-grain crackers and graham crackers.
 - Prepare food when you're feeling best. Prepare large quantities of your favorite meals and freeze leftovers in meal-size portions. Make blended fruit and yogurt shakes that can be kept in the refrigerator.
- **Get help with meals from friends and family members.** Phone for restaurant delivery or carry-out or have meals delivered by a service such as Meals on Wheels.
- **Try to get regular physical activity.** Strong, consistent evidence shows that regular activity can relieve fatigue and also enhance mood and appetite. See more under "During Treatment: Getting and Staying Active."

There are many different causes of fatigue including depression and difficulty sleeping. Talk to your doctor about your fatigue, and any other related symptoms, to determine if you'd benefit from treatments.

Loss of Appetite, Weight Loss, Reduced Muscle Mass and Undernutrition

Weight loss and undernutrition are common among cancer patients due to loss of appetite and other factors that affect eating. When severe, these issues can lower your quality of life and interfere with the functioning of important body organs such as the heart, liver and kidneys. It can also slow your body's ability to heal from surgery or radiation-induced tissue burns and infection.

These steps may help

- **Eat several small meals a day** instead of three large meals.
- **Eat high-protein foods first in your meal while your appetite is strongest**—foods such as beans, chicken, fish, meat, yogurt and eggs.
- **Eat your largest meal when you feel hungriest**, whether that's at breakfast, lunch or dinner.
- **Keep food interesting**—whether by changing up recipes and seasonings or eating in a nice restaurant.

- **Keep favorite foods** and high-calorie foods and beverages around the house or your environment during the day.

If you are not consuming enough calories and protein leading to loss of muscle mass and body weight, ask your health care team for simple, high calorie, easy-to-digest recipes like smoothies and milkshakes or suggestions for liquid or powdered commercial nutritional supplements. If you are still unable to consume enough calories and protein, you may benefit from tube feeding. A feeding tube is placed into the stomach and is used to administer a nutritional formula into the digestive tract reducing or eliminating the need to consume food through the mouth. During times when the digestive tract is not working effectively, total parenteral nutrition (TPN) may be appropriate. TPN provides nutrients directly into a vein. TPN is generally used as a last resort because of the cost and potential side effects.

Weight Gain

Weight gain is commonly seen during treatment of breast and certain other cancers, in women undergoing hormonal therapies or as a result of “induced/early menopause” from chemotherapy. While the exact causes are not known, weight gain may result in part from a change in diet and exercise routines, such as eating more due to stress or to control nausea and being less active due to fatigue. If steroids are part of your cancer treatment, they can be powerful appetite stimulants.

You may also be gaining weight because of fluid retention; if you are, see below. Tell your doctor about excess weight, especially if you gain weight rapidly over just a few days, so the cause can be identified.

- **Concentrate on healthy foods** such as vegetables, fruits, whole grains and beans and other foods that are naturally low in calories and high in fiber to help you feel full.
- **Pay attention to portion sizes**, checking food labels and the serving sizes listed.
- **Love what you eat.** Include and savor foods that you enjoy most so you feel satisfied.
- **Eat only when you're hungry.** Consider psychological counseling or medications if you find yourself eating to address feelings of stress, fear or depression, and try to find alternatives to eating out of boredom.
- **Try to get regular physical activity**, which can help manage your weight and relieve your fatigue. (See “During Treatment: Getting and Staying Active” section.)

*These steps
may help*

Fluid Retention

When patients gain weight during treatment without eating extra calories, the weight increase may be due to edema, or swelling. Certain common drugs such as prednisone and gabapentin can cause the body to retain too much fluid, as can a nutritional deficiency. Tell your health practitioner about rapid weight gain so he or she can determine the cause.

- **Drink plenty of water** unless you have been specifically advised by your doctor to limit fluids.
- **Eat less salt and foods with less sodium** such as fresh or frozen fruits and vegetables and unsalted or reduced-sodium snacks and soups. Replace processed foods such as cold cuts, which can be high in sodium, with alternatives.
- **Stay as physically active as possible.**
- **Elevate your legs when resting.**
- **If needed, your physician can prescribe medications** to minimize fluid retention.

*These steps
may help*

Nausea

Nausea is a common side effect of cancer treatment. It can sometimes be accompanied by vomiting (see below). Anticipation of a treatment session can cause nausea in some cases.

These steps may help

- **Eat small amounts of food often and slowly** instead of large meals. If nausea in the morning is a problem, keep crackers and soda at your bedside to nibble on before getting up.
- **Eat foods at room temperature or cooler**, as hot food can aggravate nausea because of strong odors.
- **Eat sitting up**, and rest sitting up or reclined with your head raised for about an hour after eating.
- **Drink beverages between meals** instead of with a meal. Drink beverages cool or chilled and sip through a straw.
- **Rinse out your mouth before and after eating**, and suck on a hard candy such as peppermint or lemon if you have a bad taste in your mouth.
- **Avoid triggers where possible** by recognizing times, foods, smells or events that trigger your nausea and trying to change your schedule or diet to avoid them.
- **If the smell of food or cooking nauseates you**, try to keep the room well-ventilated; prepare meals that don't require cooking; ask others to cook your meals for you or have meals delivered from Meals on Wheels or other similar services.
- **For nausea from radiation therapy or chemotherapy**, eat bland, soft foods on treatment days and avoid eating for an hour or two before treatment. If you find that the anticipation of treatment causes nausea, practice relaxation or meditation techniques or another activity to distract yourself.
- **Discuss the use of anti-nausea medications with your doctor.**



Foods to try:

Toast and crackers, yogurt, sherbet, popsicles, pretzels, angel food cake, canned fruits (peaches, pears, fruit cocktail), skinned chicken (baked, boiled), oatmeal, broths

Foods to avoid:

Any food that's fatty, greasy, fried, spicy, very sweet or has a strong odor

Vomiting

Vomiting can follow nausea and can be brought on by some cancer treatments. Other factors can make vomiting worse such as food odors, gas in the stomach or motion. Vomiting may occur without associated nausea. Tell your doctor if you have persistent vomiting and cannot keep liquids down. It is important to prevent dehydration if you are vomiting.

These steps may help

- **Sit upright and bend forward** after vomiting.
- **Don't eat or drink until your vomiting is controlled.**
- **Once vomiting is under control, try drinking small amounts of clear liquids.** Examples: cranberry juice, cool broth or flat soda (carbonated beverages can lead to vomiting in some people).
- **Try eating small amounts of soft foods** such as cream of wheat, pudding, frozen yogurt or gelatin when you are able to keep down clear liquids. And gradually work your way back to your regular diet.

Diarrhea

Diarrhea is another side effect that can be caused by cancer treatment, including chemotherapy and other medications, radiation therapy to the abdomen and surgery. Other potential causes include infection, food sensitivity and emotional upset. Call your health practitioner if you have severe or long-term diarrhea, which may cause dehydration, nutrient loss and other health problems. Medications may be helpful.

- **Drink plenty of liquids**, aiming for at least eight 8-ounce glasses each day. Good choices of fluids include water, diluted juice, broth or decaffeinated coffee or tea. Liquids at room temperature may be easiest to tolerate.
- **Eat small amounts of food throughout the day** rather than three large meals.
- **Some doctors recommend temporarily following a “BRAT” plan**—a low-fiber regimen featuring bananas, rice, apple sauce and toast—but its effectiveness is currently being reexamined. Check with your doctor.

*These steps
may help*

Foods to try:

Rice, noodles, hard-boiled eggs, bananas, puréed vegetables, applesauce, yogurt, kefir, white bread, skinned turkey or chicken, fish, mashed potatoes

Foods to avoid:

Raw vegetables and fruits; high-fiber vegetables like broccoli, corn, beans, cabbage, cauliflower and peas; onions and strong spices; greasy, fatty or fried foods; alcoholic beverages



Constipation

Constipation can result from some cancer treatments and pain medications. Constipation can also happen if you are not eating enough fiber or drinking enough fluids. Relying on tube feedings or physical inactivity for extended periods of time can also cause constipation.

