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## Section II – National Cancer Institute Publication *Radiation Therapy and You*

## Section III – National Cancer Institute Publication *Eating Hints*
Welcome to Duke Radiation Oncology

Thank you for choosing Duke Radiation Oncology for your care. We recognize that a cancer diagnosis is a very frightening time for the person with cancer and their family. Our primary goal at Duke Radiation Oncology is to provide expert, compassionate care and clinical service to our patients and caregivers.

To achieve this goal, we are committed to generating new knowledge about the causes, prevention, and treatment of cancer, and to inspiring future generations of clinicians. We are a team of dedicated oncology medical professionals.

We are one of the nation’s largest and most active academic radiation oncology programs, with a focus on research programs that translate directly “from bench to bedside.” Above all, we recognize that our main responsibility is to the patients we serve.

You are part of the team, and being fully informed is one of the most important jobs you have as a team member. We respect your right to be fully informed. Let us know what we can do to help and guide you through your radiation oncology treatment. We are here to help.
Contact Us

Radiation Oncology is located on the 00 level of the Duke Cancer Center.

Main telephone number:

(919) 668-3509

Fax number:

(919) 684-8232

Business hours:

8am-5pm Monday – Friday

Radiation Oncology is closed on the weekends and on public holidays.

Mailing and Shipping Address:

Department of Radiation Oncology
Box 3085
Duke Cancer Center, Medicine Circle,
Durham NC 27710

Website address:

radonc.duke.edu
Duke Radiation Oncology

Your doctor is_______________________________________________________

Your nurse is________________________________________________________

You are being treated on the____________________________________machine

Your radiation therapists are___________________________________________

Your treatment check day is___________________________________________

During radiation therapy, you will be seen once every week by your doctor and your care team. This is called a treatment check. Usually you will be seen after you have received your radiation treatment that day. On your treatment check day, you should plan to stay longer in the Radiation Oncology Department.

Radiation Oncology is an outpatient department. We are open Monday through Friday except on public holidays. The treatment machines and the clinic are closed on holidays. If your clinic day falls on a holiday during your treatment, you will still be seen that week but the day will change. Your care team will keep you informed of these changes.
Important Phone Numbers

Medical Emergencies ANYTIME: 911

For urgent medical questions: (919) 684-8111 Ask for the Radiation Oncologist on-call.

During business hours (8am to 5pm Monday – Friday) call (919) 668-6660

- To speak with your Radiation Oncology nurse
- For problems with medication, side effects and symptom management

During business hours (8am to 5pm Monday – Friday) call the machine you are being treated on for radiation treatment appointment questions:

- Blue (919) 668-6664
- Green (919) 668-6479
- Grey (919) 668-6665
- Orange (919) 660-5072
- Purple (919) 660-5094
- Red (919) 660-5073
- Tan (919) 660-2171
- Yellow (919) 668-6478

During business hours (8am to 5pm Monday – Friday)

- Patient Scheduling Hub (919) 660-2100
- Financial Care Counselors (919) 668-6687 and (919) 668-6446
Getting Help

You should call your doctor immediately if you have any of the following symptoms:

- Fever higher than 101°F, or 38.5°C, or shaking chills whether you have a fever or not
- Severe headache or change in your ability to think
- Any sudden change in mental status or level of consciousness; excessive drowsiness
- Blood in your urine (pink or red)
- Any other unexplained bleeding or bruising; for example, from gums, nose, or cough
- Blood (bright red, black, or coffee-ground appearing) or pus in stools
- New onset of shortness of breath, and/or chest pain
- Tenderness or pain in the calf, behind the knee, or the thigh
- Tenderness or pain in the upper arm or shoulder
- New swelling in one leg or arm
- Inability to eat or drink for 6–12 hours due to severe nausea and/or vomiting
- New onset of pain with urination or bowel movement
- Inability to empty your bladder at least every 6–8 hours
- Serious injury from a fall, accident, etc.

Follow these steps for urgent medical questions:

FIRST: During regular work hours, call 919 668-6660 to speak with your Radiation Oncology nurse
SECOND: After 5pm Monday-Friday and anytime on Saturday or Sunday, call 919-684-8111 and ask for the Radiation Oncologist on-call
THIRD: In a medical emergency, call 911

This information is not intended to be used as a substitute for professional medical advice, diagnosis, or treatment. You should not rely entirely on this information for your health care needs. Ask your own doctor or health care provider any specific medical questions you may have.
Meet Your Radiation Oncology Team

It takes a team and teamwork to deliver radiation therapy safely and effectively. For this to happen, your doctor will work closely with team members at Duke Radiation Oncology. You may not ever meet some members of the team but they are essential to developing, planning and delivering your treatment. You are the most important member of the team. You should not be afraid to ask questions about how your treatment is planned and how you will receive your treatment.

**Oncologist**

A member of the team who is a medical doctor; he/she specialize in treating cancer. Some oncologists specialize in a particular type of cancer treatment. For example, a radiation oncologist specializes in treating cancer with radiation.

**Medical Oncologist**

A member of the team who is a medical doctor; he/she specialize in giving drugs (called chemotherapy or targeted agents) to kill cancer cells or slow down their growth. Some medical oncologists are also hematologists, meaning they specialize in treating blood disorders.

**Radiation Oncologist**

A member of the team who is a medical doctor; he/she specialize in treating cancer and other diseases with radiation therapies. The radiation oncologist leads the radiation oncolgy team.

**Radiation Physicist**

A member of the team who makes sure that the radiation machine or implant delivers the right amount of radiation to the correct site in the body safely. The physicist works closely with the Radiation Oncologist to plan the treatment schedule and dose that has the best chance of killing the most cancer cells. Physicists are responsible for quality control and safety checks for each radiation machine.
Radiation Oncology Resident

A member of the team who is a medical doctor and is now completing additional study and training to specialize as a Radiation Oncologist.

Dosimetrist

A member of the team skilled in translating the Radiation Oncologist’s radiation therapy prescription into detailed instructions for the radiation therapists treating the patient. Dosimetry work involves careful calculations and computer modeling to arrive at the best treatment plan for the patient.

Radiation Therapist

A member of the team, radiation therapists are trained and certified in the use of machines called linear accelerators to administer daily radiation treatment to patients safely.

Radiation Oncology Nurse

A member of the team, the Radiation Oncology nurse works with the Radiation Oncology team to care for you and your family during your radiation treatments.

Radiation Medical Assistant or Nurse’s Assistant

A member of the team who works with the Radiation Oncology nurse to care for you and your family during your radiation treatments.

Clinical Research Radiation Oncology Nurse

A member of the team, the clinical research nurse will care for you and help guide you through a clinical trial. Clinical trials are studies that test new treatments.
Oncology Social Worker

A member of the team trained to counsel people affected by cancer and help them to access practical assistance. They can provide individual counseling, a support group, locate services in your community, help with home care, transportation, and guide you through the applications for disability or financial aid.

Oncology Nutritionist

A member of the team trained in providing healthy eating advice, promoting well-being during treatment and managing side effects such as decreased appetite, weight loss, dry or sore mouth.

Financial Care Counselor

A member of the team who can help with billing, co-pay and health insurance questions.
Radiation Therapy

Many patients with cancer will receive radiation therapy as part of their treatment plan. In fact, approximately 60% of patients with cancer receive radiation therapy. For some patients, radiation therapy is the only type of cancer treatment they will need. Radiation therapy is the use of high energy X-rays to damage cancer cells and stop them from growing. High doses of radiation can destroy the ability of cancer cells to grow and multiply. Both normal and cancer cells are affected by radiation but normal cells can recover quickly while the abnormal cancer cells are permanently damaged. Radiation therapy differs from chemotherapy because it is focused on controlling cancer cells only in the area being treated, i.e. a local treatment.

Most patients will receive external beam radiation therapy (EBRT). This is the most common type of radiation therapy. EBRT means you are not radioactive at any time during or after your treatment. You can continue your daily life as usual with your family and friends. EBRT treatments are normally given Monday through Friday for 4-6 weeks for most patients. Some patients may have shorter and/or longer treatment plans.

The goal of radiation therapy is to get enough radiation into the body to kill the cancer cells while preventing damage to healthy tissue. There are several ways to do this. Depending on the location, size and type of cancer, you may receive one or a combination of techniques. Your radiation oncologist will discuss your treatment plan with you. Radiation not only kills or slows the growth of cancer cells, it can also affect nearby healthy cells. Generally, the healthy cells recover after treatment is over. Your Radiation Oncologist will try to protect healthy cells during treatment by using as low a dose of radiation as possible. The radiation dose is balanced between being high enough to kill cancer cells yet low enough to limit damage to healthy cells. Safe and effective radiation therapy is given by:

- Spreading out treatment over time. You may get radiation therapy once a day for several weeks or in smaller doses twice a day. Spreading out the radiation dose allows normal cells to recover while cancer cells die.
• Aiming radiation at a precise part of your body. New techniques, such as IMRT and 3-D conformal radiation therapy, allow your doctor to aim higher doses of radiation at your cancer while reducing the radiation to nearby healthy tissue.

• Chemotherapy taken by mouth on the days you receive treatment can increase the radiation therapy effect. This is called a radiation therapy sensitizer.

**Brachytherapy:**

A small number of patients will need to have internal radiation therapy, also called brachytherapy. This involves placing radioactive sources (for example, radioactive seeds) inside your body. Your doctor will discuss this in detail with you if this is recommended for your treatment plan. A course of brachytherapy can be completed in less time. Patients typically have to make fewer visits to Radiation Oncology compared with EBRT, and the treatment is often performed on an outpatient basis. This makes treatment accessible and convenient for many patients. Most patients are able to tolerate the brachytherapy procedures very well.

**Stereotactic Radiotherapy:**

A small number of patients will have a specialized type of external beam radiation therapy called stereotactic radiotherapy. Your doctor will discuss this in detail with you if this is recommended for your treatment plan. This type of treatment uses focused radiation beams targeting a well-defined tumor, using computerized three-dimensional treatment planning, and precise treatment set-up to deliver the radiation dose with exact accuracy (i.e. stereotactically).
There are two types of stereotactic radiation:

1. Stereotactic radiosurgery (SRS) refers to a single or several stereotactic radiation treatments to the brain or spine. SRS is delivered by a team involving a radiation oncologist and a neurosurgeon.

2. Stereotactic body radiation therapy (SBRT) refers to one or several stereotactic radiation treatments within the body, excluding the brain or spine. SRS/SBRT is best for very small tumors. Doctors use specialized scans to pinpoint exactly where within the body the tumor target is located. A customized holder may be used to keep the body perfectly still during treatment, or the treatment machine may have the ability to adjust for patient movement for example (when you breathe). These techniques allow doctors to give a high dose of radiation to the tumor in a short amount of time. SRS/SBRT is a type of external beam radiation therapy that can be completed in one to five treatments, which may be delivered over two to three weeks.
What to Expect Before, During and After Treatment

Many highly qualified and professional team members will be involved in your care and in planning your treatment. It can take several appointments and up to two weeks of planning to complete the radiation therapy treatment plan. Patients and caregivers are often nervous and anxious about starting radiation therapy. At appointments ask questions, the more you understand about radiation therapy the less fearful it will be for you.

What to expect before treatment

- Your first appointment could take from 30 minutes to 2 hours. This is a new consult appointment. You should expect to meet with your radiation oncologist. You will be asked about your medical history. You will have a physical exam. This is an opportunity for you and your radiation oncologist to discuss why, how and where radiation therapy will be given. The possible side effects of your treatment will be reviewed with you.
- You should expect to meet with your radiation oncology nurse. Ask your nurse for written information about radiation therapy for your cancer at this visit.
- If you decide to have radiation therapy, you will be asked to sign a consent form.
- You will be scheduled for a treatment planning session called simulation. You should expect to meet a radiation therapist at this appointment. At simulation, you will have special scans such as CT scan or PET scan performed. You may need an IV placed if you need to have IV dye (contrast) during the scan. You will be asked to lie very still while x-rays or scans are taken to define the treatment area. The information from the scan pictures is used to plan your individual treatment plan. Simulation appointments can take from 30 minutes to 2 hours.
- During simulation the radiation therapist will place marks (clear stickers or lines) on your skin to define the treatment area. It is important that you do not remove or wash the marks from your skin. You will need these marks throughout the course of radiation therapy. The radiation therapist will use them each day to make sure you are in the correct position for treatment.
• For some cancers, such as prostate or cancer of the cervix, special markers called fiducials will be placed in the treatment field. Your doctor will discuss this with you if you need this type of marker.
• A special mold may need to be made for head and neck cancers or brain tumors. This could be a mold or a mask. It is a plastic or plaster form that helps keep you from moving during treatment. The mold ensures you are in the same position each day of treatment. Many patients do not need any type of mold. Your doctor and radiation therapist will keep you informed if you need this.
• A radiation therapist will give you a tour of the Radiation Oncology Clinic.

During Treatment

• Parking - There are two options to park your car when coming for daily treatments.

  1. **Free valet parking is provided to radiation oncology patients during daily radiation therapy only.**

     Drive to the valet parking at the main entrance to the Cancer Center. The valet will park your car and give you a pink parking ticket. Before you leave radiation oncology you will need to have your parking ticket stamped by a staff member. You will be shown where to do this.

  2. **Free parking is provided during daily radiation treatments only.**

     Patients who like to walk and feel able to can park in the parking deck on Trent Drive (PG11). You can walk directly to the Cancer Center through the Garden of Tranquility. If you choose to park your car you will receive a voucher for the time spent in Radiation Oncology.

     **In addition, a shuttle van service is provided from the parking deck to the Cancer Center.**
• Radiation Oncology is open for treatment Monday through Friday.

• Daily treatment appointments are scheduled with the radiation therapists working on the radiation therapy machines. Our team will make every effort to provide you the appointment time you request; however, this may not always be possible.

• During radiation therapy you will be given a white laminated card. You will notice a bar code on the card. Each day you come for treatment you will scan your card at the kiosks in the radiation oncology waiting area. When you scan your card, it informs the radiation therapists at your machine that you have arrived. You will be shown how to do this.

• During radiation therapy, some patients will need to have chemotherapy. Be sure to let your team know when your chemotherapy is scheduled so that appointment times can be worked out to everyone’s benefit.

• Once a week during your radiation therapy, you will meet with your radiation oncologist and your nurse. You will be told which day of the week your doctor sees patients. This is called a treatment check.

• On treatment check days you should plan to stay longer at Radiation Oncology. Usually patients are seen after their radiation therapy has been given.

• At weekly treatment checks your weight and vital signs will be checked.

• You can discuss with your Radiation Oncologist how treatment is going, the side effects you are experiencing and discuss ways to manage side effects.

• If you need to have blood work drawn during treatment, this will be done in the lab on 0 level in the Cancer Center. Your doctor will order the blood work you need. This may be done once during radiation treatment or it may be as often as weekly. Your doctor or nurse will tell you if and when you need blood drawn.
• Safety checks are performed on your individual treatment plan and on the radiation therapy machines frequently while you are having daily treatments. Your safety is our primary concern.

After Treatment

Once treatments are finished, you will be seen by your radiation oncologist regularly. These are called follow up appointments and you will generally be seen by your Radiation Oncologist. Your Radiation Oncologist will discuss with you how often you will be seen and when you need to have CT, PET, Mammograms or MRI scans done. Your Radiation Oncologist will work closely with your medical oncologist and/or surgeon in planning your follow up appointment schedule.
Dictionary

Radiation therapy involves using many terms you may have never heard before. Below is a list of words you could hear during your treatment.

**Applicator** - A device used to hold a radioactive source in place during brachytherapy.

**Blocks** - Pieces of metal alloy that can be used to shape the radiation beam from a linear accelerator.

**Bolus** - Additional material placed on the patient's skin to intentionally pull the radiation dose closer to the skin.

**Boost** - An additional dose of radiation delivered after an initial course of radiation. A boost may be the same amount of radiation therapy to a smaller treatment field in some instances.

**Brachytherapy** - Internal radiation treatment given by placing radioactive material directly into a tumor or close to it. Also called interstitial radiation therapy or intracavitary radiation therapy.

**Centigray (cGy)** – A unit of radiation, abbreviated form of centigray.

**Clinical Trials** - A cancer clinical trial is a medical research study in which people participate as volunteers to test therapies such as new drugs, new approaches to radiation therapy, new combinations of treatments, or new devices.

**Cone** - A linear accelerator attachment for electron beam treatment.

**CT or CAT Scan** - An imaging study using X-rays and a computer to create cross-sectional pictures of the body.

**Electrons** - Subatomic particles with mass and negative charge used in radiation therapy to treat superficially located tumors.
**External Beam Radiation Therapy** - Radiation therapy that uses a machine outside of the body to deliver high-energy rays directed at the cancer or tumor.

**Gray (Gy)** - The amount of radiation used in radiation therapy is measured in gray (Gy), and varies depending on the type and stage of cancer being treated. 100 cGy = 1 Gy.

**High-Dose-Rate Remote or HDR** - Brachytherapy treatment that uses a very small but intense radioactive source on the end of a flexible, computer-controlled cable. By inserting this radioactive source through one or more hollow applicators placed into or near a tumor, a precisely planned amount of radiation may be delivered.

**Hyperfractionated Radiation Therapy** - A type of radiation therapy in which the radiation doses are divided into smaller amounts and patients undergo treatment more than once a day.

**Hypofractionated Radiation Therapy** - A type of radiation therapy in which patients receive a larger dose of radiation per session over a fewer number of treatments.

**Image Guided Radiation Therapy or IGRT** - A radiation treatment guided by imaging equipment, such as CT, ultrasound or X-rays, taken in the treatment room just before radiation is given. During IGRT, the images are used as a final check to ensure accurate placement of the radiation treatment. This is also called “on board imaging”.

**Immobilization Device** - A device that is used to help a patient remain in the same position during every treatment such as a breast board or a mask.

**Implant or Brachytherapy** - Internal radiation therapy that involves placing radioactive sources inside or close to the tumor.

**Intensity Modulated Radiation Therapy or IMRT** - IMRT is a specialized form of external beam therapy that can help improve how the radiation is shaped to fit your tumor.
Internal Radiation Therapy - A procedure in which radioactive material sealed in needles, seeds, wires, or catheters is placed directly into or near a tumor. Also called brachytherapy, implant radiation, or interstitial radiation therapy.

Intraoperative Radiation Therapy or IORT - Radiation therapy given during surgery. It is helpful when vital normal organs are too close to the tumor because it allows your radiation oncologist to avoid exposing those organs to radiation.

Lasers - When used in radiation therapy, lasers beams allow for accurate and precise positioning of the patient for treatment from day to day.

Linear Accelerator - The most common type of machine used to deliver external radiation therapy.

Low-Dose-Rate Brachytherapy - Brachytherapy in which sources are left in place for the duration of treatment. This includes temporary LDR in which patients are hospitalized for several days of temporary brachytherapy. It also includes permanent LDR in which seeds are permanently placed.

Mask - A specially made device fitting over a patient's head and face to allow accurate positioning from day to day.

MR or MRI Scan - Magnetic resonance imaging (MRI) is a test that uses a magnetic field and pulses of radio wave energy to make pictures of organs and structures inside the body. MRI also may show problems that cannot be seen with other imaging methods such as x-rays, CT or PET scans.

Multileaf Collimator or MLC - Located in the head of the linear accelerator, it is used to shape the radiation beam.

Palliative Care or Palliation - Treatment that is intended to relieve symptoms but not cure disease.

PET Scan – A positron emission tomography (PET) scan is a unique type of imaging test that helps doctors see how the organs and tissues inside your body are actually functioning. The scan involves injecting a very small dose of a radioactive
chemical, called a radiotracer, into the vein of your arm. The tracer travels through the body and is absorbed by the organs and tissues being studied.

**Photons** - Energy with no mass or charge used in most radiation therapy treatments, generated by linear accelerator that is used in radiation therapy. In general, photons penetrate deeper in body than electrons that are used to treat more deeply seeded tumors.

**Port Films** - Images taken before treatment and during treatment. They are used to verify the position of the beams to confirm that treatment is accurately delivered as your doctor prescribed.

**Quality Assurance (QA) Programs** - The policies and procedures radiation therapy centers follow every day to make sure the treatment team works together to deliver radiation therapy as safely as possible. An important part of the QA program is performing specific safety tests on a daily basis.

**Radiosensitizer** - A type of drug that can make a tumor respond better to radiation therapy.

**Radiosurgery** - A technique that allows your radiation oncologist to precisely focus beams of radiation to destroy certain types of tumors. It is most often called stereotactic radiotherapy or SRS.

**Radiotherapy** - Also called radiation therapy or irradiation, it is the careful use of various forms of radiation to treat cancer and other diseases.

**Respiratory Gating-(breath-hold)** - A technique used during radiation therapy to manage the organ motion. Respiratory gating involves the administration of radiation (during both imaging and treatment delivery) within a particular portion of the patient’s breathing cycle, commonly referred to as the “gate.” The position and width of the gate within a respiratory cycle are determined by monitoring the patient’s respiratory motion, using either an external respiration signal or internal fiducial markers. Breath-hold is a special type of respiratory gating technique in which the gate is determined based on patient breath holding range. Since the beam is not continuously delivered, gated procedures are longer than nongated
procedures. For left breast cancer treatment, deep inspiration breath-hold pushes the heart away from the radiation field. For abdominal or thorax region, the tumor motion is reduced during breath-hold such that treatment can be delivered accurately to the tumor while minimizing radiation to surrounding normal tissues.

**Safety** - Radiation therapy teams follow a system of check and balances, including time out procedures before every treatment is given to a patient. This is for your safety and well-being.

**Seeds** - Radioactive pellets, approximately the size of a grain of rice, used in brachytherapy.

**Simulation** - The process of planning radiation therapy to allow the radiation to be delivered to the intended location.

**Stereotactic Body Radiation Therapy (SBRT)** - Refers to one or several stereotactic radiation treatments within the body, excluding the brain or spine.

**Stereotactic Radiosurgery (SRS)** - Refers to a single or several stereotactic radiation treatments of the brain or spine.

**Superficial** - A form of radiation where the radiation penetrates only a short distance below the surface.

**Three-Dimensional Conformal Radiotherapy (3D-CRT)** - This type of external beam radiation therapy combines multiple radiation treatment fields to deliver precise doses of radiation to the affected area and avoids radiation to nearby healthy tissue.

**Total Body Irradiation** - Delivering radiation to the entire body. In the case of lymphoma, it is often done before chemotherapy and a stem cell or bone marrow transplant.

**Treatment Plan** - A radiation oncologist’s prescription describing how a patient should be treated with radiation therapy. The radiation oncology team uses special software to maximize radiation to the tumor while sparing healthy tissue and organs.
**Wedge** - A metal filter or triangular cross-section placed within a radiation beam to intentionally change the radiation intensity from one side of the beam to the other.

**X-rays** - A type of high-energy radiation. At lower energies, x-rays are used to diagnose diseases by making pictures of the inside of the body.
Social Work

Oncology social workers are members of the team trained to counsel people affected by cancer and help them to access practical assistance. They can provide individual counseling, support groups, locate services in your community, help with in-home care (with doctor’s orders), transportation and provide education around the process of applying for disability and financial assistance.

Office hours: 8:30 am to 5:00 pm

If you would like to meet with a social worker, please contact your nurse at 919-668-6660 and the nurse will assist you in scheduling an appointment.

