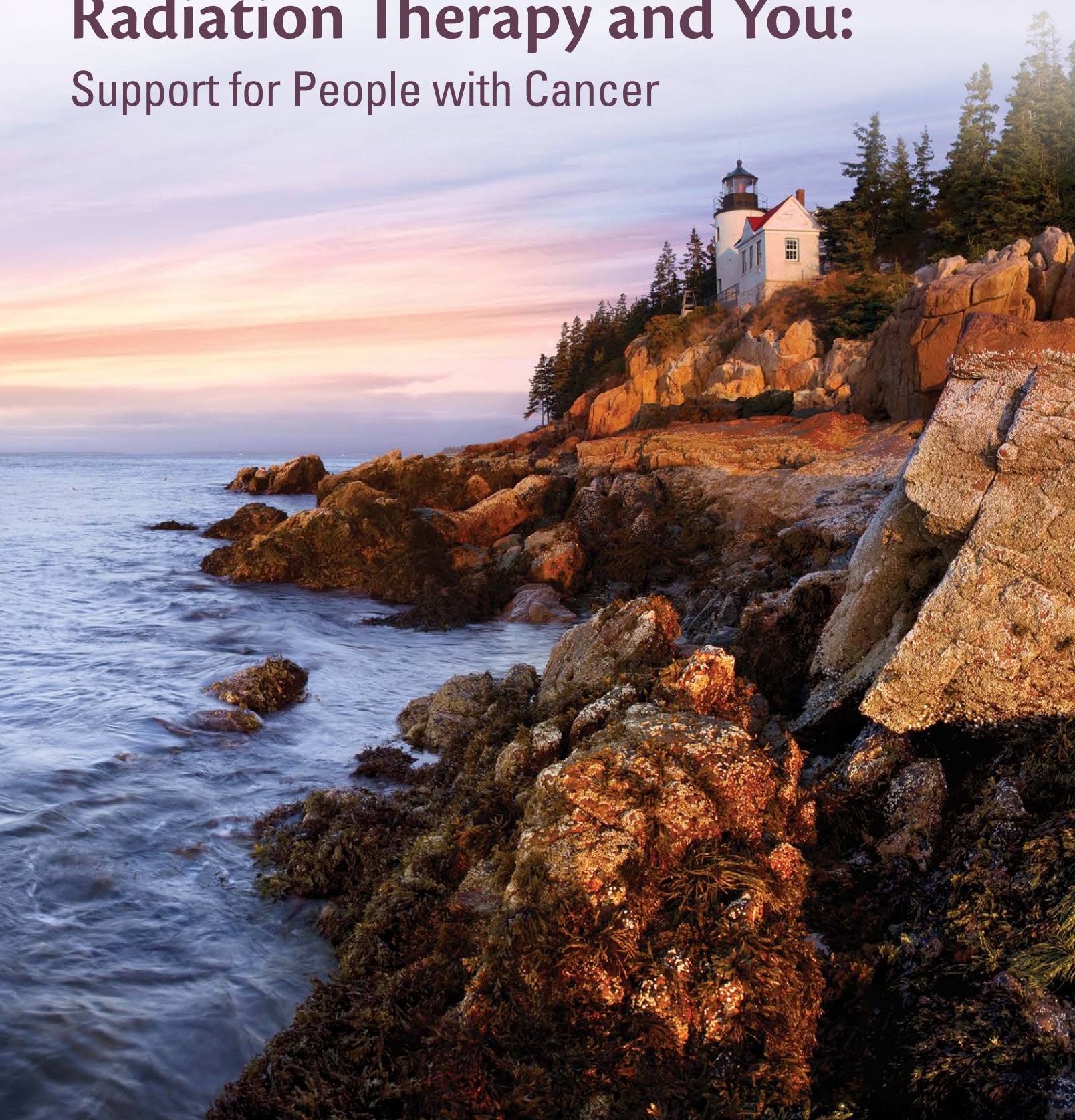


Radiation Therapy and You:

Support for People with Cancer





The Use of Product or Brand Names

Product or brand names that appear in this booklet are for example only. The US 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.

About This Booklet

Radiation Therapy and You is for you, if you are about to have or are now having radiation therapy for cancer. People who are close to you may also find this booklet helpful.

Rather than read this booklet from beginning to end, look at only those sections you need now. Later, you can always read more.

This booklet 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 main types of radiation therapy.
- ▶ **Side Effects and Ways to Manage Them.** Information about side effects that may occur, depending on the part of your body being treated, and ways you can 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.** Suggestions for foods and drinks that can help with side effects.

Talk with your doctor and nurse about the information in this booklet. They may suggest that you read certain sections or follow specific tips. Because radiation therapy affects people in different ways, they may also tell you that some of the information in this booklet does not apply to you.



Rather than read this book from beginning to end, look at only those sections you need now. Later, you can always read more.



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those sections you need now. Later, you can always read more.



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 shrink tumors. 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.

How is radiation therapy given?

Radiation therapy can be external beam or internal. External beam involves a machine outside your body that aims radiation at cancer cells. Internal radiation therapy involves placing radiation inside your body, in or near the cancer. 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 treatment with radiation therapy. In fact, more than half (about 60%) of people with cancer have radiation therapy. Sometimes, radiation therapy is the only kind of cancer treatment people have.

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:

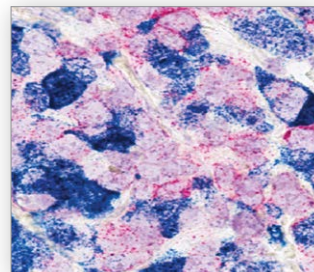
- ▶ **Treat cancer.** Radiation can be used to cure cancer, to prevent it from returning, or to stop or slow its growth.
- ▶ **Reduce symptoms.** When a cure is not possible, radiation may be used to treat pain and other problems caused by the cancer tumor. Or, it can prevent problems that may be caused by a growing tumor, 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 are severe or do not get better. Other side effects may show up months or years after radiation therapy is over. These are called late side effects.