- **Drink more liquids**, aiming for at least eight 8-ounce glasses a day. Liquids can help keep stools soft. Good choices include water, prune juice, warm juices, decaffeinated teas and hot lemonade.
- **If you develop gas, limit certain foods.** Culprit foods include broccoli, cabbage, cauliflower, beans, cucumbers, onions and carbonated drinks. Over-the-counter anti-gas products with simethicone may help you avoid discomfort from these foods. Always check with your doctor before self-medicating, even with over-the-counter medications.
- **Eat a large breakfast**, including a hot drink and high-fiber foods (like hot or cold cereal, whole-wheat toast and fruit).
- **Increase your physical activity**, aiming for a walk or other limited exercise every day.
- **Consider a fiber supplement**, over-the-counter medications such as stool softeners or laxatives if necessary. Always speak with your health practitioner first for specific guidance. (Remember to drink plenty of fluids with such a supplement.)

*These steps
may help*

Foods to try:

High-fiber vegetables like broccoli, corn, beans, cabbage, cauliflower and peas; whole-grain breads



Feeling Full Quickly

Feeling full from a small amount of food can occur for a variety of reasons and is especially likely if you've had upper abdominal surgery. It is important to try to eat enough to allow you to strengthen your body and support healing. Your doctor may prescribe a medication to help.

*These steps
may help*

- **Eat small meals throughout the day**, keeping healthy between-meal snacks on hand.
- **Fortify your meals with calorie-rich, nutritious foods.**
- **Avoid fried or greasy foods** because fat lingers in your stomach longer than carbohydrates or protein. Avoid foods that give you gas.
- **Drink beverages between meals** rather than during meals, so you feel less full while eating.
- **Rest after meals** with your head elevated.
- **Ask a health care professional about drinking blenderized drinks**, such as milkshakes, smoothies, and liquid or powdered commercial meal replacement beverages to boost calories and nutrients.

Taste Changes

Changes in how foods taste can result from chemotherapy, radiation therapy or the cancer itself. Some people experience bitter or metallic tastes, especially when eating high-protein foods such as meat. Each person's sense of taste can be affected differently, though, and so the best approaches for minimizing the unpleasant taste or enhancing flavor can vary, too. It may simply take some time after treatment is completed for your sense of taste to return to normal.

*These steps
may help*

- **Choose foods that appeal to you.** Moist and naturally sweet foods such as frozen melon balls, grapes or orange wedges may be particularly appealing, as may tart foods and beverages such as lemon yogurt or lemonade (but not if your mouth is sore).
- **If the taste of red meat is now less appealing, find healthy alternatives**, such as chicken, turkey, fish, beans, nut butters, eggs or dairy products.
- **Marinate meats** in juice, teriyaki sauce, barbecue sauce, Italian dressing or other flavorful liquid you find appetizing.
- **Add small amounts of sugar to some foods**, which may decrease salty, bitter or unpleasant tastes.
- **Serve foods cold or at room temperature**, which may improve how they taste.
- **Brush your teeth and tongue and rinse your mouth regularly**, especially before eating, to clean your taste buds. Choose alcohol-free mouthwashes: look at the label for inactive ingredients.
- **Rinse your mouth several times a day** with water or a baking soda mixture (one quart of water combined with one tablespoon of baking soda).
- **Try sour candies.**

Milk or Lactose Intolerance

People who digested milk and milk products easily before radiation or chemotherapy treatment may find they experience an intolerance to these products resulting in cramps and diarrhea. This is not common, however, and for most small amounts of dairy foods can still be tolerated in people who otherwise regularly eat them.

- **Try small portions of milk, yogurt or cheese** to see if you can tolerate them. Yogurts and aged cheeses may be easier to tolerate than other dairy products.
- **Avoid only the milk products that give you problems.**
- **Consider trying reduced-lactose milk** or milk that contains an enzyme product to help in its digestion. Such enzyme products are also available in pharmacies in capsule, pill or liquid drop form.
- **Try calcium-fortified non-dairy drinks and foods**, which you can identify by food labels. And speak with your health practitioner or registered dietitian about whether a calcium supplement could be beneficial. NOTE: These supplements can cause bloating and constipation.
- **Eat more calcium-rich vegetables**, including broccoli and greens. If eating broccoli gives you gas, try other calcium-rich vegetables like kale, spinach, arugula and collard greens.

*These steps
may help*

Food Aversion

Cancer patients often associate a particular food with the onset of unpleasant symptoms. This phenomenon is called “acquired food aversion.”

- Avoid eating your favorite foods when you know you are likely to feel sick. That way you will enjoy your favorites during times you’re feeling well.
- Remember that your food aversion will pass. In the meantime, focus on eating healthy foods you do like.

*These steps
may help*

Remember that taste changes and food aversions will pass with time after treatment. In the meantime, focus on eating healthy foods you do like.



Sore Mouth, Tongue and Throat

Soreness in the mouth or throat can result from cancer treatment or for other reasons. See your health practitioner to ensure that the soreness is not due to an infection. If it is a side effect of cancer treatment it will generally clear up in time.

Also, see your dentist before beginning cancer treatment or between treatments to help prevent dental problems.

These steps may help

- **Prepare easy-to-swallow foods and include high-calorie and high-protein foods if you are having difficulty maintaining your weight.** Cook foods until they are soft and tender and cut them into small pieces, or choose foods you can mash, blenderize or purée.
- **Serve foods cool or at room temperature**, which can be less irritating than foods that are either hot or cold. For some, cold foods such as sherbet or popsicles may also soothe soreness.
- **Drink through a straw.**
- **Avoid alcohol**, which can irritate the cells lining your mouth.
- **Rinse your mouth** several times a day with water or a baking soda mixture. Avoid commercial mouthwashes, which often contain alcohol, instead opting for an alcohol-free mouthwash.
- **Consider a medication to alleviate pain before meals or a product to numb your mouth and throat while you eat.** Your doctor can prescribe a medication, special mouthwashes, anesthetic lozenges or sprays.
- **Use a soft toothbrush.** Or, if your gums are sensitive, clean your teeth with cotton swabs or mouth swabs made especially for this purpose.
- **Remove your dentures if your gums are sore, except while eating**, and keep your dentures clean.
- **Don't smoke.**
- **Tell your doctor immediately if your gums bleed during treatment**, or if you see small white patches in your mouth. This may signal an infection that needs attention.



Easy to chew and swallow foods:

Bananas	Peach, pear or apricot nectars	Mashed potatoes	Gelatin
Apple sauce	Cottage cheese	Macaroni and cheese	Scrambled eggs
Watermelon	Yogurt	Custards	Oatmeal
Canned fruits	Milkshakes	Pudding	Puréed or mashed vegetables

Dry Mouth

A dry mouth is most common after chemotherapy and radiation therapy for specific types of cancer such as the head or neck area. A dry mouth from a reduction in the flow of saliva can make it difficult to chew and swallow and may change the way food tastes.

- **Stimulate saliva** by sucking on lemon-flavored sugar-free candies, frozen grapes or sugarless popsicles; sucking on ice chips or cubes; and trying tart foods and beverages, such as lemonade, in small amounts.
- **Opt for easy-to-swallow, moist foods** such as those with broth, gravy, sauces and salad dressings.
- **Avoid salty foods and alcohol.**
- **When drinking beverages**, sip through a straw and drink thick drinks such as fruit nectars at room temperature or colder.
- **Practice good oral hygiene.** See tips under “Sore Mouth, Tongue and Throat” relating to rinsing your mouth and brushing your teeth.
- **Keep your lips moist by applying ointment.**
- **Try using a cool mist humidifier**, especially at night.
- **Don’t smoke.**
- **If your dry mouth is severe, ask your doctor or dentist** about products that coat and protect your mouth and about saliva substitutes and stimulants.
- **Tell your health practitioner about any small, white patches in your mouth**, which may signal an infection requiring care.

Difficulty Swallowing

If you are being treated for a head or neck cancer, you may develop trouble swallowing. Talk to your doctor to determine if your treatment is the reason. You might need to have a swallowing assessment to determine which foods and liquids you can safely and effectively swallow.

- **Eat small, frequent meals.**
- **Purée foods**, or thin out mashed foods using broth, gravy, milk or water.
- **Take deep breaths** before trying to swallow, and exhale or cough after swallowing.
- **Drink plenty of fluids**, aiming for eight 8-ounce glasses a day. Liquids at room temperature may be easier to swallow. Drink beverages between rather than during meals so you don’t feel full too quickly.
- **Ask your speech therapist or registered dietitian for help** with properly placing food in your mouth to avoid choking; adjusting your dietary fiber to avoid constipation or diarrhea while on a liquid diet; and effective swallowing techniques if part or all of your tongue or jawbone has been removed.
- **Report any choking or coughing while eating** to your doctor, especially if accompanied by a fever.