Here are other helpful websites, as well.

- Cancer Financial Assistance Coalition (CFAC) – www.cancefac.org
Nutrition Services

Duke Cancer Center is able to offer our patients trained oncology nutritionists who will help you follow a healthy diet during and after your cancer treatment. Duke Cancer Center nutritionists have special training in oncology and nutrition, and base their advice on scientifically sound nutrition research.

Our nutritionists are registered dietitians who can assist you in planning an optimal diet during your cancer treatments, help manage side effects that you may experience, and answer your questions about the latest findings on cancer and nutrition.

They can also offer you open-minded advice on vitamins and supplements you may consider taking. During radiation therapy, you can take a daily multivitamin, fish oil, and calcium with vitamin D supplements. However it is recommended that you should not take extra vitamins A, C, or E in pills or capsules (think of the ace in a deck of cards) as this could possibly interfere with the effect of radiation treatments.

If you would like to meet with a nutritionist, please contact your nurse at 919-668-6660 and the nurse will assist you in scheduling an appointment.
Managing nutrition is vital to well being.

Here are 5 helpful nutrition hints during cancer treatment that will promote good sources of calories, protein and hydration.

1. Eat high calorie, high protein foods (eggs, ice cream, whole milk, yogurt, cheese, etc.)
2. Use high calorie, high protein nutritional supplement drinks when you don’t feel like eating (Ensure or Boost Plus).
3. Eat several small frequent meals/day (every 2-3 hours, 6 times/day).
4. Drink plenty of fluids (every 1-2 hours, goal of 8-10 cups of caffeine-free/non-carbonated fluids/day).
5. Add extra calories and protein to foods/liquids you are eating now (butter, gravy, dry milk powder, protein powder, peanut butter, heavy cream, whole milk, etc.).

Reference Resources

Books
1. “Nutritional Issues in Cancer Care” Kogurt & Luthringer
2. “Eat Well Stay Nourished” Support for People with Oral and Head and Neck Cancer
3. “Nutrition for Cancer Survivors” Grant, Bloch, Hamilton & Thompson
4. “Living with Cancer Cookbook” Betty Crocker

Websites
Cancer Patient Support Services

The Duke Cancer Patient Support Program (DCPSP) offers a variety of programs to help Duke Cancer Institute patients and their families cope with the impact of cancer on their lives. The DCPSP is located at the 0 level of the Cancer Center.

You will find a variety of self care guides devoted to information on specific types of cancer, side effects, coping strategies, family issues, nutrition questions, and sexuality concerns at the resource center. Duke Cancer Patient Education offers education classes for patients, their families and caregivers. Ask your nurse for more information about topics, dates and times of classes.

Support Programs are provided free of charge to patients and caregivers:

Therapy, Counseling, and Support Groups
Available to help patients and family members cope with the psychological, emotional, relational, and spiritual aspects of cancer.

Self-Image Programs
A variety of self-image products (including wigs, turbans, hats, and scarves) and resources (educational workshops) are available to help patients cope with side effects of treatment.

Seese-Thornton Garden of Tranquility
Offers cancer patients and their families a quiet place for meditation and reflection.

Pink Ribbon Yoga Retreat for Breast Cancer Survivors
The annual Pink Ribbon Yoga Retreat for Breast Cancer Survivors offers you an opportunity to relax on the beaches of North Carolina.

Other Programs
Healing expressions art kits, Kids Corner, waiting room movies, and more.

Food and parking vouchers are provided to participants of support groups. Make an appointment Call 919-684-4497.
Pet Therapy

Radiation Oncology has an active Pet Therapy program in place for our patients and caregivers. Pets play an important role in many people's lives by offering companionship, sensory stimulation and an unbiased audience. Numerous articles and studies have demonstrated the benefits of animal assisted therapy from a physiological and emotional standpoint among patients.

Look for signs indicating pet therapy is taking place in the Radiation Oncology department or check with a member of your care team about upcoming pet therapy visits.
Oncology Recreation Therapy

Oncology Recreation Therapy at the Duke Cancer Institute offers many activities, interventions, and techniques for cancer patients and their families free of charge.

Art Cart
Offers patients and their families a chance to explore and express their creativity throughout the cancer journey.

Assertiveness Training
Learn skills to reduce stress in your relationships, your workplace, and in your life with assertive communication.

Hospitality Cart
Volunteers go door-to-door offering opportunities for socialization, nourishment, and activities for structuring free time.

Laugh Mobile
Brings humor and laughter to patients.

Look Good ... Feel Better
Helps women cope with changes in their physical appearance that may result from their illness or treatment.

Recreation/Arts and Crafts
Recreational resources available to assist you in filling your free time.

Stress Reduction
Assist patients and family members in preventing, managing, and reversing the negative effects of stress.

To make an appointment call 919-681-2928
Accommodations

Each year thousands of patients locally and from across the country seek treatment from the specialists at the Duke Cancer Institute. Many patients need a place to stay during their visit.

The Duke Cancer Center is approximately 16 miles from the Raleigh-Durham International Airport (RDU). Taxis, shuttles, and public transportation are available at the airport, and some hotels offer transportation assistance as well.

Patients coming to Duke for extended periods of time may choose to stay at one of the following locations:

- **Caring House** offers comfortable and affordable housing for adults receiving outpatient treatment at the Duke Cancer Institute and their caregivers. A referral from a clinical social worker or patient resource manager is needed for first-time guests. For more information, call 919-490-5449 or visit caringhouse.org.

- **Ronald McDonald House** provides temporary housing for pediatric patients receiving treatment at Duke and their families. Your social worker or patient resource manager must make a referral to the house for your first stay, but after this you can make your own reservations. For more information contact your social worker or the Ronald McDonald House at 919-286-9305.

- **The Host Homes** program is sponsored by Duke Patient Information Services and can assist with lodging in private homes. A nominal need-based fee is charged for this housing. For more information, please call 919-681-4688.
For more information:

Families and visitors can find additional information about patient services at dukehealth.org.

Our social workers can assist you in finding accommodations that work for you.

The following hotels are located near the Duke Cancer Center:
When contacting a hotel, ask about shuttle services and a “medical room rate” to determine if a discount is available. This list is provided as a courtesy for Duke Cancer Institute patients and families and is not representative of all area lodging options.

**Millennium Hotel Durham**
2800 Campus Walk Avenue Durham, NC 27705 919-383-8575 (1.4 miles from Duke Cancer Center)

**Brookwood Inn**
2306 Elba Street Durham, NC 27705 919-286-3111 800-716-6401 (.3 miles from Duke Cancer Center)

**Duke Tower All-Condominium Hotel**
807 West Trinity Avenue Durham, NC 27701 919-687-4444 866-385-3869 (2.4 miles from Duke Cancer Center)

**Durham Marriott City Center**
201 Foster Street Durham, North Carolina 27701 919-768-6000 800-909-8375 (2.3 miles from Duke Cancer Center)

**Holiday Inn Express**
2516 Guess Road Durham, NC 919-313-3244 (2.7 miles from Duke Cancer Center)

**Homewood Suites**
3600 Mt. Moriah Road Durham, NC 27707 919-401-0610 (6.4 miles from Duke Cancer Center)

**Red Roof Inn**
4405 Highway 55 East Durham, NC 919-361-1950 (8.8 miles from Duke Cancer Center)

**University Inn**
502 Elf Street Durham, NC 27705 800-313-3585 (.4 miles from Duke Cancer Center)

**Washington Duke Inn & Golf Club**
3001 Cameron Boulevard Durham, NC 27705 919-490-0999 800-443-3853 (1.9 miles from Duke Cancer Center)
SECTION II – Radiation Therapy and You
Radiation Therapy and You
For More Information

This booklet is only one of many free booklets for people with cancer. Here are some others you may find useful:

- **Biological Therapy**
- **Chemotherapy and You: Support for People With Cancer**
- **Eating Hints: Before, During, and After Cancer Treatment**
- **Taking Part in Cancer Treatment Research Studies**
- **Thinking About Complementary & Alternative Medicine: A Guide for People With Cancer**
- **Pain Control: Support for People With Cancer**
- **When Cancer Returns**
- **Taking Time: Support for People With Cancer**

These booklets are available from the National Cancer Institute (often called NCI). NCI is a federal agency that is part of the National Institutes of Health. Call 1-800-4-CANCER (1-800-422-6237) or visit www.cancer.gov. (See page 59 for more information.)

*For information about your specific type of cancer, see the PDQ® database. PDQ® is NCI’s complete cancer database. You can find it at www.cancer.gov.*

Product or brand names that appear in this book are for example only. The U.S. Government does not endorse any specific product or brand. If products or brands are not mentioned, it does not mean or imply that they are not satisfactory.
Radiation Therapy and You is written for you—someone who is about to get or is now getting radiation therapy for cancer. People who are close to you may also find this book helpful.

This book is a guide that you can refer to throughout radiation therapy. It has facts about radiation therapy and side effects and describes how you can care for yourself during and after treatment.

This book covers:

- **Questions and Answers About Radiation Therapy.** Answers to common questions, such as what radiation therapy is and how it affects cancer cells.

- **External Beam and Internal Radiation.** Information about the two types of radiation therapy.

- **Your Feelings During Radiation Therapy.** Information about feelings, such as depression and anxiety, and ways to cope with them.

- **Side Effects and Ways To Manage Them.** A chart that shows problems that may happen as a result of treatment and ways you can help manage them.

- **Questions To Ask.** Questions for you to think about and discuss with your doctor, nurse, and others involved in your treatment and care.

- **Lists of Foods and Liquids.** Foods and drinks you can have during radiation therapy.

- **Words To Know.** A dictionary that clearly explains medical terms used in this book. These terms are in bold print the first time they appear.

- **Ways To Learn More.** Places to go for more information—in print, online (Internet), and by telephone.

Talk with your doctor and nurse about the information in this book. They may suggest that you read certain sections or follow some of the tips. Since radiation therapy affects people in different ways, they may also tell you that some of the information in this book is not right for you.
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## Questions and Answers About Radiation Therapy

### What is radiation therapy?

Radiation therapy (also called radiotherapy) is a cancer treatment that uses high doses of radiation to kill cancer cells and stop them from spreading. At low doses, radiation is used as an x-ray to see inside your body and take pictures, such as x-rays of your teeth or broken bones. Radiation used in cancer treatment works in much the same way, except that it is given at higher doses.

### How is radiation therapy given?

Radiation therapy can be external beam (when a machine outside your body aims radiation at cancer cells) or internal (when radiation is put inside your body, in or near the cancer cells). Sometimes people get both forms of radiation therapy. To learn more about external beam radiation therapy, see page 9. To learn more about internal radiation therapy, see page 15.

### Who gets radiation therapy?

Many people with cancer need radiation therapy. In fact, more than half (about 60 percent) of people with cancer get radiation therapy. Sometimes, radiation therapy is the only kind of cancer treatment people need.

### What does radiation therapy do to cancer cells?

Given in high doses, radiation kills or slows the growth of cancer cells. Radiation therapy is used to:

- **Treat cancer.** Radiation can be used to cure, stop, or slow the growth of cancer.

- **Reduce symptoms.** When a cure is not possible, radiation may be used to shrink cancer tumors in order to reduce pressure. Radiation therapy used in this way can treat problems such as pain, or it can prevent problems such as blindness or loss of bowel and bladder control.
How long does radiation therapy take to work?

Radiation therapy does not kill cancer cells right away. It takes days or weeks of treatment before cancer cells start to die. Then, cancer cells keep dying for weeks or months after radiation therapy ends.

What does radiation therapy do to healthy cells?

Radiation not only kills or slows the growth of cancer cells, it can also affect nearby healthy cells. The healthy cells almost always recover after treatment is over. But sometimes people may have side effects that do not get better or are severe. Doctors try to protect healthy cells during treatment by:

- **Using as low a dose of radiation as possible.** The radiation dose is balanced between being high enough to kill cancer cells yet low enough to limit damage to healthy cells.

- **Spreading out treatment over time.** You may get radiation therapy once a day for several weeks or in smaller doses twice a day. Spreading out the radiation dose allows normal cells to recover while cancer cells die.

- **Aiming radiation at a precise part of your body.** New techniques, such as IMRT and 3-D conformal radiation therapy, allow your doctor to aim higher doses of radiation at your cancer while reducing the radiation to nearby healthy tissue.

- **Using medicines.** Some drugs can help protect certain parts of your body, such as the salivary glands that make saliva (spit).

Does radiation therapy hurt?

No, radiation therapy does not hurt while it is being given. But the side effects that people may get from radiation therapy can cause pain or discomfort. This book has a lot of information about ways that you, your doctor, and your nurse can help manage side effects.
Is radiation therapy used with other types of cancer treatment?

Yes, radiation therapy is often used with other cancer treatments. Here are some examples:

- **Radiation therapy and surgery.** Radiation may be given before, during, or after surgery. Doctors may use radiation to shrink the size of the cancer before surgery, or they may use radiation after surgery to kill any cancer cells that remain. Sometimes, radiation therapy is given during surgery so that it goes straight to the cancer without passing through the skin. This is called intraoperative radiation.

- **Radiation therapy and chemotherapy.** Radiation may be given before, during, or after chemotherapy. Before or during chemotherapy, radiation therapy can shrink the cancer so that chemotherapy works better. Sometimes, chemotherapy is given to help radiation therapy work better. After chemotherapy, radiation therapy can be used to kill any cancer cells that remain.

Who is on my radiation therapy team?

Many people help with your radiation treatment and care. This group of health care providers is often called the “radiation therapy team.” They work together to provide care that is just right for you. Your radiation therapy team can include:

- **Radiation oncologist.** This is a doctor who specializes in using radiation therapy to treat cancer. He or she prescribes how much radiation you will receive, plans how your treatment will be given, closely follows you during your course of treatment, and prescribes care you may need to help with side effects. He or she works closely with the other doctors, nurses, and health care providers on your team. After you are finished with radiation therapy, your radiation oncologist will see you for follow-up visits. During these visits, this doctor will check for late side effects and assess how well the radiation has worked.

- **Nurse practitioner.** This is a nurse with advanced training. He or she can take your medical history, do physical exams, order tests, manage side effects, and closely watch your response to treatment. After you are finished with radiation therapy, your nurse practitioner may see you for follow-up visits to check for late side effects and assess how well the radiation has worked.
You are the most important part of the radiation therapy team.

- **Radiation nurse.** This person provides nursing care during radiation therapy, working with all the members of your radiation therapy team. He or she will talk with you about your radiation treatment and help you manage side effects.

- **Radiation therapist.** This person works with you during each radiation therapy session. He or she positions you for treatment and runs the machines to make sure you get the dose of radiation prescribed by your radiation oncologist.

- **Other health care providers.** Your team may also include a dietitian, physical therapist, social worker, and others.

- **You.** You are also part of the radiation therapy team. Your role is to:
  - Arrive on time for all radiation therapy sessions
  - Ask questions and talk about your concerns
  - Let someone on your radiation therapy team know when you have side effects
  - Tell your doctor or nurse if you are in pain
  - Follow the advice of your doctors and nurses about how to care for yourself at home, such as:
    - Taking care of your skin
    - Drinking liquids
    - Eating foods that they suggest
    - Keeping your weight the same

Be sure to arrive on time for ALL radiation therapy sessions.
Is radiation therapy expensive?

Yes, radiation therapy costs a lot of money. It uses complex machines and involves the services of many health care providers. The exact cost of your radiation therapy depends on the cost of health care where you live, what kind of radiation therapy you get, and how many treatments you need.

Talk with your health insurance company about what services it will pay for. Most insurance plans pay for radiation therapy for their members. To learn more, talk with the business office where you get treatment. You can also contact the National Cancer Institute's Cancer Information Service and ask for the “Financial Assistance for Cancer Care” fact sheet. See page 59 for ways to contact the National Cancer Institute.

Should I follow a special diet while I am getting radiation therapy?

Your body uses a lot of energy to heal during radiation therapy. It is important that you eat enough calories and protein to keep your weight the same during this time. Ask your doctor or nurse if you need a special diet while you are getting radiation therapy. You might also find it helpful to speak with a dietitian.

To learn more about foods and drinks that are high in calories or protein, see the chart on page 54. You may also want to read Eating Hints, a book from the National Cancer Institute. You can order a free copy online at http://www.cancer.gov/publications or 1-800-4-CANCER.
Can I go to work during radiation therapy?

Some people are able to work full-time during radiation therapy. Others can only work part-time or not at all. How much you are able to work depends on how you feel. Ask your doctor or nurse what you may expect based on the treatment you are getting.

You are likely to feel well enough to work when you start radiation therapy. As time goes on, do not be surprised if you are more tired, have less energy, or feel weak. Once you have finished your treatment, it may take a few weeks or many months for you to feel better.

You may get to a point during your radiation therapy when you feel too sick to work. Talk with your employer to find out if you can go on medical leave. Make sure that your health insurance will pay for treatment when you are on medical leave.

What happens when radiation therapy is over?

Once you have finished radiation therapy, you will need follow-up care for the rest of your life. Follow-up care refers to checkups with your radiation oncologist or nurse practitioner after your course of radiation therapy is over. During these checkups, your doctor or nurse will see how well the radiation therapy worked, check for other signs of cancer, look for late side effects, and talk with you about your treatment and care. Your doctor or nurse will:

- **Examine you and review how you have been feeling.** Your doctor or nurse practitioner can prescribe medicine or suggest other ways to treat any side effects you may have.

- **Order lab and imaging tests.** These may include blood tests, x-rays, or CT, MRI, or PET scans.

- **Discuss treatment.** Your doctor or nurse practitioner may suggest that you have more treatment, such as extra radiation treatments, chemotherapy, or both.

- **Answer your questions and respond to your concerns.** It may be helpful to write down your questions ahead of time and bring them with you. You can find sample questions on pages 51 and 52.
After radiation therapy is over, what symptoms should I look for?

You have gone through a lot with cancer and radiation therapy. Now you may be even more aware of your body and how you feel each day. Pay attention to changes in your body and let your doctor or nurse know if you have:

- A pain that does not go away
- New lumps, bumps, swellings, rashes, bruises, or bleeding
- Appetite changes, nausea, vomiting, diarrhea, or constipation
- Weight loss that you cannot explain
- A fever, cough, or hoarseness that does not go away
- Any other symptoms that worry you

See “Resources for Learning More” on page 59 for ways to learn more about radiation therapy.

Make a list of questions and problems you want to discuss with your doctor or nurse. Be sure to bring this list to your follow-up visits. See pages 51 and 52 for sample questions.
External Beam Radiation Therapy

What is external beam radiation therapy?

External beam radiation therapy comes from a machine that aims radiation at your cancer. The machine is large and may be noisy. It does not touch you, but rotates around you, sending radiation to your body from many directions.

External beam radiation therapy is a local treatment, meaning that the radiation is aimed only at a specific part of your body. For example, if you have lung cancer, you will get radiation to your chest only and not the rest of your body.

How often will I get external beam radiation therapy?

Most people get external beam radiation therapy once a day, 5 days a week, Monday through Friday. Treatment lasts for 2 to 10 weeks, depending on the type of cancer you have and the goal of your treatment. The time between your first and last radiation therapy sessions is called a course of treatment.

Radiation is sometimes given in smaller doses twice a day (hyperfractionated radiation therapy). Your doctor may prescribe this type of treatment if he or she feels that it will work better. Although side effects may be more severe, there may be fewer late side effects. Doctors are doing research to see which types of cancer are best treated this way.
### Where do I go for external beam radiation therapy?

Most of the time, you will get external beam radiation therapy as an outpatient. This means that you will have treatment at a clinic or radiation therapy center and will not have to stay in the hospital.

### What happens before my first external beam radiation treatment?

You will have a 1- to 2-hour meeting with your doctor or nurse before you begin radiation therapy. At this time, you will have a physical exam, talk about your medical history, and maybe have imaging tests. Your doctor or nurse will discuss external beam radiation therapy, its benefits and side effects, and ways you can care for yourself during and after treatment. You can then choose whether to have external beam radiation therapy.

If you agree to have external beam radiation therapy, you will be scheduled for a treatment planning session called a **simulation**. At this time:

- A radiation oncologist and radiation therapist will define your treatment area (also called a **treatment port** or **treatment field**). This refers to the places in your body that will get radiation. You will be asked to lie very still while x-rays or scans are taken to define the treatment area.

- The radiation therapist will then put small marks (tattoos or dots of colored ink) on your skin to mark the treatment area. You will need these marks throughout the course of radiation therapy. The radiation therapist will use them each day to make sure you are in the correct position. Tattoos are about the size of a freckle and will remain on your skin for the rest of your life. Ink markings will fade over time. Be careful not to remove them and make sure to tell the radiation therapist if they fade or lose color.

> Tell your radiation therapist if your ink marks begin to fade or lose color.
You may need a body mold. This is a plastic or plaster form that helps keep you from moving during treatment. It also helps make sure that you are in the exact same position each day of treatment.

If you are getting radiation to the head, you may need a mask. The mask has air holes, and holes can be cut for your eyes, nose, and mouth. It attaches to the table where you will lie to receive your treatments. The mask helps keep your head from moving so that you are in the exact same position for each treatment.

If the body mold or mask makes you feel anxious, see page 13 for ways to relax during treatment.

What should I wear when I get external beam radiation therapy?

Wear clothes that are comfortable and made of soft fabric, such as cotton. Choose clothes that are easy to take off, since you may need to change into a hospital gown or show the area that is being treated. Do not wear clothes that are tight, such as close-fitting collars or waistbands, near your treatment area. Also, do not wear jewelry, BAND-AIDS®, powder, lotion, or deodorant in or near your treatment area, and do not use deodorant soap before your treatment.
What happens during treatment sessions?

- You may be asked to change into a hospital gown or robe.
- You will go to a treatment room where you will receive radiation.
- Depending on where your cancer is, you will either sit in a chair or lie down on a treatment table. The radiation therapist will use your body mold and skin marks to help you get into position.
- You may see colored lights pointed at your skin marks. These lights are harmless and help the therapist position you for treatment each day.
- You will need to stay very still so the radiation goes to the exact same place each time. You can breathe as you always do and do not have to hold your breath.

The radiation therapist will leave the room just before your treatment begins. He or she will go to a nearby room to control the radiation machine and watch you on a TV screen or through a window. You are not alone, even though it may feel that way. The radiation therapist can see you on the screen or through the window. He or she can hear and talk with you through a speaker in your treatment room. Make sure to tell the therapist if you feel sick or are uncomfortable. He or she can stop the radiation machine at any time. You cannot feel, hear, see, or smell radiation.

Your entire visit may last from 30 minutes to 1 hour. Most of that time is spent setting you in the correct position. You will get radiation for only 1 to 5 minutes. If you are getting IMRT, your treatment may last longer. Your visit may also take longer if your treatment team needs to take and review x-rays.

Your radiation therapist can see, hear, and talk with you at all times while you are getting external beam radiation therapy.
Will external beam radiation therapy make me radioactive?

No, external beam radiation therapy does not make people radioactive. You may safely be around other people, even babies and young children.

How can I relax during my treatment sessions?

- Bring something to read or do while in the waiting room.
- Ask if you can listen to music or books on tape.
- Meditate, breathe deeply, use imagery, or find other ways to relax. To learn more about ways to relax, see Facing Forward: Life After Cancer Treatment, a book from the National Cancer Institute. You can order a free copy at http://www.cancer.gov/publications or 1-800-4-CANCER.