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, or in smaller doses twice a day for several weeks. Spreading out the radiation dose allows normal cells to recover while cancer cells die.
- ▶ **Aiming radiation at a precise part of your body.** Some types of radiation therapy allow your doctor to aim high doses of radiation at your cancer while reducing radiation to nearby healthy tissue. These techniques use a computer to deliver precise radiation doses to a cancer tumor or to specific areas within the tumor.

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 and discomfort. This booklet has a lot of information about ways that you and your doctor and 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. Radiation therapy given during surgery is called intraoperative radiation.
- ▶ **Radiation therapy, chemotherapy, and immunotherapy.** Radiation may be given before, during, or after chemotherapy and immunotherapy. Before or during these other treatments, radiation therapy can shrink the cancer so that the treatments work better. After treatment, radiation can be used to kill any cancer cells that remain.

Is radiation therapy expensive?

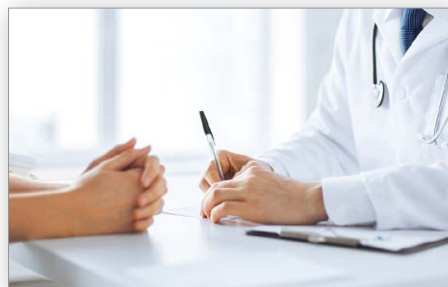
Yes, radiation therapy costs a lot of money. It uses complex machines and involves the services of many health care providers. The exact cost of your radiation therapy depends on the cost of health care where you live, what kind of radiation therapy you get, and how many treatments you need.

Talk with your health insurance company about what services it will pay for. Most insurance plans pay for radiation therapy. To learn more, talk with the business office of the clinic or hospital where you go for treatment. If you need financial assistance, there are organizations that may be able to help. To find such organizations, go to the National Cancer Institute database, Organizations that Offer Support Services at:

supportorgs.cancer.gov

and search “financial assistance.”

Or call toll-free 1-800-4-CANCER (1-800-422-6237) to ask for information on organizations that may help.



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 receiving 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 53. You might also read *Eating Hints: Before, during, and after Cancer Treatment*, a booklet from the National Cancer Institute, at: www.cancer.gov/publications/patient-education/eating-hints.



Can I continue to work during radiation therapy?

Some people are able to work full time during radiation therapy. Others can work only 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 from the treatment you will have.

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

You may get to a point during 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 while you are on medical leave.



Ask your doctor, nurse, or dietitian if you need a special diet while you are getting radiation therapy.

How can I cope with my feelings during radiation therapy?

Living with cancer and going through treatment can be very stressful. It is normal to feel anxious, depressed, afraid, angry, frustrated, helpless, or alone at some point during radiation therapy. But there are ways you can learn to cope with these feelings.

Many people find it helpful to talk with others who are going through the same thing. To meet others, think about joining a support group. These groups meet in-person and online. You might also try relaxation or meditation exercises. Some people find prayer helpful.

Exercise can also boost your mood. Try activities such as walking, biking, yoga, or water aerobics. Check with your doctor or nurse about types of exercise that you can safely do during treatment.

To learn more about coping with your feelings during cancer treatment:

- ▶ Visit the *Coping with Cancer* section of the National Cancer Institute's website at: www.cancer.gov/about-cancer/coping
- ▶ Read *Taking Time: Support for People with Cancer* at: www.cancer.gov/publications/patient-education/taking-time

For relaxation exercises:

- ▶ Visit Learning to Relax on the National Cancer Institute's website at: www.cancer.gov/about-cancer/coping/feelings/relaxation
- ▶ See *Facing Forward: Life after Cancer Treatment* at: www.cancer.gov/publications/patient-education/facing-forward



How do I make the most of radiation therapy?

You have an important role to play in your radiation therapy. To get the most from this treatment:

- ▶ Arrive on time for all radiation therapy sessions.
- ▶ Ask questions and talk about your concerns.
- ▶ Tell someone on your radiation therapy team when you have side effects and changes with eating or bowel habits.
- ▶ 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 enough liquids
- ▶ eating foods to help with side effects
- ▶ maintaining your weight



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 49 and 50 for sample questions.



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

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 regular check-ups once treatment is over. During these check-ups, your doctor or nurse will see how well the radiation therapy worked, check for signs of cancer, talk with you about your treatment and care, and look for late side effects. Late side effects are those that occur six or more months after you have completed radiation therapy. During these check-ups, your doctor or nurse will:

- ▶ **Examine you and review how you have been feeling.** Your doctor can prescribe medicine or suggest other ways to treat any side effects you may have.
- ▶ **Order lab and imaging tests,** which are tests that make pictures of areas inside the body. These tests may include blood tests, x-rays, or CT, MRI, or PET scans.
- ▶ **Discuss treatment.** Your doctor may suggest that you have more treatment, such as extra radiation treatments, chemotherapy, or other types of treatment.
- ▶ **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 49 and 50.

For more information about late side effects, visit the National Cancer Institute's website at www.cancer.gov/about-cancer/coping/survivorship/late-effects.

After I have finished radiation therapy, 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. Tell your doctor or nurse 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



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 it can move around you, sending radiation to your body from many directions.

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



External beam radiation therapy comes from a machine that aims radiation at your cancer.

