

Nutrition of the Cancer Patient



AICR Research Grants (partial listing)

Determination of Cranberry Constituents with Antiproliferative Activity Against Human Tumor Cell Lines

Peter Ferguson, Ph.D.
London Regional Cancer Center

Increased Efficacy and Amelioration of Side Effects of Radiotherapy

W. Elaine Hardman, Ph.D.
University of Texas Health Science Center at San Antonio

A Pilot Study of Silymarin During Maintenance Therapy in Children with Acute Lymphoblastic Leukemia (ALL) and Abnormal Liver Function Tests

Kara Kelly, M.D.
Columbia University

Cancer Anorexia: Peripheral Manifestation of Abnormal Hypothalamic Neurotransmitter Status Secondary to Cancer

Michael Meguid, M.D., Ph.D.
SUNY Upstate Medical University

Influence of Caloric Restriction on Brain Tumor Growth and Angiogenesis

Thomas Seyfried, Ph.D.
Boston College

Control of Prostate Carcinogenesis by PC-SPES

Tze-chen Hsieh, Ph.D.
New York Medical College

Antitumor Effects of Dietary Isothiocyanates on Prostate Cancer

Tse-Hua Tan, Ph.D.
Baylor College of Medicine

Dietary Lipids and Hormones in Breast Carcinogenesis

David Crowe, D.MSc.
University of Southern California

Editorial Review Committee: Ritva Butrum, Ph.D.; Karen Collins, M.S., R.D.; Elaine Feldman, M.D.; David Heber, M.D., Ph.D.; Jan Kasofsky, Ph.D., R.D.; Laurence Kolonel, M.D., Ph.D.; Melanie Polk, M.M.Sc., R.D., FADA; Richard S. Rivlin, M.D.; AICR Executive Staff.

Copyright © 2000 by
American Institute for Cancer Research
1759 R Street, NW
PO Box 97167
Washington, DC 20090-7167

Contents

1	Introduction.....	2
2	How Cancer Affects Nutritional Needs.....	3
3	How Treatment May Affect Nutrition.....	6
4	Tips for Handling Problems Related to Nutrition.....	14
5	Additional Information. . .	36

Special Populations Series

1 Introduction

A healthy diet is very important for someone undergoing treatment for cancer. This is a time when there is much demand on the body. There are three main nutritional goals for someone living with cancer. They are: 1) to maintain a healthy weight; 2) to select and eat healthy foods that supply the body with fuel and nutrients for repair and healing; and 3) to prevent recurrence of the cancer and the development of a second malignancy.

This booklet discusses eating for good nutrition throughout cancer therapy. Nutritional problems associated with cancer and cancer treatment are presented, along with tips to help you minimize these eating difficulties.

2 How Cancer Affects Nutritional Needs

Not only do eating habits and behaviors often change in a person with cancer, but the way the body uses nutrients changes as well.

Changes in Eating Habits and Eating Behavior

Eating the same types and the same amounts of foods you enjoyed before your diagnosis of cancer may sometimes be difficult. Eating less is the usual response, but eating more is not uncommon either.

Side effects of cancer therapy may affect your eating habits. Some foods may taste less appealing to you and, as a result, you may eat less of them. Dietary problems you had before your diagnosis may be aggravated by cancer and its treatment. For example, if you were sensitive or intolerant to certain foods before your cancer diagnosis, you may become more sensitive to them.

Coping with changes in your eating habits may seem overwhelming. You may feel anxious about eating enough of certain foods. Or you may become afraid of eating the “wrong” foods and eat very little at all. These reactions are normal. You can find tips for dealing with nutritional problems you may be experiencing in section four of this booklet.

Changes in the Way Your Body Uses Nutrients

The way the body uses nutrients is sometimes changed in people with cancer. These changes may be caused by the body's response to the tumor, the side effects of treatment, certain medications or some combination of these reasons.

It is not uncommon to experience changes in the way your body handles sugar or in your blood sugar level. You may experience hyperglycemia (high blood sugar). It is less likely you will experience hypoglycemia (low blood sugar). If you encounter one of these changes, your doctor or registered dietitian can advise you on ways to control your blood sugar through diet.