For ways to learn more about external beam radiation therapy, see the Resources for Learning More on page 59.
### Internal Radiation Therapy

#### What is internal radiation therapy?

Internal radiation therapy is a form of treatment where a source of radiation is put inside your body. One form of internal radiation therapy is called **brachytherapy**. In brachytherapy, the radiation source is a solid in the form of seeds, ribbons, or capsules, which are placed in your body in or near the cancer cells. This allows treatment with a high dose of radiation to a smaller part of your body. Internal radiation can also be in a liquid form. You receive liquid radiation by drinking it, by swallowing a pill, or through an IV. Liquid radiation travels throughout your body, seeking out and killing cancer cells.

Brachytherapy may be used with people who have cancers of the head, neck, breast, uterus, cervix, prostate, gall bladder, esophagus, eye, and lung. Liquid forms of internal radiation are most often used with people who have thyroid cancer or non-Hodgkin's lymphoma. You may also get internal radiation along with other types of treatment, including external beam radiation, chemotherapy, or surgery.

#### What happens before my first internal radiation treatment?

You will have a 1- to 2-hour meeting with your doctor or nurse before you begin internal radiation therapy. At this time, you will have a physical exam, talk about your medical history, and maybe have imaging tests. Your doctor will discuss the type of internal radiation therapy that is best for you, its benefits and side effects, and ways you can care for yourself during and after treatment. You can then choose whether to have internal radiation therapy.

#### How is brachytherapy put in place?

Most brachytherapy is put in place through a **catheter**, which is a small, stretchy tube. Sometimes, it is put in place through a larger device called an **applicator**. When you decide to have brachytherapy, your doctor will place the catheter or applicator into the part of your body that will be treated.
What happens when the catheter or applicator is put in place?

You will most likely be in the hospital when your catheter or applicator is put in place. Here is what to expect:

- You will either be put to sleep or the area where the catheter or applicator goes will be numbed. This will help prevent pain when it is put in.
- Your doctor will place the catheter or applicator in your body.
- If you are awake, you may be asked to lie very still while the catheter or applicator is put in place. If you feel any discomfort, tell your doctor or nurse so he or she can give you medicine to help manage the pain.

Tell your doctor or nurse if you are in pain.

What happens after the catheter or applicator is placed in my body?

Once your treatment plan is complete, radiation will be placed inside the catheter or applicator. The radiation source may be kept in place for a few minutes, many days, or the rest of your life. How long the radiation is in place depends on which type of brachytherapy you get, your type of cancer, where the cancer is in your body, your health, and other cancer treatments you have had.

What are the types of brachytherapy?

There are three types of brachytherapy:

- **Low-dose rate (LDR) implants.** In this type of brachytherapy, radiation stays in place for 1 to 7 days. You are likely to be in the hospital during this time. Once your treatment is finished, your doctor will remove the radiation sources and your catheter or applicator.

- **High-dose rate (HDR) implants.** In this type of brachytherapy, the radiation source is in place for 10 to 20 minutes at a time and then taken out. You may have treatment twice a day for 2 to 5 days or once a week for 2 to 5 weeks. The schedule depends on your type of cancer. During the course of treatment, your catheter or applicator may stay in place, or it may be put in place before each treatment. You may be in the hospital during this time, or you may make daily trips to the hospital to have the radiation source put in place. Like LDR implants, your doctor will remove your catheter or applicator once you have finished treatment.
**Permanent implants.** After the radiation source is put in place, the catheter is removed. The implants always stay in your body, while the radiation gets weaker each day. You may need to limit your time around other people when the radiation is first put in place. Be extra careful not to spend time with children or pregnant women. As time goes by, almost all the radiation will go away, even though the implant stays in your body.

**What happens while the radiation is in place?**

Your body will give off radiation once the radiation source is in place. With brachytherapy, your body fluids (urine, sweat, and saliva) will not give off radiation. With liquid radiation, your body fluids will give off radiation for a while.

Your doctor or nurse will talk with you about safety measures that you need to take.

If the radiation you receive is a very high dose, safety measures may include:

- Staying in a private hospital room to protect others from radiation coming from your body
- Being treated quickly by nurses and other hospital staff. They will provide all the care you need, but they may stand at a distance and talk with you from the doorway to your room.

Your visitors will also need to follow safety measures, which may include:

- Not being allowed to visit when the radiation is first put in
- Needing to check with the hospital staff before they go to your room
- Keeping visits short (30 minutes or less each day). The length of visits depends on the type of radiation being used and the part of your body being treated.
- Standing by the doorway rather than going into your hospital room
- Not having visits from children younger than 18 and pregnant women
You may also need to follow safety measures once you leave the hospital, such as not spending much time with other people. Your doctor or nurse will talk with you about the safety measures you should follow when you go home.

What happens when the catheter is taken out after treatment with LDR or HDR implants?

- You will get medicine for pain before the catheter or applicator is removed.
- The area where the catheter or applicator was might be tender for a few months.
- There is no radiation in your body after the catheter or applicator is removed. It is safe for people to be near you—even young children and pregnant women.
- For 1 to 2 weeks, you may need to limit activities that take a lot of effort. Ask your doctor what kinds of activities are safe for you.

For ways to learn more about internal radiation therapy, see Resources for Learning More on page 59.
Your Feelings During Radiation Therapy

At some point during radiation therapy, you may feel:

- Anxious
- Depressed
- Afraid
- Angry
- Frustrated
- Helpless
- Alone

It is normal to have these kinds of feelings. Living with cancer and going through treatment is stressful. You may also feel fatigue, which can make it harder to cope with these feelings.

How can I cope with my feelings during radiation therapy?

There are many things you can do to cope with your feelings during treatment. Here are some things that have worked for other people:

- **Relax and meditate.** You might try thinking of yourself in a favorite place, breathing slowly while paying attention to each breath, or listening to soothing music. These kinds of activities can help you feel calmer and less stressed.

- **Exercise.** Many people find that light exercise (such as walking, biking, yoga, or water aerobics) helps them feel better. Talk with your doctor or nurse about types of exercise that you can do.

- **Talk with others.** Talk about your feelings with someone you trust. You may choose a close friend, family member, chaplain, nurse, social worker, or psychologist. You may also find it helpful to talk to someone else who is going through radiation therapy.

- **Join a support group.** Cancer support groups are meetings for people with cancer. These groups allow you to meet others facing the same problems. You will have a
chance to talk about your feelings and listen to other people talk about theirs. You can learn how others cope with cancer, radiation therapy, and side effects. Your doctor, nurse, or social worker can tell you about support groups near where you live. Some support groups also meet over the Internet, which can be helpful if you cannot travel or find a meeting in your area.

- **Talk to your doctor or nurse about things that worry or upset you.** You may want to ask about seeing a counselor. Your doctor may also suggest that you take medicine if you find it very hard to cope with these feelings.

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### Ways to Learn More

To learn more about ways to cope with your feelings, read *Taking Time: Support for People with Cancer*, a book from the National Cancer Institute. You can get a free copy at [http://www.cancer.gov/publications](http://www.cancer.gov/publications) or 1-800-4-CANCER (1-800-422-6237).

**CancerCare, Inc.**

Offers free support, information, financial assistance, and practical help to people with cancer and their loved ones.

- Toll-free: 1-800-813-HOPE (1-800-813-4673)
- E-mail: info@cancercare.org
- Online: [http://www.cancercare.org](http://www.cancercare.org)

**The Wellness Community**

Provides free psychological and emotional support to people with cancer and their families.

- Toll-free: 1-888-793-WELL (1-888-793-9355)
- Phone: 202-659-9709
- Online: [http://www.thewellnesscommunity.org](http://www.thewellnesscommunity.org)
- E-mail: help@thewellnesscommunity.org
Radiation Therapy Side Effects

Side effects are problems that can happen as a result of treatment. They may happen with radiation therapy because the high doses of radiation used to kill cancer cells can also damage healthy cells in the treatment area. Side effects are different for each person. Some people have many side effects; others have hardly any. Side effects may be more severe if you also receive chemotherapy before, during, or after your radiation therapy.

Talk to your radiation therapy team about your chances of having side effects. The team will watch you closely and ask if you notice any problems. If you do have side effects or other problems, your doctor or nurse will talk with you about ways to manage them.

Common Side Effects

Many people who get radiation therapy have skin changes and some fatigue. Other side effects depend on the part of your body being treated.

Skin changes may include dryness, itching, peeling, or blistering. These changes occur because radiation therapy damages healthy skin cells in the treatment area. You will need to take special care of your skin during radiation therapy. To learn more, see page 40.

Fatigue is often described as feeling worn out or exhausted. There are many ways to manage fatigue. To learn more, see page 26.

Depending on the part of your body being treated, you may also have:

- Diarrhea
- Hair loss in treatment area
- Mouth problems
- Nausea and vomiting
- Sexual changes
- Swelling
- Trouble swallowing
- Urinary and bladder changes

Most of these side effects go away within 2 months after radiation therapy is finished.
Late side effects may first occur 6 or more months after radiation therapy is over. They vary by the part of your body that was treated and the dose of radiation you received. Late side effects may include infertility, joint problems, lymphedema, mouth problems, and secondary cancer. Everyone is different, so talk to your doctor or nurse about whether you might have late side effects and what signs to look for. See page 47 for more information on late side effects.

Radiation Therapy Side Effects and Ways To Manage Them, starting on page 24, explains each side effect in more detail and includes ways you and your doctor or nurse can help manage them.

Radiation therapy side effects depend on the part of your body being treated. You can use the chart on page 23 to see which side effects might affect you. Find the part of your body being treated in the column on the left, then read across the row to see the side effects. A checkmark means that you may get this side effect. Ask your doctor or nurse about your chances of getting each side effect.

To learn more about each side effect, see the page listed in the top row of the table on page 23.

Talk to your radiation therapy team about your chances of getting side effects. Show them the chart on the next page.
# Radiation Therapy Side Effects At-A-Glance

- Find the part of your body being treated in the column on the left.
- Read across the row.
- A checkmark means you may get the side effect listed.

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Diarrhea

What it is

Diarrhea is frequent bowel movements which may be soft, formed, loose, or watery. Diarrhea can occur at any time during radiation therapy.

Why it occurs

Radiation therapy to the pelvis, stomach, and abdomen can cause diarrhea. People get diarrhea because radiation harms the healthy cells in the large and small bowels. These areas are very sensitive to the amount of radiation needed to treat cancer.

Ways to manage

When you have diarrhea:

■ **Drink 8 to 12 cups of clear liquid per day.** See page 53 for ideas of drinks and foods that are clear liquids.

If you drink liquids that are high in sugar (such as fruit juice, sweet iced tea, Kool-Aid®, or Hi-C®) ask your nurse or dietitian if you should mix them with water.

■ **Eat many small meals and snacks.** For instance, eat 5 or 6 small meals and snacks rather than 3 large meals.

■ **Eat foods that are easy on the stomach (which means foods that are low in fiber, fat, and lactose).** See page 55 for other ideas of foods that are easy on the stomach. If your diarrhea is severe, your doctor or nurse may suggest the BRAT diet, which stands for bananas, rice, applesauce, and toast.
- **Take care of your rectal area.** Instead of toilet paper, use a baby wipe or squirt of water from a spray bottle to clean yourself after bowel movements. Also, ask your nurse about taking **sitz baths**, which is a warm-water bath taken in a sitting position that covers only the hips and buttocks. Be sure to tell your doctor or nurse if your rectal area gets sore.

- **Stay away from:**
  - Milk and dairy foods, such as ice cream, sour cream, and cheese
  - Spicy foods, such as hot sauce, salsa, chili, and curry dishes
  - Foods or drinks with caffeine, such as regular coffee, black tea, soda, and chocolate
  - Foods or drinks that cause gas, such as cooked dried beans, cabbage, broccoli, soy milk, and other soy products
  - Foods that are high in fiber, such as raw fruits and vegetables, cooked dried beans, and whole wheat breads and cereals
  - Fried or greasy foods
  - Food from fast food restaurants

- **Talk to your doctor or nurse.** Tell them if you are having diarrhea. He or she will suggest ways to manage it. He or she may also suggest taking medicine, such as Imodium®.

To learn more about dealing with diarrhea during cancer treatment, see *Eating Hints: Before, During, and After Cancer Treatment*, a book from the National Cancer Institute. You can get a free copy at http://www.cancer.gov/publications or 1-800-4-CANCER (1-800-422-6237).
Radiation Therapy Side Effects and Ways to Manage Them

Fatigue

What it is

Fatigue from radiation therapy can range from a mild to an extreme feeling of being tired. Many people describe fatigue as feeling weak, weary, worn out, heavy, or slow.

Why it occurs

Fatigue can happen for many reasons. These include:

- Anemia
- Anxiety
- Depression
- Infection
- Lack of activity
- Medicines

Fatigue can also come from the effort of going to radiation therapy each day or from stress. Most of the time, you will not know why you feel fatigue.

How long it lasts

When you first feel fatigue depends on a few factors, which include your age, health, level of activity, and how you felt before radiation therapy started.

Fatigue can last from 6 weeks to 12 months after your last radiation therapy session. Some people may always feel fatigue and, even after radiation therapy is over, will not have as much energy as they did before.

Ways to manage

- **Try to sleep at least 8 hours each night.** This may be more sleep than you needed before radiation therapy. One way to sleep better at night is to be active during the day. For example, you could go for walks, do yoga, or ride a bike. Another way to sleep better at night is to relax before going to bed. You might read a book, work on a jigsaw puzzle, listen to music, or do other calming hobbies.
Plan time to rest. You may need to nap during the day. Many people say that it helps to rest for just 10 to 15 minutes. If you do nap, try to sleep for less than 1 hour at a time.

Try not to do too much. With fatigue, you may not have enough energy to do all the things you want to do. Stay active, but choose the activities that are most important to you. For example, you might go to work but not do housework, or watch your children’s sports events but not go out to dinner.

Exercise. Most people feel better when they get some exercise each day. Go for a 15- to 30-minute walk or do stretches or yoga. Talk with your doctor or nurse about how much exercise you can do while having radiation therapy.

Plan a work schedule that is right for you. Fatigue may affect the amount of energy you have for your job. You may feel well enough to work your full schedule, or you may need to work less—maybe just a few hours a day or a few days each week. You may want to talk with your boss about ways to work from home so you do not have to commute. And you may want to think about going on medical leave while you have radiation therapy.

Plan a radiation therapy schedule that makes sense for you. You may want to schedule your radiation therapy around your work or family schedule. For example, you might want to have radiation therapy in the morning so you can go to work in the afternoon.

Let others help you at home. Check with your insurance company to see whether it covers home care services. You can also ask family members and friends to help when you feel fatigue. Home care staff, family members, and friends can assist with household chores, running errands, or driving you to and from radiation therapy visits. They might also help by cooking meals for you to eat now or freeze for later.

Learn from others who have cancer. People who have cancer can help each other by sharing ways to manage fatigue. One way to meet other people with cancer is by joining a support group—either in person or online. Talk with your doctor or nurse to learn more about support groups.

Talk with your doctor or nurse. If you have trouble dealing with fatigue, your doctor may prescribe medicine (called psychostimulants) that can help decrease fatigue, give you a sense of well-being, and increase your appetite. Your doctor may also suggest treatments if you have anemia, depression, or are not able to sleep at night.
Hair Loss

What it is
Hair loss (also called alopecia) is when some or all of your hair falls out.

Why it occurs
Radiation therapy can cause hair loss because it damages cells that grow quickly, such as those in your hair roots.

Hair loss from radiation therapy only happens on the part of your body being treated. This is not the same as hair loss from chemotherapy, which happens all over your body. For instance, you may lose some or all of the hair on your head when you get radiation to your brain. But if you get radiation to your hip, you may lose pubic hair (between your legs) but not the hair on your head.

How long it lasts
You may start losing hair in your treatment area 2 to 3 weeks after your first radiation therapy session. It takes about a week for all the hair in your treatment area to fall out. Your hair may grow back 3 to 6 months after treatment is over. Sometimes, though, the dose of radiation is so high that your hair never grows back.

Once your hair starts to grow back, it may not look or feel the way it did before. Your hair may be thinner, or curly instead of straight. Or it may be darker or lighter in color than it was before.

Ways to manage hair loss on your head

Before hair loss:

■ Decide whether to cut your hair or shave your head. You may feel more in control of hair loss when you plan ahead. Use an electric razor to prevent nicking yourself if you decide to shave your head.
If you plan to buy a wig, do so while you still have hair. The best time to select your wig is before radiation therapy begins or soon after it starts. This way, the wig will match the color and style of your own hair. Some people take their wig to their hair stylist. You will want to have your wig fitted once you have lost your hair. Make sure to choose a wig that feels comfortable and does not hurt your scalp.

Check with your health insurance company to see whether it will pay for your wig. If it does not, you can deduct the cost of your wig as a medical expense on your income taxes. Some groups also sponsor free wig banks. Ask your doctor, nurse, or social worker if he or she can refer you to a free wig bank in your area.

Be gentle when you wash your hair. Use a mild shampoo, such as a baby shampoo. Dry your hair by patting (not rubbing) it with a soft towel.

Do not use curling irons, electric hair dryers, curlers, hair bands, clips, or hair sprays. These can hurt your scalp or cause early hair loss.

Do not use products that are harsh on your hair. These include hair colors, perms, gels, mousse, oil, grease, or pomade.

After hair loss:

Protect your scalp. Your scalp may feel tender after hair loss. Cover your head with a hat, turban, or scarf when you are outside. Try not to be in places where the temperature is very cold or very hot. This means staying away from the direct sun, sun lamps, and very cold air.

Stay warm. Your hair helps keep you warm, so you may feel colder once you lose it. You can stay warmer by wearing a hat, turban, scarf, or wig.

Ways to learn more

American Cancer Society
Offers a variety of services to people with cancer and their families, including referrals to low-cost wig banks.

Toll-free: 1-800-ACS-2345 (1-800-227-2345)
Phone: 404-320-3333
Online: http://www.cancer.org
Mouth Changes

What they are

Radiation therapy to the head or neck can cause problems such as:

- Mouth sores (little cuts or ulcers in your mouth)
- Dry mouth (also called xerostomia) and throat
- Loss of taste
- Tooth decay
- Changes in taste (such as a metallic taste when you eat meat)
- Infections of your gums, teeth, or tongue
- Jaw stiffness and bone changes
- Thick, rope-like saliva

Why they occur

Radiation therapy kills cancer cells and can also damage healthy cells such as those in the glands that make saliva and the soft, moist lining of your mouth.

How long they last

Some problems, like mouth sores, may go away after treatment ends. Others, such as taste changes, may last for months or even years. Some problems, like dry mouth, may never go away.

Visit a dentist at least 2 weeks before starting radiation therapy to your head or neck.
Ways to manage

■ If you are getting radiation therapy to your head or neck, visit a dentist at least 2 weeks before treatment starts. At this time, your dentist will examine your teeth and mouth and do any needed dental work to make sure your mouth is as healthy as possible before radiation therapy. If you cannot get to the dentist before treatment starts, ask your doctor if you should schedule a visit soon after treatment begins.

■ Check your mouth every day. This way, you can see or feel problems as soon as they start. Problems can include mouth sores, white patches, or infection.

■ Keep your mouth moist. You can do this by:
  - Sipping water often during the day
  - Sucking on ice chips
  - Chewing sugar-free gum or sucking on sugar-free hard candy
  - Using a saliva substitute to help moisten your mouth
  - Asking your doctor to prescribe medicine that helps increase saliva

■ Clean your mouth, teeth, gums, and tongue.
  - Brush your teeth, gums, and tongue after every meal and at bedtime.
  - Use an extra-soft toothbrush. You can make the bristles softer by running warm water over them just before you brush.
  - Use a fluoride toothpaste.
  - Use a special fluoride gel that your dentist can prescribe.
  - Do not use mouthwashes that contain alcohol.
  - Gently floss your teeth every day. If your gums bleed or hurt, avoid those areas but floss your other teeth.
  - Rinse your mouth every 1 to 2 hours with a solution of 1/4 teaspoon baking soda and 1/8 teaspoon salt mixed in 1 cup of warm water.
  - If you have dentures, make sure they fit well and limit how long you wear them each day. If you lose weight, your dentist may need to adjust them.
  - Keep your dentures clean by soaking or brushing them each day.
Be careful what you eat when your mouth is sore.

- Choose foods that are easy to chew and swallow.
- Take small bites, chew slowly, and sip liquids with your meals.
- Eat moist, soft foods such as cooked cereals, mashed potatoes, and scrambled eggs.
- Wet and soften food with gravy, sauce, broth, yogurt, or other liquids.
- Eat foods that are warm or at room temperature.

Stay away from things that can hurt, scrape, or burn your mouth, such as:

- Sharp, crunchy foods such as potato or corn chips
- Hot foods
- Spicy foods such as hot sauce, curry dishes, salsa, and chili
- Fruits and juices that are high in acid such as tomatoes, oranges, lemons, and grapefruits
- Toothpicks or other sharp objects
- All tobacco products, including cigarettes, pipes, cigars, and chewing tobacco
- Drinks that contain alcohol

Stay away from foods and drinks that are high in sugar. Foods and drinks that have a lot sugar (such as regular soda, gum, and candy) can cause tooth decay.

Exercise your jaw muscles.

Open and close your mouth 20 times as far as you can without causing pain. Do this exercise 3 times a day, even if your jaw isn’t stiff.
Medicine. Ask your doctor or nurse about medicines that can protect your saliva glands and the moist tissues that line your mouth.

Call your doctor or nurse when your mouth hurts. There are medicines and other products, such as mouth gels, that can help control mouth pain.

You will need to take extra good care of your mouth for the rest of your life. Ask your dentist how often you will need dental check-ups and how best to take care of your teeth and mouth after radiation therapy is over.

Ways to learn more

National Oral Health Information Clearinghouse
A service of the National Institute of Dental and Craniofacial Research that provides oral health information for special care patients.

Phone: 301-402-7364
Online: http://www.nidcr.nih.gov

Smokefree.gov
Provides resources, including information on quit lines, a step-by-step cessation guide, and publications, to help you or someone you care about quit smoking.

Toll-free: 1-877-44U-QUIT (1-877-448-7848)
Online: http://www.smokefree.gov
Nausea and Vomiting

What they are

Radiation therapy can cause nausea, vomiting, or both. Nausea is when you feel sick to your stomach and feel like you are going to throw up. Vomiting is when you throw up food and fluids. You may also have dry heaves, which happen when your body tries to vomit even though your stomach is empty.

Why they occur

Nausea and vomiting can occur after radiation therapy to the stomach, small intestine, colon, or parts of the brain. Your risk for nausea and vomiting depends on how much radiation you are getting, how much of your body is in the treatment area, and whether you are also having chemotherapy.

How long they last

Nausea and vomiting may occur 30 minutes to many hours after your radiation therapy session ends. You are likely to feel better on days that you do not have radiation therapy.

Ways to manage

- Prevent nausea. The best way to keep from vomiting is to prevent nausea. One way to do this is by having bland, easy-to-digest foods and drinks that do not upset your stomach. These include toast, gelatin, and apple juice. To learn more, see the list of foods and drinks that are easy on the stomach on page 55.