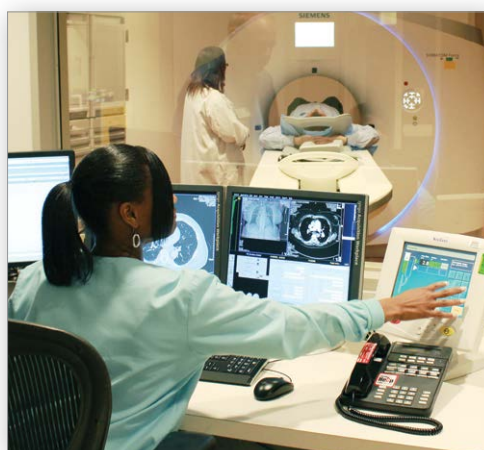
How often will I have external beam radiation therapy?

Most people have external beam radiation therapy once a day, five days a week, Monday through Friday. Treatment lasts anywhere from 2 to 10 weeks, depending on the type of cancer you have and the goal of your treatment. This span of time is called a course of treatment.

Radiation therapy may also be given on other schedules. These schedules include:

- ▶ **accelerated fractionation**, which is treatment given in larger daily or weekly doses to reduce the number of weeks of treatment
- ▶ **hyperfractionation**, which is smaller doses of radiation given more than once a day
- ▶ **hypofractionation**, which is larger doses given once a day (or less often) to reduce the number of treatments

Your doctor may prescribe one of these treatment schedules if they feel that it will work better for you.



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 spend the night in the hospital.

What happens before I begin 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 may 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.

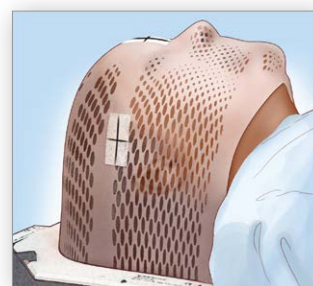
If you decide to have external beam radiation therapy, you will be scheduled for a treatment planning session called a simulation. At this time:

- ▶ A radiation oncologist (a doctor who specializes in using radiation to treat cancer) and radiation therapist will define your treatment area. You may also hear the treatment area referred to as the treatment port or treatment field. These terms refer to the places in your body that will receive radiation. You will be asked to lie very still while x-rays or scans are taken.
- ▶ The radiation therapist will put small marks (either tattoos or dots of colored ink) on your skin to mark the treatment area. These marks are needed throughout your 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 tell the radiation therapist if they have faded or lost color.

A body mold may be made of the part of the body that is being treated. This is a plastic or plaster form that keeps you from moving during treatment. It also helps make sure that you are in the exact same position each day of treatment.

You may be fitted for a mask if you are getting radiation to the head and neck area. The mask has air holes. It attaches to the table where you will lie for your treatments. The mask helps keep your head from moving so that you are in the exact same position for each treatment.

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



If you are getting radiation to the head, you may need a mask.

What should I wear for external beam radiation therapy?

Wear clothes that are comfortable and made of soft fabric, such as fleece or cotton. Choose clothes that are easy to take off because you may need to pull them away from the treatment area or change into a hospital gown. Do not wear clothes that are tight, such as close-fitting collars or waistbands, near your treatment area. Also, do not wear jewelry, adhesive bandages, or powder in the treatment area.

What happens during a treatment session?

- ▶ You may be asked to change into a hospital gown or robe.
- ▶ You will go to the 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 skin marks and body mold or face mask, if you have one, to help you get into the correct 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 will get radiation for one to five minutes. During this time, you can breathe normally and do not have to hold your breath.

The radiation therapist will leave the room just before your treatment begins. They will go to a nearby room to control the radiation machine. The therapist can watch you on a TV screen or through a window and talk with you through a speaker in the treatment room. Be sure to tell the therapist if you feel sick or are uncomfortable. They can stop the radiation machine at any time. You won't be able to feel, hear, see, or smell the radiation.

Your entire visit may last from 30 minutes to an hour. Most of that time is spent placing you in the correct position. Certain types of radiation may take longer. Your visit may also take longer if your treatment team needs to take and review x-rays.

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 pregnant women, babies, and young children.

How can I relax during my treatment sessions?

- ▶ Bring something to keep you busy in the waiting room, such as a book or magazine, crossword puzzles, or knitting.
- ▶ Use headphones to listen to music or recorded books.
- ▶ Meditate, breathe deeply, pray, use imagery, or find other ways to relax. For relaxation exercises:
 - Visit Learning to Relax on the National Cancer Institute's website at: www.cancer.gov/about-cancer/coping/feelings/relaxation
 - See *Facing Forward: Life after Cancer Treatment* at: www.cancer.gov/publications/patient-education/facing-forward



Your radiation therapist can see, hear, and talk with you at all times while you are receiving external beam radiation therapy.



Internal Radiation Therapy

What is internal radiation therapy?

Internal radiation therapy is a form of treatment in which a source of radiation is put inside your body. One form of internal radiation therapy is called brachytherapy. In brachytherapy, a solid radiation source, such as seeds, ribbons, or capsules, is placed in your body in or near the cancer.

Internal radiation can also be in liquid form. You receive liquid radiation by drinking it, swallowing a pill, or getting it through an IV line. Liquid radiation travels throughout your body, seeking out and killing cancer cells.

Brachytherapy may be used to treat many types of cancers, such as cancers of the head and neck, breast, uterus, cervix, prostate, gallbladder, esophagus, eye, and lung. Liquid forms of internal radiation are most often used to treat thyroid cancer or non-Hodgkin lymphoma.

What happens before I begin internal radiation therapy?

You will have a 1- to 2-hour meeting with your doctor or nurse to plan your treatment before you begin internal radiation therapy. At this time, you will have a physical exam, talk about your medical history, and may 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 decide 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, brachytherapy is put in place through a larger device called an applicator. Your doctor will place the catheter or applicator into your body before you begin treatment.