*These steps
may help*

Stricture

Surgery or radiation therapy sometimes causes the esophagus to narrow, making it painful and difficult for food to pass through the chest area to the stomach. Your surgeon may be able to widen the opening or insert a feeding tube to bypass the constriction while it heals.

These steps may help

- **Try to drink liquids**, which will pass through the esophagus more easily. Experiment with liquids of different viscosity or thickness. Thicker liquids may be easier to control when being swallowed. Try fruit nectars, pasteurized eggnog, smoothies or milkshakes if water and juice cause coughing or pain.
- **Try puréed fruit and vegetable packets.** These are often found in the packaged fruit section or the baby aisle of the grocery store.
- **Elevate your head while eating or drinking lying down.**

Tooth Decay

Some cancer treatments can cause tooth decay and other problems for your teeth and gums. Some changes to your eating habits may make the problem worse.

These steps may help

- **See your dentist before starting treatment**, especially if you have a history of tooth or gum problems, to help prevent infection or other problems.
- **See your dentist regularly**—more often than usual if you're receiving treatment that affects the mouth (such as radiation to the head and neck). Inform your dentist about all medications you are taking.
- **Use a soft toothbrush**, or, if your gums are sensitive, clean your teeth with cotton swabs or mouth swabs made especially for this purpose.
- **Rinse your mouth with warm water** when your mouth and gums are sore. Also, rinse your mouth if you have vomited to remove acid.
- **Limit excess sugar and sticky/sweet foods in your diet** unless you are experiencing poor appetite or difficulty maintaining your weight.
- **Brush or rinse your mouth** after each time you eat.

See your dentist before starting treatment, especially if you have a history of tooth or gum problems, to help prevent infection or other problems later on.



QUESTIONS TO ASK YOUR HEALTH PRACTITIONER OR DIETITIAN

About Nutrition During Treatment

Are there any changes I should make to my current diet?

Should I be taking a multivitamin? (If you are taking supplements of any kind, bring a list of what you are taking and share it with your health practitioner and dietitian.)

If my treatment is causing me to vomit often, should I be concerned about getting necessary nutrients?

Should I try liquid meal replacements if I have trouble keeping solid food down?

What if I just don't feel like eating much for a couple days after treatment?

4 TIPS FOR KEEPING FOOD SAFE

Food safety is especially important for those undergoing cancer treatment and involves four basic steps:

1. Wash hands and surfaces often.

Bacteria can spread throughout the kitchen and get onto cutting boards, utensils, countertops and food. In addition to thoroughly washing fruits and vegetables, change sponges and dishtowels often.

2. Separate, don't cross-contaminate.

When handling raw meat, poultry, seafood and eggs, keep these foods away from ready-to-eat foods to stop bacteria from spreading. Use separate cutting boards for raw meat, poultry and fish.

3. Cook food thoroughly to proper temperatures.

Use a food thermometer, inserted into the center of the food, to check when foods are safely cooked. They must be heated to the U.S. Department of Agriculture-recommended safe minimum internal temperatures (Fahrenheit):

Chicken Breast: 165°	Leftovers and Casseroles: 165°
Egg Dishes: 160°	Pork: 160°
Fish: 145°	Steaks and Roasts: 145°
Ground Beef: 160°	Whole Poultry: 165°

4. Refrigerate food promptly.

Refrigerate or freeze leftover foods within 1 hour to slow the growth of harmful bacteria (use several shallow containers for large volumes). Use a thermometer to make sure refrigerator temperature is consistently 40°F or below and the freezer 0°F or below.

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

Read food product expiration dates and look for signs of spoilage. **If in doubt, throw it out.**

Source: USDA

During Treatment

GETTING AND STAYING ACTIVE

3

The old advice to “just get plenty of rest” during cancer treatment has been updated. Today, research is showing that exercise, when carefully monitored, is a powerful tool to improve endurance, lessen fatigue and improve self-esteem. That’s why experts now recommend that you get and stay as active as you safely can.

If you were not exercising regularly before your diagnosis, take it slowly and carefully now. It is important to build up your level of activity in a step-by-step manner and to keep your oncologist and other providers informed.

Of course, how much activity you’re able to do during treatment depends on many factors related to your specific diagnosis, treatment, age and fitness level. Ask your health care team for guidance.

BENEFITS OF BEING ACTIVE

Among cancer patients overall, moderate, carefully supervised physical activity has been shown to **increase**:

- Quality of life
- Muscle mass
- Muscle strength and power
- Aerobic fitness
- Maximum walk distance
- Immune system capacity
- Physical function
- Flexibility

... And has been shown to **decrease**:

- Nausea
- Body fat
- Fatigue
- Heart rate
- Length of hospitalization
- Symptoms/side effects
- Resting blood pressure
- Stress
- Depression
- Anxiety



How Exercise Can Help You Deal with Common Treatment Side Effects

Fatigue

Fatigue is the most common side effect of cancer treatment and can have an effect on many aspects of your life. The notion that getting more activity can make an already tired cancer patient feel less tired might seem surprising. But that's exactly what a consistent body of research conducted among cancer patients now shows: light exercise helps people in cancer treatment feel more rested and energetic.

These steps may help

- If possible, start exercising before your treatment begins. It'll be easier to stay on track if fatigue does set in once you've built a "buffer" of regular activity into your day.
- Opt for several short exercise sessions over a single long workout every day. Exercising for small amounts of time several times a day (e.g., 10-minute bouts of activity, 4 times a day) will help keep fatigue at bay better than one long, extended exercise session. Both strategies confer health benefits—but when it comes to battling fatigue, small exercise sessions keep energy levels high throughout the day.
- Exercise during the time of the day when you feel like you have the most energy. In addition, make sure you eat within 30 minutes of completing your exercise session (try to eat foods with some protein content) and drink plenty of water both during and following your exercise session.

Weight Loss

Although it's more common for cancer patients to gain weight rather than lose it, the weight that is gained often comes with a loss of muscle. Those patients who do lose weight end up losing both fat and muscle mass. Regular exercise, particularly resistance exercise, can help restore and even prevent loss of muscle mass during treatment.

These steps may help

- Aim to perform resistance-type exercises at least twice a week and up to 4 times a week if you can. This will stimulate muscle growth and metabolism. Try exercises that target the upper body (wall push-ups), lower body (sitting up and down on a chair) as well as the whole body (stair walking).
- To maintain muscle, vary the number of repetitions of each exercise. As you become stronger, increase the weight, intensity or both. A trainer certified to work with cancer patients can help you tailor a safe, personalized program.



Weight Gain

A major side effect of certain types of cancer therapies is weight gain, particularly gain of fat mass. In this regard, endurance exercise such as walking and biking are ideal weight maintenance activities. But to keep from losing muscle mass, try to combine cardiovascular exercises with resistance exercises.

- Aim for a session of cardiovascular exercise a minimum of 3 times a week. Traditionally, the advice to prevent gaining weight called for long sessions at a low intensity. Now, however, it is becoming clear that it's best to mix it up. Talk to a certified trainer about ways to vary the length and intensity of these sessions. If you currently exercise 3 times a week, for example, you could vary exercise in the following ways:
 - Session 1: Type: Easy: duration (~45 minutes), intensity (low).
 - Session 2: Type: Moderate-Hard: duration (~20 minutes), intensity (medium-hard).
 - Session 3: Type: Moderate: duration (~30 minutes), intensity (moderate).
- Following this type of varied schedule keeps your body “on its toes,” continually adapting in ways that keep your metabolism humming. However, pay careful attention to your energy levels and be sure to take days off when you need to, particularly following a harder exercise day. Days off to recover are just as important as exercise days.
- Once again, it helps to incorporate resistance exercises (see “Weight Loss”) to maintain muscle mass.

*These steps
may help*

Difficulty Sleeping

Problems falling asleep, and staying asleep, are one of the most common side effects of cancer therapy. There is now encouraging evidence that exercise helps you sleep better.

- Avoid exercising within 1 to 2 hours of your normal bedtime.
- Activities that move the whole body, such as swimming, typically require the greatest energy expenditure. As such, they are the most likely to help you sleep.
- Waking 30–60 minutes earlier to fit in exercise will provide you with more energy throughout the day and help you sleep better.

*These steps
may help*

Activities that move the whole body, such as swimming, typically require the greatest energy expenditure. As such, they are the most likely to help you sleep.