- Try to relax before treatment. You may feel less nausea if you relax before each radiation therapy treatment. You can do this by spending time doing activities you enjoy, such as reading a book, listening to music, or other hobbies.
■ **Plan when to eat and drink.** Some people feel better when they eat before radiation therapy; others do not. Learn the best time for you to eat and drink. For example, you might want a snack of crackers and apple juice 1 to 2 hours before radiation therapy. Or, you might feel better if you have treatment on an empty stomach, which means not eating 2 to 3 hours before treatment.

■ **Eat small meals and snacks.** Instead of eating 3 large meals each day, you may want to eat 5 or 6 small meals and snacks. Make sure to eat slowly and do not rush.

■ **Have foods and drinks that are warm or cool (not hot or cold).** Before eating or drinking, let hot food and drinks cool down and cold food and drinks warm up.

■ **Talk with your doctor or nurse.** He or she may suggest a special diet of foods to eat or prescribe medicine to help prevent nausea, which you can take 1 hour before each radiation therapy session. You might also ask your doctor or nurse about acupuncture, which may help relieve nausea and vomiting caused by cancer treatment.

To learn more about dealing with nausea and vomiting during cancer treatment, see *Eating Hints: Before, During, and After Cancer Treatment*, a book from the National Cancer Institute. You can get a free copy at http://www.cancer.gov/publications or 1-800-4-CANCER (1-800-422-6237).
Radiation Therapy Side Effects and Ways to Manage Them

Sexual and Fertility Changes

What they are

Radiation therapy sometimes causes sexual changes, which can include hormone changes and loss of interest in or ability to have sex. It can also affect fertility during and after radiation therapy. For a woman, this means that she might not be able to get pregnant and have a baby. For a man, this means that he might not be able to get a woman pregnant. Sexual and fertility changes differ for men and women.

Be sure to tell your doctor if you are pregnant before you start radiation therapy.

Problems for women include:

- Pain or discomfort when having sex
- Vaginal itching, burning, dryness, or atrophy (when the muscles in the vagina become weak and the walls of the vagina become thin)
- **Vaginal stenosis**, when the vagina becomes less elastic, narrows, and gets shorter
- Symptoms of menopause for women not yet in menopause. These include hot flashes, vaginal dryness, and not having your period.
- Not being able to get pregnant after radiation therapy is over

Problems for men include:

- **Impotence** (also called **erectile dysfunction** or ED), which means not being able to have or keep an erection
- Not being able to get a woman pregnant after radiation therapy is over due to fewer or less effective sperm
**Why they occur**

Sexual and fertility changes can happen when people get radiation therapy to the pelvic area. For women, this includes radiation to the vagina, uterus, or ovaries. For men, this includes radiation to the testicles or prostate. Many sexual side effects are caused by scar tissue from radiation therapy. Other problems, such as fatigue, pain, anxiety, or depression, can affect your interest in having sex.

**How long they last**

After radiation therapy is over, most people want to have sex as much as they did before treatment. Many sexual side effects go away after treatment ends. But you may have problems with hormone changes and fertility for the rest of your life. If you are able to get pregnant or father a child after you have finished radiation therapy, it should not affect the health of the baby.

**Ways to manage**

For both men and women, it is important to be open and honest with your spouse or partner about your feelings, concerns, and how you prefer to be intimate while you are getting radiation therapy.

For women, here are some issues to discuss with your doctor or nurse:

- **Fertility.** Before radiation therapy starts, let your doctor or nurse know if you think you might want to get pregnant after your treatment ends. He or she can talk with you about ways to preserve your fertility, such as preserving your eggs to use in the future.

- **Sexual problems.** You may or may not have sexual problems. Your doctor or nurse can tell you about side effects you can expect and suggest ways for coping with them.

- **Birth control.** It is very important that you do not get pregnant while having radiation therapy. Radiation therapy can hurt the fetus at all stages of pregnancy. If you have not yet gone through menopause, talk with your doctor or nurse about birth control and ways to keep from getting pregnant.

- **Pregnancy.** Make sure to tell your doctor or nurse if you are already pregnant.

Talk to your doctor or nurse if you want to have children in the future.
Stretching your vagina. Vaginal stenosis is a common problem for women who have radiation therapy to the pelvis. This can make it painful to have sex. You can help by stretching your vagina using a dilator (a device that gently stretches the tissues of the vagina). Ask your doctor or nurse where to find a dilator and how to use it.

Lubrication. Use a special lotion for your vagina (such as Replens*) once a day to keep it moist. When you have sex, use a water- or mineral oil-based lubricant (such as K-Y Jelly* or Astroglide*).

Sex. Ask your doctor or nurse whether it is okay for you to have sex during radiation therapy. Most women can have sex, but it is a good idea to ask and be sure. If sex is painful due to vaginal dryness, you can use a water- or mineral oil-based lubricant.

For men, here are some issues to discuss with your doctor or nurse:

Fertility. Before you start radiation therapy, let your doctor or nurse know if you think you might want to father children in the future. He or she may talk with you about ways to preserve your fertility before treatment starts, such as banking your sperm. Your sperm will need to be collected before you begin radiation therapy.

Impotence. Your doctor or nurse can let you know whether you are likely to become impotent and how long it might last. Your doctor can prescribe medicine or other treatments that may help.

Sex. Ask if it is okay for you to have sex during radiation therapy. Most men can have sex, but it is a good idea to ask and be sure.

If you want to father children in the future, your sperm will need to be collected before you begin treatment.
Ways to learn more

**American Cancer Society**
Offers a variety of services to patients and their families. It also supports research, provides printed materials, and conducts educational programs.

Toll-free:   1-800-ACS-2345 (1-800-227-2345)
Phone:   404-320-3333
Online:   http://www.cancer.org

**fertileHope**
Dedicated to helping people with cancer faced with infertility.

Toll-free:   1-888-994-HOPE (1-888-994-4673)
Online:   http://www.fertilehope.org
Skin Changes

What they are

Radiation therapy can cause skin changes in your treatment area. Here are some common skin changes:

- **Redness.** Your skin in the treatment area may look as if you have a mild to severe sunburn or tan. This can occur on any part of your body where you are getting radiation.

- **Pruritus.** The skin in your treatment area may itch so much that you always feel like scratching. This causes problems because scratching too much can lead to skin breakdown and infection.

- **Dry and peeling skin.** This is when the skin in your treatment area gets very dry—much drier than normal. In fact, your skin may be so dry that it peels like it does after a sunburn.

- **Moist reaction.** Radiation kills skin cells in your treatment area, causing your skin to peel off faster than it can grow back. When this happens, you can get sores or ulcers. The skin in your treatment area can also become wet, sore, or infected. This is more common where you have skin folds, such as your buttocks, behind your ears, under your breasts. It may also occur where your skin is very thin, such as your neck.

- **Swollen skin.** The skin in your treatment area may be swollen and puffy.

Why they occur

Radiation therapy causes skin cells to break down and die. When people get radiation almost every day, their skin cells do not have enough time to grow back between treatments. Skin changes can happen on any part of the body that gets radiation.

How long they last

Skin changes may start a few weeks after you begin radiation therapy. Many of these changes often go away a few weeks after treatment is over. But even after radiation therapy ends, you may still have skin changes. Your treated skin may always look darker and blotchy. It may feel very dry or thicker than before. And you may always burn quickly and be sensitive to the sun. You will always be at risk for skin cancer in the treatment area. Be sure to avoid tanning beds and protect yourself from the sun by wearing a hat, long sleeves, long pants, and sunscreen with an SPF of 30 or higher.
Ways to manage

■ **Skin care.** Take extra good care of your skin during radiation therapy. Be gentle and do not rub, scrub, or scratch in the treatment area. Also, use creams that your doctor prescribes.

■ **Do not put anything on your skin that is very hot or cold.** This means not using heating pads, ice packs, or other hot or cold items on the treatment area. It also means washing with lukewarm water.

■ **Be gentle when you shower or take a bath.** You can take a lukewarm shower every day. If you prefer to take a lukewarm bath, do so only every other day and soak for less than 30 minutes. Whether you take a shower or bath, make sure to use a mild soap that does not have fragrance or deodorant in it. Dry yourself with a soft towel by patting, not rubbing, your skin. Be careful not to wash off the ink markings that you need for radiation therapy.

■ **Use only those lotions and skin products that your doctor or nurse suggests.** If you are using a prescribed cream for a skin problem or acne, you must tell your doctor or nurse before you begin radiation treatment. Check with your doctor or nurse before using any of the following skin products:
  - Bubble bath
  - Cornstarch
  - Cream
  - Deodorant
  - Hair removers
  - Makeup
  - Oil
  - Ointment
  - Perfume
  - Powder
  - Soap
  - Sunscreen

■ **Cool, humid places.** Your skin may feel much better when you are in cool, humid places. You can make rooms more humid by putting a bowl of water on the radiator or using a humidifier. If you use a humidifier, be sure to follow the directions about cleaning it to prevent bacteria.

■ **Soft fabrics.** Wear clothes and use bed sheets that are soft, such as those made from cotton.

■ **Do not wear clothes that are tight and do not breathe,** such as girdles and pantyhose.
■ **Protect your skin from the sun every day.** The sun can burn you even on cloudy days or when you are outside for just a few minutes. Do not go to the beach or sun bathe. Wear a broad-brimmed hat, long-sleeved shirt, and long pants when you are outside. Talk with your doctor or nurse about sunscreen lotions. He or she may suggest that you use a sunscreen with an SPF of 30 or higher. You will need to protect your skin from the sun even after radiation therapy is over, since you will have an increased risk of skin cancer for the rest of your life.

■ **Do not use tanning beds.** Tanning beds expose you to the same harmful effects as the sun.

■ **Adhesive tape.** Do not put bandages, BAND-AIDS®, or other types of sticky tape on your skin in the treatment area. Talk with your doctor or nurse about ways to bandage without tape.

■ **Shaving.** Ask your doctor or nurse if you can shave the treated area. If you can shave, use an electric razor and do not use pre-shave lotion.

■ **Rectal area.** If you have radiation therapy to the rectal area, you are likely to have skin problems. These problems are often worse after a bowel movement. Clean yourself with a baby wipe or squirt of water from a spray bottle. Also ask your nurse about sitz baths (a warm-water bath taken in a sitting position that covers only the hips and buttocks.)

■ **Talk with your doctor or nurse.** Some skin changes can be very serious. Your treatment team will check for skin changes each time you have radiation therapy. Make sure to report any skin changes that you notice.

■ **Medicine.** Medicines can help with some skin changes. They include lotions for dry or itchy skin, antibiotics to treat infection, and other drugs to reduce swelling or itching.
Throat Changes

What they are

Radiation therapy to the neck or chest can cause the lining of your throat to become inflamed and sore. This is called esophagitis. You may feel as if you have a lump in your throat or burning in your chest or throat. You may also have trouble swallowing.

Why they occur

Radiation therapy to the neck or chest can cause throat changes because it not only kills cancer cells, but can also damage the healthy cells that line your throat. Your risk for throat changes depends on how much radiation you are getting, whether you are also having chemotherapy, and whether you use tobacco and alcohol while you are getting radiation therapy.

How long they last

You may notice throat changes 2 to 3 weeks after starting radiation. You will most likely feel better 4 to 6 weeks after radiation therapy has finished.

Ways to manage

■ Be careful what you eat when your throat is sore.
  - Choose foods that are easy to swallow.
  - Cut, blend, or shred foods to make them easier to eat.
  - Eat moist, soft foods such as cooked cereals, mashed potatoes, and scrambled eggs.
  - Wet and soften food with gravy, sauce, broth, yogurt, or other liquids.
  - Drink cool drinks.
  - Sip drinks through a straw.
  - Eat foods that are cool or at room temperature.

■ Eat small meals and snacks. It may be easier to eat a small amount of food at one time. Instead of eating 3 large meals each day, you may want to eat 5 or 6 small meals and snacks.

■ Choose foods and drinks that are high in calories and protein. When it hurts to swallow, you may eat less and lose weight. It is important to keep your weight the same during radiation therapy. Having foods and drinks that are high in calories and protein can help you. See the chart of foods and drinks that are high in calories and protein on page 54 for ideas.
■ Sit upright and bend your head slightly forward when you are eating or drinking. Remain sitting or standing upright for at least 30 minutes after eating.

■ Don’t have things that can burn or scrape your throat, such as:
  - Hot foods and drinks
  - Spicy foods
  - Foods and juices that are high in acid, such as tomatoes and oranges
  - Sharp, crunchy foods such as potato or corn chips
  - All tobacco products, such as cigarettes, pipes, cigars, and chewing tobacco
  - Drinks that contain alcohol

■ Talk with a dietitian. He or she can help make sure you eat enough to maintain your weight. This may include choosing foods that are high in calories and protein and foods that are easy to swallow.

■ Talk with your doctor or nurse. Let your doctor or nurse know if you notice throat changes, such as trouble swallowing, feeling as if you are choking, or coughing while eating or drinking. Also, let him or her know if you have pain or lose any weight. Your doctor can prescribe medicines that may help relieve your symptoms, such as antacids, gels that coat your throat, and pain killers.

Ways to learn more

To learn more about dealing with throat problems, the following books from the National Cancer Institute may help you: *Eating Hints: Before, During, and After Cancer Treatment* and *Pain Control: Support for People With Cancer*. You can get free copies at www.cancer.gov/publications or by calling 1-800-4-CANCER (1-800-422-6237).

**Smokefree.gov**

Provides resources, including information on quit lines, a step-by-step cessation guide, and publications, to help you or someone you care about quit smoking.

**Toll-free:** 1-877-44U-QUIT (1-877-448-7848)

**Online:** http://www.smokefree.gov
Urinary and Bladder Changes

What they are

Radiation therapy can cause urinary and bladder problems, which can include:

- Burning or pain when you begin to urinate or after you empty your bladder
- Trouble starting to urinate
- Trouble emptying your bladder
- Frequent, urgent need to urinate
- Cystitis, a swelling (inflammation) in your urinary tract
- Incontinence, when you cannot control the flow of urine from your bladder, especially when coughing or sneezing
- Frequent need to get up during sleep to urinate
- Blood in your urine
- Bladder spasms, which are like painful muscle cramps

Why they occur

Urinary and bladder problems may occur when people get radiation therapy to the prostate or bladder. Radiation therapy can harm the healthy cells of the bladder wall and urinary tract, which can cause inflammation, ulcers, and infection.

How long they last

Urinary and bladder problems often start 3 to 5 weeks after radiation therapy begins. Most problems go away 2 to 8 weeks after treatment is over.

Drink 6 to 8 cups of fluids each day.
Ways to manage

- **Drink a lot of fluids.** This means 6 to 8 cups of fluids each day. Drink enough fluids so that your urine is clear to light yellow in color.

- **Avoid coffee, black tea, alcohol, spices, and all tobacco products.**

- **Talk with your doctor or nurse if you think you have urinary or bladder problems.** He or she may ask for a urine sample to make sure that you do not have an infection.

- **Talk to your doctor or nurse if you have incontinence.** He or she may refer you to a physical therapist who will assess your problem. The therapist can give you exercises to improve bladder control.

- **Medicine.** Your doctor may prescribe antibiotics if your problems are caused by an infection. Other medicines can help you urinate, reduce burning or pain, and ease bladder spasms.
Late Side Effects

Late side effects are those that first occur at least 6 months after radiation therapy is over. Late side effects are rare, but they do happen. It is important to have follow-up care with a radiation oncologist or nurse practitioner for the rest of your life.

Whether you get late side effects will depend on:

■ The part of your body that was treated

■ The dose and length of your radiation therapy

■ If you received chemotherapy before, during, or after radiation therapy

Your doctor or nurse will talk with you about late side effects and discuss ways to help prevent them, symptoms to look for, and how to treat them if they occur.

Some late side effects are brain problems, infertility, joint problems, lymphedema, mouth problems, and secondary cancers.

Brain Changes

What they are

Radiation therapy to the brain can cause problems months or years after treatment ends. Side effects can include memory loss, problems doing math, movement problems, incontinence, trouble thinking, or personality changes. Sometimes, dead tumor cells can form a mass in the brain, which is called radiation necrosis.

Ways to manage

You will need to have check-ups with your doctor or nurse for the rest of your life. If you have symptoms, you will have tests to see whether they are due to the cancer or late side effects.

If you have late side effects, your doctor or nurse practitioner:

■ Will talk with you about ways to manage late side effects

■ May refer you to a physical, occupational, or speech therapist who can help with problems caused by late side effects

■ May prescribe medicine or suggest surgery to help with the symptoms
Infertility

What it is
For men, infertility means not being able to get a woman pregnant. For women, it means not being able to get pregnant.

Ways men with infertility can become a parent:
- **Donor sperm.** This means getting a woman pregnant with sperm given by another man.
- **Adoption.** Taking on legal responsibility for someone else’s child and raising the child as your own.

Ways women with infertility can become a parent:
- **Donor embryos.** Another couple donates a fertilized egg that your doctor implants in your uterus to carry until birth.
- **Donor eggs.** An egg (donated by someone else) is fertilized by your partner’s sperm. Your doctor implants the fertilized egg in your uterus to carry until birth.
- **Surrogacy.** Another woman carries and gives birth to your child. She can also donate her egg, which is fertilized by your partner’s sperm.
- **Adoption.** Taking on legal responsibility for someone else’s child and raising the child as your own.

Joint Changes

What they are
Radiation therapy can cause scar tissue and weakness in the part of the body that was treated. This can lead to loss of motion in your joints, such as your jaw, shoulders, or hips. Joint problems can show up months or years after radiation therapy is over.

Ways to manage
Notice early signs of joint problems. These signs include:
- Trouble getting your mouth to open wide
- Pain when you make certain movements, such as reaching over your head or putting your hand in a back pocket

Talk with your doctor or nurse. He or she may refer you to a physical therapist who will assess your joint problems. The therapist can give you exercises to decrease pain, increase strength, and improve movement.
Lymphedema

What it is
Swelling in an arm or a leg caused by a build up of lymph fluid. Lymphedema can happen if your lymph nodes were removed during surgery or damaged by radiation therapy.

Tell your doctor or nurse if you notice swelling in the arm or leg on the side where you had radiation.

Ways to manage

■ Meet with your doctor or nurse. Ask about your risk of lymphedema and ways to prevent it. Your doctor or nurse may suggest exercises, medicines, or compression garments (special wraps to put on your legs or arms). You might also want to ask for a referral to a physical therapist.

■ Be active. Exercise can help prevent and treat lymphedema. Ask your doctor, nurse, or physical therapist which exercises are safe for you to do.

■ Take care of your arm or leg.
  - Use skin lotion at least once a day.
  - Avoid sunburn. Use sunscreen with an SPF of 30 or higher and wear long sleeves and long pants if you need to be in the sun.
  - Wear gloves when you garden or cook.
  - Clip your toenails straight across, file your fingernails, and do not cut your cuticles.
  - Keep your feet clean and wear dry, cotton socks.
  - Clean cuts with soap and water and then use antibacterial ointment.
  - Avoid extreme hot or cold, such as ice packs or heating pads.
  - Do not put pressure on your arm or leg. For example, do not cross your legs when sitting or carry your purse on the side that had radiation.
  - Wear loose clothes that do not have tight elastic cuffs or waistbands.

■ Notice early signs of lymphedema. Let your doctor or nurse know if you have:
  - Pain or a sense of heaviness in your arm or leg
  - A feeling of tightness in your arm or leg
  - Trouble putting on your shoes or rings
  - Weakness in your arm or leg
  - Redness, swelling, or other signs of infection
Mouth Changes

What they are
Radiation therapy to your head and neck can cause late side effects in your mouth. Problems may include dry mouth, cavities, or bone loss in the jaw.

Ways to manage

■ **Visit your dentist.** You may be asked to have your teeth checked every 1 to 2 months for at least 6 months after radiation treatment ends. During this time, your dentist will look for changes in your mouth, teeth, and jaw.

■ **Exercise your jaw.** Open and close your mouth 20 times as far as you can without causing pain. Do this exercise 3 times a day, even if your jaw isn’t stiff.

■ **Take good care of your teeth and gums.** This means flossing, using daily fluoride treatments, and brushing your teeth after meals and before you go to bed.

■ **Have your dentist contact your radiation oncologist before you have dental or gum surgery.** This includes not having teeth pulled from the part of your mouth that received radiation. There may be other options than surgery.

Secondary Cancer

What it is
Radiation therapy can cause a new cancer many years after you have finished treatment. This does not happen very often.

Ways to manage
You will need to have check-ups with your radiation oncologist or nurse practitioner for the rest of your life to check for cancer—the one you were treated for and any new cancer that may occur.

See Resources for Learning More on pages 59 and 60 for ways to learn more about late side effects.
Questions To Ask Your Doctor or Nurse

Here are some questions you might want to ask your doctor or nurse. You may want to write down their answers so you can review them again later.

What kind of radiation therapy will I get?

________________________________________________________________________
________________________________________________________________________

How can radiation therapy help?

________________________________________________________________________
________________________________________________________________________

How many weeks will my course of radiation therapy last?

________________________________________________________________________
________________________________________________________________________

What kinds of side effects should I expect during my course of radiation therapy?

________________________________________________________________________
________________________________________________________________________

Will these side effects go away after radiation therapy is over?

________________________________________________________________________
________________________________________________________________________

What kind of late side effects should I expect after radiation therapy is over?

________________________________________________________________________
________________________________________________________________________
What can I do to manage these side effects?

________________________________________________________________________
________________________________________________________________________

What will you do to manage these side effects?

________________________________________________________________________
________________________________________________________________________

How can I learn more about radiation therapy?

________________________________________________________________________
________________________________________________________________________

Which sections should I read in this book?

________________________________________________________________________
________________________________________________________________________
## Lists of Foods and Liquids

### Clear Liquids

This list may help if you have diarrhea. See page 24 for more information.

<table>
<thead>
<tr>
<th>Types of Liquids</th>
<th>Includes . . .</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Soups</strong></td>
<td>Bouillon</td>
</tr>
<tr>
<td></td>
<td>Clear, fat-free broth</td>
</tr>
<tr>
<td></td>
<td>Consommé</td>
</tr>
<tr>
<td></td>
<td>Strained vegetable broth</td>
</tr>
<tr>
<td><strong>Drinks</strong></td>
<td>Apple juice</td>
</tr>
<tr>
<td></td>
<td>Clear carbonated beverages</td>
</tr>
<tr>
<td></td>
<td>Cranberry or grape juice</td>
</tr>
<tr>
<td></td>
<td>Fruit-flavored drinks</td>
</tr>
<tr>
<td></td>
<td>Fruit punch</td>
</tr>
<tr>
<td></td>
<td>Sports drinks</td>
</tr>
<tr>
<td></td>
<td>Tea</td>
</tr>
<tr>
<td></td>
<td>Water</td>
</tr>
<tr>
<td><strong>Sweets</strong></td>
<td>Fruit ices without fruit pieces</td>
</tr>
<tr>
<td></td>
<td>Fruit ices without milk</td>
</tr>
<tr>
<td></td>
<td>Honey</td>
</tr>
<tr>
<td></td>
<td>Jelly</td>
</tr>
<tr>
<td></td>
<td>Plain gelatin dessert</td>
</tr>
<tr>
<td></td>
<td>Popsicles</td>
</tr>
</tbody>
</table>
# Foods and Drinks That Are High in Calories or Protein

This list may help if you need ideas for keeping your weight the same. See pages 5 and 43 for more information.

