

Radiation Therapy

Radiation therapy is a very effective way to destroy cancer cells that may still exist after surgery. This reduces the risk of cancer occurring again. Radiation and chemotherapy work very differently. Radiation focuses on a specific area of the body. Chemotherapy attacks cancer by treating the whole body. Because they are so different, radiation and chemotherapy can provide a strong attack together against cancers.

Why Radiation's Necessary

It's possible that the whole cancer was removed during surgery. However, breast cancer surgery cannot guarantee that every last cancer cell has been removed from your body. Individual cancer cells are too small to be felt and seen at surgery or detected by X-ray. Any cells that remain after surgery can grow and eventually form a lump or show up as an abnormality on a mammogram. Or, cancer cells can spread to other parts of your body.

After surgery for breast cancer, radiation therapy is an extra "insurance policy" to help make sure the cancer doesn't return. For patients with small tumors who undergo a mastectomy (removal of the whole breast), and have tumors completely removed with surgery, there is no need for radiation. However, for patients who only have part of the breast removed, or have larger tumors, or multiple lymph nodes involved with the cancer, radiation is needed to ensure that the cancer does not grow back in the area from which it was removed. The time to deal with any possible leftover cancer cells is right after surgery. The chances are good that hardly any cancer cells are still there. For this reason, your doctor will suggest that you start radiation therapy soon after your breast cancer surgery or after you complete chemotherapy. Without radiation or other additional therapies after surgery, you may have a much higher risk of the cancer returning.

Recent research has shown that women who receive radiation after lumpectomy are more likely to live longer and remain free of cancer longer than women who do not get radiation. Another research study showed that women who don't get radiation after lumpectomy have a greater chance of the cancer coming back in the same breast. Other research has shown that even women with very small cancers benefit from radiation after lumpectomy.

How Radiation Works

Light is a form of energy that we can see. Radiation behaves much like light, but has much more energy, and is invisible to the human eye. In radiation therapy, high-energy beams of radiation are focused on the breast from which cancer was removed. Over time, this focused radiation damages cells that are in the path of its beam—normal cells as well as cancer cells. However, cancer cells are more easily destroyed by radiation, while healthy, normal cells repair themselves and survive. There are two ways to give radiation therapy: externally and internally. **External radiation** is more common. For external radiation, you lie down on a table and a large machine (called a "linear

accelerator") delivers high-energy radiation to the affected breast. **Internal radiation** is less common and uses radioactive material temporarily placed inside the breast, where the tumor used to be.

What to Expect

The Planning Session

A planning appointment will be scheduled to "map" the area of the body where you will receive radiation treatment. This is a very important process designed to set up the treatment to conform to each patient's body shape. This session can be long, as the planning is detailed, and may involve making a shape of support materials tailored to each patient's body. Further treatments will be much shorter time. A non-washable ink marker (pen), or small tattoo will be used to draw an outline of the area. This marking is meant to be a guide to target the radiation the same way each treatment session. The marks are usually no larger than the head of the pin. If the mark is made with a pen, the ink will eventually fade. Because of this, you shouldn't wash the area of the mark too aggressively during the time you are receiving treatment. If the mark is made with a tattoo, it won't fade on its own but it can be removed later.

Your doctor may tell you to avoid taking vitamins C, A, D, and E during radiation therapy because they can interfere with radiation's ability to destroy tumor cells.

Treatment Schedule

Typically, you will receive treatment once a day, five days a week, for between five and seven weeks. Daily appointments are usually about a half-hour. The radiation staff will try to give you a daily appointment time that is as convenient as possible for you. To give you some time off during therapy and to allow your normal tissue time to recover, treatment centers are not open on weekends. One day a week, you might have a slightly longer appointment, so your doctor and nurse can talk with you and examine you to see how you are doing in your treatment. To get the full benefit of radiation therapy, it's important for you to keep all of your scheduled appointments.

Daily Treatment Routine

When you arrive for treatment you'll change into a hospital gown or robe. You'll remove clothing on the upper half of your body and any jewelry that might get in the way (such as long necklaces).

You will be placed in the treatment position. Typically, you'll lie on your back with your arm (the one on the side of the breast area being treated) raised above your head. Supports may be used to help secure your position and make you more comfortable. If you are receiving radiation after mastectomy, a flat piece of rubbery material may be placed on top of your skin.

Next, the technician will carefully line up the radiation machine (linear accelerator) to treat each treatment area. After the machine is positioned, the technician will leave the room.



Although you may feel alone, you are not. The technician can see you through a window or on a television screen and can hear you at all times.

You cannot feel radiation, but you can hear the whirring sound of the machine. During this time, you must remain completely still, though you don't have to hold your breath. It only takes between thirty seconds and a few minutes to deliver the radiation. The technician will return to position you for the second treatment area. Typically, you will have two different areas treated each day.

Each week, you will have X-rays taken. Your doctor uses these to double-check that the radiation is treating the correct areas of your body.

Is the Radiation Working?

You will be receiving radiation to destroy any cancer cells that may have been left behind after surgery. Because cancer cells are too small to be seen (except by microscope), there is no way of really knowing if the radiation is working. The X-rays of your treatment area tell your doctor if radiation is reaching the areas where it can do the most good. Having radiation therapy is like buying auto insurance. You hope you don't ever have to rely on that policy, but you certainly want it there to protect you, just in case.

Boost (Increase) Dose

Through the first five to six weeks of your treatment, you will receive radiation to your entire breast area. During the final week or two, you will also receive another dose targeted directly to the area around your surgery. This dose is called the "boost" and can be delivered either through external radiation or internal radiation.