GETTING STARTED

Consider these steps as you embark on a physical activity program:

- Check your physical activity plan with your health practitioner. If you can, seek the guidance of a certified exercise oncology professional or exercise physiologist.
- Make sure you have exercise shoes that are comfortable and fit you well. Wear clothing that allows free motion while exercising.
- Start slowly—a few minutes of walking or riding a stationary bike each day or lifting light weights may work for you. Having a friend or family member participate with you during regular exercise is also a great way to make physical activity a fun part of your day.
- As you get stronger, increase the amount of physical activity in your schedule.



Cardiovascular Damage (Cardiotoxicity)

Certain cancer treatments may cause damage to your heart and surrounding blood vessels. This damage may increase the risk of cardiovascular disease later on.

Now, however, there's good evidence that exercise can help prevent treatment-related cardiotoxicity, and help restore cardiovascular function, even years after cancer therapy is completed.

These steps may help

- Start exercising, if possible, before treatment begins. This will increase heart health, which will act as a buffer against cardiac damage.
- If you are already undergoing treatment, ask your oncology professional about your cardiac health. If this information is out of date, ask for a cardiac test (most likely an echocardiogram) to ensure that your heart is healthy enough to tolerate exercise.

The current evidence supports **cardiovascular** exercise for the prevention and treatment of cardiotoxicity, but there's as yet no strong evidence that resistance exercises will help prevent this condition.

After Treatment

HEALTHY EATING

4

Research has shown that the choices you make about food, physical activity and weight management can reduce your chance of developing cancer.

Until relatively recently, research had focused on reducing this risk of getting cancer in the first place. AICR has worked steadily for more than a decade to promote the study of these same lifestyle factors in cancer survivors. Though this is a relatively new area of investigation, so far the science suggests that the same simple guidelines that help prevent cancer also help guard against its return.

What's more, these lifestyle adjustments can help protect against additional serious illnesses like heart disease, stroke and diabetes.

AICR CANCER PREVENTION RECOMMENDATIONS

Be a healthy weight

Keep your weight within the healthy range and avoid weight gain in adult life

Be physically active

Be physically active as part of everyday life—walk more and sit less

Eat a diet rich in whole grains, vegetables, fruits and beans

Make whole grains, vegetables, fruits and pulses (legumes) such as beans and lentils a major part of your usual daily diet

Limit consumption of “fast foods” and other processed foods high in fat, starches or sugars

Limiting these foods helps control calorie intake and maintain a healthy weight

Limit consumption of red and processed meat

Eat no more than moderate amounts of red meat, such as beef, pork and lamb. Eat little, if any, processed meat

Limit consumption of sugar-sweetened drinks

Drink mostly water and unsweetened drinks

Limit alcohol consumption

For cancer prevention, it's best not to drink alcohol

Do not use supplements for cancer prevention

Aim to meet nutritional needs through diet alone

For mothers: breastfeed your baby, if you can

Breastfeeding is good for both mother and baby
(Note: However, new mothers receiving chemotherapy should not breastfeed.)

After a cancer diagnosis: follow our Recommendations, if you can

Check with your health professional about what is right for you

- Not smoking and avoiding other exposure to tobacco and excess sun are also important in reducing cancer risk.
- Following these Recommendations is likely to reduce intakes of salt, saturated and trans fats, which together will help prevent other non-communicable diseases.

If you continue to face challenges eating and maintaining your weight after treatment is over, talk to your doctor or a registered dietitian for more information before making any big changes to your diet.

While many questions remain about the best diet for cancer survivors, available science on diet and survivorship has led AICR experts to conclude: **Following a few simple dietary guidelines that help prevent cancer may also help guard against its return.**

Among the most important dietary goals:

- **$\frac{2}{3}$ Plant Foods.** Make sure that foods like vegetables, fruits, whole grains and beans always take up at least $\frac{2}{3}$ of your plate. To maximize the variety of vitamins, minerals and protective “phytochemicals” (protective compounds found naturally in plants) in your diet, choose colorful produce such as dark leafy greens, tomatoes, strawberries, blueberries, carrots and cantaloupe.
- **$\frac{1}{3}$ Animal Protein.** If you eat fish, poultry, lean red meat, cheese and other animal foods, make sure they take up only $\frac{1}{3}$ or less of the space on your plate. (As much as possible, avoid eating processed meats like cold cuts, bacon, sausage and ham.) And try to go meatless several times a week, opting for a meal such as a veggie stir-fry or black bean burritos. You don’t have to become a vegetarian or give up the foods you love, though; it’s your overall pattern of eating that counts.

THE NEW AMERICAN PLATE

AICR calls our healthy approach to meal planning the “New American Plate.”

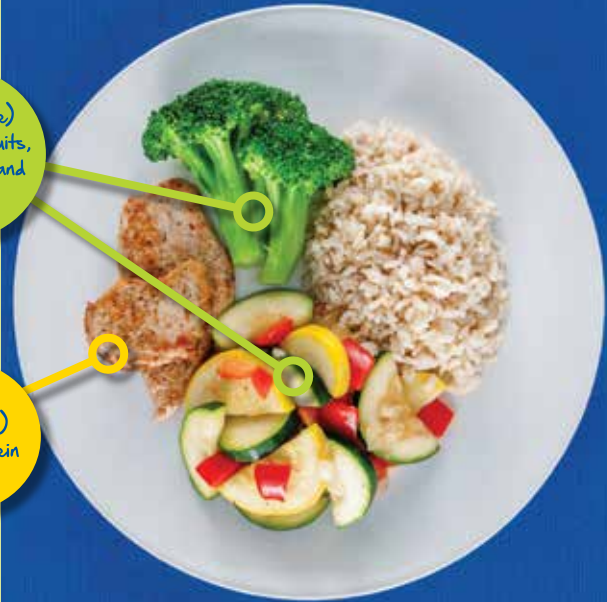
Look at your plate and think about the proportions of food: aim for meals made up of at least $\frac{2}{3}$ vegetables, fruits, whole grains or beans and no more than $\frac{1}{3}$ animal protein.

For quick, easy, cancer-fighting recipes, see the AICR brochure series, ***The New American Plate*** and visit “Recipes from the AICR Test Kitchen” on the AICR website, www.aicr.org.

The New American Plate

$\frac{2}{3}$ (or more)
vegetables, fruits,
whole grains and
beans

$\frac{1}{3}$ (or less)
animal protein



SERVING SIZES MATTER

Keep an eye on the portions you eat. These visuals can help you get the amounts you need:

- **Chopped vegetables:** 1 cup (1 baseball or rounded handful)
- **Raw leafy vegetables, such as lettuce:** 2 cups (2 baseballs or 2 handfuls)
- **Fresh fruit:** $\frac{1}{2}$ cup (1 small piece or $\frac{1}{2}$ baseball or rounded handful)
- **Pasta, rice or cooked cereal:** $\frac{1}{2}$ cup ($\frac{1}{2}$ baseball or rounded handful)
- **Ready-to-eat cereal:** 1 oz. (varies from $\frac{1}{4}$ cup to 1 $\frac{1}{4}$ cups—check label)
- **Meat, poultry (boneless) or seafood:** 3 oz. cooked (deck of cards)
- **Dried beans:** $\frac{1}{2}$ cup cooked ($\frac{1}{2}$ baseball or rounded handful)
- **Nuts:** $\frac{1}{4}$ cup (scant handful)
- **Natural cheese:** 1 $\frac{1}{2}$ oz. (4 dice)

Source: U.S. Department of Agriculture



In addition to focusing on eating mostly plant foods and less red meat, the following recommendations are also important:

Salt (Sodium)

Most of us get far more sodium than we need, most of it from processed foods. Reading food labels will help you identify low-sodium processed foods. You can add flavor and protective phytochemicals to your food by substituting herbs and spices such as basil, turmeric, paprika, thyme and dill.

Alcohol

Despite some evidence linking moderate alcohol consumption to lower risk for heart disease, this protective effect does not apply to cancer. AICR recommends avoiding even small amounts of alcohol. If you do choose to drink, limit your intake to one drink a day for women and two for men.

Alcoholic drinks increase the risk of pre- and post-menopausal breast cancer. And drinking two or more alcoholic drinks a day is a cause of colorectal cancer.

Smoking

Tobacco in any form is a major cause of cancer and should be entirely avoided. If you currently smoke or use tobacco in any form, ask your health professional about ways to quit.