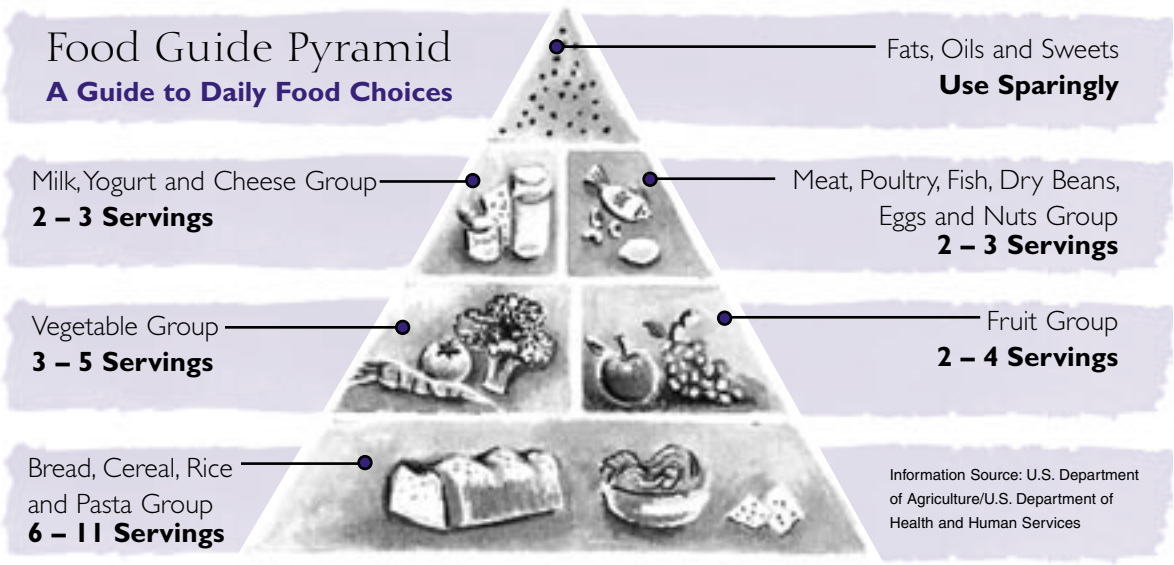
The Food Guide Pyramid below lists the recommended number of servings from each food group. Some cancer patients, however, may have trouble consuming enough of a wide variety of foods to satisfy nutritional needs.

Common Vitamin and Mineral Deficiencies Experienced by Cancer Patients

Folate	Vitamin A	Vitamin C
Copper	Iron	Magnesium
Zinc	Calcium	Vitamin D

These individuals may benefit from a multi-vitamin/mineral supplement. Such a supplement can help people reach the Recommended Dietary Allowance (RDA) of important nutrients. Many liquid meal replacement beverages can help satisfy protein requirements as well. Protein is important to maintain body strength but should not be consumed in excess.

It is important, however, not to take supplements in doses that would raise your intake in excess of the RDA. Excessive amounts of these substances may interfere with the beneficial effects of certain cancer chemotherapies and/or radiation therapy. If you are concerned about your intake of a specific vitamin or mineral, speak



with your doctor. And always be sure to tell your doctor which nutrient supplements or herbal preparations you are taking (if any) and in what amounts.

3 How Treatment May Affect Nutrition

There are several different methods of treating cancer. Each may affect your nutritional needs and your eating habits.

Surgery

Surgery is often the preferred treatment for tumors that have not spread. Through surgery, the tumor and any nearby tissue that may contain cancer cells are removed. Sometimes healthy tissue may have to be removed from around the tumor to help keep the cancer from spreading. Whether or not surgery is used depends on the type of cancer, its location and how much it has spread to other parts of the body.

Surgery can cause temporary or permanent nutritional challenges. The operation itself will increase your need for calories to do the extra work of healing. You may be advised to eat slightly more calories and protein to provide enough nutrients for healing. Long-term nutritional problems may result when parts of the digestive system or gastrointestinal (G.I.) tract are removed or altered through surgery. Difficulty with chewing and swallowing and poor absorption of nutrients in the intestine may occur. You

can find help dealing with these problems in section four of this booklet.

Radiation Therapy

Radiation therapy uses high energy waves to damage cancer cells so they are unable to multiply. It may be used either alone or in combination with surgery or chemotherapy.

Radiation may be used before surgery to shrink a tumor or after surgery to destroy any cancer cells that may remain in the area.

Radiation treatments can lead to nutritional problems just as surgery can. These usually occur when the G.I. tract is in the treatment area. Some problems occur early in treatment and last only a short time, such as irritation of the mouth, tongue and throat, milk intolerance, nausea, vomiting or diarrhea. Other problems may appear months after therapy and are longer lasting, such as dry mouth, stricture or narrowing of the esophagus, malabsorption of nutrients, abdominal discomfort, diarrhea or constipation. You can find help in dealing with these problems in section four of this booklet.

Chemotherapy

Chemotherapy is the use of drugs to destroy cancer cells by disrupting their ability to grow and multiply. Chemotherapy may be used alone or along with radiation and/or surgery. Unlike surgery or radiation, chemotherapy is “systemic.” This means it can affect the entire body rather than just part of it unless it is infused to a target area.

