

## Radiation Therapy Side Effects

It's very important to remember that every person reacts differently to treatment. Any side effect you might have depends on the type and location of cancer, the dose of radiation being given, and your general health. Some people have few or no side effects, while others have quite a few.

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### How long do side effects last?

Remember that the type of radiation side effects you might have depends on the prescribed dose and schedule. Most side effects go away within a few months of ending treatment. Some side effects may continue after treatment ends because it takes time for the healthy cells to recover from radiation.

Side effects might limit your ability to do some things. What you can do will depend on how you feel. Some patients are able to go to work or enjoy leisure activities while they get radiation therapy. Others find they need more rest than usual and can't do as much. If you have side effects that are bothersome and affecting your daily activities or health, the doctor may stop your treatments for a while, change the schedule, or change the type of treatment you're getting. Tell your cancer care team about any side effects you notice so they can help you with them.

### Early and late effects of radiation therapy

- **Early side effects** happen during or shortly after treatment. These side effects tend

to be short-term, mild, and treatable. They're usually gone within a few weeks after treatment ends. The most common early side effects are fatigue (feeling tired) and skin changes. Other early side effects usually are related to the area being treated, such as hair loss and mouth problems when radiation treatment is given to this area.

- **Late side effects** can take months or even years to develop. They can occur in any normal tissue in the body that has received radiation. The risk of late side effects depends on the area treated as well as the radiation dose that was used. Careful treatment planning can help avoid serious long-term side effects. It's always best to talk to your radiation oncologist about the risk of long-term side effects.

### **Radioprotective drugs for reducing side effects**

One way to reduce side effects is by using radioprotective drugs, but these are only used for certain types of radiation given to certain parts of the body. These drugs are given before radiation treatment to protect certain normal tissues in the treatment area. The one most commonly used today is amifostine. This drug may be used in people with head and neck cancer to reduce the mouth problems caused by radiation therapy.

Not all doctors agree on how these drugs should be used in radiation therapy. These drugs have their own side effects, too, so be sure you understand what to look for.

### **Common general side effects of radiation therapy**

#### **Fatigue**

[Fatigue](#)<sup>1</sup> is feeling tired physically, mentally, and emotionally. It's very common for people with cancer and often happens with radiation therapy. Most people start to feel tired after a few weeks of radiation therapy. This happens because radiation treatments destroy some healthy cells as well as the cancer cells. Fatigue usually gets worse as treatment goes on. Stress from being sick and daily trips for treatment can make fatigue worse. Managing fatigue is an important part of care.

Fatigue felt during radiation treatment is different from the fatigue of everyday life, and it might not get better with rest. It can last a long time and can get in the way of your usual activities. But it will usually go away over time after treatment ends.

Only you know if you have fatigue and how bad it is. No lab tests or x-rays can diagnose or describe your level of fatigue. The best measure of fatigue comes from your own

report to your cancer care team. You can describe your level of fatigue as none, mild, moderate, or severe. Or you can use a scale of 0 to 10, where a 0 means no fatigue, and a 10 is the worst fatigue you could imagine.

Either way you choose, it's important to describe your fatigue to your cancer care team. Be sure to talk with them if:

- Your fatigue doesn't get better, keeps coming back, or gets worse.
- You're more tired than usual during or after an activity.
- You're feeling tired, and it's not related to something you've done.
- You become confused or can't focus your thoughts.
- You can't get out of bed for more than 24 hours.
- Your fatigue disrupts your social life or daily routine.

If you need to take time off from work, talk to your employer.

## Skin problems

Your skin in the radiation treatment area might look [red, irritated, swollen, blistered, sunburned, or tanned](#)<sup>2</sup>. After a few weeks, your skin might become dry, flaky, or itchy, or it may peel. This is sometimes called radiation dermatitis. It's important to let your cancer care team know about any skin changes. They can suggest ways to ease the discomfort, lessen further irritation, and prevent infection.

These problems usually go away gradually after treatment ends. In some cases, though, the treated skin will stay darker and might be more sensitive than it was before.

You need to be gentle with your skin. Here are some ways to do this:

- **Do not wear tight, rough-textured, or stiff clothes over the treatment area.** This includes anything tight or elastic that squeezes the area. Instead, wear loose clothing made from soft, smooth fabrics. Do not starch your clothes.
- **Do not rub, scrub, scratch, or use adhesive tape on treated skin.** If your skin must be covered or bandaged, use paper tape or other tape for sensitive skin. Try to put the tape outside the treatment area, and don't put the tape in the same place each time.
- **Do not put heat or cold (such as a heating pad, heat lamp, or ice pack) on the treatment area** without talking to your cancer care team first. Even hot water may hurt your skin, so use only lukewarm water for washing the treated area.