One alcohol drink is equal to:

- 12 ounces of beer
- 5 ounces of wine
- 1.5 ounces of 80-proof distilled spirits



Some supplements have been shown to interfere with chemotherapy and other medications. That's why it's important to tell your health care team about any supplements you are taking.

Healthy or Harmful?

The summaries below are designed to separate fact from fiction on various hot nutrition topics.

Are Dietary Supplements Good Substitutes for Nutrients in Food?

The short answer is no. Supplements are not a replacement for whole foods in your diet. Most research indicates that protective nutrients in food are far preferable to pills. Supplements may not be well-absorbed by the body, and, in high doses, may be potentially harmful.

What about Phytochemical Supplements?

Skip these supplements, AICR recommends, and instead fill your plate with plant-based foods. Phytochemicals are substances in plant foods that seem to have various roles in cancer protection, such as protecting body cells from damage, acting as antioxidants and affecting cancer-associated hormones. Scientists have identified hundreds of phytochemicals that play a role in health and believe there are thousands more.

Each vegetable and fruit has its own phytochemical profile. Broccoli's combination is different from that of cherries, leeks, zucchini, cucumbers, carrots or tomatoes. So eating large amounts of a variety of healthful plant-based foods will give you an arsenal of cancer protection; phytochemical supplements are no substitute.



Can a Macrobiotic Diet Prevent Disease?

There is no evidence that a macrobiotic diet can cure or prevent disease. Because it is based on grains, vegetables, seaweed, beans and various soups, a macrobiotic diet requires care and planning. Many physicians recommend patients on macrobiotic diets take a complete multi-vitamin including vitamins B12 and D, to ensure they obtain all the nutrients they need.

Should I Only Eat Organic Foods?

The term “organic” is defined as plant foods grown without pesticides or weed killers. There are many reasons you may wish to choose organic, but it is not known whether organic foods help reduce cancer risk more than their non-organic counterparts. If you do opt for organic, remember that organic cookies, chips and other snacks can contain exactly the same amount of calories, fat and sugar as conventional brands.

Soy Foods in Moderation Are Safe

Health experts once thought that soy might be harmful for breast cancer survivors. Soy isoflavones are similar to estrogen, a hormone that fuels the growth of breast cancer. But recently, scientists have found that animals used in studies of this risk break down isoflavones differently than humans do. Now scientists believe that soy is safe for women with breast cancer. Although more studies are needed to find out whether eating soy foods prevents recurrence, simply eating moderate amounts of soy foods does not increase a breast cancer survivor’s risk of recurrence or death. A moderate amount is 1–2 standard half-cup servings daily of whole soy foods, such as a half a cup of tofu or edamame (green soybeans) or 1 cup of soy milk.

Will a Vegetarian Diet Protect Me?

A vegetarian diet may be a healthier alternative to Western diets, but there is no clear evidence that a vegetarian diet is more protective against cancer than a mostly plant-based diet containing small amounts of meat and dairy foods. A vegetarian meal plan should include a variety of foods, including many different vegetables and fruits, whole grains and protein alternatives to meat (such as beans, eggs, tofu, fish or small amounts of low-fat cheeses).

Does Sugar Feed Cancer?

The belief that sugar in the diet somehow preferentially “feeds” cancer is very common among patients, but the truth is more complicated. All cells, including cancer cells, in our body use sugar (glucose) from our bloodstream for fuel. We get that blood sugar from foods we eat containing carbohydrates, including healthful vegetables, fruits, whole grains and low-fat dairy sources. Some glucose is even produced within our bodies from protein.

The connection between sugar and cancer is indirect. Eating a lot of high-sugar foods may mean more calories in your diet than you need, which lead to excess weight and body fat. It is excess body fat that has been convincingly linked to greater risk of twelve types of cancers.

Should I Take Fiber Supplements?

The AICR/WCRF expert report and its updates found strong, consistent evidence that diets high in fiber help protect against colorectal cancer. That means enjoy meals containing plenty of vegetables, whole grains, beans and fruits, not fiber supplements.

Should I Follow a Ketogenic Diet?

The ketogenic diet is an acceptable medical option for treatment of epilepsy, and is being studied in people with brain cancer. The use of the ketogenic diet during treatment for different types of cancer is also being studied, but currently there is no recommendation for cancer patients to follow this restrictive diet.

Evaluating Nutrition Information

Cancer survivors, as a group, are highly motivated to learn about health issues and make positive lifestyle changes. But survivor research is in its early stages, and dependable, science-based recommendations can be difficult to find. Meanwhile, uninformed or even unscrupulous individuals sometimes rush to fill the information gap with inaccurate or misleading advice.

Media reports can overstate the results of research; makers of products may tout unverified health claims; and the Internet enables baseless rumors about diet and cancer to reach people worldwide.

BE INFORMED

Here are some tips for evaluating what's reliable when it comes to health claims:

- **Read information closely.**
 - Science progresses slowly and carefully, so be wary of products described with words such as “breakthrough,” “miracle,” or even “discovery.” Another red flag is a product whose claims rely on anecdotal evidence (“testimonials” or “case histories”) rather than published data based on research with many patients.
- **Get the whole story.**
 - Television and radio reports about science can be short and lacking in detail. Look for more complete information in magazines or newspapers: Who conducted and paid for the study? Was it published by a trusted source? Is there a consensus from research in the field to round out the information from this single study?
- **Maintain a healthy skepticism and a particular wariness of easy answers.**
 - Human nature has us looking for quick fixes to solve health problems. But cancer is a complex disease, the human body an intricate machine and the foods we eat contain a vast number of health-promoting components. The most healthful strategy will address the overall diet, not single foods or supplements.
- **Turn to your doctor or other health care provider for advice you can rely on.**
 - Talk with your health professional before trying a new strategy, as he or she can share the benefit of their extensive training, experience and knowledge of meaningful developments in the cancer field. Inform them about all the medications and supplements you are taking. **There are certain herbal supplements, for example, that may interact with cancer medications and make treatment less effective.**
- **Understand that cancer is not one disease, but many.**
 - Nutrition and exercise may impact the risk and progression of different cancers differently.
- **See the list of useful resources on page 40.**

After Treatment

GETTING AND STAYING ACTIVE

5

Being physically active delivers great rewards. Whether it's your first time becoming active or your fitness routine took a back seat while you received treatment for cancer, aim to get at least 30 minutes of moderate activity daily.

Along with eating a healthy diet, being active reduces your risk of not only cancer, but also diabetes, heart disease, stroke and other serious health problems. Physical activity can help control hormone levels, reduce inflammation in the body and boost immune function, which enhances your cells' ability to fight off disease.

Much of the research into physical activity and cancer has focused on prevention. A growing number of studies suggest that physical activity may also help prevent recurrence of certain cancers.

Everyone's risk for cardiovascular disease increases as they age, but cancer survivors are at a higher risk than other people, due to cardiac damage (cardiotoxicity) that can occur during cancer therapy. The good news from current studies is that regular cardiovascular exercise can help keep therapy-induced heart damage from happening in the first place (see page 20 for tips). But even years after cardiac injury has occurred, exercise can help survivors recover heart health.

Other potential long-term effects of cancer therapy include weight gain, high blood pressure, high cholesterol and type II diabetes. Getting and staying physically active also helps reduce the risk and severity of these effects and can even help reverse many of these conditions once they occur. Your health care team can offer specific advice on physical activity that's tailored to your situation; follow their guidance.

An expert panel convened by the American College of Sports Medicine (ACSM) concluded that exercise training is safe and beneficial for cancer survivors after—and even during—treatment.



For additional ideas for adding physical activity to your routine, see the AICR brochure, *The Facts About Physical Activity and Your Cancer Risk*.



These tips may help:

- Before you start exercising, ask your oncology professional about your cardiac health. If this information is out of date, ask for a cardiac test (most likely an echocardiogram) to ensure that your heart is healthy enough to tolerate exercise.
- The federal 2018 Physical Activity Guidelines for Americans recommend at least 150 to 300 minutes of moderate-intensity or 75 to 150 minutes of vigorous-intensity aerobic activity, per week. They also recommend doing muscle-strengthening activities on 2 or more days a week.
- Remember to mix it up by varying both the length and intensity of your workout.
- After 4–6 weeks, try starting to increase the number of exercise sessions per week (move from 3 or 4 to 4 or 5) as well as the length and intensity of each session. But pay careful attention to your energy levels and be sure to take days off when appropriate, particularly following a harder exercise day. Days off to recover are just as important as exercise days. Again, a trainer certified to work with cancer patients can offer specific advice to keep your physical activity session fun and interesting.