It is more common to receive your additional "boost" of radiation externally. In that case, you won't notice any difference from the usual method of treating the whole breast. You will receive this dose from the same machine that is used for your other therapy, and you'll probably lie in the same position.

If you receive your additional "boost" of radiation internally, you will have small tubes sewn under your skin in the area where the tumor was removed. Radioactive "seeds" are placed in these tubes that emit radiation to the nearby tissue. In most cases, you will have these "seeds" within you for a day or two. During this time, you will be required to remain in the hospital. This method of internal radiation makes you radioactive to yourself and to anyone who comes in contact with you. However, the hospital staff know how to protect everyone. A newer method that briefly implants the seeds and then takes them out lets you receive internal radiation without staying in the hospital. Then you will still have tubes placed under your skin, but you do not remain radioactive when you leave the treatment center.

Side Effects:

The actual delivery of radiation treatment is painless. But the radiation itself does cause some pain and discomfort over time. You will not lose your hair during radiation therapy, unless you are also being treated with chemotherapy. The side effects of radiation treatment are usually temporary.

Skin Effects:

In the area where you are receiving radiation, your skin can turn red, become more sensitive, and get easily irritated. It is similar to sunburn. The raw areas and discomfort will start to get much better about one to two weeks after your radiation treatment is finished. If you are in the middle of your radiation treatment and your skin becomes irritated, you will still have to return for treatment. Here are things you can do to make the skin less sensitive and to help it get better after radiation treatment:

- Wear loose clothing, preferably cotton, that doesn't rub the irritated area. If the skin around the treated breast area becomes especially uncomfortable, wear a loose cotton bra without under wires. Or don't wear a bra.
- Use warm water, not hot, while showering.
- Do not let shower water fall directly on your breast.
- Avoid harsh soaps (such as "Ivory", "Dial", and "Irish Spring" brands); instead use fragrance-free soaps with a moisturizer (such as Dove brand).
- Moisturize the skin after your daily treatment with an ointment/lotion such as "A&D", "Eucerin", "Aquaphor", or "Radiacare" brands. Put a lot on at night.
- Apply aloe vera. Or try "hydrocortisone cream" (available without a prescription at any drugstore). Spread it thinly over the affected area three times a day.
- If areas become especially red, itchy, sore, and start to burn, ask your doctor for a stronger cream that is available by prescription.
- If your skin forms a blister or peels wet, leave the top of the blister there. That keeps the area clean while the new skin grows back underneath. If the blister opens, the exposed raw area can be quite painful. Keep the area dry and clean with only warm water. Pat the area dry and then apply petroleum jelly ("Vaseline") and a bandage that doesn't stick. To relieve discomfort from blistering or peeling, take Tylenol.
- You can blow air on the area with a hair dryer set to "air" (no heat).
- Use cornstarch powder instead of deodorant in your armpit to reduce friction.
- Avoid strong soaps or deodorants.
- Don't shave under your arm.

Fatigue Effects:

During the weeks of your treatment, you may feel tired. This feeling can last for a few weeks—even months—after treatment ends. Although there may be no cure for fatigue, there are ways to limit the impact of fatigue on your life:

- A little bit of exercise should give you more energy. Try to establish a regular routine of walking or light swimming.
- Many patients find that regular, brief naps during the day give them more energy overall. Save your energy for only the most important activities during the day.
- When you are undergoing treatment, it is a good time to ask for help at home and at the office. Ask your family, friends, and co-workers to help with chores, cooking, shopping, or office tasks.

Breast Effects:

During a course of radiation therapy to the whole breast, most women will notice increasing fullness, swelling, and stiffness of the whole breast. The swelling combined with the skin irritation makes the breast area sore. Once treatment is over, and the swelling slowly goes away, the breast can become firmer, rounder, and more "youthful," with less of a droop. You may feel that your breast appears smaller than it used to.

Between the surgery and the radiation, your breast may remain somewhat numb and tender. If this is how your breast feels to you, you may not want it touched. After months, these sensations should improve a lot but maybe not completely.

Women will probably not be able to nurse their babies in the breast that received radiation, because that breast is no longer able to produce significant milk.

Chest Wall Effects

In order to treat the whole breast, your doctor cannot avoid including part of the chest wall muscles and rib cage in the treatment area. During and soon after radiation treatment, you may experience brief shooting pains, like an electric shock. These pains can be eased with Tylenol. Soon after treatment is over they will go away on their own.

Over a long time, you may feel stiff muscles in the chest wall area during extra action like vacuuming or other chores. This problem is usually minor, happens only sometimes, and improves with non-prescription pain medications.

Over the years, radiation to the ribcage makes the ribs slightly more likely to break. The chance of this happening is small. If a break does occur, it usually happens only after a trauma, injury, or violent movement, such as a coughing fit.

Heart and Lung Effects

In the past, some women who received radiation to the left breast area had more heart attacks. That's because older machines gave radiation near the heart. Fewer heart complications happen now because new machines do better sparing normal tissue.

A small part of the lung is usually within the treatment area of the whole breast. Scar tissue can form there after radiation is over. This is not dangerous to you. In the future, if you have a chest X-ray for an unrelated reason, it is good for you to tell the doctor about your radiation treatment. That way, the doctor who reads the X-ray won't think the scar shows pneumonia or a new tumor. Symptoms of the scar are uncommon, including a dry cough that doesn't produce any phlegm and shortness of breath. If the symptoms don't go away on their own, they usually disappear in a short time after taking steroid medicine in a pill.