Once the catheter or applicator is in place, the radiation source will be placed inside. The radiation source may be kept in place for a few minutes, for many days, or for the rest of your life. How long the radiation source remains in place depends on the type of brachytherapy you have, 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, the radiation source stays in place for one to seven days. You are likely to be in the hospital during this time. Once your treatment is finished, your doctor will remove the radiation source and the catheter or applicator.
- ▶ **High-dose rate (HDR) implants.** In this type of brachytherapy, the radiation source is left in place for just 10 to 20 minutes at a time and then taken out. You may have treatment twice a day for two to five days or once a week for two to five 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. As with LDR implants, your doctor will remove the 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, but the radiation gets weaker each day. As time goes on, almost all radiation will go away. When the radiation is first put in place, you may need to limit your time around other people. Be extra careful not to spend time with children or pregnant women.

What happens while the radiation is in place?

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

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 pregnant women and children younger than a year old



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 any 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 a week or two, you may need to limit activities that take a lot of effort. Ask your doctor what kinds of activities are safe for you and which ones you should avoid.



Tell your doctor or nurse if you are in pain.

Radiation Therapy Side Effects

Side effects are problems that can occur as a result of treatment. They may occur with radiation therapy because the high doses of radiation that are 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 other types of cancer treatments before, during, or after your radiation therapy.

Talk with your doctor or nurse 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, 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 in the treatment area. These changes occur because radiation passes through the skin on its way to the cancer. 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 weary or exhausted. There are many ways to manage fatigue. To learn more, see page 24.

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 a few months after you have finished radiation therapy.



Late side effects may occur six 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, rarely, second primary cancers. Everyone is different, so talk with your doctor or nurse about whether you might have late side effects and what signs to look for. For more information about late side effects, visit the National Cancer Institute's website at www.cancer.gov/about-cancer/coping/survivorship/late-effects.

Ways to Manage Side Effects, starting on page 22, explains each side effect in more detail and includes ways you and your doctor or nurse can manage them.



Talk with your radiation therapy team about your chances of getting side effects. Show them the chart on the next page.

Treatment Areas and Possible Side Effects

Which radiation therapy side effects you have may depend on the part of your body that is treated. The part of your body being treated is called the treatment area. To figure out which side effects you might expect, find the part of your body being treated in the following chart. Possible side effects are listed next to each treatment area. Ask your doctor or nurse about your chances of getting each side effect.

Part of the Body Being Treated	Possible Side Effects
Brain	• Fatigue, see page 24 • Hair loss, see page 27 • Nausea and vomiting, see page 34 • Skin changes, see page 40 • Headache • Blurry vision
Breast	• Fatigue, see page 24 • Hair loss, see page 27 • Skin changes, see page 40 • Tenderness • Swelling
Chest	• Fatigue, see page 24 • Hair loss, see page 27 • Skin changes, see page 40 • Throat changes, such as trouble swallowing, see page 43 • Cough • Shortness of breath
Head and Neck	• Fatigue, see page 24 • Hair loss, see page 27 • Mouth changes, see page 30 • Skin changes, see page 40 • Throat changes, such as trouble swallowing, see page 43 • Taste changes • Less active thyroid gland
Pelvis	• Diarrhea, see page 22 • Fatigue, see page 24 • Hair loss, see page 27 • Nausea and vomiting, see page 34 • Sexual and fertility changes, see page 36 • Skin changes, see page 40 • Urinary and bladder changes, page 45
Rectum	• Diarrhea, see page 22 • Fatigue, see page 24 • Hair loss, see page 27 • Sexual and fertility changes, see page 36 • Skin changes, see page 40 • Urinary and bladder changes, see page 45
Stomach and Abdomen	• Diarrhea, see page 22 • Fatigue, see page 24 • Hair loss, see page 27 • Nausea and vomiting, see page 34 • Skin changes, see page 40 • Urinary and bladder changes, see page 45

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 that line the inside of the intestines. These areas are very sensitive to the amount of radiation needed to treat cancer.



Radiation to the shaded area may cause diarrhea.

Ways to manage

When you have diarrhea:

- ▶ **Drink 8 to 12 cups of clear liquid per day.** Severe diarrhea can cause you to become dehydrated, a problem that can become serious. This problem is caused by the loss of too much water from the body. Making sure you drink enough can help prevent it. See page 51 for 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 extra water.
- ▶ **Eat small meals and snacks.** Many people find that they eat better if they eat five or six small meals and snacks each day, rather than three large meals.
- ▶ **Eat foods that are high in salts such as sodium and potassium.** Your body can lose these salts when you have diarrhea, and it is important to replace them. Foods that are high in sodium or potassium include bananas, oranges, peach and apricot nectar, and boiled or mashed potatoes.

- ▶ **Eat low-fiber foods.** Foods that are high in fiber can make diarrhea worse. Low-fiber foods include bananas, white rice, white toast, and plain or vanilla yogurt. See page 52 for other low-fiber foods.
- ▶ **Take care of your rectal area.** Instead of toilet paper, use a baby wipe or squirt 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.



- ▶ **Avoid:**
 - beer, wine, and other types of alcohol
 - 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 with your doctor or nurse.** Tell them if you are having diarrhea. They can suggest ways to manage it. They may also suggest taking medicine, such as Imodium®.

 **Learn More** -----

To learn more about dealing with diarrhea during cancer treatment:

- ▶ See *Eating Hints: Before, during, and after Cancer Treatment* at: www.cancer.gov/publications/patient-education/eating-hints

Ways to Manage Side Effects

Fatigue

What it is

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

Why it occurs

Fatigue can be caused by many problems, such as:

- ▶ anemia
- ▶ appetite changes
- ▶ anxiety
- ▶ depression
- ▶ infection
- ▶ lack of activity
- ▶ medicines
- ▶ pain
- ▶ trouble breathing
- ▶ trouble sleeping
- ▶ other medical problems

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 will first feel fatigue depends on a few factors, such as your age, health, how active you are, and how you felt before radiation therapy started.