The drugs used in chemotherapy interfere with cells as they divide and reproduce. Cancer cells are affected most because they divide and reproduce more often than normal cells. But normal cells can also be affected, particularly cells that

normally reproduce very rapidly, such as in the lining of the gastrointestinal tract. When this happens side effects may occur.

The most common side effects of chemotherapy include nausea, vomiting, hair loss and fatigue. Other common side effects include infection, bleeding and anemia. Some chemotherapy drugs

can cause constipation or diarrhea. Others may cause a strange taste in the mouth, making eating unpleasant. Still other drugs can cause water retention and bloating. These effects may lead to weight loss, weight gain or other nutritional problems. You can find help in dealing with nutritional problems in section four of this booklet.

Cancer Surgery and Nutrition

Area of Cancer	Surgical Procedures	Possible Nutrition Problems
Head areas, Neck, Tongue	Removal of all or part of the affected area	Makes chewing and swallowing difficult
Jaw	Removal of jaw bone	Requires tube feeding
Esophagus	Removal (esophagectomy) with reconstruction using muscle from the intestine	Food may leak into the lungs or the new esophagus may narrow
Stomach	Removal (gastrectomy) or partial removal	Food may travel to the intestines too quickly or low blood sugar may develop
Small Intestine	Opening created outside the body (jejunostomy or ileostomy) or removal	Poor absorption of nutrients, vitamin B-12 deficiency, salt and water imbalance, blocked bowels
Pancreas	Removal	Poor absorption of nutrients, diabetes
Large Intestine	Removal (colectomy) with or without an opening created outside the body (colostomy)	Poor absorption of nutrients and water, leading to diarrhea

Radiation and Nutrition

Location of Cancer	Area of Treatment	Short-term Effects	Long-term Effects
Brain, Mouth, Esophagus, Thyroid	Head and neck	Irritation of mouth, tongue, esophagus	Dry mouth, tooth decay, stricture of esophagus, loss of taste
Stomach, Liver, Pancreas, Gallbladder, Kidney	Abdomen	Irritation of stomach, diarrhea, milk intolerance, nausea and vomiting	Some of these symptoms may continue in some patients
Breast, Lung	Upper torso	Irritation of stomach and esophagus	Some of these symptoms may continue in some patients
Colon, Rectum	Lower torso	Diarrhea	Some of these symptoms may continue in some patients
Prostate, Uterus, Ovaries, Cervix, Bladder	Pelvis	Diarrhea, malabsorption	Some of these symptoms may continue in some patients

Hormone Therapy

This treatment may include the use of drugs to block the body's production of hormones or surgery to remove hormone-producing organs. Hormone therapy is most commonly used to treat cancers of the breast, prostate, ovary and endometrium.

Hormone therapy can cause a number of side effects including nausea, vomiting, swelling, weight gain and hot flashes. Some hormones cause an increase in appetite. In some cases, large doses of hormones are given to advance a therapeutic effect, such as adrenal hormones to

shrink swelling of the brain that occurs with a brain tumor.

Biological Therapy

Biological therapy, also called immunotherapy, is a relatively new form of cancer therapy. In this form, the body's immune system is used to help fight cancer. Interferon and interleukin-2 are used to enhance the ability of white blood cells to fight cancer. Since these are new forms of treatment, their effects on nutrition are not yet fully known. However, these agents may produce "flu-like" symptoms, including diarrhea, weakness and loss of appetite.

Chemotherapy and Nutrition

Chemotherapy-induced Side Effects

Irritation and inflammation of mouth, tongue, throat
Diarrhea
Constipation
Nausea
Vomiting
Taste changes
Appetite changes (increased, decreased)
Weight changes (increased, decreased)
Milk intolerance
Food aversions
Weakness
Anemia

Gene Therapy

A very new form of cancer treatment, gene therapy is still in its investigational stages. This approach to cancer treatment involves replacing a cancer-causing gene, or oncogene, with a normal gene. The effects of gene therapy on nutrition of the patient are currently being investigated.

Complementary/Alternative Medicine

Complementary/alternative medicine (CAM), now called “integrative” medicine, consists of a wide variety of approaches and therapies not included in conventional medicine. People may use CAM treatments alone or in addition to mainstream treatments. Examples of CAM include herbal treatments, homeopathy, acupuncture, macrobiotic diets and spiritual healing.

Although certain complementary/alternative therapies for cancer may appear to help in some instances, scientific evidence proving their effectiveness is often lacking. These unproven therapies should therefore be approached with great caution.

Keep in mind that just because a therapy is “natural” does not guarantee that it is harmless. Unproven treatments could be ineffective, toxic (combining certain herbs with certain drugs, for example), or could prevent the patient from seeking timely conventional and effective treatment for cancer. Complementary therapies should complement, but never replace, traditional approaches to cancer treatment.

