



Radiation Therapy

What It Is, How It Helps



Every cancer. Every life.™

Radiation therapy is one of the most common treatments for cancer. Radiation may be used alone or with other treatments.

If your treatment plan includes radiation therapy, this booklet will help you learn more about what you can expect and answer some questions you may have.

What is radiation therapy?

Radiation therapy uses strong beams of energy to treat cancer. There are many types of radiation. Some types are x-rays, gamma rays, electron beams, and protons.

How does radiation therapy work?

Radiation therapy damages the DNA inside cancer cells. This keeps them from growing and making more cancer cells. Radiation can also harm normal cells near the tumor. But normal cells can fix themselves; cancer cells can't.

Sometimes radiation is the only treatment needed. Other times it's used along with surgery, chemotherapy, or other treatments.

Radiation therapy is used in cancer treatment for different reasons:

- To try to cure the cancer
- To shrink a tumor before surgery
- To try to stop cancer from coming back
- To help ease symptoms caused by the cancer
- To help other cancer treatments work better
- To kill any leftover cancer cells after other cancer treatment

Talk to your cancer care team about the goal of your treatment.

How many radiation treatments will I need?

Radiation treatment may last anywhere from one day up to several weeks. The number of treatments you need depends on the size and type of cancer, where the cancer is, your overall health, the type of radiation used, and other treatments you're getting.

Many people get treatments once a day, five days a week, for several weeks. There are some kinds of radiation that are only given once or twice. Your radiation care team will tell you how many treatments you will need and for how long.

Are there different kinds of radiation?

Radiation can be given in three ways. They are:

- External beam
- Internal (brachytherapy)
- Systemic

Some people may get more than one kind of radiation. The type you get depends on the kind of cancer you have and where it is.

External beam radiation therapy

An external beam radiation therapy (EBRT) machine sends high-energy beams from outside of the body into the area with the tumor. There are many kinds of EBRT. Certain kinds of EBRT are better for certain kinds of cancer. The most common types of EBRT are:

- Three-dimensional conformal radiation therapy (3D-CRT)
- Intensity-modulated radiation therapy (IMRT)
- Stereotactic radiosurgery (SRS)
- Stereotactic body radiation therapy (SBRT)
- Intraoperative radiation therapy (IORT)
- Proton beam radiation therapy
- Total body irradiation (TBI)

Simulation

Before your first radiation treatment, you will have a planning appointment called simulation or CT sim. It usually takes about one hour.

During simulation, the radiation team may:

- Make a mold or other device to fit a part of your body. Molds help keep you in the same position during every treatment.
- Take x-ray, CT, or MRI images to help plan your radiation treatments.

- Make tiny marks on your skin (radiation tattoos). These are the size of a freckle and help line the machine up for each treatment. Sometimes stickers or temporary marks are used instead.

What happens during external beam radiation treatment?

- You lie down on a treatment table under the radiation machine. Sometimes molds or other objects are used to position your body. The radiation therapist may put shields or blocks between the machine and other parts of your body. These protect the rest of your body from the radiation.
- The radiation therapist goes into a nearby room to turn on the machine. The machine may move around you. You might hear sounds from the machine like a clicking or whirring. You may see lights that line up with the marks on your skin.
- During treatment, the machine sends beams of radiation through your skin to the tumor. You will not feel anything. Treatment will last just a few minutes.
- When the radiation therapist is in the other room, you can still talk to each other through a speaker the entire time.

You are not radioactive after getting EBRT. It is safe for you to be close to people and pets.

Internal radiation

Internal radiation is also called brachytherapy. The radiation doctor places radioactive material (sometimes called an implant) in the tumor or near it. With internal radiation, doctors can use a higher dose of radiation in a smaller area than they can with EBRT. This helps reduce damage to healthy tissue around the tumor.

The radiation implant might look like a wire, a tube, pellets, or seeds. The implant you get might be removed after a while or left in place.

How are implants placed?

The doctor places one or more implants in or near the tumor with a small tube called an applicator or catheter. Pictures are usually taken (using an x-ray, ultrasound, CT, or MRI) during the procedure to help the doctor find the exact area the implant should be placed.

High-dose rate (HDR) brachytherapy

High-dose rate (HDR) brachytherapy uses an implant that puts out higher doses of radiation. The implant is left in place for 10 to 20 minutes and is then removed. The radioactive implant is not left in your body. Some people get HDR brachytherapy once or twice a day for a few weeks.

Some people must stay in the hospital to get these daily treatments. But most people can go home between treatments.

Low-dose rate (LDR) brachytherapy

Low-dose rate (LDR) brachytherapy gives off lower doses of radiation over a longer period of time. Some implants are left in for a few days and then removed.

You may have to stay in the hospital for a few days while you get treatment. Other people can go home the same day.

Will I be radioactive during or after brachytherapy?

Whether you are radioactive will depend on the type of brachytherapy you get.

- Some smaller implants are left in the body permanently and never taken out. Over time, they stop giving off radiation.
- If you have a temporary implant, you may have to stay in the hospital during treatment. Pregnant individuals and children might not be allowed to visit. Once the implant is removed, your body will likely no longer give off radiation.