- **Protect the treated area from the sun.** Your skin may be extra sensitive to sunlight. If possible, cover the treated skin with dark-colored or UV-protective clothing before going outside. Ask your cancer care team if you should use sunscreen. If so, use a broad spectrum sunscreen with a sun protection factor (SPF) of at least 30. Reapply the sunscreen often. Continue to give your skin extra protection from sunlight, even after radiation therapy ends.
- **Use only lukewarm water and mild soap.** Just let water run over the treated area. Do not rub. Also be careful not to rub away the ink marks needed for your radiation therapy until it's done.
- **Check with your cancer care team before shaving the treated area.** They might recommend that you use an electric shaver.
- **Ask your cancer care team before using anything on the skin in the treatment area.** This includes powders, creams, perfumes, deodorants, body oils, ointments, lotions, hair-removal products, or home remedies while you're being treated and for several weeks afterward. Many skin products can leave a coating on the skin that can cause irritation, and some may even affect the dose of radiation that enters the body.

## Hair loss

Radiation therapy can cause [hair to be thinned or lost](#)<sup>3</sup> in the area being treated. For instance, radiation to your head may cause you to lose some or all the hair on your head (even eyebrows and lashes), but if you get treatment to your hip, you won't lose the hair on your head.

Most people find that their hair grows back after treatment ends, but it can be hard to deal with hair loss. When it does grow back, your hair may be thinner or a different texture than it was before. Ask your cancer care team if you have any questions or concerns about hair loss.

If you do lose your hair, your scalp may be tender and you may want to cover your head. Wear a hat or scarf to protect your head when you're in the sun. If you prefer to wear a hairpiece or wig, be sure the lining doesn't irritate your scalp. Your local American Cancer Society office may be able to help you get wigs or hats.

## Low blood counts

Rarely, radiation therapy can cause [changes in your blood count levels](#)<sup>4</sup>. These blood

cells help your body fight infection and prevent bleeding. If your blood tests show low blood counts, your treatment might be stopped for a week or so to allow your blood counts to return to normal. This side effect is more likely if you're also getting chemotherapy.

## **Specific side effects of radiation therapy that affect parts of the body**

### **If you're getting radiation therapy to the brain**

People with brain tumors often get stereotactic radiosurgery (radiation given in one large dose) if the cancer is in only one or a few sites in the brain. Side effects depend on where the radiation is aimed. Some side effects might show up quickly, but others might not show up until 1 to 2 years after treatment. Talk with your radiation oncologist about what to watch for and when to call your doctor.

If the cancer is in many areas, sometimes the whole brain is treated with radiation. The side effects of whole brain radiation therapy may not be noticeable until a few weeks after treatment begins.

Radiation to the brain can cause these short-term side effects:

- Headaches
- Hair loss
- Nausea
- Vomiting
- Extreme tiredness (fatigue)
- Hearing loss
- Skin and scalp changes
- Trouble with memory and speech
- Seizures

Some of these side effects can happen because radiation has caused the brain to swell. Medicines are usually given to prevent brain swelling, but it's important to let your cancer care team know about headaches or any other symptoms. Treatment can affect each person differently, and you may not have these particular side effects.

Radiation to the brain can also have side effects that show up later – usually from 6 months to many years after treatment ends. These delayed effects can include serious problems such as memory loss, stroke-like symptoms, and poor brain function. You may also have an increased risk of having another tumor in the area, although this is

not common.

Talk with your cancer care team about what to expect from your specific treatment plan.

### **If you're getting radiation therapy to the head or neck**

People who get radiation to the head and neck might have side effects such as:

- Soreness (or even open sores) in the mouth or throat
- Dry mouth
- Trouble swallowing
- Changes in taste
- Nausea
- Earaches
- Tooth decay
- Swelling in the gums, throat, or neck
- Hair loss
- Changes in skin texture
- Jaw stiffness

### ***How to care for your mouth during treatment***

If you get radiation therapy to the head or neck, you need to take good care of your teeth, gums, mouth, and throat. Here are some tips that may help you manage mouth problems:

- Avoid spicy and rough foods, such as raw vegetables, dry crackers, and nuts.
- Don't eat or drink very hot or very cold foods or beverages.
- Don't smoke, chew tobacco, or drink alcohol – these can make mouth sores worse.
- Stay away from sugary snacks.
- Ask your cancer care team to recommend a good mouthwash. The alcohol in some mouthwashes can dry and irritate mouth tissues.
- Rinse your mouth with warm salt and soda water every 1 to 2 hours as needed. (Use 1 teaspoon of salt and 1 teaspoon of baking soda in 1 quart of water.)
- Sip cool drinks often throughout the day.
- Eat sugar-free candy or chew gum to help keep your mouth moist.
- Moisten food with gravies and sauces to make it easier to eat.
- Ask your cancer care team about medicines to help treat mouth sores and control

pain while eating.