<table>
<thead>
<tr>
<th>Types of Foods and Drinks</th>
<th>Includes . . .</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soups</td>
<td>Cream soups</td>
</tr>
<tr>
<td>Drinks</td>
<td>Instant breakfast shakes</td>
</tr>
<tr>
<td></td>
<td>Milkshakes</td>
</tr>
<tr>
<td></td>
<td>Whole milk (instead of low-fat or skim)</td>
</tr>
<tr>
<td>Main meals and other foods</td>
<td>Beans, legumes</td>
</tr>
<tr>
<td></td>
<td>Butter, margarine, or oil</td>
</tr>
<tr>
<td></td>
<td>Cheese</td>
</tr>
<tr>
<td></td>
<td>Chicken, fish, or beef</td>
</tr>
<tr>
<td></td>
<td>Cottage cheese</td>
</tr>
<tr>
<td></td>
<td>Cream cheese on crackers or celery</td>
</tr>
<tr>
<td></td>
<td>Deviled ham</td>
</tr>
<tr>
<td></td>
<td>Eggs, such as scrambled or deviled eggs</td>
</tr>
<tr>
<td></td>
<td>Muffins</td>
</tr>
<tr>
<td></td>
<td>Nuts, seeds, wheat germ</td>
</tr>
<tr>
<td></td>
<td>Peanut butter</td>
</tr>
<tr>
<td>Desserts and other sweets</td>
<td>Custards</td>
</tr>
<tr>
<td></td>
<td>Frozen yogurt</td>
</tr>
<tr>
<td></td>
<td>Ice cream</td>
</tr>
<tr>
<td></td>
<td>Puddings</td>
</tr>
<tr>
<td></td>
<td>Yogurt</td>
</tr>
<tr>
<td>Replacements and other supplements</td>
<td>Powdered milk added to foods (pudding, milkshakes, or scrambled eggs)</td>
</tr>
<tr>
<td></td>
<td>High-protein supplements, such as Ensure® and Carnation® Instant Breakfast®</td>
</tr>
</tbody>
</table>
Foods and Drinks That Are Easy on the Stomach
This list may help if you have diarrhea or nausea and vomiting. See pages 24 and 34 for more information.

<table>
<thead>
<tr>
<th>Types of Foods and Drinks</th>
<th>Includes . . .</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soups</td>
<td>Clear broth, such as chicken or beef</td>
</tr>
<tr>
<td>Drinks</td>
<td>Clear carbonated beverages</td>
</tr>
<tr>
<td></td>
<td>Cranberry or grape juice</td>
</tr>
<tr>
<td></td>
<td>Fruit-flavored drinks</td>
</tr>
<tr>
<td></td>
<td>Fruit punch</td>
</tr>
<tr>
<td></td>
<td>Sports drinks</td>
</tr>
<tr>
<td></td>
<td>Tea</td>
</tr>
<tr>
<td></td>
<td>Water</td>
</tr>
<tr>
<td>Main meals and snacks</td>
<td>Boiled potatoes</td>
</tr>
<tr>
<td></td>
<td>Chicken, broiled or baked without the skin</td>
</tr>
<tr>
<td></td>
<td>Crackers</td>
</tr>
<tr>
<td></td>
<td>Cream of wheat</td>
</tr>
<tr>
<td></td>
<td>Noodles</td>
</tr>
<tr>
<td></td>
<td>Oatmeal</td>
</tr>
<tr>
<td></td>
<td>Pretzels</td>
</tr>
<tr>
<td></td>
<td>Rice</td>
</tr>
<tr>
<td></td>
<td>Toast</td>
</tr>
<tr>
<td>Sweets</td>
<td>Angel food cake</td>
</tr>
<tr>
<td></td>
<td>Canned peaches</td>
</tr>
<tr>
<td></td>
<td>Gelatin</td>
</tr>
<tr>
<td></td>
<td>Sherbet</td>
</tr>
<tr>
<td></td>
<td>Yogurt</td>
</tr>
</tbody>
</table>
Words To Know

3-D conformal radiation therapy (ray-dee-AY-shun): Uses a computer to create a 3-D picture of a cancer tumor. This allows doctors to give the highest possible dose of radiation to the tumor, while sparing the normal tissue as much as possible.

Acupuncture (AK-yoo-PUNK-cher): A technique of inserting thin needles through the skin at specific points on the body to control pain and side effects. It is a type of complementary and alternative medicine.

Alopecia (al-oh-PEE-shuh): Hair loss; when some or all of your hair falls out.

Anemia (a-NEE-mee-a): A problem in which the number of red blood cells is below normal.

Applicator: A large device used to place brachytherapy in the body.

Brachytherapy (BRAKE-ee-THER-a-pee): Treatment in which a solid radioactive substance is implanted inside your body, near or next to the cancer cells.

CT scan: A series of detailed pictures of areas inside the body, taken from different angles; the pictures are created by a computer linked to an x-ray machine.

Catheter: A flexible tube used to place brachytherapy in the body.

Course of treatment: All of your radiation therapy sessions.

Cystitis: Inflammation in your urinary tract.

Diet: Foods you eat (does not always refer to a way to lose weight).

Dilator (DYE-lay-tor): A device that gently stretches the tissues of the vagina.

Dry heaves: A problem that occurs when your body tries to vomit even though your stomach is empty.

Erectile dysfunction (e-WRECK-tile dis-FUNK-shun): Not able to have an erection of the penis adequate for sexual intercourse. Also called impotence.

Esophagitis: Inflammation of the esophagus (the tube that carries food from the mouth to the stomach).

External beam radiation therapy (ray-dee-AY-shun): Treatment in which a radiation source from outside your body aims radiation at your cancer cells.

Fatigue: A feeling of being weary or exhausted.

Follow-up care: Check-up appointments that you have after your course of radiation therapy is over.

Hyperfractionated radiation therapy ((hy-per-FRAK-shuh-NAYT-id ray-dee-AY-shun THAYR-uh-pee): Treatment in which radiation is given in smaller doses twice a day.
**Imaging tests:** Tests that produce pictures of areas inside the body.

**Implant:** Radioactive material put in your body through a sealed thin wire, catheter, or tube.

**Impotence (IM-po-tense):** Not able to have an erection of the penis adequate for sexual intercourse. Also called erectile dysfunction.

**IMRT (intensity-modulated radiation therapy):** A technique that uses a computer to deliver precise radiation doses to a cancer tumor or specific areas within the tumor.

**Incontinence (in-KAHN-tih-nens):** A problem in which you cannot control the flow of urine from your bladder.

**Infertility:** Not being able to produce children.

**Inflammation:** Redness, swelling, pain, and/or a feeling of heat in an area of the body.

**Internal radiation therapy (ray-dee-AY-shun):** Treatment in which a radioactive substance is put inside your body.

**Intraoperative radiation (ray-dee-AY-shun):** Radiation treatment aimed directly at cancer during surgery.

**Late side effects:** Side effects that first occur 6 or more months after radiation therapy is finished.

**Local treatment:** Radiation is aimed at only the part of your body with cancer.

**Lymphedema:** A problem in which excess fluid collects in tissue and causes swelling. It may occur in the arm or leg after lymph vessels or lymph nodes in the underarm or groin are removed by surgery or treated with radiation.

**Medical leave:** Taking time off work for a while due to a medical problem.

**MRI (magnetic resonance imaging):** A procedure in which radio waves and a powerful magnet linked to a computer are used to create detailed pictures of areas inside the body.

**Nausea:** When you have an upset stomach or queasy feeling and feel like you are going to throw up.

**Pelvis:** The area between your legs. Also called the groin.

**Permanent implants:** Radioactive pellets or seeds that always stay in your body.

**PET (Positron emission tomography) scan:** A procedure in which a small amount of radioactive glucose (sugar) is injected into a vein, and a scanner is used to make detailed, computerized pictures of areas inside the body where the glucose is used. Because cancer cells often use more glucose than normal cells, the pictures can be used to find cancer cells in the body.

**Pruritus:** Severe itching.

**Psychostimulants:** Medicines that can help decrease fatigue, give a sense of well-being, and increase appetite.
Radiation necrosis: A problem in which dead tumor cells form a mass in the brain.

Radiation oncologist (ray-dee-AY-shun on-KO-lo-jist): A doctor who specializes in using radiation to treat cancer.

Radiation therapy (ray-dee-AY-shun): High doses of radiation used to treat cancer and other diseases.

Radiotherapy (RAY-dee-o-THER-a-pee): Another word for radiation therapy.

Simulation (sim-you-LAY-shun): A process used to plan radiation therapy so that the target area is precisely located and marked.

Sitz bath: A warm-water bath taken in a sitting position that covers only the hips and buttocks.

Skin breakdown: A side effect from radiation therapy in which the skin in the treatment area peels off faster than it can grow back.

Support groups: Meetings for people who share the same problems, such as cancer.

Treatment field: One or more places on your body where the radiation will be aimed. Also called treatment port.

Treatment port: One or more places on your body where the radiation will be aimed. Also called treatment field.


Vaginal stenosis (ste-NO-sis): A problem in which the vagina narrows and gets smaller.

Vomiting: When you get sick and throw up your food.

Xerostomia: Dry mouth.
Resources for Learning More

National Cancer Institute

Cancer Information Service
Answers questions about cancer clinical trials and cancer-related services and helps users find information on the NCI Web site. Provides NCI printed materials.

Toll-free: 1-800-4-CANCER (1-800-422-6237)
TTY: 1-800-332-8615
Online: http://www.cancer.gov
Chat online: http://www.cancer.gov/help

American Cancer Society
Offers a variety of services to patients and their families. It also supports research, provides printed materials, and conducts educational programs.

Toll-free: 1-800-ACS-2345 (1-800-227-2345)
Online: http://www.cancer.org

American Society for Therapeutic Radiology and Oncology
A society of radiation oncology professionals who specialize in treating patients with radiation therapy. Patients can get information on treating cancer with radiation and find a radiation oncologist in their area.

Toll-free: 1-800-962-7876
Online: http://www.astro.org

CancerCare, Inc.
Offers free support, information, financial assistance, and practical help to people with cancer and their loved ones.

Toll-free: 1-800-813-HOPE (1-800-813-4673)
Online: http://www.cancercare.org
E-mail: info@cancercare.org

fertileHOPE
Dedicated to helping people with cancer faced with infertility.

Toll-free: 1-888-994-HOPE (1-888-994-4673)
Online: http://www.fertilehope.org
**National Brain Tumor Foundation**
Dedicated to providing information and support for brain tumor patients, their family members, and health care professionals, while supporting innovative research into better treatment options and a cure for brain tumors.

Toll-free: 1-800-934-2873  
Online: http://www.braintumor.org

**National Lymphedema Network**
Provides education and guidance to lymphedema patients, health care professionals, and the general public by disseminating information on the prevention and management of primary and secondary lymphedema.

Toll-free: 800-541-3259  
Phone: 510-208-3200  
Online: http://www.lymphnet.org  
E-mail: nln@lymphnet.org

**National Oral Health Information Clearinghouse**
A service of the National Institute of Dental and Craniofacial Research that provides oral health information for special care patients.

Phone: 301-402-7364  
Online: http://www.nidcr.nih.gov

**The Wellness Community**
Provides free psychological and emotional support to cancer patients and their loved ones.

Toll-free: 1-888-793-WELL (1-888-793-9355)  
Phone: 202-659-9709  
Online: http://www.thewellnesscommunity.org  
E-mail: help@thewellnesscommunity.org
SECTION III – Eating Hints
Eating Hints
Before, During, and After Cancer Treatment
About this Book

*Eating Hints* is written for you—someone who is about to get, or is now getting, cancer treatment. Your family, friends, and others close to you may also want to read this book.

You can use this book before, during, and after cancer treatment. It has hints about common types of eating problems, along with ways to manage them.

This book covers:

- What you should know about cancer treatment, eating well, and eating problems
- How feelings can affect appetite
- Hints to manage eating problems
- How to eat well after cancer treatment ends
- Foods and drinks to help with certain eating problems
- Ways to learn more

Talk with your doctor, nurse, or dietitian about any eating problems that might affect you during cancer treatment. He or she may suggest that you read certain sections or follow some of the tips.

Rather than read this book from beginning to end, look at just those sections you need now. Later, you can always read more.
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People with cancer have different diet needs

People with cancer often need to follow diets that are different from what they think of as healthy. For most people, a healthy diet includes:

- Lots of fruits and vegetables, and whole grain breads and cereals
- Modest amounts of meat and milk products
- Small amounts of fat, sugar, alcohol, and salt

When you have cancer, though, you need to eat to keep up your strength to deal with the side effects of treatment. When you are healthy, eating enough food is often not a problem. But when you are dealing with cancer and treatment, this can be a real challenge.

When you have cancer, you may need extra protein and calories. At times, your diet may need to include extra milk, cheese, and eggs. If you have trouble chewing and swallowing, you may need to add sauces and gravies. Sometimes, you may need to eat low-fiber foods instead of those with high fiber. Your dietitian can help you with any diet changes you may need to make.

Cancer treatment can cause side effects that lead to eating problems

Cancer treatments are designed to kill cancer cells. But these treatments can also damage healthy cells. Damage to healthy cells can cause side effects. Some of these side effects can lead to eating problems. See the list on page 11 to see the types of eating problems that cancer treatment may cause.
Common eating problems during cancer treatment include:

- Appetite loss
- Changes in sense of taste or smell
- Constipation
- Diarrhea
- Dry mouth
- Lactose intolerance
- Nausea
- Sore mouth
- Sore throat and trouble swallowing
- Vomiting
- Weight gain
- Weight loss

Some people have appetite loss or nausea because they are stressed about cancer and treatment. People who react this way almost always feel better once treatment starts and they know what to expect.

**Things to do and think about before you start cancer treatment**

- Until treatment starts you will not know what, if any, side effects or eating problems you may have. If you do have problems, they may be mild. Many side effects can be controlled. Many problems go away when cancer treatment ends.

- Think of your cancer treatment as a time to get well and focus just on yourself.

- Eat a healthy diet before treatment starts. This helps you stay strong during treatment and lowers your risk of infection.

- Go to the dentist. It is important to have a healthy mouth before you start cancer treatment.
- Ask your doctor, nurse, or dietitian about medicine that can help with eating problems.

- Discuss your fears and worries with your doctor, nurse, or social worker. He or she can discuss ways to manage and cope with these feelings.

- Learn about your cancer and its treatment. Many people feel better when they know what to expect. See the list of helpful resources in “Ways to Learn More” starting on page 65.

### Ways you can get ready to eat well

- Fill the refrigerator, cupboard, and freezer with healthy foods. Make sure to include items you can eat even when you feel sick.

- Stock up on foods that need little or no cooking, such as frozen dinners and ready-to-eat cooked foods.

- Cook some foods ahead of time and freeze in meal-sized portions.

- Ask friends or family to help you shop and cook during treatment. Maybe a friend can set up a schedule of the tasks that need to be done and the people who will do them.

- Talk with your doctor, nurse, or dietitian about what to expect. You can find lists of foods and drinks to help with many types of eating problems on pages 49 to 64.

### Not everyone has eating problems during cancer treatment

There is no way to know if you will have eating problems and, if so, how bad they will be. You may have just a few problems or none at all. In part, this depends on the type of cancer you have, where it is in your body, what kind of treatment you have, how long treatment lasts, and the doses of treatment you receive.

During treatment, there are many helpful medicines and other ways to manage eating problems. Once treatment ends, many eating problems go away. Your doctor, nurse, or dietitian can tell you more about the types of eating problems you might expect and ways to manage them. If you start to have eating problems, tell your doctor or nurse right away.
If you start to have eating problems, tell your doctor or nurse right away.

Talk with your doctor, nurse, or dietitian about foods to eat

Talk with your doctor or nurse if you are not sure what to eat during cancer treatment. Ask him or her to refer you to a dietitian. A dietitian is the best person to talk with about your diet. He or she can help choose foods and drinks that are best for you during treatment and after.

Make a list of questions for your meeting with the dietitian. Ask about your favorite foods and recipes and if you can eat them during cancer treatment. You might want to find out how other patients manage their eating problems. You can also bring this book and ask the dietitian to mark sections that are right for you.

If you are already on a special diet for diabetes, kidney or heart disease, or other health problem, it is even more important to speak with a doctor and dietitian. Your doctor and dietitian can advise you about how to follow your special diet while coping with eating problems caused by cancer treatment.

For more information on how to find a dietitian, contact the American Dietetic Association. See “Ways to Learn More” on page 65 for ways to reach them.

Ways to get the most from foods and drinks

During treatment, you may have good days and bad days when it comes to food. Here are some ways to manage:

◆ Eat plenty of protein and calories when you can. This helps you keep up your strength and helps rebuild tissues harmed by cancer treatment.

◆ Eat when you have the biggest appetite. For many people, this is in the morning. You might want to eat a bigger meal early in the day and drink liquid meal replacements later on.
Eat those foods that you can, even if it is only one or two items. Stick with these foods until you are able to eat more. You might also drink liquid meal replacements for extra calories and protein.

Do not worry if you cannot eat at all some days. Spend this time finding other ways to feel better, and start eating when you can. Tell your doctor if you cannot eat for more than 2 days.

Drink plenty of liquids. It is even more important to get plenty to drink on days when you cannot eat. Drinking a lot helps your body get the liquid it needs. Most adults should drink 8 to 12 cups of liquid a day. You may find this easier to do if you keep a water bottle nearby. Also, try some of the clear liquids listed on page 49.

If others are making meals for you, be sure to tell them your needs and concerns.

Taking special care with food to avoid infections

Some cancer treatments can make you more likely to get infections. When this happens, you need to take special care in the way you handle and prepare food. Here are some ways:

Keep hot foods hot and cold foods cold. Put leftovers in the refrigerator as soon as you are done eating.

Scrub all raw fruits and vegetables before you eat them. Do not eat foods (like raspberries) that cannot be washed well. You should scrub fruits and vegetable that have rough surfaces, such as melons, before you cut them.

Wash your hands, knives, and counter tops before and after you prepare food. This is most important when preparing raw meat, chicken, turkey, and fish.

Use one cutting board for meat and one for fruits and vegetables.
- Thaw meat, chicken, turkey, and fish in the refrigerator or defrost them in the microwave. Do not leave them sitting out.

- Cook meat, chicken, turkey, and eggs thoroughly. Meats should not have any pink inside. Eggs should be hard, not runny.

- Do not eat raw fish or shellfish, such as sushi and uncooked oysters.

- Make sure that all of your juices, milk products, and honey are pasteurized.

- Do not use foods or drinks that are past their freshness date.

- Do not buy foods from bulk bins.

- Do not eat at buffets, salad bars, or self-service restaurants.

- Do not eat foods that show signs of mold. This includes moldy cheeses such as bleu cheese and Roquefort.

For more information about infection and cancer treatment, see *Chemotherapy and You: Support for People With Cancer*, a book from the National Cancer Institute. You can get it free by calling 1-800-4-CANCER (1-800-422-6237) or online at www.cancer.gov/publications.

**Using food, vitamins, and other supplements to fight cancer**

Many people want to know how they can help their body fight cancer by eating certain foods or taking vitamins or supplements. But, there are no studies that prove that any special diet, food, vitamin, mineral, dietary supplement, herb, or combination of these can slow cancer, cure it, or keep it from coming back. In fact, some of these products can cause other problems by changing how your cancer treatment works.

Talk with your doctor, nurse, or dietitian before going on a special diet or taking any supplements. To avoid problems, be sure to follow their advice.
For more information about complementary and alternative therapies, see *Thinking About Complementary & Alternative Medicine: A Guide for People With Cancer*. You can get this book free from the National Cancer Institute. Call 1-800-4-CANCER (1-800-422-6237) or order online at www.cancer.gov/publications.

Talk with your doctor before going on a special diet or taking any supplements. Some vitamins and supplements can change how your cancer treatment works.

A special note for caregivers

- **Do not be surprised or upset if your loved one’s tastes change from day to day.** There may be days when he or she does not want a favorite food or says it tastes bad now.

- **Keep food within easy reach.** This way, your loved one can have a snack when he or she is ready to eat. You might put a snack-pack of applesauce or pudding (along with a spoon) on the bedside table. Or try keeping a bag of cut-up carrots on the refrigerator shelf.

- **Offer gentle support.** This is much more helpful than pushing your loved one to eat. Suggest that he or she drinks plenty of clear and full liquids when he or she has no appetite. For ideas on clear liquids, see page 49, and for full liquids, see page 50.

- **Talk with your loved one about ways to manage eating problems.** Doing this together can help you both feel more in control.

For more information about being a caregiver, see *When Someone You Love Is Being Treated for Cancer*. You can get this book free from the National Cancer Institute. Call 1-800-4-CANCER (1-800-422-6237) or order online at www.cancer.gov/publications.
Feelings Can Affect Your Appetite During Cancer Treatment

During cancer treatment, you may feel:

- Depressed
- Anxious
- Afraid
- Angry
- Helpless
- Alone

It is normal to have these feelings. Although these are not eating problems themselves, strong feelings like these can affect your interest in food, shopping, and cooking. Fatigue can also make it harder to cope.

Coping with your feelings during cancer treatment

There are many things you can do to cope with your feelings during treatment so they do not ruin your appetite. Here are some ideas that have worked for other people.

- **Eat your favorite foods on days you do not have treatment.** This way, you can enjoy the foods, but they won’t remind you of something upsetting.

- **Relax, meditate, or pray.** Activities like these help many people feel calm and less stressed.

- **Talk with someone you trust about your feelings.** You may want to talk with a close friend, family member, religious or spiritual leader, nurse, social worker, counselor, or psychologist. You may also find it helpful to talk with someone who has gone through cancer treatment.
**Join a cancer support group.** This can be a way to meet others dealing with problems like yours. In support group meetings, you can talk about your feelings and listen to other people talk about theirs. You can also learn how others cope with cancer, treatment side effects, and eating problems. Ask your doctor, nurse, or social worker about support group meetings near you. You may also want to know about support groups that meet over the Internet. These can be very helpful if you cannot travel or there is no group that meets close by.

**Learn about eating problems and other side effects before treatment starts.** Many people feel more in control when they know what to expect and how to manage problems that may occur.

**Get enough rest.** Make sure you get at least 7 to 8 hours of sleep each night. During the day, spend time doing quiet activities such as reading or watching a movie.

**Do not push yourself to do too much or more than you can manage.** Look for easier ways to do your daily tasks. Many people feel better when they ask for or accept help from others.

**Be active each day.** Studies show that many people feel better when they take short walks or do light exercise each day. Being active like this can also help improve your appetite.

**Talk with your doctor or nurse about medicine if you find it very hard to cope with your feelings.**

**Ways to learn more**

The following groups provide support for people with cancer and their families and friends.

**The Cancer Support Community**

Dedicated to providing support, education, and hope to people affected by cancer.

- **Call:** 1-888-793-9355 or 202-659-9709
- **Visit:** www.cancersupportcommunity.org
- **E-mail:** help@cancersupportcommunity.org
CancerCare, Inc.

Offers free support, information, financial assistance, and practical help to people with cancer and their loved ones.