Fatigue can last from six weeks to a year after your last radiation therapy session. Some people may always feel fatigue and not have as much energy as they did before radiation therapy.



Fatigue is a common side effect, and there is a good chance that you will feel some level of fatigue during treatment.



Ways to manage

- ▶ **Try to sleep at least eight 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. Another way is to relax right before going to bed. Do calming activities before bedtime, such as reading, working on a jigsaw puzzle, or listening to music.
- ▶ **Plan time to rest.** Take short naps or rest breaks between activities.
- ▶ **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. Try to let go of things that don't matter as much now. For example, you might go to work but not do housework. You might watch your children's sports events but not cook dinner.
- ▶ **Exercise.** Research shows that most people feel better when they get some exercise each day. Go for a short walk, ride a bike, or do yoga. Talk with your doctor or nurse about types of exercise you can do while having radiation therapy.
- ▶ **Relax.** Meditation, prayer, gentle yoga, guided imagery, and visualization are ways you can learn to relax and decrease stress. For relaxation exercises:
 - Visit Learning to Relax on the National Cancer Institute's website at: www.cancer.gov/about-cancer/coping/feelings/relaxation
 - See *Facing Forward: Life after Cancer Treatment* at: www.cancer.gov/publications/patient-education/facing-forward
- ▶ **Eat and drink well.** It can be easier to eat if you have five or six small meals each day, rather than three large ones. Keep foods around that are easy to fix, such as canned soups, frozen meals, yogurt, and cottage cheese. Drink plenty of fluids each day—about eight cups of water or juice.
- ▶ **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 need to commute. If possible, 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.** Think about how 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.** 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.
- ▶ **Keep track of how you feel each day.** Keeping a record will help you plan how to best use your time. Share your record with your nurse. Let your doctor or nurse know if you notice changes in your energy level, such as whether you have lots of energy or are very tired.
- ▶ **Talk with your doctor or nurse.** They can suggest treatments for problems that may be causing your fatigue, such as anemia (a problem in which the number of red blood cells is below normal), depression, or trouble sleeping.

Hair Loss

What it is

Hair loss is when some or all of your hair falls out. With radiation therapy, you will lose hair only on the part of your body being treated. Hair loss is also called alopecia.

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 happens only 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 the hair between your legs but not the hair on your head.

How long it lasts

You may start losing hair in your treatment area two to three 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 three to six 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. If you do decide to shave your head, use an electric razor to prevent nicking yourself.
- ▶ **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 may be able to deduct the cost of your wig as a medical expense on your income taxes. Check with your tax preparer. Some groups also sponsor free wig banks. Ask your doctor, nurse, or social worker if they 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 it with a soft towel, instead of rubbing it.
- ▶ **Do not use items that can hurt your scalp,** such as:
 - straightening or curling irons
 - brush rollers or curlers
 - electric hair dryers
 - hair bands and clips
 - hairsprays
 - hair dyes
 - products to perm or relax your hair
- ▶ **Do not use products that are harsh on your hair.** Examples include hair colors, perms, gels, mousse, oil, grease, or pomade.



You will lose hair only on the part of your body being treated.

After hair loss:

- ▶ **Protect your scalp.** Your scalp may feel tender after hair loss. Protect it from very cold air and sunburn by covering your head with a hat, turban, or scarf when you are outside.
- ▶ **Stay warm.** Your hair helps keep you warm, so you may feel colder once it is gone. Stay warmer and more comfortable by wearing a hat, turban, scarf, or wig.

Ways to Learn More -----

Contact these organizations for more information about coping with hair loss:

American Cancer Society

Toll-free: 1-800-ACS-2345 (1-800-227-2345)

Online: www.cancer.org

Look Good...Feel Better

Toll-free: 1-800-395-LOOK (1-800-395-5665)

Online: www.lookgoodfeelbetter.org

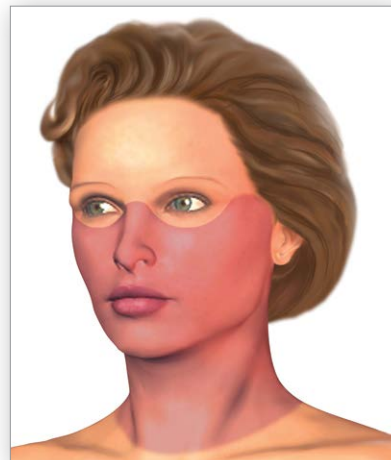


Mouth Changes

What they are

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

- ▶ mouth sores that are like 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



Radiation to the shaded area may cause mouth changes.

Why they occur

Radiation therapy kills cancer cells and can also damage healthy cells such as those in the glands that make saliva and in 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, such as dry mouth, may improve, but never go away.

Ways to manage

- ▶ **Visit a dentist.** Your mouth needs to be as healthy as possible before radiation therapy to the head and neck. So, it is important that you see a dentist several weeks before beginning treatment. Be sure to tell your dentist that you have cancer and that you will have radiation therapy.
- ▶ The dentist will examine your teeth and mouth and do any needed dental work. If you do have dental work, you will need to heal before beginning radiation therapy.
- ▶ **Check your mouth every day.** This way, you can see or feel problems as soon as they start. Problems to look out for include mouth sores, white patches, or infection.
- ▶ **Keep your mouth moist.** Here are tips to help you:
 - Sip water often during the day.
 - Suck on ice chips.
 - Chew sugar-free gum.
 - Suck on sugar-free hard candy.
 - Use a saliva substitute.
 - Ask your doctor if medicine that helps increase saliva will help you.
- ▶ **Clean your mouth, teeth, gums, and tongue.**
 - Brush your teeth, gums, and tongue after every meal and at bedtime.
 - Use an extra-soft toothbrush. Make the bristles softer by running warm water over them just before you brush.
 - Use 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 couple of hours with a salt water solution. There are many recipes for such a solution, but an example is to mix 1/4 teaspoon baking soda and 1/4 teaspoon salt with 1 quart (4 cups) 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 soft, moist foods, such as cooked cereals, mashed potatoes, and scrambled eggs.
- Soften food by mixing it with gravy, sauce, broth, yogurt, or other liquids.
- Eat foods that are warm or at room temperature.