If these measures are not enough, ask your cancer care team for advice. Mouth dryness may be a problem even after treatment is over. If so, talk to your team about what you can do.

### ***How to care for your teeth during treatment***

Radiation treatment to your head and neck can increase your chances of getting cavities. This is especially true if you have dry mouth as a result of treatment.

Before starting radiation, talk to your cancer care team about whether you should get a complete check-up with your dentist. Ask your dentist to talk with your radiation doctor before you start treatment. If you have one or more problem teeth, your dentist may suggest removing them before you start treatment. Radiation (and dry mouth) might damage them to the point where they'll need to be removed anyway, and this can be harder to do after treatment starts.

If you wear dentures, they may no longer fit well because of swollen gums. If your dentures cause sores, you may need to stop wearing them until your radiation therapy is done to keep sores from getting infected.

Your dentist may want to see you during your radiation therapy to check your teeth, talk to you about caring for your mouth and teeth, and help you deal with any problems. Most likely, you will be told to:

- Clean your teeth and gums with a very soft brush after meals and at least one other time each day.
- Use fluoride toothpaste that contains no abrasives.
- Rinse your mouth well with cool water or a baking soda solution after you brush. (Use 1 teaspoon of baking soda in 1 quart of water.)
- If you normally floss, ask your dentist or cancer care team if this is OK during treatment. Tell your cancer care team if this causes bleeding or other problems.

### **If you're getting radiation therapy to the breast**

If you have [radiation to the breast](#)<sup>5</sup>, it can affect your heart or lungs as well causing other side effects.

### ***Short-term side effects***

Radiation to the breast can cause:

- Skin irritation, dryness, and color changes
- Breast soreness
- Breast swelling from fluid build-up (lymphedema)

To avoid irritating the skin around the breasts, try to go without wearing a bra. If this isn't possible, wear a soft cotton bra without underwires.

If your shoulders feel stiff, ask your cancer care team about exercises to keep your shoulder moving freely.

Breast soreness, color changes, and fluid build-up (lymphedema) will most likely go away a month or 2 after you finish radiation therapy. If fluid build-up continues to be a problem, ask your cancer care team what steps you can take. See [Lymphedema](#)<sup>6</sup> for more information.

### ***Long-term changes to the breast***

Radiation therapy may cause long-term changes in the breast. Your skin may be slightly darker, and pores may be larger and more noticeable. The skin may be more or less sensitive and feel thicker and firmer than it was before treatment. Sometimes the size of your breast changes – it may become larger because of fluid build-up or smaller because of scar tissue. These side effects may last long after treatment.

After about a year, you shouldn't have any new changes. If you do see changes in breast size, shape, appearance, or texture after this time, tell your cancer care team about them right away.

### ***Less common side effects in nearby areas***

Although it's rare, radiation to the breast can affect organs in the chest, including the heart and lungs. This is not as common today as it was in the past, because modern radiation therapy equipment allows doctors to better focus the radiation beams on the area with cancer, with less affect to other areas.

**Rib fractures:** In rare cases, radiation therapy may weaken the ribs, which could lead to a fracture. Be sure you understand what to look for and tell your cancer care team if you notice any of these side effects.



**Heart complications:** Radiation to the breast can also affect the heart. It can cause hardening of the arteries (which can make you more likely to have a heart attack later on), heart valve damage, or irregular heartbeats.

**Lung damage (radiation pneumonitis):** Getting radiation to the breast can sometimes cause an inflammation of the lungs, which is called radiation pneumonitis. See “If you’re getting radiation to the chest” below for more details.

**Damage to the nerves in the shoulder and arm:** Radiation to the breast can sometimes damage some of the nerves to the arm. This is called **brachial plexopathy** and can lead to numbness, tingling, pain, and weakness in the shoulder, arm, and hand.

### ***Side effects of brachytherapy***

If your treatment includes brachytherapy (internal radiation implants), you might notice breast tenderness, tightness, redness, and bruising. You may also have some of the same side effects that happen with external radiation treatment. Let your cancer care team know about any problems you notice.

### **If you’re getting radiation therapy to the chest**

Radiation treatment to the chest may cause side effects such as:

- Sore throat
- Swallowing problems
- Loss of appetite
- Cough
- Shortness of breath

Radiation can also cause other problems in the heart or lungs.