- Call: 1-800-813-HOPE (1-800-813-4673)
- Visit: www.cancercare.org
- E-mail: info@cancercare.org

To read more about ways to cope with your feelings, see *Taking Time: Support for People With Cancer*. To learn more about coping with fatigue caused by cancer treatment, see *Chemotherapy and You* and *Radiation Therapy and You*. These books are from the National Cancer Institute. You can get free copies at www.cancer.gov/publications or 1-800-4-CANCER (1-800-422-6237).
Eating Problems At-A-Glance

Below is a list of eating problems that cancer treatment may cause. Not everyone gets every eating problem. Some people don't have any problems. Which ones you might have will depend on the type and doses of treatment you receive and whether you have other health problems, such as diabetes or kidney or heart disease.

Talk with your doctor, nurse or dietitian about the eating problems on this list. Ask which ones might affect you. Put a check mark next to the ones you may get or are having now and go to the pages listed to learn more.

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Appetite Loss

What it is

Appetite loss is when you do not want to eat or do not feel like eating very much. It is a common problem that occurs with cancer and its treatment. You may have appetite loss for just 1 or 2 days, or throughout your course of treatment.

Why it happens

No one knows just what causes appetite loss. Reasons may include:

✦ The cancer itself
✦ Fatigue
✦ Pain
✦ Feelings such as stress, fear, depression, and anxiety
✦ Cancer treatment side effects such as nausea, vomiting, or changes in how foods taste or smell

Ways to manage with food

✦ When it is hard to eat, drink a liquid or powdered meal replacement (such as “instant breakfast”).

✦ Eat 5 or 6 small meals each day instead of 3 large meals. You may find it helps to eat smaller amounts at one time. This can also keep you from feeling too full.

✦ Keep snacks nearby for when you feel like eating. Take easy-to-carry snacks such as peanut butter crackers, nuts, granola bars, or dried fruit when you go out. You can find more quick and easy snack ideas on page 57.

✦ Add extra protein and calories to your diet. You can find ways to add protein on page 59 and calories on page 63.
Drink liquids throughout the day—even when you do not want to eat. Choose liquids that add calories and other nutrients. These include juice, soup, and milk and soy-based drinks with protein. You can find lists of clear liquids on page 49 and full-liquid foods on page 50.

Eat a bedtime snack. This will give extra calories but won’t affect your appetite for the next meal.

Change the form of a food. For instance, you might make a fruit milkshake instead of eating a piece of fruit. There is a recipe on the next page.

Eat soft, cool, or frozen foods. These include yogurt, milkshakes, and popsicles. There is a recipe for banana milkshake on the next page.

Eat larger meals when you feel well and are rested. For many people, this is in the morning after a good night’s sleep.

Sip only small amounts of liquids during meals. Many people feel too full if they eat and drink at the same time. If you want more than just small sips, have a larger drink at least 30 minutes before or after meals.

Other ways to manage

Talk with a dietitian. He or she can discuss ways to get enough calories and protein even when you do not feel like eating.

Try to have relaxed and pleasant meals. This includes being with people you enjoy as well as having foods that look good to eat.

Exercise. Being active can help improve your appetite. Studies show that many people with cancer feel better when they get some exercise each day.

Talk with your nurse or social worker if fear, depression, or other feelings affect your appetite or interest in food. He or she can suggest ways to help.

Tell your doctor if you are having nausea, vomiting, or changes in how foods taste or smell. Your doctor can help control these problems so that you feel more like eating.
RECIPE
To help with appetite loss

Banana Milkshake

1 whole ripe banana, sliced
Vanilla extract (a few drops)
1 cup milk

Put all ingredients into a blender.
Blend at high speed until smooth.

Yield: 1 serving
Serving size:
Approximately 2 cups

If made with whole milk:
Calories per serving:
255 calories
Protein per serving: 9 grams

If made with 2% milk:
Calories per serving:
226 calories
Protein per serving: 9 grams

If made with skim milk:
Calories per serving:
190 calories
Protein per serving: 9 grams

To learn more about dealing with appetite loss, see the section about weight loss on page 41.
Changes in Sense of Taste or Smell

What it is

Food may have less taste or certain foods (like meat) may be bitter or taste like metal. Your sense of smell may also change. Sometimes, foods that used to smell good to you no longer do.

Why it happens

Cancer treatment, dental problems, or the cancer itself can cause changes in your sense of taste or smell. Although there is no way to prevent these problems, they often get much better after treatment ends.

Ways to manage with food

- **Choose foods that look and smell good.** Avoid foods that do not appeal to you. For instance, if red meat (such as beef) tastes or smells strange, then try chicken or turkey.

- **Marinate foods.** You can improve the flavor of meat, chicken, or fish by soaking it in a marinade. You can buy marinades in the grocery store or try fruit juices, wine, or salad dressing. While soaking food in a marinade, keep it in the refrigerator until you are ready to cook it.

- **Try tart foods and drinks.** These include oranges and lemonade. Tart lemon custard might taste good and add extra protein and calories. But do not eat tart foods if you have a sore mouth or sore throat.

- **Make foods sweeter.** If foods have a salty, bitter, or acid taste, adding sugar or sweetener to make them sweeter might help.

- **Add extra flavor to your foods.** For instance, you might add bacon bits or onion to vegetables or use herbs like basil, oregano, and rosemary. Use barbecue sauce on meat and chicken.
Avoid foods and drinks with smells that bother you. Here are some ways to help reduce food smells:

- Serve foods at room temperature
- Keep foods covered
- Use cups with lids (such as travel mugs)
- Drink through a straw
- Use a kitchen fan when cooking
- Cook outdoors
- When cooking, lift lids away from you

Eat with plastic forks and spoons if you have a metal taste in your mouth.

Other ways to manage

- Talk with a dietitian. He or she can give you other ideas about how to manage changes in taste and smell.

- Eat with plastic forks and spoons. If you have a metal taste in your mouth, eating with plastic forks and spoons can help. If you enjoy eating with chopsticks, those might help, too. Also, try cooking foods in glass pots and pans instead of metal ones.

- Keep your mouth clean. Keeping your mouth clean by brushing and flossing can help food taste better.

- Use special mouthwashes. Ask your dentist or doctor about mouthwashes that might help, as well as other ways to care for your mouth.

- Go to the dentist. He or she can make sure that your changed sense of taste or smell is not from dental problems.

- Talk with your doctor or nurse. Tell them about any changes in taste or smell and how these changes keep you from eating.
Constipation

What it is

Constipation occurs when bowel movements become less frequent and stools become hard, dry, and difficult to pass. You may have painful bowel movements, feel bloated, or have nausea. You may belch, pass a lot of gas, and have stomach cramps or pressure in the rectum.

Why it happens

Chemotherapy, the location of the cancer, pain medication, and other medicines can cause constipation. It can also happen when you do not drink enough liquids or do not eat enough fiber. Some people get constipation when they are not active.

Ways to manage with food

- **Drink plenty of liquids.** Drink at least 8 cups of liquids each day. One cup is equal to 8 ounces. For ideas, see the list of clear liquids on page 49.

- **Drink hot liquids.** Many people find that drinking warm or hot liquids (such as coffee, tea, and soup) can help relieve constipation. You might also try drinking hot liquids right after meals.

- **Eat high-fiber foods.** These include whole grain breads and cereals, dried fruits, and cooked dried beans or peas. Try the recipe on page 19. For other ideas, see the list of high-fiber foods on page 55. People with certain types of cancer should not eat a lot of fiber, so check with your doctor before adding fiber to your diet.
Talk with your doctor before taking laxatives, stool softeners, or any medicine to relieve constipation.

Other ways to manage

◆ **Talk with a dietitian.** He or she can suggest foods to help relieve constipation.

◆ **Keep a record of your bowel movements.** Show this to your doctor or nurse and talk about what is normal for you. This record can be used to figure out whether you have constipation.

◆ **Be active each day.** Being active can help prevent and relieve constipation. Talk with your doctor about how active you should be and what kind of exercise to do.

◆ **Let your doctor or nurse know if you have not had a bowel movement in 2 days.** Your doctor may suggest a fiber supplement, laxative, stool softener, or enema. Do not use any of these without first asking your doctor or nurse.
Apple/Prune Sauce

1/3 cup unprocessed bran
1/3 cup applesauce
1/3 cup mashed stewed prunes

Blend all ingredients and store in a refrigerator.

Take 1-2 tablespoons of this mixture before bedtime, then drink 8 ounces of water.

Note: Make sure you drink the water, or else this recipe will not work to relieve constipation.

Yield: 16 servings

Serving size: 1 tablespoon

Calories per serving: 10 calories
Diarrhea

What it is

Diarrhea occurs when you have frequent bowel movements that may be soft, loose, or watery. Foods and liquids pass through the bowel so quickly that your body cannot absorb enough nutrition, vitamins, minerals, and water from them. This can cause dehydration (which occurs when your body has too little water). Diarrhea can be mild or severe and last a short or long time.

Why it happens

Diarrhea can be caused by cancer treatments such as radiation therapy to the abdomen or pelvis, chemotherapy, or biological therapy. These treatments cause diarrhea because they can harm healthy cells in the lining of your large and small bowel. Diarrhea can also be caused by infections, medicine used to treat constipation, or antibiotics.

Ways to manage with food

◆ **Drink plenty of fluids to replace those you lose from diarrhea.** These include water, ginger ale, and sports drinks such as Gatorade® and Propel®. You can see a list of more clear liquids on page 49.

◆ **Let carbonated drinks lose their fizz before you drink them.** Add extra water if drinks make you thirsty or they cause nausea.

◆ **Eat 5 or 6 small meals each day instead of 3 large meals.**

◆ **Eat foods and liquids that are high in sodium and potassium.** When you have diarrhea, your body loses these substances, and it is important to replace them. Liquids with sodium include bouillon or fat-free broth. Foods high in potassium include bananas, canned apricots, and baked, boiled, or mashed potatoes.
Eat low-fiber foods. Foods high in fiber can make diarrhea worse. Low-fiber foods include plain or vanilla yogurt, white toast, and white rice. You can find a list of more low-fiber foods on page 54.

Have foods and drinks at room temperature, neither too hot nor too cold.

Avoid foods or drinks that can make diarrhea worse. These include:

- Foods high in fiber, such as whole wheat breads and pasta
- Drinks that have a lot of sugar, such as regular soda and fruit punch
- Very hot or very cold drinks
- Greasy, fatty, or fried foods, such as French fries and hamburgers
- Foods and drinks that can cause gas. These include cooked dried beans and raw fruits and vegetables.
- Milk products, unless they are low-lactose or lactose-free
- Beer, wine, and other types of alcohol
- Spicy foods, such as pepper, hot sauce, salsa, and chili
- Foods or drinks with caffeine. These include regular coffee, tea, some sodas, and chocolate.
- Sugar-free products that are sweetened with xylitol or sorbitol. These are found mostly in sugar-free gums and candy. Read product labels to find out if they have these sweeteners in them.
- Apple juice, since it is high in sorbitol

Drink only clear liquids for 12 to 14 hours after a sudden attack of diarrhea. This lets your bowels rest and helps replace lost fluids. Let your doctor know if you have sudden diarrhea.

Ask your doctor or nurse before taking medicine for diarrhea.
Other ways to manage

◆ **Talk with a dietitian.** He or she can help you choose foods to prevent dehydration. The dietitian can also tell you which foods are good to eat and which ones to avoid when you have diarrhea.

◆ **Be gentle when wiping yourself after a bowel movement.** Instead of toilet paper, clean yourself with wet wipes or squirt water from a spray bottle. Tell your doctor or nurse if your rectal area is sore or bleeds or if you have hemorrhoids.

◆ **Tell your doctor if you have had diarrhea for more than 24 hours.** He or she also needs to know if you have pain and cramping. Your doctor may prescribe medicine to help control these problems. You may also need IV fluids to replace lost water and nutrients. This means you will receive the fluids through a needle inserted into a vein. Do not take medicine for diarrhea without first asking your doctor or nurse.
Dry Mouth

What it is
Dry mouth occurs when you have less saliva than you used to. This can make it harder to talk, chew, and swallow food. Dry mouth can also change the way food tastes.

Why it happens
Chemotherapy and radiation therapy to the head or neck area can damage the glands that make saliva. Biological therapy and some medicines can also cause dry mouth.

Ways to manage with food

- **Sip water throughout the day.** This can help moisten your mouth, which can help you swallow and talk. Many people carry water bottles with them.

- **Have very sweet or tart foods and drinks (such as lemonade).** These help you make more saliva. But do not eat or drink anything sweet or tart if you have a sore mouth or sore throat. It might make these problems worse.

- **Chew gum or suck on hard candy, popsicles, and ice chips.** These help make saliva, which moistens your mouth. Choose sugar-free gum or candy since too much sugar can cause cavities in your teeth. If you also have diarrhea, check with your dietitian before using sugar-free products as some sweeteners can make it worse.

- **Eat foods that are easy to swallow.** Try pureed cooked foods or soups. You can find a list of foods and drinks that are easy to chew and swallow on page 56.

- **Moisten food with sauce, gravy, or salad dressing.** This helps make food easy to swallow.

- **Do not drink beer, wine, or any type of alcohol.** These can make your mouth even drier.
Avoid foods that can hurt your mouth. This includes foods that are very spicy, sour, salty, hard, or crunchy.

Other ways to manage

- Talk with a dietitian. He or she can discuss ways to eat even when a dry mouth makes it hard for you to chew.
- Keep your lips moist with lip balm.
- Rinse your mouth every 1 to 2 hours. Mix ¼ teaspoon baking soda and ⅛ teaspoon salt with 1 cup warm water. Rinse with plain water after using this mixture.
- Do not use mouthwash that has alcohol. Alcohol makes a dry mouth worse.
- Do not use tobacco products, and avoid second-hand smoke. Tobacco products and smoke can hurt your mouth and throat.
- Talk with your doctor or dentist. Ask about artificial saliva or other products to coat, protect, and moisten your mouth and throat. These products can help with severe dry mouth.

Ways to learn more

National Oral Health Information Clearinghouse

A service of the National Institute of Dental and Craniofacial Research that provides oral health information for special care patients. Ask about their booklets, Chemotherapy and Your Mouth and Head and Neck Radiation Treatment and Your Mouth.

Call: 301-402-7364
Visit: www.nidcr.nih.gov
E-mail: nidcrinfo@mail.nih.gov
Lactose Intolerance

What it is

Lactose intolerance occurs when your body cannot digest or absorb a milk sugar called lactose. Lactose is in milk products such as cheese, ice cream, and pudding. Symptoms of lactose intolerance can be mild or severe and may include gas, cramps, and diarrhea. These symptoms may last for weeks or even months after treatment ends. Sometimes, lactose intolerance is a life-long problem.

Why it happens

Lactose intolerance can be caused by radiation therapy to the abdomen or pelvis or other treatments that affect the digestive system, such as surgery or antibiotics.

Ways to manage with food

◆ Prepare your own low-lactose or lactose-free foods. You can find a sample recipe on the next page.

◆ Choose lactose-free or low-lactose milk products. Most grocery stores have products (such as milk and ice cream) labeled “lactose-free” or “low-lactose.”

◆ Try products made with soy or rice (such as soy or rice milk and ice cream). These products do not have any lactose. People with certain types of cancer may not be able to eat soy products. So, ask your dietitian if soy is safe for you to add to your diet.

◆ Choose milk products that are low in lactose. Hard cheeses (such as cheddar) and yogurt are less likely to cause problems.
Other ways to manage

- Talk with a dietitian. He or she can help you choose foods that are low in lactose.
- Talk with your doctor. He or she may suggest medicine to help with lactose intolerance. These include lactase tablets. Lactase is a substance that breaks down lactose.

**RECIPE**

To help with lactose intolerance

**Lactose-Free Double Chocolate Pudding**

2 squares baking chocolate (1 ounce each)  
1 cup nondairy creamer, rice, soy, or lactose-free milk  
1 tablespoon cornstarch  
¼ cup granulated sugar  
1 teaspoon vanilla extract

Melt chocolate in a small pan.  
Measure cornstarch and sugar into a separate saucepan.  
Add part of the liquid and stir until cornstarch dissolves.  
Add the rest of the liquid.  
Cook over medium heat until warm.  
Stir in chocolate until mixture is thick and comes to a boil.  
Remove from heat.  
Blend in vanilla and cool.

**Yield:**  
2 servings  
**Serving size:**  
¾ cup  
**Calories per serving:**  
382 calories  
**Protein per serving:**  
1 gram
Nausea

What it is

Nausea occurs when you feel queasy or sick to your stomach. It may be followed by vomiting (throwing up), but not always. Nausea can keep you from getting the food and nutrients you need. Not everyone gets nausea and those who do may get it right after a treatment or up to 3 days later. Nausea almost always goes away once treatment ends.

Why it happens

Nausea can be a side effect of surgery, chemotherapy, biological therapy, and radiation therapy to the abdomen, small intestine, colon, or brain. It can also be caused by certain types of cancer or other illnesses.

Ways to manage with food

◆ Eat foods that are easy on your stomach. These include white toast, plain or vanilla yogurt, and clear broth. Try lemon, lime, or other tart-flavored foods. You can see more ideas of foods that are easy on the stomach on pages 52 and 53.

◆ Eat 5 or 6 small meals each day instead of 3 large meals. Many people find it easier to eat smaller amounts, more often.

◆ Do not skip meals and snacks. Even if you do not feel hungry, you should still eat. For many people, having an empty stomach makes nausea worse.

◆ Choose foods that appeal to you. Do not force yourself to eat any food that makes you feel sick. At the same time, do not eat your favorite foods, so you don’t link them to feeling sick.

◆ Sip only small amounts of liquids during meals. Many people feel full or bloated if they eat and drink at the same time.

◆ Have liquids throughout the day. Drink slowly. Sip liquids through a straw. Or, drink from a water bottle.
• Have foods and drinks that are not too hot and not too cold. Let hot foods and drinks cool down and cold foods and drinks warm up before you eat or drink them. You can cool hot foods and drinks by adding ice or warm up cold foods in a microwave.

• Eat dry toast or crackers before getting out of bed if you have nausea in the morning.

• Plan when it is best for you to eat and drink. Some people feel better when they eat a light meal or snack before treatment. Others feel better when they have treatment on an empty stomach (nothing to eat or drink for 2 to 3 hours before).

Be sure to tell your doctor or nurse if antinausea medicine does not help.

Other ways to manage

• Talk with your doctor about medicine to prevent nausea (antiemetics or antinausea medicines). Be sure to tell your doctor or nurse if the medicines are not helping. If one medicine does not work well, your doctor may prescribe another. You may need to take them 1 hour before each treatment and for a few days after. The type of cancer treatment you get and how you react to it affects how long you need to take these medicines. Acupuncture may also help. Talk with your doctor or nurse if you want to try it.

• Talk with a dietitian about ways to get enough to eat even if you have nausea.

• Relax before each cancer treatment. You may feel better if you try deep breathing, meditation, or prayer. Many people relax with quiet activities such as reading or listening to music.

• Rest after meals. But do so sitting up, not lying down.
◆ Wear clothes that are comfortable and loose.

◆ Keep a record of when you feel nausea and why. Show this to your nurse, doctor, or dietitian. He or she might suggest ways to change your diet.

◆ Avoid strong food and drink smells. These include foods that are being cooked, coffee, fish, onions, and garlic. Ask a friend or family member to cook for you to help avoid cooking smells.

◆ Open a window or turn on a fan if your living area feels stuffy. Fresh air can help relieve nausea. Be sure not to eat in rooms that are too warm or stuffy.
Sore Mouth

What it is

Radiation therapy to the head or neck, chemotherapy, and biological therapy can cause mouth sores (little cuts or ulcers in your mouth) and tender gums. Dental problems or mouth infections, such as thrush, can also make your mouth sore.

Why it happens

Cancer treatments can harm the fast-growing cells in the lining of your mouth and lips. Your mouth and gums will most likely feel better once cancer treatment ends.

Ways to manage with food

◆ Choose foods that are easy to chew. Certain foods can hurt a sore mouth and make it harder to chew and swallow. To help, choose soft foods such as milkshakes, scrambled eggs, and custards. Try the recipe on page 33. For other ideas, see page 56 for a list of foods and drinks that are easy to chew and swallow.

◆ Cook foods until they are soft and tender.

◆ Cut food into small pieces. You can also puree foods using a blender or food processor.

◆ Drink with a straw. This can help push the drinks beyond the painful parts of your mouth.

◆ Use a very small spoon (such as a baby spoon). This will help you take smaller bites, which may be easier to chew.

◆ Eat cold or room-temperature food. Your mouth may hurt more if food is too hot.

◆ Suck on ice chips. Ice may help numb and soothe your mouth.
Avoid certain foods and drinks when your mouth is sore. These include:

- Citrus fruits and juices, such as oranges, lemons, and lemonade
- Spicy foods, such as hot sauces, curry dishes, salsa, and chili peppers
- Tomatoes and ketchup
- Salty foods
- Raw vegetables
- Sharp, crunchy foods, such as granola, crackers, and potato and tortilla chips
- Drinks that contain alcohol

If you have a sore mouth, do not use tobacco products or drink alcohol.

Other ways to manage

- Talk with a dietitian. He or she can help you choose foods that are easy on a sore mouth.

- Visit a dentist at least 2 weeks before starting biological therapy, chemotherapy, or radiation therapy to the head or neck. It is important to have a healthy mouth before starting cancer treatment. Try to get all needed dental work done before your treatment starts. If you can’t, ask your doctor or nurse when it will be safe to go to the dentist. Tell your dentist that you have cancer and the type of treatment you are getting.

- Rinse your mouth 3 to 4 times a day. Mix ¼ teaspoon baking soda and ½ teaspoon salt with 1 cup warm water. Rinse with plain water after using this mixture.

- Check each day for any sores, white patches, or puffy and red areas in your mouth. This way, you can see or feel problems as soon as they start. Tell your doctor if you notice these changes.
Do not use items that can hurt or burn your mouth, such as:
- Mouthwash with alcohol in it
- Toothpicks or other sharp objects
- Cigarettes, cigars, or other tobacco products
- Beer, wine, liquor, or other type of alcohol

Tell your doctor and dentist if your mouth or gums are sore. They can figure out whether these are from treatment or dental problems. Ask the dentist about special products to clean and soothe sore teeth and gums.

Ask your doctor about medicine for pain. He or she may suggest lozenges or sprays that numb your mouth while eating.

Ways to learn more

**National Oral Health Information Clearinghouse**
A service of the National Institute of Dental and Craniofacial Research that provides oral health information for special care patients. Ask about their booklets, *Chemotherapy and Your Mouth* and *Head and Neck Radiation Treatment and Your Mouth*.

Call: 301-402-7364
Visit: www.nidcr.nih.gov
E-mail: nidcrinfo@mail.nih.gov

**Smokefree.gov**
Provides resources, including information about tobacco quit lines, a step-by-step smoking cessation guide, and publications to help you or someone you care about quit smoking.

Call: 1-877-44U-QUIT (1-877-448-7848)
Visit: www.smokefree.gov
RECIPE
To help with a sore mouth

Fruit and Cream

1 cup whole milk
1 cup vanilla ice cream or frozen yogurt
1 cup canned fruit (peaches, apricots, pears) in heavy syrup with juice
Almond or vanilla extract to taste

Yield:
2 servings

Serving size:
1 1/2 cups

If made with ice cream:
Calories per serving:
302 calories
Protein per serving:
7 grams

If made with frozen yogurt:
Calories per serving:
268 calories
Protein per serving:
9 grams

Blend ingredients in a blender and chill well before serving.
Sore Throat and Trouble Swallowing

What it is

Chemotherapy and radiation therapy to the head and neck can make the lining of your throat inflamed and sore (esophagitis). It may feel as if you have a lump in your throat or that your chest or throat is burning. You may also have trouble swallowing. These problems may make it hard to eat and cause weight loss.