It is important to tell your doctor if you are using any complementary/alternative therapies as part of your overall treatment plan so he or she can take that into account when planning your conventional treatment.

There is now more scientific research on specific CAM therapies, and some may prove to be safe and effective. Much more knowledge is needed about them, however.

4 Tips for Handling Problems Related to Nutrition

So far we've described what kinds of challenges you may encounter, depending on the type of cancer treatment you receive. Now we'll discuss what you can do about them. In this section, you will find tips for handling nutritional problems.

It's important to remember that these suggestions are not meant to replace talking to your doctor. Speak with him or her about any changes in your eating patterns and any problems you may have with appetite, eating or digestion. Your doctor may refer you to a registered dietitian specializing in nutritional care of the cancer patient.

Weight Loss and Loss of Appetite

Weight loss is very common in cancer patients. It can be caused by many factors, including loss of appetite, increased demand for energy, changes in the way the body processes and absorbs food, physical difficulty in eating due to surgery, side effects of treatment or feelings of anxiety or depression.

Severe weight loss and undernutrition can interfere with the work of the heart, liver, kidneys and other important organs in the body. Also, when a patient is undernourished, the ability to heal and to fight off infections is weakened.

Here are some tips for getting back on the road to a healthy weight. Your doctor and registered dietitian can help you determine your healthy weight goal and your individual calorie and nutrient needs.

If you have lost weight:

- Eat several small meals a day instead of three large meals.
- Keep favorite foods around the house. That way you may find yourself eating more often.
- When eating a meal, eat high-protein foods first, when your appetite is strongest. Some examples of high-protein foods are beans, peas, tofu, chicken, fish, meat, yogurt, eggs and nuts.
- Eat the most when you feel hungriest. If you are very hungry at breakfast or lunch, make that your largest meal of the day, even if you would typically eat a smaller meal at that time.
- Go for a walk before mealtime to stimulate your appetite.
- Take an interest in food by trying new recipes and products or occasionally eating in a favorite restaurant.

- If the odors of food bother you, try eating things cold or at room temperature.
- Experiment with new or different seasonings.
- Make mealtimes more leisurely – take your time at the table.
- Drink beverages between meals instead of with meals. Drinking a beverage while you eat can make you feel full faster.
- Sip on higher-calorie beverages during the day such as juice, nectar, milk or a fruit and yogurt smoothie.
- Ask your physician or registered dietitian about liquid or powdered nutritional supplements. They come in a variety of calorie levels and flavors and are easy to swallow and digest. Some products may taste better than others, so you may want to give several of them a try.

Weight Gain

Weight gain is not uncommon in cancer patients. Weight gain may result from taking a medication, such as tamoxifen for breast cancer or certain antidepressants. Chemotherapy may cause a false menopause, which is commonly accompanied by weight gain. For other patients, a change in eating behavior, due to stress, fear or depression, may mean an increase in food intake and subsequent weight gain. Some patients with nausea feel better when they eat more frequently or if they have something in their mouth most of the time. Fluid retention, which causes swelling (edema), may be another reason your weight may increase. Tell your doctor about any excess weight so he or she can determine the cause, especially if the weight gain occurs rapidly over a few days.

The following tips can help patients who are gaining weight – for reasons other than fluid retention – to maintain a healthy weight. (If you

have fluid retention, see tips on page 34.) Some patients are overweight when they begin cancer therapy. The following suggestions will be helpful for these individuals as well.

If you have gained excessive amounts of weight:

- Select healthy foods, including a variety of vegetables, fruits, whole grains and beans. These foods are naturally low in calories and are loaded with nutrients and fiber, which can help you feel full.
- Pay attention to your portion sizes. Try measuring out the serving size listed on the label of the foods you eat most often. Remember what this portion looks like on a plate the next time you serve yourself or eat out. This can help you get a handle on how much you're eating.
- Eat only when you're hungry. Eating to comfort feelings of stress, fear or depression will not alleviate those emotions. Speak to your doctor about psychological counseling or medication to get to the root of negative feelings.
- Ask your doctor if there is an effective mood-elevating medication that does not promote weight gain.



Select healthy foods, including a
variety of vegetables, fruits,
 whole grains and beans.

Diarrhea

Diarrhea can result from many causes, including chemotherapy, radiation therapy to the abdomen, certain medications, infection, food sensitivity, emotional upset or removal of part of the stomach, intestines, pancreas or colon. Severe diarrhea or long-term diarrhea may cause dehydration, nutrient loss and other health problems. Call your doctor if you have severe diarrhea.