### ***Heart complications***

Getting radiation to the middle portion of the chest can raise your risk of heart disease. This risk increases with higher radiation doses and larger treatment areas in this part of your body. Radiation can also cause hardening of the arteries (which can make you more likely to have a heart attack later on), heart valve damage, or irregular heartbeats.

### ***Radiation pneumonitis***

Radiation pneumonitis is inflammation of the lungs that can be caused by radiation treatment to the chest (or less often, the breast). It may occur about 3 to 6 months after getting radiation therapy. It's more likely if you have other lung diseases, like emphysema (which involves gradual damage of lung tissue). Common symptoms of radiation pneumonitis include:

- Shortness of breath that usually gets worse with exercise
- Chest pain, which is often worse when taking in a deep breath
- Cough
- Pink-tinged sputum
- Low-grade fever
- Weakness

Sometimes there are no symptoms, and radiation pneumonitis is found on a chest x-ray.

Symptoms often go away on their own, but if treatment is needed, it is based on trying to decrease the inflammation. Steroids, like prednisone, are usually used. With treatment, most people recover without any lasting effects. But if it persists, it can lead to pulmonary fibrosis (stiffening or scarring of the lungs). When this happens, the lungs can no longer fully inflate and take in air.

Be sure you understand what to look for, and tell your cancer care team if you notice any of these side effects.

### **If you're getting radiation therapy to the abdomen (belly)**

If you are getting radiation to your stomach or some part of the abdomen (belly), you may have side effects such as:

- Nausea
- Vomiting
- Belly cramps
- Diarrhea
- Constipation

Eating or avoiding certain foods can help with some of these problems, so diet planning is an important part of radiation treatment of the stomach or abdomen. Ask your cancer care team about what you can expect, and what medicines you should take to help relieve these problems. Check with your cancer care team about any home remedies or over-the-counter drugs you're thinking about using.

These problems should get better when treatment is over.

### ***Managing nausea***

Some people feel queasy for a few hours right after radiation therapy. If you have this problem, try not eating for a couple of hours before and after your treatment. You may handle the treatment better on an empty stomach. If the problem doesn't go away, ask your cancer care team about medicines to help prevent and treat nausea. Be sure to take the medicine exactly as you are told to do.

If you notice nausea before your treatment, try eating a bland snack, like toast or crackers, and try to relax as much as possible. See [Nausea and Vomiting](#)<sup>7</sup> to get tips to help an upset stomach and learn more about how to manage these side effects.

### ***Managing diarrhea***

Many people have diarrhea at some point after starting radiation therapy to the abdomen. Your cancer care team may prescribe medicines or give you special instructions to help with the problem. Diet changes may also be recommended, such as:

- Try a clear liquid diet (water, weak tea, apple juice, peach nectar, clear broth, popsicles, and plain gelatin) as soon as diarrhea starts or when you feel like it's going to start.
- Don't eat foods that are high in fiber or can cause gas or cramps, such as raw fruits and vegetables, beans, cabbage, whole-grain breads and cereals, sweets, and spicy foods.
- Eat frequent, small meals.
- Do not drink milk or eat milk products if they irritate your bowels.
- When the diarrhea starts to improve, try eating small amounts of low-fiber foods, such as rice, bananas, applesauce, yogurt, mashed potatoes, low-fat cottage cheese, and dry toast.
- Be sure you take in enough potassium (it can be found in bananas, potatoes, beans, peaches, and many other foods). This is an important mineral you may lose through diarrhea.

### **If you're having radiation therapy to the pelvis**

Radiation therapy to the pelvis (for example, as treatment for bladder, ovarian, or prostate cancer) can cause side effects such as:

- Bladder problems
- Fertility problems
- Changes in your sex life

You might also have some of the same problems people get from radiation to the abdomen, such as nausea, vomiting, diarrhea, or constipation.

### ***Bladder problems***

Radiation to the pelvis can cause problems with urination, including:

- Pain or burning sensations
- Trouble passing urine
- Blood in the urine
- An urge to urinate often

Most of these problems get better over time, but radiation therapy can cause longer-term side effects as well:

- **Radiation cystitis.** If the radiation damages the lining of the bladder, radiation cystitis can be a long-term problem that causes blood in the urine or pain when passing urine.
- **Urinary incontinence.** Radiation treatments for certain cancers, such as prostate and bladder cancer, may make you unable to control your urine or have leakage or dribbling. There are different types and degrees of incontinence, but it can be treated. Even if incontinence can't be corrected completely, it can still be helped. See [Bladder and Bowel Incontinence](#)<sup>8</sup> to learn more. This side effect is most often a problem for men being treated for prostate cancer, but some of the information might also be helpful for women dealing with treatment-related incontinence.
- **Fistulas.** In rare cases, radiation can cause an opening called a **fistula** to form between organs in the pelvis, such as between the vagina and the bladder, or between the bladder and the rectum. These can be fixed with surgery.