Since brachytherapy is sealed in a container, your body fluids are not usually radioactive. Follow all directions from your cancer care team after you receive brachytherapy.

Systemic radiation

Systemic radiation is given by mouth as a pill or injected into the vein through a needle in the arm. The radioactive medicine travels through the body, finds the cancer, and gives off radiation. Sometimes they are called radiopharmaceuticals or radionuclides.

Will I be radioactive after systemic radiation therapy?

Because systemic radiation goes through your whole body, the radiation will be in your body fluids for a few days.

Over time, your body will get rid of the radiation. Your body fluids (such as spit, sweat, blood, stool, urine) will be radioactive for a few days.

Your radiation care team will tell you what you need to do to keep others around you safe until the radiation is out of your body.

What are the side effects of radiation?

Some people have very few side effects, while others have many. The most common side effects are:

- Feeling very tired (fatigue)
- Skin changes over the treated area (radiation dermatitis)
- Not feeling like you want to eat much (appetite loss)

Other side effects depend on the part of the body being treated. For example, if you get radiation to your head, you might have hair loss. Or if you get radiation to your neck or chest, you might have a sore throat.

Your radiation care team will tell you what side effects are possible with the kind of radiation you are getting and which part of your body is getting treated.

Next, we will talk about how to manage some of the most common side effects of radiation.

How do I deal with fatigue?

Fatigue is feeling tired physically, mentally, and emotionally. It can keep you from doing the things you want and need to do. It's not like the fatigue you feel at the end of a long, hard day. The fatigue caused by cancer and treatments is worse and causes more problems. Rest does not always make it go away.

Fatigue from radiation treatment usually goes away a few weeks after treatment ends.

Here are some things you can do to help yourself feel better:

- Do the things you need to do when you feel your best. For example, if you have the most energy in the morning, plan to do the most important activities during that time.
- Ask for help, and let people help you.
- Put things you use a lot within easy reach.
- Try to find a relaxing activity. Many people feel better with things like deep breathing, prayer, talking with others, reading, or listening to music.
- Get both rest and activity. Don't spend too much time in bed, which can make you weak. Don't let rest or daytime naps keep you from sleeping at night. A few short rest breaks are better than one long one.

- Move your body every day. Talk to your cancer care team about physical activity before you start.
- Pain, nausea, vomiting, and other side effects can make fatigue worse. Tell you cancer team if you are having these symptoms.
- Depression can make you feel more tired. Talk with your doctor if you think you may be depressed.

Tell your cancer care team about your fatigue, especially if:

- It doesn't get better, keeps coming back, or gets worse.
- You have trouble breathing after activity.
- You're more tired than usual during or after an activity.
- Your fatigue doesn't get better with rest or sleep.
- You become confused or can't think.
- You can't get out of bed for more than 24 hours.
- You can't do the things you need or want to do.

What can I do about skin changes?

Skin around the part of your body being treated may get red, swollen, blistered, sunburned, or tanned. After a few weeks, your skin may become dry, flaky, itchy, or it may peel. This is sometimes called **radiation dermatitis**.

Tell your cancer care team about any skin changes. They can suggest ways to help your skin feel better and help keep it from getting worse.

Be gentle with your skin. Here are some ways to do this.

Do:

- Wear loose clothes that are soft and smooth.
- Protect treated skin from the sun. Your skin may be extra sensitive to sunlight, even after radiation treatment ends. Wear clothes that cover your skin or use sunscreen with an SPF of at least 30.
- Use only lukewarm water and mild soap. Just let the water run over the treated skin instead of rubbing.
- Ask your cancer care team before using anything on your treated skin. This includes powders, creams, perfumes, deodorants, oils, lotions, or home remedies.

Do not:

- Rub, scratch, or use tape on the treated skin. If you must cover your skin with anything, use gauze wrap and paper tape or other tape for sensitive skin. Try not to let the tape touch the treatment area.
- Use heat or cold (such as a heating pad/pack or ice pack) on the treated skin.

- Use pre-shave, after-shave, or hair removal products. If you must shave the area, use an electric shaver. Talk to your cancer care team before you shave treated areas.

Many skin changes go away over time after treatment ends. But the treated skin may stay darker or be more sensitive than it was before.

What should I do if I have problems eating?

You might not feel like eating much during treatment. Eating may be more of a problem if you're getting radiation to your belly, chest, neck, or throat.

Eating as well as you can is important. Not eating can lead to weight loss, fatigue, weakness, and other problems.

Here are some tips that may help if you are having trouble eating:

- **Eat five or six small meals or snacks throughout the day** instead of two or three large meals.
- **Make eating more enjoyable** by playing your favorite music, watching TV, or eating with friends or family.
- **Keep high-calorie and high-protein snacks around.** Some ideas are hard-boiled eggs, peanut butter, cheese, ice cream, yogurt, milkshakes, protein bars, liquid supplements, pudding, nuts, and trail mix.