Why it happens

Some types of chemotherapy and radiation to the head and neck can harm fast-growing cells, such as those in the lining of your throat. Your risk for a sore throat, trouble swallowing, or other throat problems depends on:

◆ How much radiation you are getting
◆ If you are getting chemotherapy and radiation therapy at the same time
◆ Whether you use tobacco or drink alcohol during your course of cancer treatment

Ways to manage with food

◆ Eat 5 or 6 small meals each day instead of 3 large meals. You may find it easier to eat a smaller amount of food at one time.

◆ Choose foods that are easy to swallow. Some foods are hard to chew and swallow. To help, choose soft foods such as milkshakes, scrambled eggs, and cooked cereal. For other ideas, see page 56 for a list of foods and drinks that are easy to chew and swallow.

◆ Choose foods and drinks that are high in protein and calories. See the lists about ways to add protein on page 59 and ways to add calories on page 63. If weight loss is a problem, see the section about weight loss on page 41.

◆ Cook foods until they are soft and tender.
◆ Cut food into small pieces. You can also puree foods using a blender or food processor.

◆ Moisten and soften foods with gravy, sauces, broth, or yogurt.

◆ Sip drinks through a straw. This may make them easier to swallow.

◆ Do not eat or drink things that can burn or scrape your throat, such as:
  - Hot foods and drinks
  - Spicy foods
  - Foods and juices that are high in acid, such as tomatoes, oranges, and lemonade
  - Sharp, crunchy foods, such as potato and tortilla chips
  - Drinks that contain alcohol

Tell your doctor or nurse if you:
◆ Have trouble swallowing
◆ Feel as if you are choking
◆ Cough while eating or drinking

Other ways to manage
◆ Talk with a dietitian. He or she can help you choose foods that are easy to swallow.

◆ Sit upright and bend your head slightly forward when eating or drinking. Stay sitting or standing upright for at least 30 minutes after eating.

◆ Do not use tobacco products. These include cigarettes, pipes, cigars, and chewing tobacco. All of these can make your throat problems worse.
◆ **Think about tube feedings.** Sometimes, you may not be able to eat enough to stay strong and a feeding tube may be a good option. Your doctor or dietitian will discuss this with you if he or she thinks it will help you.

◆ **Talk with your doctor or nurse.** Tell your doctor or nurse if you have trouble swallowing, feel as if you are choking, cough while eating or drinking, or notice other throat problems. Also mention if you have pain or are losing weight. Your doctor may prescribe medicines to help relieve these symptoms. They include antacids and medicines to coat your throat and control your pain.

**Ways to learn more**

**Smokefree.gov**

Provides resources, including information about tobacco quit lines, a step-by-step smoking cessation guide, and publications to help you or someone you care about quit smoking.

Call: 1-877-44U-QUIT (1-877-448-7848)

Visit: www.smokefree.gov
Vomiting

What it is

Vomiting is another way to say “throwing up.”

Why it happens

Vomiting may follow nausea and be caused by cancer treatment, food odors, motion, an upset stomach, or bowel gas. Some people vomit when they are in places (such as hospitals) that remind them of cancer. Vomiting, like nausea, can happen right after treatment or 1 or 2 days later. You may also have dry heaves, which occur when your body tries to vomit even though your stomach is empty.

Biological therapy, some types of chemotherapy, and radiation therapy to the abdomen, small intestine, colon, or brain can cause nausea, vomiting, or both. Often, this happens because these treatments harm healthy cells in your digestive track.

Ways to manage with food

♦ Do not have anything to eat or drink until your vomiting stops.

♦ Once the vomiting stops, drink small amounts of clear liquids (such as water or bouillon). Be sure to start slowly and take little sips at a time. You can find a list of other clear liquids on page 49.

♦ Once you can drink clear liquids without vomiting, try full-liquid foods and drinks or those that are easy on your stomach. You can slowly add back solid foods when you start feeling better. There is a list of full-liquid foods on page 50 and a list of foods and drinks that are easy on the stomach on page 52.
Eat 5 or 6 small meals each day instead of 3 large meals. Once you start eating, it may be easier to eat smaller amounts at a time. Do not eat your favorite foods at first, so that you do not begin to dislike them.

Be sure to tell your doctor or nurse if your antinausea medicine is not helping.

Other ways to manage

- **Talk with a dietitian.** He or she can suggest foods to eat once your vomiting stops.

- **Ask your doctor to prescribe medicine to prevent or control vomiting (antiemetics or antinausea medicines).** Be sure to tell your doctor or nurse if the medicine is not helping. Your doctor may prescribe another. You may need to take these medicines 1 hour before each treatment and for a few days after. The type of cancer treatment you get and how you react to it affects how long you need to take these medicines. You may also want to talk with your doctor or nurse about acupuncture. It might also help.

- **Prevent nausea.** One way to prevent vomiting is to prevent nausea. You can learn more about nausea on page 27.

- **Call your doctor if your vomiting is severe or lasts for more than 1 or 2 days.** Vomiting can lead to dehydration (which occurs when your body does not have enough water). Your doctor needs to know if you cannot keep liquids down.
Weight Gain

What it is

Weight gain occurs when you have an increase in body weight. Many people with cancer think they will lose weight and are surprised, and sometimes upset, when they gain weight.

Why it happens

Weight gain can happen for many reasons:

- People with certain types of cancer are more likely to gain weight.

- Hormone therapy, certain types of chemotherapy, and medicines such as steroids can cause weight gain. These treatments can also cause your body to retain water, which makes you feel puffy and gain weight.

- Some treatments can also increase your appetite so you feel hungry and eat more. You gain weight when you eat more calories than your body needs.

- Cancer and its treatments can cause fatigue and changes in your schedule that may lead to a decrease in activity. Being less active can cause weight gain.

Do not go on a diet to lose weight before talking with your doctor about it. He or she will help figure out why you are gaining weight and discuss what you can do about it.

Ways to manage with food

- Eat lots of fruits and vegetables. These are high in fiber and low in calories. They can help you feel full without adding a lot of calories.
Eat foods that are high in fiber, such as whole grain breads, cereals, and pasta. For more ideas, see the list of high-fiber foods on page 55. People with certain types of cancer should not eat a lot of fiber, so check with your doctor before adding fiber to your diet.

Choose lean meats, such as lean beef, pork trimmed of fat, or poultry without skin.

Choose low-fat milk products. These include low-fat or non-fat yogurt and skim or 1% milk.

Eat less fat. Eat only small amounts of butter, mayonnaise, desserts, fried foods, and other high-calorie foods.

Cook with low-fat methods, such as broiling, steaming, grilling, or roasting.

Eat small portion sizes. When you eat out, take half of your meal home to eat later.

Eat less salt. This helps you not retain water if your weight gain is from fluid retention.

Other ways to manage

Talk with a dietitian. He or she can discuss ways to limit the amount of salt you eat if your weight gain is from fluid retention. A dietitian can also help you choose healthy foods and make healthy changes to your favorite recipes.

Exercise each day. Not only does exercise help you burn calories, but studies show that it helps people with cancer feel better. Talk with your doctor or nurse about how much exercise to do while having cancer treatment.

Talk with your doctor before going on a diet to lose weight. He or she can help figure out why you are gaining weight and prescribe medicine (called a diuretic) if you have fluid retention.
Weight Loss

What it is

Weight loss is when you have a decrease in body weight.

Why it happens

Weight loss can be caused by cancer itself, or by side effects of cancer treatment, such as nausea and vomiting. Stress and worry can also cause weight loss. Many people with cancer have weight loss during treatment.

Ways to manage with food

- Eat when it is time to eat, rather than waiting until you feel hungry. You still need to eat even if you do not feel hungry while being treated for cancer.

- Eat 5 or 6 small meals each day instead of 3 large meals. You may find it easier to eat smaller amounts at one time.

- Eat foods that are high in protein and calories. You can also add protein and calories to other foods. Try the recipe for peanut butter snack spread on page 43. For other ideas, see the lists of how to add protein on page 59 and how to add calories on page 63.

- Drink milkshakes, smoothies, juices, or soups if you do not feel like eating solid foods. These can provide the protein, vitamins, and calories your body needs. Try the recipe for the high-protein milkshake on page 43. For other ideas, see the list of full-liquid foods on page 50.

- Cook with protein-fortified milk. You can use protein-fortified milk (instead of regular milk) when cooking foods such as macaroni and cheese, pudding, cream sauce, mashed potatoes, cocoa, soups, or pancakes. See the recipe for protein-fortified milk on the next page.
Other ways to manage

- **Talk with a dietitian.** He or she can give you ideas about how to maintain or regain your weight. This includes choosing foods that are high in protein and calories and adapting your favorite recipes.

- **Be as active as you can.** You might have more appetite if you take a short walk or do other light exercise. Studies show that many people with cancer feel better when they exercise each day.

- **Think about tube feedings.** Sometimes, you may not be able to eat enough to stay strong and a feeding tube may be a good option. Your doctor or dietitian will discuss this with you if he or she thinks it will help you.

- **Tell your doctor if you are having eating problems,** such as nausea, vomiting, or changes in how foods taste and smell. He or she can help control these so you can eat better.

### RECIPES

**To help with weight loss**

### Protein-Fortified Milk

1 quart (4 cups) whole milk
1 cup nonfat instant dry milk

Pour liquid milk into a deep bowl.
Add dry milk and beat slowly with a mixer until dry milk is dissolved (usually less than five minutes).
Refrigerate and serve cold.

**Note:** If it tastes too strong, start with ½ cup of dry milk powder and slowly work up to 1 cup.

**Yield:** 1 quart

**Serving size:** 1 cup

**Calories per serving:** 211 calories

**Protein per serving:** 14 grams
High-Protein Milkshake

1 cup protein-fortified milk
2 tablespoons butterscotch sauce, chocolate sauce, or your favorite fruit syrup or sauce
½ cup ice cream
½ teaspoon vanilla extract

Put all ingredients in a blender.
Blend at low speed for 10 seconds.

Yield: 1 serving
Serving size: Approximately 1½ cups
Calories per serving: 425 calories
Protein per serving: 17 grams

Peanut Butter Snack Spread

1 tablespoon nonfat instant dry milk
1 tablespoon honey
1 teaspoon water
5 tablespoons smooth peanut butter
1 teaspoon vanilla extract

Combine dry milk, water, and vanilla, and stir to moisten.
Add honey and peanut butter, and stir slowly until blended.
Spread on crackers.
Mixture also can be formed into balls, chilled, and eaten as candy.
K e e p s we ll in a r e f r i g e r a t o r , b u t i s h a r d t o s t r e a d w h e n c o ld .

Yield: 6 tbsp
Serving size: 3 tbsp
Calories per serving: 279 calories
Protein per serving: 11 grams
After Cancer Treatment

Many eating problems go away when treatment ends

Once you finish cancer treatment, many of your eating problems will get better. Some eating problems, such as weight loss and changes in taste or smell, may last longer than your course of treatment. If you had treatment for head and neck cancer or surgery to remove part of your stomach or intestines, then eating problems may always be part of your life.

Return to healthy eating

While healthy eating by itself cannot keep cancer from coming back, it can help you regain strength, rebuild tissue, and improve how you feel after treatment ends. Here are some ways to eat well after treatment ends:

◆ Prepare simple meals that you like and are easy to make.

◆ Cook 2 or 3 meals at a time. Freeze the extras to eat later on.

◆ Stock up on frozen dinners.

◆ Make cooking easy, such as buying cut-up vegetables from a salad bar.

◆ Eat many different kinds of foods. No single food has all the vitamins and nutrients you need.

◆ Eat lots of fruits and vegetables. This includes eating raw and cooked vegetables, fruits, and fruit juices. These all have vitamins, minerals, and fiber.

◆ Eat whole wheat bread, oats, brown rice, or other whole grains and cereals. These have needed complex carbohydrates, vitamins, minerals, and fiber.

◆ Add beans, peas, and lentils to your diet and eat them often.

◆ Go easy on fat, salt, sugar, alcohol, and smoked or pickled foods.

◆ Choose low-fat milk products.
◆ Eat small portions (about 6 to 7 ounces each day) of lean meat and poultry without skin.

◆ Use low-fat cooking methods, such as broiling, steaming, grilling, and roasting.

**Talk with a dietitian**

You may find it helpful to talk with a dietitian even when you are finished with cancer treatment. A dietitian can help you return to healthy eating or discuss ways to manage any lasting eating problems.
# Eating Problems That May Be Caused by Certain Cancer Treatments

<table>
<thead>
<tr>
<th>Cancer Treatment</th>
<th>What Sometimes Happens: Side Effects</th>
</tr>
</thead>
</table>
| **Surgery**           | • Surgery may slow digestion (how the body uses food). It can also affect eating if you have surgery of the mouth, stomach, intestines, or throat.  
                        | • After surgery, some people have trouble getting back to normal eating. If this happens, you may need to get nutrients through a feeding tube or IV (through a needle directly into a vein).  
                        | **Note:** Surgery increases your need for good nutrition. If you are weak or underweight, you may need to eat a high-protein, high-calorie diet before surgery. |
| **Radiation Therapy** | Radiation therapy damages healthy cells as well as cancer cells. When you have radiation therapy to the head, neck, chest, or esophagus, you may have eating problems such as:  
                        | • **Changes in your sense of taste** (page 15)  
                        | • **Dry mouth** (page 23)  
                        | • **Sore mouth** (page 30)  
                        | • **Sore throat** (page 34)  
                        | • **Tooth and jaw problems**  
                        | • **Trouble swallowing** (page 34)  
                        | When you have radiation therapy to the abdomen or pelvis, you may have problems with:  
                        | • **Cramps, bloating**  
                        | • **Diarrhea** (page 20)  
                        | • **Nausea** (page 27)  
                        | • **Vomiting** (page 37) |
Eating Problems That May Be Caused by Certain Cancer Treatments

<table>
<thead>
<tr>
<th>Cancer Treatment</th>
<th>What Sometimes Happens: Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chemotherapy</strong></td>
<td>Chemotherapy works by stopping or slowing the growth of cancer cells, which grow and divide quickly. But it can also harm healthy cells that grow and divide quickly, such as those in the lining of your mouth and intestines. Damage to healthy cells can lead to side effects. Some of these side effects can lead to eating problems, such as:</td>
</tr>
<tr>
<td></td>
<td>• Appetite loss (page 12)</td>
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<tr>
<td></td>
<td>• Changes in your sense of taste (page 15)</td>
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<tr>
<td></td>
<td>• Constipation (page 17)</td>
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<td></td>
<td>• Diarrhea (page 20)</td>
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<td></td>
<td>• Nausea (page 27)</td>
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<td></td>
<td>• Sore mouth (page 30)</td>
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<td>• Sore throat (page 34)</td>
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<td></td>
<td>• Vomiting (page 37)</td>
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<tr>
<td></td>
<td>• Weight gain (page 39)</td>
</tr>
<tr>
<td></td>
<td>• Weight loss (page 41)</td>
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<tr>
<td><strong>Biological Therapy</strong></td>
<td>Biological therapy can affect your interest in food or ability to eat. Problems can include:</td>
</tr>
<tr>
<td>(Immunotherapy)</td>
<td>• Changes in your sense of taste (page 15)</td>
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<tr>
<td></td>
<td>• Diarrhea (page 20)</td>
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<td></td>
<td>• Dry mouth (page 23)</td>
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Eating Problems That May Be Caused by Certain Cancer Treatments

<table>
<thead>
<tr>
<th>Cancer Treatment</th>
<th>What Sometimes Happens: Side Effects</th>
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</thead>
<tbody>
<tr>
<td>Biological Therapy (Immunotherapy)</td>
<td>• Appetite loss caused by flu-like symptoms, such as muscle aches, fatigue, and fever (page 12)</td>
</tr>
<tr>
<td>(continued)</td>
<td>• Nausea (page 27)</td>
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<tr>
<td></td>
<td>• Sore mouth (page 30)</td>
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<tr>
<td></td>
<td>• Vomiting (page 37)</td>
</tr>
<tr>
<td></td>
<td>• Weight loss, severe (page 41)</td>
</tr>
<tr>
<td>Hormone Therapy</td>
<td>Hormone therapy can affect your interest in food or ability to eat.</td>
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<tr>
<td></td>
<td>Problems can include:</td>
</tr>
<tr>
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<td>• Changes in your sense of taste (page 15)</td>
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<tr>
<td></td>
<td>• Diarrhea (page 20)</td>
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</tbody>
</table>

Hormone therapy can affect your interest in food or ability to eat. Problems can include:
• Changes in your sense of taste (page 15)
• Diarrhea (page 20)
Lists of Foods and Drinks

Clear Liquids

This list may help if you have appetite loss, constipation, diarrhea, or vomiting.

- See page 12 to read more about appetite loss.
- See page 17 to read more about constipation.
- See page 20 to read more about diarrhea.
- See page 37 to read more about vomiting.

<table>
<thead>
<tr>
<th>Types</th>
<th>Liquids</th>
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</thead>
<tbody>
<tr>
<td><strong>Soups</strong></td>
<td>Bouillon</td>
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<tr>
<td></td>
<td>Clear broth</td>
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<tr>
<td></td>
<td>Consommé</td>
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<tr>
<td><strong>Drinks</strong></td>
<td>Clear fruit juices (such as apple, cranberry, or grape)</td>
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<tr>
<td></td>
<td>Clear carbonated soda or water</td>
</tr>
<tr>
<td></td>
<td>Flavored water</td>
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<tr>
<td></td>
<td>Fruit-flavored drinks</td>
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<tr>
<td></td>
<td>Fruit punch</td>
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<tr>
<td></td>
<td>Sports drinks</td>
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<tr>
<td></td>
<td>Water</td>
</tr>
<tr>
<td></td>
<td>Weak tea with no caffeine</td>
</tr>
<tr>
<td><strong>Desserts and snacks</strong></td>
<td>Fruit ices made without fruit pieces or milk</td>
</tr>
<tr>
<td></td>
<td>Gelatin</td>
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<tr>
<td></td>
<td>Hard candy</td>
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<tr>
<td></td>
<td>Honey</td>
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<tr>
<td></td>
<td>Jelly</td>
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<tr>
<td></td>
<td>Popsicles</td>
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<tr>
<td>**Meal replacements</td>
<td>Clear nutrition supplements (such as Resource® Breeze,)</td>
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<tr>
<td>and supplements</td>
<td>Carnation® Instant Breakfast® juice, and Enlive®)</td>
</tr>
</tbody>
</table>
Full-Liquid Foods

This list may help if you have appetite loss, vomiting, or weight loss.
◆ See page 12 to read more about appetite loss.
◆ See page 37 to read more about vomiting.
◆ See page 41 to read more about weight loss.

<table>
<thead>
<tr>
<th>Types</th>
<th>Foods and Drinks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereals</td>
<td>Refined hot cereals (such as Cream of Wheat®, Cream of Rice®, instant oatmeal, and grits)</td>
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<tr>
<td>Soups</td>
<td>Bouillon</td>
</tr>
<tr>
<td></td>
<td>Broth</td>
</tr>
<tr>
<td></td>
<td>Soup that has been strained or put through a blender</td>
</tr>
<tr>
<td>Drinks</td>
<td>Carbonated drinks</td>
</tr>
<tr>
<td></td>
<td>Coffee</td>
</tr>
<tr>
<td></td>
<td>Fruit drinks</td>
</tr>
<tr>
<td></td>
<td>Fruit punch</td>
</tr>
<tr>
<td></td>
<td>Milk</td>
</tr>
<tr>
<td></td>
<td>Milkshakes</td>
</tr>
<tr>
<td></td>
<td>Smoothies</td>
</tr>
<tr>
<td></td>
<td>Sports drinks</td>
</tr>
<tr>
<td></td>
<td>Tea</td>
</tr>
<tr>
<td></td>
<td>Tomato juice</td>
</tr>
<tr>
<td></td>
<td>Vegetable juice</td>
</tr>
<tr>
<td></td>
<td>Water</td>
</tr>
</tbody>
</table>
### Full-Liquid Foods

**continued**

<table>
<thead>
<tr>
<th>Types</th>
<th>Foods and Drinks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Desserts and snacks</strong></td>
<td>Custard (soft or baked)</td>
</tr>
<tr>
<td></td>
<td>Frozen yogurt</td>
</tr>
<tr>
<td></td>
<td>Fruit purees that are watered down</td>
</tr>
<tr>
<td></td>
<td>Gelatin</td>
</tr>
<tr>
<td></td>
<td>Honey</td>
</tr>
<tr>
<td></td>
<td>Ice cream with no chunks (such as nuts or cookie pieces)</td>
</tr>
<tr>
<td></td>
<td>Ice milk</td>
</tr>
<tr>
<td></td>
<td>Jelly</td>
</tr>
<tr>
<td></td>
<td>Pudding</td>
</tr>
<tr>
<td></td>
<td>Sherbet</td>
</tr>
<tr>
<td></td>
<td>Sorbet</td>
</tr>
<tr>
<td></td>
<td>Syrup</td>
</tr>
<tr>
<td></td>
<td>Yogurt (plain or vanilla)</td>
</tr>
<tr>
<td><strong>Meal replacement and supplements</strong></td>
<td>Instant breakfast drinks (such as Carnation® Instant Breakfast®)</td>
</tr>
<tr>
<td></td>
<td>Liquid meal replacements (such as Ensure® and Boost®)</td>
</tr>
<tr>
<td></td>
<td>Clear nutrition supplements (such as Resource® Breeze, Carnation® Instant Breakfast® juice, and Enlive!)</td>
</tr>
</tbody>
</table>
Foods and Drinks That Are Easy on the Stomach

This list may help if you have nausea or once your vomiting is under control.

- See page 27 to read more about nausea.
- See page 37 to read more about vomiting.