If you have diarrhea:

- Aim for eight glasses of liquids each day as a minimum. Drinking enough is especially important while you have diarrhea to prevent dehydration.
- Good choices of fluids include water, diluted juices, broth or decaffeinated coffee or tea. Large amounts of coffee and tea do not count toward your total; the caffeine may cause you to lose fluids.
- Liquids at room temperature are easier to tolerate than those that are very hot or very cold.
- Eat small amounts of food throughout the day instead of three large meals.
- Ask your doctor about medications that may be helpful for diarrhea.



Stay hydrated with water, diluted juice or **decaffeinated** coffee or tea.

foods to try

Some people find relief by eating the following foods:

- low-fiber foods like white rice, noodles, white bread and mashed potatoes
- soft cooked or puréed vegetables
- soft canned or cooked fruit without skins, such as bananas and applesauce
- skinned turkey or chicken, lean ground beef, cooked fish and thoroughly cooked eggs

foods to avoid

The following foods may worsen diarrhea:

- foods and beverages that cause gas such as beans, onions, carbonated drinks and chewing gum
- high-fiber foods such as broccoli, corn, beans, cabbage, peas and cauliflower
- some milk and dairy products, except for yogurt, which is generally well-tolerated
- raw vegetables and fruits, nuts
- greasy, fatty, fried, very sweet or very spicy foods
- alcoholic beverages and caffeinated beverages
- sugar-free candies and gums that contain sorbitol (a sugar replacer that has a mild laxative effect)

Constipation

Constipation can be the result of certain cancer drugs, medications, a diet without enough fluid or fiber, a reliance on tube feedings or a lack of physical activity. Constipation should not be confused with an intestinal obstruction. If you cannot pass stools and are suffering from one or more of the following: nausea, vomiting, abdominal pain, or a swelling of the abdomen, report this to your doctor immediately.

If you have constipation:

- Drink more liquids, aiming for eight glasses a day. Drinking enough is especially important while you have constipation to help keep stools soft. Good choices are water, prune juice, warm juices, decaffeinated teas and hot lemonade.
- Have a hot drink about one half hour before your usual time for a bowel movement.



Drinking
eight glasses of
liquids a day may
help relieve constipation.

foods to
try

**Eat high-fiber foods
including:**

- fresh vegetables and fruits such as potatoes with skins, prunes, carrots, oranges and berries
- legumes including lentils, peas and beans
- whole wheat bread
- wheat bran added to foods such as casseroles and hot cereals
- whole grain cereals
- If you develop gas, limit broccoli, cabbage, cauliflower, cucumbers, onions, carbonated drinks and beans. Using the anti-gas product “Bean-o” (widely available in pharmacies), may allow you to keep eating high-fiber foods without discomfort.
- 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. Try to get some exercise, such as taking a walk, every day. Talk to your doctor before starting a new exercise program.
- Talk to your doctor about using a fiber supplement. Be sure to drink plenty of fluids if you use a fiber supplement.
- Laxatives may be occasionally necessary. Your doctor can make specific suggestions.

Nausea

Nausea is a common side effect of cancer surgery, chemotherapy, radiation therapy, immunotherapy and some medications. Vomiting may or may not accompany the queasy feeling of nausea. Nausea can prevent you from eating enough.

If you experience nausea:

- Eat small amounts of food often and slowly. Eat six or more small meals during the day rather than three large meals.
- Keep the room well-ventilated, since some patients find that the odors of some foods may produce nausea.
- Drink beverages between meals rather than with a meal.
- Drink beverages cool or chilled and sip through a straw.
- Eat foods at room temperature or cooler; hot foods can aggravate nausea.
- Eat sitting up. Also, rest sitting up or reclined with your head raised for about an hour after eating.
- Rinse out your mouth before and after eating. If there is a bad taste in your mouth, suck on hard candy such as peppermint or lemon.
- Don't force yourself to eat favorite foods when you feel nauseated. It may cause you to permanently dislike them.
- If nausea in the morning is a problem, keep crackers at your bedside to nibble on before you get up.
- For some nauseated patients, it may be helpful to keep food out of sight until it is time to eat.

foods to try

These foods may help your nausea:

- toast, saltine crackers, dry cereal or breadsticks
- yogurt
- sherbet and popsicles
- canned peaches, pears, fruit cocktail
- skinned chicken (not fried)
- hot cereal such as oatmeal
- clear liquids such as water, broth, cranberry juice and flat soda
- candied dried ginger
- ice chips

foods to avoid

These foods may make your nausea worse:

- fatty, greasy, fried or spicy foods
- candy, cake, rich desserts
- foods with strong odors



Foods like saltine crackers, yogurt or canned fruit cocktail may help relieve nausea.