An expert panel convened by the American College of Sports Medicine (ACSM) concluded that exercise training is safe and beneficial for cancer survivors after—and even during—treatment. They noted that exercise programs should be tailored to a person's diagnosis and abilities. By working with your health professionals and goals, you can design a personalized exercise program to give you the greatest benefits while avoiding injury.

Physical activity need not be overwhelming, even when you're just getting back in the groove. It's not about running marathons or enduring grueling exercise sessions. You will gain health benefits and help lower your risk of cancer by making activity an everyday part of your life.

Remember...

- **Physical activity can be low-cost or free.** You don't have to join a gym or buy equipment. A pair of supportive rubber-soled shoes from a discount shoe store or an exercise DVD can do fine. Search YouTube for exercise videos.
- **Break it up.** Research suggests that breaking up the recommended 30 daily minutes into 10- to 15-minute sessions of brisk walking or another activity provides the same health benefits. Give yourself a break from sedentary tasks every hour or two with a brisk walk.
- **Be active by yourself or with others.** You may prefer to use exercise as your time alone or you may get more motivated by joining a class or having an activity buddy.
- **Go at your own pace.** Start where you are. Some physical activity is better than none, so even if you resolve to exercise for 30 minutes each day and then miss a day, don't give up. Just forgive yourself and get back to it, maybe trying something different or a different time of day that works better for you.

The Role of Weight

Like healthy eating patterns and regular physical activity, recent research shows that maintaining a healthy weight is key in keeping cancer from returning. The research is clear that carrying extra body fat, especially around the abdomen, increases cancer risk. This seems to be related to an increase in certain hormones and substances that can encourage cancer development. By combining a healthy, varied diet with regular physical activity, you can more easily achieve a healthy weight.

Your doctor can help you determine what is a healthy weight for you. Let him or her know if you recently gained unwanted weight.

Overweight?

The bottom line for losing extra pounds: **Choose foods that are low in calories.**

Plant-based foods are naturally low in calories and rich in nutrients. By choosing vegetables, fruits, whole grains and beans as the focus of your meals rather than animal foods and sweets, you'll be eating fewer calories. This is beneficial for many reasons and will likely make it easier to achieve or maintain a healthy weight.

For one thing, you'll be able to eat more to feel full, but you'll actually take in fewer calories. Building meals around plant foods also helps calorie-packed foods like meat and full-fat dairy products take up less room on the plate. Rarely eat chips, fries, cookies and other low-fiber, high-fat products.

Snacking wisely is a key element of successful weight control. Between meals, choose healthy snacks. Try interesting, unfamiliar fruits such as kiwifruit and papaya to add variety and satisfy your sweet tooth. Monitor your portions to keep calories under control.

To quench your thirst, head to the water cooler instead of the vending machine. Sugary drinks such as sodas, fruit punches and specialty coffee drinks loaded with whipped cream and syrups have a high number of calories without much nutrition.

Underweight?

A registered dietitian can help you with strategies for consuming high-calorie, yet healthy, foods. Two strategies that work for some people are 1) incorporating blenderized milkshakes and smoothies or a liquid commercial nutritional product into the diet, and 2) eating small, frequent meals throughout the day if it is difficult to eat a large meal all at once.

GET F.I.T.T.

Think about getting FITT. Using these four letters, you can remember the key components of a physical activity program: frequency, intensity, time and type.

F

Frequency refers to how often you are physically active and is usually measured in days per week.

I

Intensity describes how hard your body is working during physical activity and often is described as light, moderate or vigorous.

T

Time measures how long you spend being physically active each day.

T

Type describes the kind of activity you choose.

Start out slowly, and try to increase your FITT numbers until you are able to meet the recommended amount of physical activity every week.

EXPLORE A VARIETY OF PHYSICAL ACTIVITIES

IF YOU...	THEN TRY...
Have sore joints	Swimming or water aerobics, which use water buoyancy to avoid impact on the joints and water resistance to increase the workout on your muscles, lungs and circulation.
Enjoy music	Dancing—line dancing, ballroom dancing, belly dancing, hula dancing or improvisational movement.
Need to relax or improve balance	Participating in an ancient Asian practice, such as tai chi (a slow-motion martial art) or yoga, which stretches and strengthens your muscles.
Like animals	Checking with a local animal shelter or veterinarian’s office to inquire about volunteering. Walking dogs provides light to moderate activity.
Enjoy company	Joining a club for hiking, boating, cycling, running or walking or a sports team of your peers.
Take pleasure in helping others	Raking leaves, shoveling snow or washing the car for a neighbor. If you live in an area with historical, cultural or natural attractions, inquire about volunteering as a walking tour guide.
Like spending time with family	Finding activities to do together, such as canoeing, bowling or playing physically interactive video games.



Cancer and Its Treatment

GENERAL INFORMATION



Some of you may find it useful to have general information about the cancer and treatment options presented here in CancerResource. At the end of this section, you will also find a list of resources for more detailed information.

What Is Cancer?

As we live longer lives, more and more people are likely to get cancer. Already, there are millions of Americans who have been diagnosed with and successfully treated for the disease. Better, and more regular, screening has helped detect cancer at its earliest and most treatable stages. And treatment methods have vastly improved over the years. As a result, many people have become long-term survivors. As this has occurred, efforts to help survivors better cope with the effects of treatment and lower their risk of recurrence have increased.

Although the term “cancer” is often used as if it were one disease, cancer is actually a group of more than 100 different diseases affecting various parts of the body. They all have one characteristic in common, however: the uncontrolled growth and spread of abnormal cells that can invade and damage healthy body tissues and organs.

Although the term “cancer” is often used as if it were one disease, cancer is actually a group of more than 100 different diseases affecting various parts of the body.



Cancer is rarely caused by a single factor; rather, it is the result of a complex interaction between cancer-causing substances, called carcinogens, and heredity. The process begins with the many thousands of genes found in each cell of the human body. Genes, made up of DNA, carry instructions for making the proteins that regulate all body processes, including how efficiently we process foods, metabolize toxins and fight infections.

Genes are activated, or switched on and off, by signals in the body or by environmental influences. For instance, an unhealthy diet, cigarette smoke, too much sun or high levels of certain chemicals can damage DNA and cause genes to mutate, or change. When the body's normal repair mechanism doesn't work properly, because of genetic or environmentally caused mutation, the damaged cell continues to grow and multiply abnormally and can eventually lead to cancer.

Many people believe that all cancer is triggered by defective genes. However, most people who get cancer do not inherit altered, or mutated, genes. But in fact, only about 5 to 10 percent of all cancers are thought to be caused by an inherited "cancer gene." Even if there is a strong family history of a particular cancer, it does not mean that cancer is inevitable. Dietary and lifestyle factors can interact with the genes to influence whether we actually get the disease.

Understanding Your Diagnosis

It is very important to understand the diagnosis you receive when you visit the doctor. Powerful emotions—including denial, anger, fear, stress, loneliness, depression and hope—are a natural response to even a potential diagnosis of cancer. Getting the facts about your situation will help you make informed decisions in the days ahead. If you are nervous or don't think you'll remember what you are being told, then bring someone with you, ask your doctor to write out the information you need or take notes yourself. **Don't be afraid to ask questions.** Make sure you understand what the doctor is saying.

The accompanying worksheet includes some questions you'll want answered to help you take charge of your medical care.

As you cope with the issues associated with a cancer diagnosis, including the effects on your family routines and roles, speak openly about your feelings. If you or family members are having trouble adjusting to the diagnosis, considering seeking referrals to local support organizations for help. Many people find that cancer support groups or talking with another survivor with a similar diagnosis and treatment are a wonderful source of strength and hope and can offer practical ideas for everyday life.



QUESTIONS TO ASK YOUR HEALTH CARE PROVIDER

About Your Diagnosis

Exactly what type of cancer do I have?

What stage is the cancer in? What does that mean?

How does my stage affect what I am supposed to do?

What other health professionals do I need to speak with? How can they help me?

How was my diagnosis determined?

What tests were taken and what did they show?

Are more tests planned?

What is my prognosis?

Note: You should ask your doctor to give you an honest answer, to the best of his/her ability, neither minimizing nor maximizing your chances. How likely are you to survive? How likely are you to have a good quality of life?