- **Eat your favorite foods any time of the day.** If you like breakfast foods, you can eat them for dinner.
- **Eat when you're hungry, even if it's not mealtime.**
- **If others offer to cook for you or bring you meals, let them.** Don't be shy about telling them what you want to eat.

Tell your cancer care team if you:

- Have trouble swallowing
- Gag, cough, or choke when you try to swallow
- Have pain when you chew or swallow
- Can't eat or drink for more than 24 hours
- Have vomiting or diarrhea for more than 24 hours

Frequently asked questions

Will I have pain?

Radiation therapy isn't painful, but some of the side effects can be.

If you have any pain, talk to your cancer care team. Describe the pain and where it is in as much detail as you can. This will help your team know how best to help you with your pain.

Pain is not part of cancer treatment. Get help if you have pain.

Will I be able to work during treatment?

Some people work during treatment, and others don't. It depends on your situation, if you've had surgery or other treatments, and the kind of work you do.

Talk to your cancer care team about your plans for work during treatment. They can make suggestions based on your treatment plan and possible side effects.

If you decide to take time off, talk to your supervisor or human resources team. Check with your insurance company about coverage, and check your state's family and medical leave laws (FMLA).

How can I care for my mental health?

Feeling stressed about getting radiation therapy can affect your thoughts, emotions, and feelings. You might feel depressed, afraid, angry, alone, or helpless. Talk to your cancer care team if you are feeling this way.

Some tips to support your mental health include:

- **Join a support group.** You might feel like you are alone or that no one understands how you feel. Support groups connect you with others who have gone through or are going through the same things you are.
- **Find a counselor.** Sometimes it's easier to speak with someone you don't know. Counselors or therapists can help

you find ways to manage anxiety, negative thoughts, or to talk about your feelings to your loved ones.

- **Mindfulness and relaxation.** These practices have been shown to reduce stress, anxiety, and depression. Mindfulness can improve communication and relationships, increase positive feelings, and improve focus and sleep.

Remember, your cancer team is there to support you mentally, not just physically. They won't know how you're feeling or be able to help unless you talk to them.

Will radiation affect my sex life?

Some kinds of radiation therapy in the pelvic area (lower abdomen) can affect a person's sex life during and after treatment. It will depend on the type of radiation, the area being treated, and the type of cancer you have.

Here are some questions you may want to ask your cancer care team before starting radiation treatment:

- How might radiation treatment affect my sex life?
- Is it safe to have sex during radiation treatment?
- Are there any types of sex I should avoid?
- Should I or my partner use birth control while I'm getting treatment? What about after treatment ends?
- Can my body fluids pass medications or radioactivity on to my partner?

Will I be able to have children after radiation therapy?

If you are getting radiation near your ovaries or testicles, it is possible that it might cause these organs to stop working (sterility) and prevent you from being able to have children (infertility). Talk to your doctor about how your treatment may affect your ability to have children in the future.

It's important not to get pregnant while getting radiation; it can harm the growing baby. If there's a chance you are or might become pregnant, talk to your radiation care team right away.

What should I ask my doctor?

Before you start radiation therapy, you will meet with your radiation care team. Work with them to decide what's best for you. Ask the doctor, nurses, and others all the questions you have. Talking with them can help you know what to expect.

Be ready. Write down questions before your appointment. Take them with you, and don't be afraid to say you need to know more. Here are some questions you might want to ask:

- What kind of radiation do you think will work best for me?
- What's the goal of my radiation treatment?
- How will we know if the radiation is working?
- How will the radiation be given? How often? For how long?

- Will I need other kinds of treatment? If so, what kind?
- How do I get ready for radiation treatment?
- Do I need to follow a special diet?
- Will you need to put marks on my skin? What will they look like?
- Will any side effects change my eating, drinking, exercise, work, or sex life?
- Will I still be able to work or go to school during treatment?
- Will the treatment or side effects change the way I look?
- How long might the side effects last?
- What's the chance that the cancer will spread or come back if I get radiation? What's the chance that the cancer will spread or come back if I don't get it?
- Does my insurance pay for radiation treatment? If not, how will I pay for it?

What happens after treatment ends?

When radiation treatments end, you'll still need to have checkups. Your primary care provider and your cancer care team will work with you to schedule follow-up appointments. Sometimes most of your care might be turned over to your family doctor, and you might only see your cancer care team once in a while or if you have a problem.



Here are some questions you might want to ask your care team after radiation ends:

- When can I go back to my normal activities?
- How often do I need to see you? What about my family doctor?
- Will I need to have tests done after treatment? If so, what tests and why?
- What problems do I need to watch for?
- Who should I call when I have problems?



This booklet has information on radiation therapy. It tells you:

- How radiation works
- Types of radiation therapy
- Things you can do to take care of yourself while getting radiation
- Common side effects of radiation therapy and how to manage them
- Questions you may want to ask your care team, so you know what to expect

To learn more about radiation therapy, visit the American Cancer Society website at **cancer.org** or call us at **1-800-227-2345**. We're here when you need us.



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