Food Odors and Nausea

If the smell of food cooking or cooling nauseates you, try:

- opening windows when preparing foods and eating
 - preparing meals that don't need cooking
 - heating frozen dinners in the oven or microwave
 - asking others to cook your meals for you or have meals delivered from "Meals on Wheels" or another meal delivery service in your area
 - when you're feeling better, cooking your favorite foods in large batches and freezing meal-size portions. You'll have them available when you don't feel like cooking
-
- If nausea occurs during radiation therapy or chemotherapy, avoid eating for one or two hours before treatment. Try eating bland, soft foods on treatment days.
 - Try to recognize times, foods, smells or events that trigger your nausea. If possible, try to make changes in your schedule or diet that help you avoid these triggers.
 - Talk to your doctor about medication to help relieve your nausea.

"Anticipatory Nausea"

Sometimes nausea can occur even before a treatment session or other event begins. Your brain remembers how you felt after previous sessions and anticipates feeling that way again. This is called "anticipatory nausea" and there are several things you can do to prevent it from happening or to lessen the discomfort.

- Try to distract yourself during the activities you associate with your treatment.
- Practice relaxation or meditation techniques to take your mind off the treatment.
- Sometimes changing something in the environment or in the routine can help. For example, if the smell from the alcohol wipe used to clean your skin before an injection makes you feel nauseated, another kind of skin cleanser might be substituted.

Vomiting

Vomiting can follow nausea. It can be brought on by treatment, food odors, gas in the stomach or motion. Contact your doctor if you are vomiting for more than 24 hours.

If you experience vomiting:

- Do not eat or drink until you have the vomiting under control.
- Sit upright after vomiting and bend forward.
- Once vomiting is under control, try drinking small amounts of clear liquids such as cranberry juice, cool broth or flat soda (carbonated beverages may cause burping which can stimulate vomiting in some people).
- When you are able to keep down clear liquids, try eating small amounts of soft foods such as cream of wheat, pudding, frozen yogurt or gelatin.
- Once you can tolerate soft foods, gradually work your way back to your regular diet.

Sore Mouth, Tongue and Throat

Soreness of the mouth, tongue and throat can result from cancer therapy or other reasons. See your doctor if you have a sore mouth to be sure it is not the result of a correctable dental problem. Try to arrange to see your dentist before you begin cancer treatment, or in between treatments, to take care of any work that needs to be done. Soreness usually clears up with time. Preventive dentistry is crucial before you begin chemotherapy or radiation.

foods to try

Bland, soft foods are easy to chew and swallow.

- bananas, applesauce, watermelon, canned fruits
- peach, pear and apricot nectars
- puréed or mashed vegetables such as mashed potatoes
- oatmeal or other cooked cereal
- cottage cheese, yogurt, milkshakes
- custards, puddings, gelatin
- macaroni and cheese, scrambled eggs, ground meats

foods to avoid

Avoid foods that can irritate your mouth.

- citrus fruits or juices such as grapefruit, orange, lemon and lime
- spicy or salty foods
- pickled or vinegary foods
- tomato-based foods such as chili, salsa, spaghetti sauce and pizza
- rough, coarse or dry foods
- hot spices, such as pepper, chili powder, nutmeg, cloves, curry and horseradish

If you have a sore mouth, tongue or throat:

- Cook foods until they are very soft and tender.
- Cut foods into very small pieces or grind or purée them. Make moist stews and casseroles, or mix foods with thin gravies or sauces to make them easier to swallow.
- Serve foods cold or at room temperature. Hot and warm foods can irritate a sore mouth and throat. Cold foods such as sherbet or popsicles may soothe soreness.
- Use a straw for drinking fluids.
- Avoid alcohol. It can irritate the delicate membranes in your mouth.
- Rinse your mouth several times a day with water or a baking soda mixture (combine one quart water and one tablespoon baking soda) to remove food and promote healing. Avoid commercial mouthwashes; most are too harsh for a tender mouth.
- Use a toothbrush with soft bristles.
- Do not smoke under any circumstances.

- Remove your dentures (except during eating) if your gums are sore. Keep your dentures clean.
- Ask your physician about special mouthwashes and anesthetic lozenges and sprays that can numb the mouth and throat long enough for you to eat meals.
- If you experience bleeding of the gums during treatment, tell your doctor immediately and arrange to see your dentist or a periodontist.
- If you see small, white patches in your mouth, tell your physician or nurse. This may be evidence of an infection that may require special attention.

Dry Mouth

A dry mouth occurs most often after chemotherapy and radiation therapy to the head or neck area. The therapy can reduce the flow of saliva. This may make it difficult to chew and swallow. It may also change the way foods taste. To relieve a dry mouth, follow the suggestions for handling a sore mouth on page 27 and these ideas below.