What are the next steps to take?

Note: If your doctor is not an oncologist, or cancer specialist, you should be advised to see one for further tests or for treatment. If your doctor is an oncologist, treatment options will be recommended.

Finding a Doctor and Health Care Team

One important consideration in cancer treatment is deciding on a doctor. You can find a board-certified oncologist by researching online and by asking your primary care physician, managed-care representative or a hospital's oncology department. You must feel confident that your oncologist is not only experienced, but also competent and up-to-date and that he or she sees you as a partner in your treatment.

When visiting an oncologist, it may lessen your anxiety to bring a list of questions and paper and a pen or recorder with you. It's a good idea to bring a family member or close friend with you to provide another pair of ears that may catch something you might miss—and to ask questions. Be sure you feel comfortable having an open discussion with your provider, as good communication is critical to a doctor-patient relationship and in taking an active role in your treatment.

Even if you are satisfied with your health team, a second opinion can be useful. It can give you confidence in the information you have already obtained or offer a different approach to treatment.



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QUESTIONS TO ASK YOUR ONCOLOGIST

About Your Treatment

What is your experience in treating this type of cancer?

What kinds of treatment do you recommend and why?

Are clinical trials or investigational agents an option for me?

What are the chances that the treatment(s) you suggest will be successful?

How long is treatment, typically?

What are the side effects of the treatment?

How do you determine if symptoms I am experiencing are normal or adverse responses to the medications or other treatment?

What will my quality of life be during and after treatment?

Who is available for medical questions when you are not?

Is a nurse or other health care professional available to deal with phone inquiries?

What is the schedule for follow-up and post-treatment?

When do you generally return phone calls?

What is the cost of treatment and is it covered by my health plan?

Introduction to Treatment Options

There are several methods for treating cancer. The most common are surgery, radiation therapy and chemotherapy, and targeted or biological therapies. Complementary/alternative therapies (sometimes referred to as “integrative therapies”) are increasingly being incorporated into mainstream medicine. These include meditation, visualization, massage and acupuncture. Regardless of the type of treatment, the goal is the same: to stop the uncontrolled growth of cancer cells with as few harmful side effects as possible.

There is no one “best” method for treating all cancers, and a combination of treatments is commonly used. Different cancers are treated in different ways. In deciding on a specific type of treatment, the physician must consider a number of factors, including the type, stage and location of the cancer, as well as the patient’s health status and age.

Below is a brief description of the various treatment methods.

Surgery

Surgery removes the tumor and any nearby tissue that may contain cancer cells. Sometimes, healthy tissue around the tumor has to be removed to help keep the cancer from spreading. The location and extent of surgery determine the short- and long-term side effects.

Radiation Therapy

In radiation therapy (also called x-ray therapy, radiotherapy, brachytherapy or irradiation), high-energy rays are used to damage cancer cells so they are unable to grow and multiply. Radiation therapy is directed only to a specific area of the body where treatment is needed. As a result, it generally causes side effects that are mostly limited to one area, most of which are not permanent. The most common side effects are fatigue and skin rashes or redness in the area being treated. In some cases, radiation therapy may cause a decrease in the type of blood cells that help protect the body against infection, bleeding and anemia.

Chemotherapy

Chemotherapy is treatment with anti-cancer drugs. The type and stage of cancer determine which drugs are used. Often, more than one drug is used during a single course of treatment. Although chemotherapy drugs target the cancer cells, they may have a toxic effect on healthy cells, and temporary side effects can occur. Unlike radiation therapy, chemotherapy may affect cells in several parts of your body as the drugs travel through the bloodstream. Common side effects include nausea and vomiting, hair loss, loss of appetite and fatigue. Other side effects include an increased chance of infection, bleeding and anemia due to a decrease in normal blood cells. It may take several months to recover from many of the side effects of chemotherapy, and even longer for some symptoms. Talk to your doctor about ways of coping and if referral to another health care practitioner (such as a dietitian or physiotherapist) can help.

Hormone Therapy

Some types of cancer are affected by hormones that fuel the growth of cancer cells. For these cancers, your doctor may recommend medications that block cancer cells from getting the hormones that feed cell growth. Hormone therapy can cause a number of side effects, depending on the specific intervention. A surgical procedure (such as removing the ovaries or testicles) may have a similar result in lowering hormone levels in the body to protect against cancer recurrence. In some cases, the treatment interferes with the body's normal production or use of hormones. For example, women taking tamoxifen may experience some symptoms of menopause, such as hot flashes. Although rare, some patients may have nausea and vomiting, swelling, increased appetite and weight gain. Because some hormones cause an increase in appetite, they are also occasionally prescribed for patients with weight loss or a reduced appetite.

Targeted Therapies

Targeted therapy involves the use of drugs that are targeted against specific messages sent by cancer cells to help them grow. They are designed to take advantage of the unique features of cancer cells to disable them. Targeted therapies include biologic, immunologic and gene therapy. Many of these treatments are considered investigational because they are still under study and their effectiveness has not been proven.

To determine the safety and effectiveness of a targeted therapy, it is studied in a clinical trial—a carefully controlled study that often compares the new therapy with standard treatment methods. Sometimes the investigational treatment is not helpful, but other times it can lead to significant improvements in health and quality of life. Patients who participate in clinical trials make an important contribution to the advancement of medical science and cancer care.

- **Biologic Therapy**

Biologic agents target specific message systems within cancer cells that send signals to turn on cell growth. Some have been approved for treating cancer in combination with chemotherapy agents. Many others are being studied to block different growth pathways of cancer cells. Side effects depend on the type of treatment. Some can damage the heart muscle. Others can cause flu-like symptoms, such as fever, chills, nausea, vomiting, fatigue and skin rashes.

- **Immunotherapy**

Immunotherapy focuses on using the body's immune system to help fight cancer or lessen treatment side effects.

- **Gene Therapy**

Initiated in the 1990s, gene therapy replaces an active cancer-causing gene, or oncogene, with a normal gene. It might also involve removing bone marrow from a cancer patient, inserting a “designer” gene and then returning bone marrow to the patient. At present, there are a number of serious obstacles to the complete success of gene therapy that need to be overcome before this process is routinely available.

Integrative Medicine

Also referred to as “complementary therapies,” integrative therapies do not replace mainstream therapies, but may be used to provide added benefits. Popular complementary therapies include acupuncture, botanicals/herbals, antioxidants/dietary supplements, mind-body therapies and special diets.

While certain complementary therapies for cancer may appear to help some people, scientific evidence proving their effectiveness is often lacking. And some of these therapies may be harmful and may dangerously interact and interfere with conventional treatments. Be informed about the therapies you are considering using, and always approach unconventional, complementary and alternative cancer therapies with caution. Keep in mind that just because a therapy is “natural,” it is not guaranteed to be harmless. These therapies should complement, but never replace, traditional medical approaches to cancer treatment. To protect your well-being, always inform your physician about any complementary therapies, such as supplements, you are using.

Treatment Side Effects

Most methods of treating cancer are associated with side effects. This is because treatments that destroy or limit the growth of cancer cells may also damage healthy cells and tissues. The range of side effects depends on the type of treatment and individual differences.

Ask your doctor about the side effects you might expect from a specific treatment method. Realize, though, that it is not possible to predict exactly what the type and extent of the side effects might be for you. Indeed, there may be no side effects at all, or only limited ones.

Hair loss and fatigue are two of the most common effects.

Hair Loss

Many patients are concerned about this side effect of chemotherapy. Some drugs may cause the hair to thin out, while others may cause the loss of all body hair. Some people decide to wear a wig, hair piece or turban, or to contact hair replacement centers with experience helping those with cancer. Fortunately, the hair loss is only temporary, and the hair usually grows back after an interval of no treatment with the chemotherapy.

Fatigue

Fatigue occurs in many people with cancer, especially in those actively receiving treatment. Tips about nutrition and physical activity, during therapy and after completing treatment, are discussed in much greater detail in previous sections.

Conclusion

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Decisions about how to approach cancer treatment and care can become more manageable through a better understanding of care options. It is therefore AICR's hope that CancerResource can serve you well as you work to regain, and maintain, good health.

Many cancer survivors find they can regain a sense of control and feel personal satisfaction by becoming more involved in their treatment and recovery and by adopting a healthy lifestyle.

This manual has aimed to address some of the major issues faced by patients and survivors. You may have many remaining questions about cancer and its treatment and also about getting back to life after cancer.