► **Avoid things that can hurt, scrape, or burn your mouth, such as:**

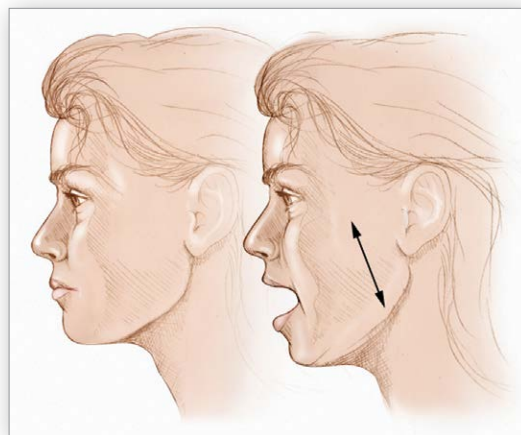
- sharp, crunchy foods, such as potato or corn chips
- hot foods
- spicy foods, such as hot sauce, curry dishes, salsa, and chili
- fruits and juices that are high in acid, such as tomatoes, oranges, lemons, and grapefruit
- toothpicks or other sharp objects
- all tobacco products, including cigarettes, pipes, cigars, and chewing tobacco
- drinks that contain alcohol

► **Avoid foods and drinks that are high in sugar.** Foods and drinks that have a lot of sugar, such as regular soda, gum, and candy, can cause tooth decay.



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

- ▶ **Exercise your jaw muscles.** Open and close your mouth 20 times as far as you can without causing pain. Do this exercise three times a day, even if your jaw isn't stiff.
- ▶ **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 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 care for your teeth and mouth after you finish radiation therapy.



Exercise your jaw 3 times a day.

Ways to Learn More

Contact this organization for more information about coping with mouth problems:

National Institute of Dental and Craniofacial Research

Toll-free: 1-866-232-4528

Online: www.nidcr.nih.gov/OralHealth/Topics/CancerTreatment

For help quitting smoking, contact:

Smokefree.gov

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

Online: www.smokefree.gov

 Do not use tobacco or drink alcohol while you are getting radiation therapy to your head or neck.

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.



Radiation to the shaded area may cause nausea and vomiting.

How long they last

Nausea and vomiting may occur 30 minutes to many hours after your radiation therapy session. 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 eating and drinking bland, easy-to-digest foods and drinks that do not upset your stomach. These foods might include toast, gelatin, and apple juice. To learn more, see the list of foods and drinks that are easy on the stomach on page 54.



Eat five or six small meals and snacks each day instead of three large meals.

- ▶ **Try to relax before treatment.** You may feel less nausea if you relax before each radiation therapy treatment. You can help yourself relax by spending time doing quiet activities you enjoy, such as reading a book or listening to music. For relaxation exercises:

- Visit Learning to Relax on the National Cancer Institute's website at: www.cancer.gov/about-cancer/coping/feelings/relaxation
- See *Facing Forward: Life after Cancer Treatment* at: www.cancer.gov/publications/patient-education/facing-forward



- ▶ **Plan when to eat and drink.** Some people feel better when they eat before getting radiation therapy, and others do not. Learn the best time for you to eat and drink. Try a light snack, such as crackers and apple juice one to two hours before radiation therapy. Or, you might feel better if you have treatment on an empty stomach, which means not eating two to three hours before treatment.
- ▶ **Eat small meals and snacks.** Many people find that they eat better if they eat five or six small meals and snacks each day, rather than three large meals. Make sure to eat slowly and do not rush.
- ▶ **Have foods and drinks that are at room temperature (not too hot and not too cold).** Before eating or drinking, give hot food and drinks a chance to cool down. Warm cold food and drinks in the microwave for a short time.
- ▶ **Talk with your doctor or nurse.** They may suggest a special diet or prescribe medicine to help prevent nausea. You might also ask them about acupuncture, which may help relieve nausea and vomiting caused by cancer treatment. Acupuncture is a type of complementary and alternative medicine. It is a technique that involves inserting thin needles through the skin at specific points on the body.

Ways to Learn More -----

For more information about dealing with nausea and vomiting:

- ▶ Visit the Side Effects section of the National Cancer Institute's website at: www.cancer.gov/about-cancer/treatment/side-effects
- ▶ Read *Eating Hints: Before, during, and after Cancer Treatment* at: www.cancer.gov/publications/patient-education/eating-hints

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, both while you are getting treatment and after it ends. Sexual and fertility changes are different 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, such as hot flashes, vaginal dryness, and not having your period
- ▶ loss of fertility, which means never being able to get pregnant

Problems for men include:

- ▶ impotence (also called erectile dysfunction or ED), which means not be able to have or keep an erection
- ▶ loss of fertility, which means never being able to father a child, due to having fewer or less effective sperm



Radiation to the shaded area may cause sexual and fertility changes.

Why they occur

Sexual and fertility changes can happen when people have 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. Scar tissue from radiation therapy causes many sexual side effects. 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 do conceive a child after you have finished radiation therapy, the fact that you had this treatment 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 and concerns, and how you prefer to be intimate while you are having radiation therapy.

