

Radiation Therapy Safety

Some patients worry about the safety of radiation therapy. While radiation therapy involves exposure to hazardous radioactive particles, it has been used to safely treat cancer for more than 100 years. Many advancements have been made that have led to safety regulations and checkpoints during treatment. Treatment centers must follow certain rules and regulations to keep patients, workers, and visitors safe.

- [General radiation safety](#)
- [Safety for specific types of radiation](#)

It's important to remember that every patient is different, and your safety instructions may be different from other patients or people you know who have received radiation therapy to treat cancer. Any precautions you might need to take depend on what treatment is used and type and dose of radiation that's given. If needed, your cancer care team will give you exact instructions so you know what steps to take, and how long any precautions need to be followed. You should follow their instructions exactly.

General radiation safety

A common abbreviation used by doctors and radiation experts is *ALARA*. ALARA stands for “as low as reasonably achievable.” This means that people should limit being exposed to radiation that has no benefit to them. Keep in mind that it's impossible to avoid all radiation, and you can learn more in [Sun and Other Types of Radiation](#)¹.

For people who need radiation therapy to treat their cancer, special precautions are used to protect other parts of their body from exposure to radiation.

Before you begin receiving radiation therapy, the cancer care team works carefully to develop an effective treatment plan that is also safe. Treatment will focus on giving

radiation to the cancer while limiting exposure of healthy tissue. Your treatment plan will be reviewed often during the time of your therapy, and computers are used to monitor you and the amount of radiation that's being given.

Every time you have a radiation treatment, your cancer care team will follow all safety rules and will be sure that you receive your treatment safely by measuring and monitoring your dose. You may notice special clothing and protective equipment being used by the members of your cancer care team when they are in the area where radiation therapy is given. This is because they must meet certain regulations that help to limit their exposure to radiation when caring for patients who need treatment and imaging tests.

It's important to know that not all radiation treatments work the same way or have the same safety precautions. And, it's important to know that safety concerns of radiation therapy are very different than safety concerns of other treatments for cancer, such as chemotherapy, targeted therapy, hormone therapy, and immunotherapy.

Safety for specific types of radiation

External beam radiation therapy

External radiation therapy is given from an outside source, involves a beam of radiation aimed at a part of the body, and affects cells in your body only for a moment. Because there's no radiation source inside your body, you are not radioactive at any time during or after treatment.

Internal radiation therapy (brachytherapy)

Internal radiation therapy uses a *sealed* source of radiation that is implanted (put inside your body) where the cancer is located. Depending on the type of implant used, your body may give off a small amount of radiation for a short time.

The radiation usually doesn't travel much farther than the area being treated, so the chances that others could be exposed to radiation is small. Still, you may be asked to stay in the hospital and might have to limit visitors during treatment. You also may be asked to stay a certain distance away from them. Pregnant women and children might not be allowed to visit you. If your implant is *temporary*, your body will no longer give off radiation once it is removed. If your implant is *permanent*, it will slowly stop giving off radiation after a while.

Radioembolization

During radioembolization, the radiation source stays near the tumor. The radiation travels a very short distance, so the effects are mostly to the tumor. However, you may have to limit contact with other people for up to one week after treatment. It is especially important to avoid close contact with children and women who are pregnant. Be sure to ask your treatment team what precautions you need to take.

Oral or systemic radiation treatment

Oral or systemic radiation uses an *unsealed* radioactive substance that goes through your whole body. Because of this, some radiation will be in your body for a few days until your body has had a chance to get rid of it. You may need to stay in the hospital for 1 or 2 days, and may need to take special precautions at home.

To protect others from radiation, the drugs are kept in special containers that hold the radiation inside, and you'll be treated in a shielded room that also keeps the radiation inside. The health providers handling the drugs might wear safety gear that protects them from exposure while giving you the radioactive drug.