### **How fertility might be affected**

**For women:** Talk to your cancer care team about how radiation might affect your

fertility (ability to have a baby). It's best to do this **before** starting treatment so you are aware of possible risks to your fertility.

Depending on the radiation dose, women getting radiation therapy in the pelvic area sometimes stop having menstrual periods and have other symptoms of menopause. Report these symptoms to your cancer care and ask them how to relieve these side effects. Sometimes menstrual periods will return when radiation therapy is over, but sometimes they do not.

See [Fertility and Women With Cancer](#)<sup>9</sup> to learn more.

**For men:** Radiation therapy to an area that includes the testicles can reduce both the number of sperm and their ability to function. If you want to father a child in the future and are concerned about reduced fertility, talk to your cancer care team **before** starting treatment. One option may be to bank your sperm ahead of time.

See [Fertility and Men With Cancer](#)<sup>10</sup> to learn more.

### **How sex might be affected**

With some types of radiation therapy involving the pelvis and/or sex organs, men and women may notice changes in their ability to enjoy sex or a decrease in their level of desire.

**For women:** During radiation treatment to the pelvis, some women are told not to have sex. Some women may find sex painful. Treatment can also cause vaginal itching, burning, and dryness. You most likely will be able to have sex within a few weeks after treatment ends, but check with your doctor first. Some types of treatment can have long-term effects, such as scar tissue that could affect the ability of the vagina to stretch during sex. Again, your cancer care team can offer ways to help if this happens to you. You can also get more information in [Sex and Women With Cancer](#)<sup>11</sup>.

**For men:** Radiation may affect the nerves that allow a man to have erections. If erection problems do occur, they are usually gradual, over the course of many months or years. Talk with your doctor about treatment options if this is a concern for you. You can get more information in [Sex and Men With Cancer](#)<sup>12</sup>.

If you get [internal radiation therapy](#)<sup>13</sup> with seed implants, check with your cancer care team about safety precautions during sex

### **More information about side effects**

For more information about the side effects mentioned here and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>14</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/managing-cancer/side-effects/fatigue.html](http://www.cancer.org/cancer/managing-cancer/side-effects/fatigue.html)
2. [www.cancer.org/cancer/managing-cancer/side-effects/hair-skin-nails.html](http://www.cancer.org/cancer/managing-cancer/side-effects/hair-skin-nails.html)
3. [www.cancer.org/cancer/managing-cancer/side-effects/hair-skin-nails/hair-loss.html](http://www.cancer.org/cancer/managing-cancer/side-effects/hair-skin-nails/hair-loss.html)
4. [www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts.html](http://www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts.html)
5. [www.cancer.org/cancer/types/breast-cancer/treatment/radiation-for-breast-cancer.html](http://www.cancer.org/cancer/types/breast-cancer/treatment/radiation-for-breast-cancer.html)
6. [www.cancer.org/cancer/managing-cancer/side-effects/swelling/lymphedema.html](http://www.cancer.org/cancer/managing-cancer/side-effects/swelling/lymphedema.html)
7. [www.cancer.org/cancer/managing-cancer/side-effects/eating-problems/nausea-and-vomiting.html](http://www.cancer.org/cancer/managing-cancer/side-effects/eating-problems/nausea-and-vomiting.html)
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11. [www.cancer.org/cancer/managing-cancer/side-effects/fertility-and-sexual-side-effects/sexuality-for-women-with-cancer.html](http://www.cancer.org/cancer/managing-cancer/side-effects/fertility-and-sexual-side-effects/sexuality-for-women-with-cancer.html)
12. [www.cancer.org/cancer/managing-cancer/side-effects/fertility-and-sexual-side-effects/sexuality-for-men-with-cancer.html](http://www.cancer.org/cancer/managing-cancer/side-effects/fertility-and-sexual-side-effects/sexuality-for-men-with-cancer.html)
13. [www.cancer.org/cancer/managing-cancer/treatment-types/radiation/internal-radiation-therapy-brachytherapy.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/radiation/internal-radiation-therapy-brachytherapy.html)
14. [www.cancer.org/cancer/managing-cancer/side-effects.html](http://www.cancer.org/cancer/managing-cancer/side-effects.html)

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