



## Radiation Therapy

Radiation therapy is a cancer treatment that uses focused beams of radiation to shrink or kill tumors.

- Radiation therapy does not make patients radioactive.

### About Radiation Therapy

Radiation therapy (also known as external beam radiation therapy) uses high-energy (ionizing) radiation to shrink or kill tumors. Because radiation damages cells and destroys their ability to divide, external beam radiation therapy uses focused radiation beams produced by a machine outside the body to target tumor cells inside the body. These machines are called linear accelerators.

The linear accelerator creates radiation beams that are aimed at the tumor. The radiation from these beams can also damage healthy cells. Before therapy, doctors carefully plan the best way to aim the radiation beam to damage the tumor as much as possible while doing as little damage to healthy cells as possible.

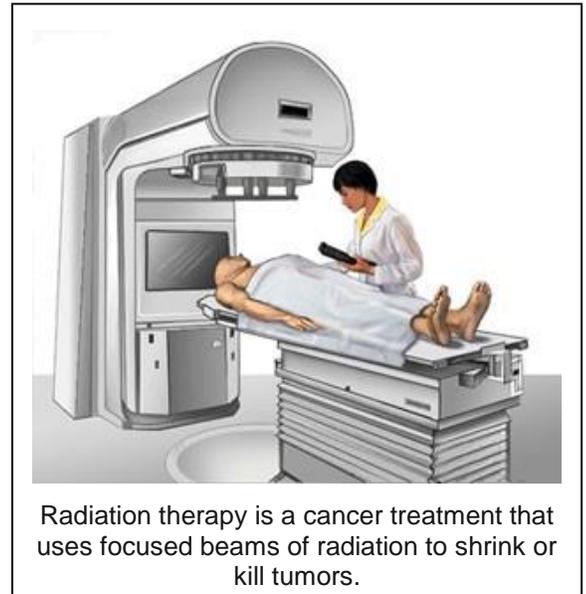
Radiation therapy does not make the patient radioactive. Like a flashlight, when you turn it on and shine it at your skin, your skin is illuminated where the beam hits your skin. When you turn the flashlight off, your skin returns to its normal shade and is no longer illuminated.

There are many different types of radiation therapy that can be used to treat tumors. Some examples of radiation therapy include:

- **Three-Dimensional Conformal Radiation Therapy (3D-CRT)** – 3D-CRT uses specialized computers to get an accurate picture of the size, shape and location of the tumor. Doctors use these images to create a precisely focused treatment. 3D-CRT can use single or multiple x-ray beams to target the tumor.
- **Proton Therapy** – Proton therapy uses a beam of protons to target tumors. As opposed to x-rays, which deposit energy along their path, protons deposit the majority of their energy at the end of their path. Doctors use proton therapy with the goal of creating less damage to healthy tissue and more damage to the targeted tumor, where the proton beam ends.

Radiation therapy can cause side effects.

- Acute effects, such as hair loss or nausea, can occur during the period of treatment. Most acute effects disappear after treatment.



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- Because radiation can also increase the risk of cancer, there is a small chance that the cancer treatment itself will produce another cancer years later. Cancer therapy patients are therefore screened frequently for cancer after successful treatment of their primary tumor.

Doctors and other scientists continue to research radiation therapy methods to increase accuracy, decrease exposure to healthy tissue and reduce side effects.

## Rules and Guidance

### THE STATES

State radiation programs work with the U.S. Food and Drug Administration to keep external radiation therapy machines safe. They regulate the use of x-ray equipment in medical, dental and veterinary work. States also register and inspect the equipment.

### U.S DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS), U.S. FOOD AND DRUG ADMINISTRATION (FDA)

The states regulate use of x-ray equipment. FDA's Center for Devices and Radiological Health (CDRH) regulates the manufacture of radiation-emitting electronic equipment.

### NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

NIST does not regulate medical equipment used in external beam radiation treatment. However, NIST makes x-ray machines safer for patients and workers. They update the technology and measurement standards used in designing x-ray machines.

## What you can do

Radiation therapy patients should follow instructions given by the doctor, nurse or the radiation therapist. If they have any concerns or questions before having radiation treatment, they should talk to the doctor or the radiation therapist.

Patients should let the doctor and radiation therapist know if they are pregnant or nursing.

## Where to learn more

You can learn more about radiation therapy by visiting the resources available on the following webpage: <http://www3.epa.gov/radtown/radiation-therapy.html#learn-more>.