Patient and family safety for oral or systemic radiation treatment

If you're getting systemic radiation treatment, sometimes safety measures are needed to protect the people around you. This is because the radioactive materials can leave your body through saliva, sweat, blood, and urine and that makes these fluids radioactive. It's very important to keep radiation exposure to the people around you as limited as possible.

In most cases for systemic radiation treatment, the safety precautions must be followed only the first few days after treatment.

Here are examples of things you might be told to do if you're getting systemic radiation treatment:

- Wash your laundry separately from the rest of the household, including towels and sheets.
- Sit down when using the toilet to avoid splashing of body waste.
- Flush the toilet twice after each use, and wash your hands well after using the toilet.
- Use separate utensils and towels.
- Drink extra fluids to flush the radioactive material out of your body.
- No kissing or sexual contact (often for at least a week).
- Keep a distance away from others in your household. For example, you might be

told to keep one arm's length, or maybe six feet, between yourself and others for a specific length of time. You might also be told to sleep in a separate bed in a separate room for a specific number of nights. This depends on the type of treatment you receive.

- Avoid contact with infants, children, and women who are pregnant for a specific amount of time.
- Avoid contact with pets for a specific amount of time.
- Avoid public transportation for a specific amount of time.
- Plan to stay home from work, school, and other activities for a specific amount of time.

Again, the information here describes some safety concerns of different types of radiation therapy. Precautions during and after treatment might be needed, depending on the type of radiation being given. It's very important to be sure you understand what you need to do to protect the people around you. **Talk to your cancer care team about your specific situation.**

Hyperlinks

1. www.cancer.org/cancer/risk-prevention/radiation-exposure.html

References

American College of Radiology, American Board of Surgery, American College of Nuclear Medicine, American Society for Radiation Oncology, Society of Interventional Radiology, Society of Nuclear Medicine and Molecular Imaging Practice Parameter for Selective Internal Radiation Therapy (SIRT) or Radioembolization for Treatment of Liver Malignancies. Acr.org. Accessed at <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/RMBD.pdf?la=en> on August 27, 2021.

American College of Radiology and the Radiological Society of North America. *Introduction to cancer therapy (radiation oncology)*. Accessed at https://www.radiologyinfo.org/en/info.cfm?pg=intro_onco#part_two on December 26, 2019.

American College of Radiology and the Radiological Society of North America. *Radiation therapy*. Accessed at <https://www.radiologyinfo.org/en/submenu.cfm?pg=onco> on December 26, 2019.

Drapek L. Radiation therapy. In Newton S, Hickey, Brant, JM, eds. *Mosby's Oncology Nurse Advisor*. 2nd ed. St Louis, MO: Elsevier; 2017:168-171.

Forshaw K, Hall AE, Boyes AW, et al. Patients' experiences of preparation for radiation therapy: A qualitative study. *Oncol Nurs Forum*. 2017; 44(1):E1-E9.

Iwamoto RR, Haas ML, Gosselin TK (Eds). *Manual for radiation oncology nursing practice and education*. 4th ed. Pittsburgh, PA: Oncology Nursing Society; 2012.

Morgan MA, TenHaken RK, Lawrence TS. Essentials of radiation therapy. In DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer Principles and Practice of Oncology*. 11th ed. Philadelphia, PA: Lippincott, Williams, & Wilkins; 2018:196-217.

National Cancer Institute (NCI). *Radiation therapy to treat cancer*. Accessed at <https://www.cancer.gov/about-cancer/treatment/types/radiation-therapy> on December 26, 2019.

Last Revised: December 27, 2019

Written by

The American Cancer Society medical and editorial content team
(<https://www.cancer.org/cancer/acs-medical-content-and-news-staff.html>)

Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as editors and translators with extensive experience in medical writing.

American Cancer Society medical information is copyrighted material. For reprint requests, please see our Content Usage Policy (www.cancer.org/about-us/policies/content-usage.html).

cancer.org | 1.800.227.2345