You may have issues of insurance coverage for your cancer treatment, for example, and job-related issues as you pass the important milestone of returning to work. A range of emotional issues are common as you make the transition to life after cancer. Cancer support organizations may be able to offer assistance, services and advice on where to turn for help for your specific issues.



For questions on diet, nutrition and cancer, you can call the AICR Nutrition Hotline to speak with a registered dietitian.

Our dietitians cannot offer advice on cancer treatments (including the use of supplements) but they can suggest ways to ease cancer-associated dietary challenges.

Call 1-800-843-8114 (toll-free), 9:00am–5:00pm eastern time, Monday through Friday.

USEFUL RESOURCES

American Institute for Cancer Research

1560 Wilson Blvd.
Suite 1000
Arlington, VA 22209

1-800-843-8114
email: aicrweb@aicr.org

www.aicr.org

AICR is the only major national cancer organization with a primary focus on the roles of diet, weight and physical activity in cancer prevention, treatment and survival.

National Cancer Institute

Office of Communications and Public Liaison
9609 Medical Center Drive
Bethesda, MD 20892-9760

1-800-4-CANCER (1-800-422-6237)
email: nciocpl@mail.nih.gov

www.cancer.gov

NCI is a part of the federal government's National Institutes of Health. NCI keeps a database of thousands of clinical trials accepting participants.

Visit **www.cancer.gov/clinicaltrials** to learn more.

American Cancer Society

250 Williams Street, NW
Atlanta, GA 30303

1-800-227-2345
www.cancer.org

ACS is a nationwide voluntary organization dedicated to eliminating cancer.

Academy of Nutrition and Dietetics

120 South Riverside Plaza
Suite 2190
Chicago IL 60606-6995

1-800-877-1600

www.eatright.org

To find a local registered dietitian, visit the Academy's website. Some registered dietitians are also certified specialists in oncology (CSO). A registered dietitian who is a CSO has completed a minimum of two years in clinical oncology practice and passed a certification examination.

Healthfinder™

www.healthfinder.gov

Healthfinder™ is a federal government health information website.

MEDLINEplus

www.medlineplus.gov

MEDLINEplus is a consumer-oriented site maintained by the National Library of Medicine; it provides access to information and journal articles on a range of diseases and conditions.

OncoLink

www.oncolink.org

OncoLink educates cancer patients and their families about psychosocial support, personal experiences, clinical trials, financial issues and more. It is supported by the Hospital of the University of Pennsylvania.

Glossary

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The following glossary defines some of the terms associated with cancer and cancer care. Remember, your health care providers are there to help you. If you don't understand what is being said, ask them to explain it in simpler terms.

Adenocarcinoma • A cancer that develops in gland-forming tissue. Most breast cancers are adenocarcinomas. (See Carcinoma).

Adjuvant therapy • Anticancer drugs or hormones given after surgery and/or radiation to help prevent the cancer from recurring.

Alternative medicine • Diagnosis, treatment and/or prevention that complements mainstream medicine by contributing to a common whole, by satisfying a demand not met by orthodoxy or by diversifying the conceptual framework of medicine. Also referred to as “complementary” or “integrative” medicine.

Anemia • Having too few red blood cells. Symptoms of anemia include feeling tired, weak and short of breath.

Benign • A term used to describe a tumor that is not cancerous.

Biological therapy • Treatment to stimulate or restore the ability of the immune system to fight infection and disease. Also used to lessen the side effects of some cancer treatments. Also called immunotherapy or biological response modifier therapy.

Biopsy • The removal of a sample of tissue or cells for examination under a microscope for purposes of diagnosis.

Bone marrow • The inner, spongy tissue of bones where blood cells are made.

Botanicals • Foods and supplements derived from any plant part, including the seeds, flowers, fruits, roots, leaves and stems.

Cancer • A general name for more than 100 diseases in which abnormal cells grow out of control; a malignant tumor.

Carcinogen • Any substance that causes cancer in animals or humans.

Carcinoma • Cancer that begins in epithelial tissues, which line or cover the surfaces of organs, glands and other body structures. Most cancers in humans are carcinomas. (See Adenocarcinoma.)

Carcinoma in situ • Cancer that is confined to the cells where it began and has not spread into surrounding tissues.

Chemotherapy • The use of drugs to treat cancer.

Clinical trials • Medical research studies conducted with volunteers. Each study is designed to answer specific scientific questions and to find better ways to prevent or treat cancer.

Complementary medicine • Diagnosis, treatment and/or prevention that complements mainstream medicine by contributing to a common whole, by satisfying a demand not met by orthodoxy or by diversifying the conceptual framework of medicine. Also referred to as “alternative” or “integrative” medicine.

Diet • Food and drink regularly consumed for nourishment.

Dietary supplement • A product (other than tobacco) intended to supplement the diet that bears or contains one or more of the following dietary ingredients: a vitamin, mineral, amino acid, herb or other botanical; intended for ingestion in the form of a capsule, powder, softgel or gelcap; and not represented as a conventional food or as a sole item of a meal or the diet.

Enteral feeding • Nutrients provided by mouth or through the gastrointestinal tract.

Health care team • A group of trained professionals who work together to provide patient care. For example, a physician, nurse, registered dietitian, physical therapist, radiation therapist, social worker.

Hormone therapy • The use of drugs or surgery to remove, block or add hormones in order to treat cancer. It is used to treat cancers of the breast, prostate and other hormone-responsive tissues.

Immune system • Complex network of cells and organs that protect the body from attacks by foreign “invaders.” It is one of the body’s main defenses against disease.

Immunotherapy • See Biological therapy.

Integrative medicine • A term used to refer to the integration of complementary/alternative medicine into conventional treatment.

Lymph nodes • Small bean-shaped structures scattered throughout the body along the channels of the lymphatic system. Lymph nodes contain white blood cells and act as filters by keeping bacteria and cancer cells from entering the bloodstream.

Lymphatic system • The organs and tissues that produce, store and carry white blood cells that fight infection and other diseases. Includes bone marrow, spleen, thymus, lymph nodes, and a network of thin tubes that carry lymph and white blood cells into tissues of the body.

Malignant ● A term used to describe a tumor that is cancerous. It can invade surrounding tissues and spread to other parts of the body.

Metastasis ● When cancer cells break away from their original site and spread to other parts of the body.

Mutation ● Change in the genes or hereditary material in cells.

Nutrients ● Essential chemical compounds found in food (protein, carbohydrate, fat, vitamins, minerals, water) that are needed for normal body function.

Oncologist ● A physician who specializes in treating cancer. A board-certified oncologist has specialty training and has passed examinations in that area of expertise.

Parenteral feeding ● Nutrients provided through a vein, bypassing the gastrointestinal tract.

Phytochemicals ● Substances found in plants that may reduce the risk of cancer.

Platelets ● Special blood cells that help form clots and stop bleeding.

Primary care ● Doctor that oversees your general medical care. Can refer you to appropriate specialists, when needed.

Prognosis ● The likely outcome of a disease; the chance of recovery.

Radiation therapy ● Cancer treatment with high-energy rays used to kill cancer cells and shrink tumors.

Red blood cells ● Cells that supply oxygen to tissues throughout the body.

Registered dietitian (RD) ● An expert on the role of food and nutrition in health and disease. An RD must have at least a four-year college degree in this area and must pass an extensive examination on his/her knowledge to become registered. RDs may also be called nutritionists, but not all nutritionists are RDs.

Remission ● The partial or complete disappearance of signs and symptoms of disease.

Sarcoma ● A cancer of supportive or connective tissue, such as cartilage, bone or muscle.

Stage ● The extent of cancer in the body, and whether it has spread from the original location to other parts of the body. Staging refers to testing to determine whether the cancer has spread.

Tumor ● An abnormal growth of cells or tissues. Tumors may be benign (non-cancerous) or malignant (cancerous).

White blood cells ● The cells of the immune system that fight infection.

Get to Know 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 fund innovative research conducted at universities, hospitals and research centers. Find evidence-based tools and information for lowering cancer risk, including AICR's Cancer Prevention Recommendations, at **www.aicr.org**.

AICR's Third Expert Report, *Diet, Nutrition, Physical Activity and Cancer: a Global Perspective*, brings together the very latest research, findings and Cancer Prevention Recommendations from the

Continuous Update Project (CUP). The CUP is the world's largest source of scientific research on cancer prevention and survivorship through diet, weight and physical activity.



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