To relieve a dry mouth:

- Sip water or other beverages through a straw throughout the day to make it easier for you to talk and swallow. Aim for eight cups of liquid a day as a minimum. Limit consumption of caffeinated coffee, teas and colas.
- Try thick drinks, such as fruit nectars, at room temperature or cold.
- Avoid salty foods.
- Try tart foods and beverages, such as lemonade, in small amounts, which may help your mouth produce more saliva.
- Suck on ice cubes or chips, especially prior to radiation of head and neck areas.

- Suck on hard candy such as lemon drops, frozen grapes or popsicles, or chew sugarfree gum.
- Eat foods moistened with broth, gravy, sauces and salad dressings. Moist foods are easier to swallow.
- Avoid alcohol.
- Practice good oral hygiene. See the tips on rinsing and toothbrush selection on page 27, in the section for sore mouth. Avoid commercial mouthwashes.
- Keep your lips moist with lip salves.
- Try using a cool mist humidifier, especially at night.
- If your dry mouth is severe, ask your doctor or dentist about products that coat and protect your mouth. There are a variety of saliva substitutes available. They include Moistin, Optimoist, MouthKote and Glandosane, among others.
- If you see small, white patches in your mouth, tell your physician or nurse. This may be evidence of an infection that may require special attention.
- Do not smoke under any circumstances.



Suck on frozen grapes or
popsicles to help
 relieve dry mouth.

Difficulty Swallowing

Problems with swallowing can be the result of cancer and its treatment, such as surgery to the head and neck. Or it may be due to other reasons. Talk to your doctor if you are experiencing difficulty swallowing.

To make eating easier:

- Take deep breaths before attempting to swallow. Exhale or cough after swallowing.
- Aim for eight cups of liquids each day as a minimum. Drink beverages between rather than during meals so you don't feel full too quickly. Liquids at room temperature may be easier to swallow.
- Eat small, frequent meals.
- Mashed foods should not be too thick. Thin them out using broth, gravy, milk or water.
- Report any choking or coughing while eating to your doctor, especially if accompanied by a fever.

If part or all of your tongue or jawbone has been removed, chewing and tongue movement may be limited. Food will move down your digestive tract once it gets to the throat. Effective swallowing techniques can be taught by a speech therapist, registered dietitian or nurse.

The following suggestions may also be helpful:

- Thicken liquids to consistency suggested by your speech therapist or registered dietitian.
- Avoid very hot or very cold foods.
- Purée foods so they are easier to swallow.
- Add gelatin to cakes, cookies, crackers, sandwiches, puréed fruits and other cold foods to make them easier to tolerate. (Mix one tablespoon unflavored gelatin in two cups liquid until dissolved and pour over food.)

- Eat with a spoon; it is easier to control than a fork.
- Ask your therapist to show you how to properly place food in your mouth to avoid choking.
- Exercise your tongue and your jaw. Try to move them through the usual range of motion – stick your tongue out and back, yawn and move your jawbone from side to side.
- Liquid diets can be either high or low in fiber, so you need not suffer constipation or diarrhea. Speak with a registered dietitian about adjusting the fiber in your diet to meet your needs.
- Report any choking or coughing while eating right away to your doctor, especially if accompanied by a fever.

Stricture

Sometimes surgery or radiation therapy can cause the esophagus to narrow, making it difficult for food to pass through to the stomach. This is called stricture. Your surgeon may be able to widen the opening or insert a feeding tube to bypass the problem until it heals. Try drinking liquids, which will pass through the esophagus more easily. And keep your head elevated both during and after drinking or eating.

Feeling Full Quickly

Feeling full quickly after eating a small amount of food is not uncommon, especially if you've had upper abdominal surgery. Not eating enough can weaken the body and delay healing.

If you feel full quickly when eating:

- Eat small meals throughout the day. Keep healthy snacks on hand to eat between meals.
- Avoid fried or greasy foods. Fat stays in your stomach longer than carbohydrates or protein.

- Avoid foods that give you gas.
- Drink your beverages between rather than during meals. Drinking a beverage during a meal can fill you up more quickly.
- Rest with your head elevated after meals.
- If you eat small meals and are finding it difficult to eat frequently during the day, fortify your meals with foods that are rich in calories and nutrients. Try adding nonfat dry milk, wheat germ or ground meat to soups, hot cereals, casseroles, or other dishes.
- Ask a health professional about drinking a liquid or powdered meal replacement beverage to provide needed calories and nutrients.

Keep in mind that even though it is important to eat, it is also important to maintain a healthy weight. Therefore, it is unwise to force yourself if you're feeling full or are no longer hungry.



Seasonings such as **onion**, **garlic**, herbs and **spices** may make foods more appealing.