For women, issues to discuss with your doctor or nurse include:

- ▶ **Fertility.** Before radiation therapy starts, let your doctor or nurse know if you think you might want to get pregnant after your treatment ends. They can talk with you about ways to preserve your fertility, such as saving 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.



- ▶ **Stretching your vagina.** Vaginal stenosis is a common problem for women who have radiation therapy to the pelvis. This problem can make it painful to have sex. You can help by stretching your vagina using a dilator, which is 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.

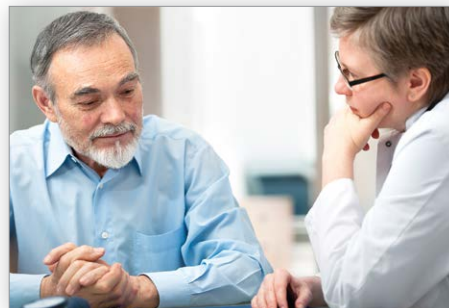


Talk with your doctor or nurse if you want to have children in the future.



For men, issues to discuss with your doctor or nurse include:

- ▶ **Fertility.** Before you start radiation therapy, let your doctor or nurse know if you think you might want to father children in the future. They will talk with you about options, 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

For more information about sexual and fertility problems, contact:

American Cancer Society

Toll-free: 1-800-ACS-2345 (1-800-227-2345)

Online: www.cancer.org

LIVESTRONG Fertility

Toll-free: 1-855-844-7777

Online: www.livestrong.org/what-we-do/program/fertility

Skin Changes

What they are

Radiation therapy can cause skin changes in your treatment area. Some common skin changes include:

- ▶ **Redness.** Your skin in the treatment area may look as if you have a mild to severe sunburn or tan.
- ▶ **Severe itching.** The skin in your treatment area may itch very badly. It is important to avoid scratching, which can cause skin breakdown and infection. Skin breakdown is a problem that happens when the skin in the treatment area peels off faster than it can grow back.
- ▶ **Dry and peeling skin.** The skin in your treatment area can get very dry. It may get so dry that it starts to peel, as if you have had a bad sunburn. If it peels off faster than it can grow back, you may develop sores or ulcers.
- ▶ **Moist reaction.** The skin in your treatment area can become wet, sore, and infected. This problem is more common where you have skin folds, such as your buttocks, behind your ears, and 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 kills healthy skin cells in the treatment area. When people get radiation therapy almost every day, their skin cells do not have enough time to grow back between treatments. Skin changes can happen anywhere on 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 go away a few weeks after treatment is over. But even after radiation therapy ends, some skin changes may remain. Skin in the treatment area may always look darker and blotchy. It may feel very dry or thicker than before. And you will always burn quickly and be sensitive to the sun.

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. Use creams that your doctor or nurse suggests.
- ▶ **Do not put anything on your skin that is very hot or cold.** Do not use heating pads, ice packs, or other hot or cold items on the treatment area.
- ▶ **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 don't soak for too long. Whether you take a shower or bath, use a mild soap. 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, 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 | • hair removers | • perfume |
| • cornstarch | • makeup | • powder |
| • cream | • oil | • soap |
| • deodorant | • ointment | • 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 made of very soft fabrics.
- ▶ **Do not wear clothes in your treatment area that are tight and do not breathe,** such as girdles, body shapers, and pantyhose.



Take extra good care of your skin during radiation therapy.
Be gentle and do not rub, scrub, or scratch.

- ▶ **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 sunbathe. Wear a broad-brimmed hat, long-sleeved shirt, and long pants when you are outside. Talk with your doctor or nurse about sunscreen lotions. They 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.
- ▶ **Do not use tanning beds.** Tanning beds expose you to the same harmful effects as the sun.
- ▶ **Adhesive tape.** Do not put adhesive bandages 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 treatment area. If you can shave, use an electric razor, but do not use pre or aftershave products if the treatment area includes your face.
- ▶ **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. Ask your nurse if sitz baths might help you. Sitz baths are warm water baths 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. These include lotions for dry or itchy skin, antibiotics to treat infection, and drugs to reduce swelling or itching.

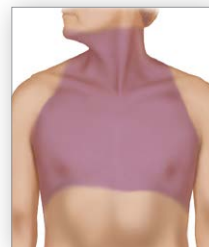


Be careful not to wash off the ink markings you need for radiation therapy.

Throat Changes

What they are

Radiation therapy to the neck or chest can cause the lining of your throat to become swollen and sore. This problem 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.



Radiation to the shaded area may cause throat changes.

Why they occur

Radiation therapy to the neck or chest can cause throat changes because it not only kills cancer cells but also can 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 other treatments such as chemotherapy and immunotherapy, and whether you use tobacco and alcohol while you are getting radiation therapy.

How long they last

You may notice throat changes two to three weeks after starting radiation. You will most likely feel better four to six weeks after you have finished radiation therapy.

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.

Let your doctor or nurse know if you:

- have trouble swallowing
- feel as if you are choking
- cough while you are eating or drinking

- ▶ **Eat small meals and snacks.** It may be easier to eat a small amount of food at one time. Instead of eating three large meals each day, eat five or six 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 maintain your weight during radiation therapy. Having foods and drinks that are high in calories and protein can help you. See the chart on page 53 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.
- ▶ **Avoid 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.** They can help make sure you eat enough to maintain your weight.
- ▶ **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 them know if you have throat pain or lose weight. Your doctor can prescribe medicines that may help relieve your symptoms, such as antacids, gels that coat your throat, and painkillers.