<table>
<thead>
<tr>
<th>Types</th>
<th>Foods and Drinks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Soups</strong></td>
<td>Clear broth (such as chicken, vegetable, or beef)</td>
</tr>
<tr>
<td></td>
<td>All kinds (strain or puree, if needed), except those made with foods that cause gas, such as dried beans and peas, broccoli, or cabbage</td>
</tr>
<tr>
<td><strong>Drinks</strong></td>
<td>Clear carbonated drinks that have lost their fizz</td>
</tr>
<tr>
<td></td>
<td>Cranberry or grape juice</td>
</tr>
<tr>
<td></td>
<td>Fruit-flavored drinks</td>
</tr>
<tr>
<td></td>
<td>Fruit punch</td>
</tr>
<tr>
<td></td>
<td>Milk</td>
</tr>
<tr>
<td></td>
<td>Sports drinks</td>
</tr>
<tr>
<td></td>
<td>Tea</td>
</tr>
<tr>
<td></td>
<td>Vegetable juices</td>
</tr>
<tr>
<td></td>
<td>Water</td>
</tr>
<tr>
<td><strong>Main meals and other food</strong></td>
<td>Avocado</td>
</tr>
<tr>
<td></td>
<td>Beef (tender cuts)</td>
</tr>
<tr>
<td></td>
<td>Cheese, hard (mild types, such as American)</td>
</tr>
<tr>
<td></td>
<td>Cheese, soft or semi-soft (such as cottage cheese or cream cheese)</td>
</tr>
<tr>
<td></td>
<td>Chicken or turkey (broiled or baked without skin)</td>
</tr>
<tr>
<td></td>
<td>Eggs</td>
</tr>
<tr>
<td></td>
<td>Fish (poached or broiled)</td>
</tr>
<tr>
<td></td>
<td>Noodles</td>
</tr>
<tr>
<td></td>
<td>Pasta (plain)</td>
</tr>
<tr>
<td></td>
<td>Peanut butter, creamy (and other nut butters)</td>
</tr>
<tr>
<td></td>
<td>Potatoes, without skins (boiled or baked)</td>
</tr>
</tbody>
</table>
Foods and Drinks That Are Easy on the Stomach  

<table>
<thead>
<tr>
<th>Types</th>
<th>Foods and Drinks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main meals and other food</strong></td>
<td></td>
</tr>
<tr>
<td><em>(continued)</em></td>
<td></td>
</tr>
<tr>
<td>Pretzels</td>
<td></td>
</tr>
<tr>
<td>Refined cold cereals (such as corn flakes, Rice Krispies®, Rice Chex®, and Corn Chex®)</td>
<td></td>
</tr>
<tr>
<td>Refined hot cereals (such as Cream of Wheat®)</td>
<td></td>
</tr>
<tr>
<td>Saltine crackers</td>
<td></td>
</tr>
<tr>
<td>Tortillas (white flour)</td>
<td></td>
</tr>
<tr>
<td>Vegetables (tender, well-cooked)</td>
<td></td>
</tr>
<tr>
<td>White bread</td>
<td></td>
</tr>
<tr>
<td>White rice</td>
<td></td>
</tr>
<tr>
<td>White toast</td>
<td></td>
</tr>
<tr>
<td><strong>Desserts and snacks</strong></td>
<td></td>
</tr>
<tr>
<td>Angel food cake</td>
<td></td>
</tr>
<tr>
<td>Bananas</td>
<td></td>
</tr>
<tr>
<td>Canned fruit, such as applesauce, peaches, and pears</td>
<td></td>
</tr>
<tr>
<td>Custard</td>
<td></td>
</tr>
<tr>
<td>Frozen yogurt</td>
<td></td>
</tr>
<tr>
<td>Gelatin</td>
<td></td>
</tr>
<tr>
<td>Ice cream</td>
<td></td>
</tr>
<tr>
<td>Ice milk</td>
<td></td>
</tr>
<tr>
<td>Lemon drop candy</td>
<td></td>
</tr>
<tr>
<td>Popsicles</td>
<td></td>
</tr>
<tr>
<td>Pudding</td>
<td></td>
</tr>
<tr>
<td>Sherbet</td>
<td></td>
</tr>
<tr>
<td>Sorbet</td>
<td></td>
</tr>
<tr>
<td>Yogurt (plain or vanilla)</td>
<td></td>
</tr>
<tr>
<td><strong>Meal replacements and supplements</strong></td>
<td></td>
</tr>
<tr>
<td>Instant breakfast drinks (such as Carnation® Instant Breakfast®)</td>
<td></td>
</tr>
<tr>
<td>Liquid meal replacements (such as Ensure®)</td>
<td></td>
</tr>
<tr>
<td>Clear nutrition supplements (such as Resource® Breeze, Carnation® Instant Breakfast® juice, and Enlive!*®)</td>
<td></td>
</tr>
</tbody>
</table>
Low-Fiber Foods

This list may help if you have diarrhea. See page 20 to read more about diarrhea.

<table>
<thead>
<tr>
<th>Types</th>
<th>Foods and Drinks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main meals and other foods</strong></td>
<td>Chicken or turkey (skinless and baked, broiled, or grilled)</td>
</tr>
<tr>
<td></td>
<td>Cooked refined cereals (such as Cream of Rice*, instant oatmeal, and grits)</td>
</tr>
<tr>
<td></td>
<td>Eggs</td>
</tr>
<tr>
<td></td>
<td>Fish</td>
</tr>
<tr>
<td></td>
<td>Noodles</td>
</tr>
<tr>
<td></td>
<td>Potatoes, without skins (boiled or baked)</td>
</tr>
<tr>
<td></td>
<td>White bread</td>
</tr>
<tr>
<td></td>
<td>White rice</td>
</tr>
<tr>
<td><strong>Fruits and vegetables</strong></td>
<td>Carrots (cooked)</td>
</tr>
<tr>
<td></td>
<td>Canned fruit (such as peaches, pears, and applesauce)</td>
</tr>
<tr>
<td></td>
<td>Fruit juice</td>
</tr>
<tr>
<td></td>
<td>Mushrooms</td>
</tr>
<tr>
<td></td>
<td>String beans (cooked)</td>
</tr>
<tr>
<td></td>
<td>Vegetable juice</td>
</tr>
<tr>
<td><strong>Snacks</strong></td>
<td>Angel food cake</td>
</tr>
<tr>
<td></td>
<td>Animal crackers</td>
</tr>
<tr>
<td></td>
<td>Custard</td>
</tr>
<tr>
<td></td>
<td>Gelatin</td>
</tr>
<tr>
<td></td>
<td>Ginger snaps</td>
</tr>
<tr>
<td></td>
<td>Graham crackers</td>
</tr>
<tr>
<td></td>
<td>Saltine crackers</td>
</tr>
<tr>
<td></td>
<td>Sherbet</td>
</tr>
<tr>
<td></td>
<td>Sorbet</td>
</tr>
<tr>
<td></td>
<td>Vanilla wafers</td>
</tr>
<tr>
<td></td>
<td>Yogurt (plain or vanilla)</td>
</tr>
</tbody>
</table>
## High-Fiber Foods

This list may help if you have constipation or weight gain.

- See page 17 to read more about constipation.
- See page 39 to read more about weight gain.

<table>
<thead>
<tr>
<th>Type</th>
<th>Foods and Drinks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main meals and other foods</strong></td>
<td>Bran muffins&lt;br&gt;Bran or whole-grain cereals&lt;br&gt;Cooked dried or canned peas and beans (such as lentils or pinto, black, red, or kidney beans)&lt;br&gt;Peanut butter (and other nut butters)&lt;br&gt;Soups with vegetables and beans (such as lentil and split pea)&lt;br&gt;Whole-grain cereals (such as oatmeal and shredded wheat)&lt;br&gt;Whole-wheat bread&lt;br&gt;Whole-wheat pasta</td>
</tr>
<tr>
<td><strong>Fruits and vegetables</strong></td>
<td>Apples&lt;br&gt;Berries (such as blueberries, blackberries, and strawberries)&lt;br&gt;Broccoli&lt;br&gt;Brussel sprouts&lt;br&gt;Cabbage&lt;br&gt;Corn&lt;br&gt;Dried fruit (such as apricots, dates, prunes, and raisins)&lt;br&gt;Green leafy vegetables (such as spinach, lettuce, kale, and collard greens)&lt;br&gt;Peas&lt;br&gt;Potatoes with skins&lt;br&gt;Spinach&lt;br&gt;Sweet potatoes&lt;br&gt;Yams</td>
</tr>
<tr>
<td><strong>Snacks</strong></td>
<td>Bran snack bars&lt;br&gt;Granola&lt;br&gt;Nuts&lt;br&gt;Popcorn&lt;br&gt;Seeds (such as pumpkin or sunflower)&lt;br&gt;Trail mix</td>
</tr>
</tbody>
</table>
Foods and Drinks That Are Easy To Chew and Swallow

This list may help if you have dry mouth, sore mouth, sore throat, or trouble swallowing.
◆ See page 23 to read more about dry mouth.
◆ See page 30 to read more about sore mouth.
◆ See page 34 to read more about sore throat and trouble swallowing.

<table>
<thead>
<tr>
<th>Types</th>
<th>Foods and Drinks</th>
</tr>
</thead>
</table>
| **Main meals and other foods** | Baby food  
Casseroles  
Chicken salad  
Cooked refined cereals (such as Cream of Wheat®, Cream of Rice®, instant oatmeal, and grits)  
Cottage cheese  
Eggs (soft boiled or scrambled)  
Egg salad  
Macaroni and cheese  
Mashed potatoes  
Peanut butter, creamy  
Pureed cooked foods  
Soups  
Stews  
Tuna salad  
Custard |
| **Desserts and Snacks**      | Flan  
Fruit (pureed or baby food)  
Gelatin  
Ice cream  
Milkshakes  
Puddings  
Sherbet  
Smoothies  
Soft fruits (such as bananas or applesauce)  
Sorbet  
Yogurt (plain or vanilla) |
| **Meal replacements and supplements** | Instant breakfast drinks (such as Carnation® Instant Breakfast®)  
Liquid meal replacements (such as Ensure®)  
Clear nutrition supplements (such as Resource® Breeze, Carnation® Instant Breakfast® juice, and Enlive!) |
Quick and Easy Snacks

This list may help if you have appetite loss. See page 12 to read more about appetite loss.

<table>
<thead>
<tr>
<th>Types of Foods and Drinks</th>
<th>Examples</th>
</tr>
</thead>
</table>
| **Drinks**                | Chocolate milk  
Instant breakfast drinks  
Juices  
Milk  
Milkshakes |
| **Main meals and other foods** | Bread  
Cereal  
Cheese, hard or semisoft  
Crackers  
Cream soups  
Hard-boiled and deviled eggs  
Muffins  
Nuts  
Peanut butter (and other nut butters)  
Pita bread and hummus  
Pizza  
Sandwiches |
| **Fruits and vegetables** | Applesauce  
Fresh or canned fruit  
Vegetables (raw or cooked) |

*continued on next page*
### Desserts and Snacks

<table>
<thead>
<tr>
<th>Types of Foods and Drinks</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cakes and cookies made with whole grains, fruits, nuts, wheat germ, or granola</td>
<td></td>
</tr>
<tr>
<td>Custard</td>
<td></td>
</tr>
<tr>
<td>Dips made with cheese, beans, or sour cream</td>
<td></td>
</tr>
<tr>
<td>Frozen yogurt</td>
<td></td>
</tr>
<tr>
<td>Gelatin</td>
<td></td>
</tr>
<tr>
<td>Granola</td>
<td></td>
</tr>
<tr>
<td>Granola bars</td>
<td></td>
</tr>
<tr>
<td>Ice cream</td>
<td></td>
</tr>
<tr>
<td>Nuts</td>
<td></td>
</tr>
<tr>
<td>Popcorn</td>
<td></td>
</tr>
<tr>
<td>Popsicles</td>
<td></td>
</tr>
<tr>
<td>Puddings</td>
<td></td>
</tr>
<tr>
<td>Sherbet</td>
<td></td>
</tr>
<tr>
<td>Sorbet</td>
<td></td>
</tr>
<tr>
<td>Trail mix</td>
<td></td>
</tr>
<tr>
<td>Yogurt</td>
<td></td>
</tr>
</tbody>
</table>
Ways To Add Protein

This list may help if you have appetite loss, sore throat, trouble swallowing, or weight loss.

◆ See page 12 to read more about appetite loss.
◆ See page 34 to read more about sore throat and trouble swallowing.
◆ See page 41 to read more about weight loss.

<table>
<thead>
<tr>
<th>Types</th>
<th>How To Use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hard or semisoft cheese</strong></td>
<td>• Melt on:</td>
</tr>
<tr>
<td></td>
<td>- Sandwiches</td>
</tr>
<tr>
<td></td>
<td>- Bread</td>
</tr>
<tr>
<td></td>
<td>- Muffins</td>
</tr>
<tr>
<td></td>
<td>- Tortillas</td>
</tr>
<tr>
<td></td>
<td>- Hamburgers</td>
</tr>
<tr>
<td></td>
<td>- Hot dogs</td>
</tr>
<tr>
<td></td>
<td>- Meats and fish</td>
</tr>
<tr>
<td></td>
<td>- Vegetables</td>
</tr>
<tr>
<td></td>
<td>- Eggs</td>
</tr>
<tr>
<td></td>
<td>- Desserts</td>
</tr>
<tr>
<td></td>
<td>- Stewed fruit</td>
</tr>
<tr>
<td></td>
<td>- Pies</td>
</tr>
<tr>
<td></td>
<td>• Grate and add to:</td>
</tr>
<tr>
<td></td>
<td>- Soups</td>
</tr>
<tr>
<td></td>
<td>- Sauces</td>
</tr>
<tr>
<td></td>
<td>- Casseroles</td>
</tr>
<tr>
<td></td>
<td>- Vegetable dishes</td>
</tr>
<tr>
<td></td>
<td>- Mashed potatoes</td>
</tr>
<tr>
<td></td>
<td>- Rice</td>
</tr>
<tr>
<td></td>
<td>- Noodles</td>
</tr>
<tr>
<td></td>
<td>- Noodles</td>
</tr>
<tr>
<td></td>
<td>- Meatloaf</td>
</tr>
</tbody>
</table>

| **Cottage cheese/ricotta cheese** | • Mix with or use to stuff fruits and vegetables |
|                                   | • Add to:                                                             |
|                                   |   - Casseroles                                                        |
|                                   |   - Spaghetti                                                         |
|                                   |   - Noodles                                                           |
|                                   |   - Egg dishes (such as omelets, scrambled eggs, and soufflés)       |

continued on next page
# Ways To Add Protein

## Types

<table>
<thead>
<tr>
<th>Types</th>
<th>How To Use</th>
</tr>
</thead>
</table>
| **Milk**                                   | • Use milk instead of water in drinks and in cooking  
• Use in hot cereal, soups, cocoa, and pudding                                                                                                         |
| **Nonfat instant dry milk**                | • Add to milk and milk drinks (such as pasteurized eggnog and milkshakes)  
• Use in:  
  - Casseroles  
  - Meatloaf  
  - Breads  
  - Muffins  
  - Sauces  
  - Cream soups  
  - Mashed potatoes  
  - Macaroni and cheese  
  - Pudding  
  - Custard  
  - Other milk-based desserts                                                                                                                     |
| **Meal replacements, supplements, and protein powder** | • Use “instant breakfast powder” in milk drinks and desserts  
• Mix with ice cream, milk, and fruit flavoring for a high-protein milkshake                                                                           |
| **Ice cream, yogurt, and frozen yogurt**   | • Add to:  
  - Carbonated drinks  
  - Milk drinks (such as milkshakes)  
  - Cereal  
  - Fruit  
  - Gelatin  
  - Pies  
• Mix with soft or cooked fruits  
• Make a sandwich of ice cream or frozen yogurt between cake slices, cookies, or graham crackers  
• Mix with breakfast drinks and fruit, such as bananas                                                                                           |
**Ways To Add Protein continued**

<table>
<thead>
<tr>
<th>Types</th>
<th>How To Use</th>
</tr>
</thead>
</table>
| **Eggs**                     | • Add chopped hard-boiled eggs to salads, salad dressings, vegetables, casseroles, and creamed meats  
                                • Make a rich custard with eggs, milk, and sugar  
                                • Add extra hard-boiled yolks to deviled egg filling and sandwich spread  
                                • Beat eggs into mashed potatoes, pureed vegetables, and sauces. (Make sure to keep cooking these dishes after adding the eggs because raw eggs may contain harmful bacteria.)  
                                • Add extra eggs or egg whites to:  
                                  - Custard  
                                  - Puddings  
                                  - Quiches  
                                  - Scrambled eggs  
                                  - Omelets  
                                  - Pancake or French toast batter |
| **Nuts, seeds, and wheat germ** | • Add to:  
                                   - Casseroles  
                                   - Breads  
                                   - Muffins  
                                   - Pancakes  
                                   - Cookies  
                                   - Waffles  

• Sprinkle on:  
  - Fruit  
  - Cereal  
  - Ice cream  
  - Yogurt  
  - Vegetables  
  - Salads  
  - Toast |

*continued on next page*
### Ways To Add Protein

#### continued

<table>
<thead>
<tr>
<th>Types</th>
<th>How To Use</th>
</tr>
</thead>
</table>
| **Nuts, seeds, and wheat germ (continued)** | - Use in place of breadcrumbs in recipes  
- Blend with parsley, spinach, or herbs and cream to make a sauce for noodle, pasta, or vegetable dishes  
- Roll bananas in chopped nuts |
| **Peanut butter and other nut butters**    | - Spread on:  
  - Sandwiches  
  - Toast  
  - Muffins  
  - Crackers  
  - Waffles  
  - Pancakes  
  - Fruit slices  
- Use as a dip for raw vegetables  
- Blend with milk and other drinks  
- Swirl through soft ice cream and yogurt |
| **Meat, poultry, and fish**                | - Add chopped, cooked meat or fish to:  
  - Vegetables  
  - Salads  
  - Casseroles  
  - Soups  
  - Sauces  
  - Biscuit dough  
  - Omelets  
  - Soufflés  
  - Quiches  
  - Sandwich fillings  
  - Chicken and turkey stuffings  
- Wrap in pie crust or biscuit dough as turnovers  
- Add to stuffed baked potatoes |
| **Beans, legumes, and tofu**               | - Add to casserole, pasta, soup, salad, and grain dishes  
- Mash cooked beans with cheese and milk |
Ways To Add Calories

This list may help if you have appetite loss, sore throat, trouble swallowing, or weight loss.
◆ See page 12 to read more about appetite loss.
◆ See page 34 to read more about sore throat and trouble swallowing.
◆ See page 41 to read more about weight loss.

<table>
<thead>
<tr>
<th>Types</th>
<th>How To Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>• Use whole milk instead of low-fat</td>
</tr>
<tr>
<td></td>
<td>• Put on hot or cold cereal</td>
</tr>
<tr>
<td></td>
<td>• Pour on chicken and fish while baking</td>
</tr>
<tr>
<td></td>
<td>• Mix in hamburgers, meatloaf, and croquettes</td>
</tr>
<tr>
<td></td>
<td>• Make hot chocolate with milk</td>
</tr>
<tr>
<td>Cheese</td>
<td>• Melt on top of casseroles, potatoes, and vegetables</td>
</tr>
<tr>
<td></td>
<td>• Add to omelets</td>
</tr>
<tr>
<td></td>
<td>• Add to sandwiches</td>
</tr>
<tr>
<td>Granola</td>
<td>• Use in cookie, muffin, and bread batters</td>
</tr>
<tr>
<td></td>
<td>• Sprinkle on:</td>
</tr>
<tr>
<td></td>
<td>- Vegetables</td>
</tr>
<tr>
<td></td>
<td>- Yogurt</td>
</tr>
<tr>
<td></td>
<td>- Ice cream</td>
</tr>
<tr>
<td></td>
<td>- Pudding</td>
</tr>
<tr>
<td></td>
<td>- Custard</td>
</tr>
<tr>
<td></td>
<td>- Fruit</td>
</tr>
<tr>
<td></td>
<td>• Layer with fruits and bake</td>
</tr>
<tr>
<td></td>
<td>• Mix with dried fruits and nuts for a snack</td>
</tr>
<tr>
<td></td>
<td>• Use in pudding recipes instead of bread or rice</td>
</tr>
<tr>
<td>Dried fruits (raisins, prunes, apricots, dates, figs)</td>
<td>• Plump them in warm water, and eat for breakfast, dessert, or snack</td>
</tr>
<tr>
<td></td>
<td>• Add to:</td>
</tr>
<tr>
<td></td>
<td>- Muffins</td>
</tr>
<tr>
<td></td>
<td>- Cookies</td>
</tr>
<tr>
<td></td>
<td>- Breads</td>
</tr>
</tbody>
</table>

*continued on next page*
Ways To Add Calories  

<table>
<thead>
<tr>
<th>Types</th>
<th>How To Use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dried fruits</strong></td>
<td>- Cakes</td>
</tr>
<tr>
<td>(raisins, prunes, apricots, dates, figs)</td>
<td>- Rice and grain dishes</td>
</tr>
<tr>
<td><em>(continued)</em></td>
<td>- Cereals</td>
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<tr>
<td></td>
<td>- Puddings</td>
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<tr>
<td></td>
<td>- Stuffings</td>
</tr>
<tr>
<td></td>
<td>- Cooked vegetables (such as carrots, sweet potatoes, yams, and acorn or butternut squash)</td>
</tr>
<tr>
<td></td>
<td>• Bake in pies and turnovers</td>
</tr>
<tr>
<td></td>
<td>• Combine with nuts or granola for snacks</td>
</tr>
<tr>
<td><strong>Eggs</strong></td>
<td>• Add chopped hard-boiled eggs to salads, salad dressings, vegetables, casseroles, and creamed meats</td>
</tr>
<tr>
<td></td>
<td>• Make a rich custard with eggs, milk, and sugar</td>
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<tr>
<td></td>
<td>• Add extra hard-boiled yolks to deviled egg filling and sandwich spread</td>
</tr>
<tr>
<td></td>
<td>• Beat eggs into mashed potatoes, pureed vegetables, and sauces. (Make sure to keep cooking these dishes after adding the eggs because raw eggs may contain harmful bacteria.)</td>
</tr>
<tr>
<td></td>
<td>• Add extra eggs or egg whites to:</td>
</tr>
<tr>
<td></td>
<td>- Custards</td>
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<tr>
<td></td>
<td>- Puddings</td>
</tr>
<tr>
<td></td>
<td>- Quiches</td>
</tr>
<tr>
<td></td>
<td>- Scrambled eggs</td>
</tr>
<tr>
<td></td>
<td>- Omelets</td>
</tr>
<tr>
<td></td>
<td>- Pancake or French toast batter</td>
</tr>
</tbody>
</table>
For more resources, see *National Organizations That Offer Cancer-Related Services* at www.cancer.gov. In the search box, type in the words “national organizations.” Or call 1-800-4-CANCER (1-800-422-6237) for more help.

**National Cancer Institute (NCI)**

Find out more from these free NCI services.

- **Call:** 1-800-4-CANCER (1-800-422-6237)
- **Visit:** www.cancer.gov
- **Chat:** www.cancer.gov/livehelp
- **E-mail:** cancergovstaff@mail.nih.gov

**American Dietetic Association**

The nation’s largest organization of food and nutrition professionals. They can help you find a dietitian in your area.

- **Visit:** www.eatright.org

**American Institute for Cancer Research**

Answers questions about diet, nutrition, and cancer through its “Nutrition Hotline” phone and e-mail service. Has many consumer and health professional brochures, plus health aids about diet and nutrition, and their link to cancer and cancer prevention.

- **Call:** 1-800-843-8114
- **Visit:** www.aicr.org
- **E-mail:** aicrweb@aicr.org
The Cancer Support Community

Dedicated to providing support, education, and hope to people affected by cancer.

Call: 1-888-793-9355 or 202-659-9709
Visit: www.cancersupportcommunity.org
E-mail: help@cancersupportcommunity.org

CancerCare, Inc.

Offers free support, information, financial assistance, and practical help to people with cancer and their loved ones.

Call: 1-800-813-HOPE (1-800-813-4673)
Visit: www.cancercare.org
E-mail: info@cancercare.org

National Oral Health Information Clearinghouse

A service of the National Institute of Dental and Craniofacial Research that provides oral health information for special care patients.

Call: 301-402-7364
Visit: www.nidcr.nih.gov
E-mail: nidcrinfo@mail.nih.gov

Smokefree.gov

Provides resources, including information about tobacco quit lines, a step-by-step smoking cessation guide, and publications to help you or someone you care about quit smoking.

Call: 1-877-44U-QUIT (1-877-448-7848)
Visit: www.smokefree.gov
Notes
SECTION IV – Site Specific Information