Taste Changes

Changes in how foods taste can be the result of chemotherapy, radiation therapy or the cancer itself. Dental problems may also cause taste changes. Some patients complain of bitter or metallic tastes, especially when eating foods high in protein such as meat. Each person's sense of taste can be affected differently. Depending on how your tastes have changed, some of the following ideas for improving flavor may work for you.

To improve flavor:

- Choose and prepare foods that look and smell good to you. Foods may taste better if served cold or at room temperature.
- Frozen fruits such as melon balls, grapes or orange wedges that are moist and slightly sweet may be appealing.
- If red meat tastes different, choose chicken, turkey, fish, tofu, beans, eggs or dairy products that don't have a strong smell.
- Marinate meats in juice, soy sauce, barbecue sauce, Italian dressing or other flavorful liquid you find appetizing.
- Adding sugar to some foods can help decrease salty, bitter or unpleasant tastes.
- Tart foods and beverages such as oranges, lemon yogurt or lemonade may be appealing. (Do not eat these foods if your mouth is sore.)
- Rinse your mouth and brush your teeth and tongue regularly. (Avoid commercial mouthwashes if your mouth is sore.)
- See your dentist to be certain that you aren't developing any new infections in your mouth.

Milk or Lactose Intolerance

If you were able to digest milk and milk products easily before you began radiation or chemotherapy treatment, but now develop cramps and diarrhea after you drink milk or eat certain dairy foods, then you may be suffering from acquired milk or lactose intolerance. The cancer therapy has probably temporarily inhibited the growth of cells in your intestinal tract that make the enzymes to digest lactose, which is the main carbohydrate (sugar) in milk. In most patients, the condition eventually reverses itself. The following measures may be helpful in the meantime.

If you are lactose intolerant:

- Avoid the milk or dairy products that give you problems. Yogurts and aged cheeses may be easier to tolerate. Look for a reduced lactose milk or milk that contains “Lactaid,” an enzyme product that helps you digest the lactose in milk.
- Lactaid and other enzyme products are available in capsule, pill or liquid drop form. Look for them in pharmacies.
- Try calcium-fortified drinks or foods. Read food labels to find fortified selections. Speak with your doctor or registered dietitian about whether you could benefit from taking a calcium supplement.

Fluid Retention

Sometimes patients gain extra weight during treatment without eating extra calories. This weight gain may be due to swelling or edema. Certain drugs, such as prednisone, can cause the body to retain too much fluid as can a nutritional deficiency. If you notice rapid weight gain, tell your doctor so he or she can determine the cause.

If you are retaining fluids:

- Drink enough water during the day.
- Eat less salt and foods with less sodium.
- Stay as physically active as possible.
- Elevate your legs when resting.
- Your physician can prescribe medication to help minimize fluid retention.

Fatigue

Fatigue is very common among cancer patients. Feeling tired can certainly make it harder to prepare and eat nourishing meals.

If you experience fatigue:

- Consider asking friends and relatives for help.
- Use frozen dinners. There are dozens of healthful varieties now available.
- Meal-making is easier if you use convenience products such as frozen or canned fruits and vegetables, canned beans, prepared pasta sauces and instant brown rice. Read labels to look for products that are low in sodium and high in nutrients.
- Have healthy snacks on hand. Keep foods like dried fruit (raisins, dates, apricots), cheese and whole grain crackers, graham crackers and snack-size puddings in the house.
- Prepare blended fruit and yogurt shakes and keep them in the refrigerator for between-meal snacks.
- When you’re feeling better, prepare large quantities of your favorite meals and freeze the leftovers in meal-size portions.
- Consider buying prepared foods from your grocery store, phoning for carryout or delivery food, or having meals delivered from “Meals on Wheels” or another meal delivery service in your area.

5 Additional Information

If you would like more information about your treatment options and how to live well with cancer, contact the American Institute for Cancer Research. The Institute provides referrals on a variety of cancer-related issues and concerns.

American Institute for Cancer Research
1759 R Street, NW
PO Box 97167
Washington, DC 20090-7167
1-800-843-8114 or 202-328-7744
www.aicr.org

How You Can Support Cancer Research and Education Through Your Will

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

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

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

AICR's official name:

American Institute for Cancer Research

AICR's mailing address:

1759 R Street, NW
Washington, DC 20009

AICR's telephone number:

202-328-7744

AICR's identification:

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

AICR's tax-exempt IRS number:

52-1238026

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

**Prepared by the American Institute for Cancer Research, August 1987
Latest Revision, October 2005**

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

American Institute for Cancer Research
1759 R Street, NW
PO Box 97167
Washington, DC 20090-7167
1-800-843-8114 or 202-328-7744
www.aicr.org



Stopping cancer before it starts