Ways to Learn More -----

To learn more about throat changes, read:

- ▶ *Eating Hints: Before, during, and after Cancer Treatment* at:
www.cancer.gov/publications/patient-education/eating-hints
- ▶ *Cancer Pain Control: Support for People with Cancer* at:
www.cancer.gov/publications/patient-education/pain-control

For help quitting smoking, contact:

Smokefree.gov

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

Online: 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 urinate (empty your bladder)
- ▶ trouble starting to urinate
- ▶ trouble emptying your bladder completely
- ▶ 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
- ▶ waking frequently to urinate
- ▶ blood in your urine
- ▶ bladder spasms, which are like painful muscle cramps



Radiation to the shaded area may cause urinary and bladder changes.

Why they occur

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

How long they last

Urinary and bladder problems often start three to five weeks after radiation therapy begins. Most problems go away two to eight weeks after treatment is over.

Ways to manage

- ▶ **Drink lots of fluids.** Drink six to eight cups of fluids each day, enough 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.** You may need to provide a urine sample to check whether you have an infection.
- ▶ **Talk with your doctor or nurse if you have incontinence.** They 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.



Drink six to eight cups of fluids each day.

Late Effects

Radiation therapy can cause health problems that may not show up for months or years after treatment has ended. Late effects are specific to the part of your body that was treated and the doses of radiation you received. Your doctor should talk with you about late effects when you discuss your follow-up care.



For more information about late effects and ways to manage them, see the *Late Side Effects* section of the National Cancer Institute's website at www.cancer.gov/about-cancer/coping/survivorship/late-effects.



Questions to Ask Your Doctor or Nurse

Here are some questions for you to ask your doctor or nurse.

About Radiation Therapy

Why do I need radiation therapy?

What kind of radiation therapy will I receive?

How can radiation therapy help me?

How many weeks will my course of radiation therapy last?

How can I learn more about radiation therapy?

About Side Effects

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

What will you do to help me manage these side effects?

Will these side effects go away after I finish radiation therapy?

What kinds of late side effects should I expect after I finish radiation therapy?

About This Booklet

Which sections in this booklet will be the most helpful to me?

Lists of Foods and Liquids

Clear Liquids

This list may help if you have diarrhea. See page 22 for more information.

Soups

- ▶ bouillon
- ▶ clear, fat-free broth
- ▶ consommé
- ▶ strained vegetable broth

Drinks

- ▶ apple juice
- ▶ clear carbonated beverages
- ▶ cranberry or grape juice
- ▶ fruit-flavored drinks
- ▶ fruit punch
- ▶ sports drinks
- ▶ tea
- ▶ water

Sweets

- ▶ fruit ices without fruit pieces
- ▶ fruit ices without milk
- ▶ honey
- ▶ jelly
- ▶ plain gelatin dessert
- ▶ ice pops

Low-Fiber Foods

This list may help if you have diarrhea. See page 22 for more information.

Main Meals

- ▶ chicken and turkey, without the skin
- ▶ cooked refined cereals
- ▶ cottage cheese
- ▶ eggs
- ▶ fish
- ▶ noodles
- ▶ potatoes, baked or mashed without the skin
- ▶ white bread
- ▶ white rice

Fruits and Vegetables

- ▶ asparagus
- ▶ bananas
- ▶ canned fruits, such as peaches, pears, and applesauce
- ▶ clear fruit juice
- ▶ vegetable juice

Snacks

- ▶ angel food cake
- ▶ gelatin
- ▶ saltine crackers
- ▶ sherbet or sorbet
- ▶ yogurt, plain or vanilla

Foods and Drinks That Are High in Calories or Protein

This list may help if you need ideas for maintaining your weight. See pages 4 and 43 for more information.

Soups

- ▶ cream soups
- ▶ soups with lentils, dried peas, or beans, such as pinto, black, red, or kidney

Drinks

- ▶ instant breakfast shakes
- ▶ milkshakes
- ▶ smoothies
- ▶ whole milk (instead of low-fat or skim)

Main Meals and Other Foods

- ▶ legumes, such as lentils and pinto, kidney, and black beans
- ▶ butter, margarine, or oil
- ▶ cheese
- ▶ chicken, fish, or beef
- ▶ cottage cheese
- ▶ cream cheese on crackers or celery
- ▶ deviled ham
- ▶ eggs, such as scrambled or deviled eggs
- ▶ muffins
- ▶ nuts, seeds, wheat germ
- ▶ peanut butter

Desserts and Other Sweets

- ▶ custards, soft or baked
- ▶ frozen yogurt
- ▶ ice cream
- ▶ muffins
- ▶ puddings
- ▶ yogurt

Meal Replacements and Other Supplements

- ▶ powdered milk added to foods, such as pudding, milkshakes, or scrambled eggs
- ▶ high-protein supplements, such as Ensure® and Carnation® Instant Breakfast®

Foods and Drinks That Are Easy on the Stomach

This list may help if you have diarrhea or nausea and vomiting. See pages 22 and 34 for more information.

Soups and Drinks

- ▶ clear broth, such as chicken or beef
- ▶ drinks
- ▶ clear carbonated beverages
- ▶ cranberry or grape juice
- ▶ fruit-flavored drinks
- ▶ fruit punch
- ▶ sports drinks
- ▶ tea
- ▶ water

Main Meals and Snacks

- ▶ chicken, broiled or baked without skin
- ▶ crackers
- ▶ Cream of Rice®
- ▶ instant oatmeal
- ▶ noodles
- ▶ potatoes, boiled without skin
- ▶ pretzels
- ▶ saltine crackers
- ▶ white rice
- ▶ white toast

Sweets

- ▶ angel food cake
- ▶ canned fruit, such as applesauce, peaches, and pears
- ▶ gelatin
- ▶ ice pops
- ▶ sherbet or sorbet
- ▶ yogurt, plain or vanilla



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