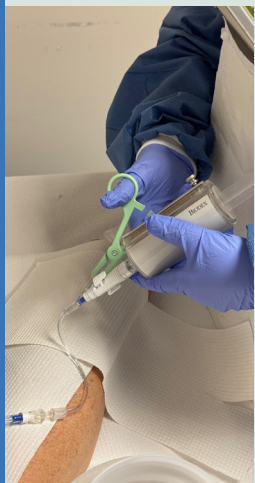


# RADIOPHARMACEUTICAL THERAPY FOR CANCER



**ASTRO**

AMERICAN SOCIETY FOR RADIATION ONCOLOGY

# RADIOPHARMACEUTICAL THERAPY FOR CANCER

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## WHAT IS RADIOPHARMACEUTICAL THERAPY (RPT)?

Radiopharmaceutical therapy (RPT), which is also called theranostics or radioligand therapy, is a treatment that uses injected or ingested radioactive material to target and treat certain types of cancer.

RPT is a form of **internal radiation treatment** that delivers targeted radiation to cancer cells using a radioactive drug. Unlike external radiation therapy that treats cancer from outside the body with focused beams to specific areas, RPT works from the inside by traveling through your bloodstream to seek out and destroy cancer cells. This targeted approach differs from chemotherapy, which affects both healthy and cancerous cells, because RPT is designed to attach to cancer cells while minimizing damage to healthy tissue. While surgery removes visible tumors and immunotherapy helps your immune system fight cancer, RPT can reach cancer cells that are too small to see or in hard-to-reach places, often causing fewer side effects than traditional treatments.

## HOW DOES RPT WORK?

Radiation damages the DNA of cancer cells, making it difficult for them to grow or divide.

Radiopharmaceuticals are medicines that carry a radioactive component designed to seek out and bind to cancer cells. Once attached, they deliver a focused dose of radiation directly to the tumor — helping to treat cancer while limiting damage to healthy tissues.



## TYPES OF RPT

Common examples include:

- **Radioactive Iodine (I-131)** – Used to treat thyroid cancer
- **Lutetium-177 PSMA** – Used to treat advanced prostate cancer
- **Lutetium-177 dotatate** – Designed to treat neuroendocrine tumors that express specialized proteins on the surface of cancer cells
- **Radium-223 dichloride** – Mimics calcium and targets cancer that has spread to bones from the prostate

## RPT BENEFITS

- Precisely targets cancer cells while sparing most healthy tissue
- Often has fewer side effects compared to other medications used to treat metastatic cancer (cancer that has spread throughout the body)
- Delivered as an outpatient procedure in many cases

## WHAT ARE THE SIDE EFFECTS OF RPT?

Side effects can vary depending on the specific drug used and your individual health, but may include:

- Fatigue
- Nausea or vomiting
- Decreased appetite
- Dry mouth or altered taste
- Diarrhea or constipation
- Damage to kidneys
- Mild pain or swelling at injection site
- Brief increase in bone pain, where cancer is present
- Lowered blood counts (which may increase risk of infection or bruising)
- Temporary radiation precautions (to protect others)

Your care team will explain what to expect and how to manage any symptoms.

## WHO ARE THE MEMBERS OF THE RPT TEAM?

Your RPT team may include:

- **Authorized User** – A radiation oncologist or nuclear medicine physician that specializes in treatment planning and delivery of radiopharmaceuticals, and oversees the treatment
- **Nurse, Nuclear Medicine Technologist and Radiation Therapist** – Assists during and after your treatment

- **Medical Physicist** – Ensures safe and accurate dosing
- **Pharmacist** – Prepares the radiopharmaceutical safely

This multidisciplinary team works together to ensure you receive safe, effective and personalized care.

## IS RPT SAFE?

Yes, RPT is a safe and well-regulated treatment. Safety measures are built into every step of your care. The amount of radiation you receive has been carefully studied to determine how much is needed to destroy cancer cells while protecting healthy tissues.

You may need to follow radiation safety precautions at home for a few days, such as:

- Limiting close contact with others, especially children and pregnant people
- Careful toilet hygiene or possibly using a separate bathroom, if instructed
- Washing laundry separately
- Sleeping alone for a short time
- Storing material that is contaminated with body fluids or waste

Your team will give you clear instructions based on the type of treatment you receive.



# WHAT HAPPENS BEFORE, DURING AND AFTER TREATMENT?

## Before Treatment

- You will undergo lab tests and imaging (like PET or CT scans) to determine if this therapy is right for you.
- You will receive safety instructions and may need to stop certain medications.
- Some patients may need to follow a special diet or prepare their thyroid or kidneys to handle the treatment.

## During Treatment

- The medicine is given by injection into a vein or taken by mouth as a capsule.
- The injection is generally quick but may take up to a few hours for certain treatments, and you may rest and be observed for a short time after.
- You will be monitored for side effects.
- Some radiopharmaceutical treatments are repeated in 4-, 6- or 8-week intervals.
- Most patients go home the same day. A brief hospital stay for radiation safety purposes may be required for certain treatments.

## After Treatment Follow-up

- Your care team will schedule follow-up visits to monitor side effects and evaluate how well the therapy is working.



- You may need imaging scans or blood tests at regular intervals.
- Safety precautions may apply for a few days to a week after treatment.

## WHAT ARE CLINICAL TRIALS?

Clinical trials are research studies that explore new radiopharmaceuticals or treatment combinations. Participating in a clinical trial may give you access to cutting-edge therapies not yet widely available. Ask your care team if any trials may be right for your condition.

## HOW CAN PATIENTS BEST CARE FOR THEMSELVES DURING RPT?

Self-care is important during and after treatment. Here are some helpful tips:

- **Stay hydrated** – helps your body clear radiation
- **Get enough rest** – fatigue is common
- **Follow all safety guidelines** – protects those around you
- **Eat well** – helps your body recover
- **Keep track of symptoms** – and tell your care team if anything changes

## WE'RE HERE FOR YOU

RPT is a powerful, targeted way to treat cancer. Our experienced care team is with you every step of the way to ensure you feel safe, supported and informed. If you have any questions or concerns, please contact your health care provider.

SUGGESTED QUESTIONS TO ASK YOUR TEAM

What radiopharmaceutical will I receive?

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How many treatments will I need and how often?

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How does it work against my type of cancer?

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What are the risks and side effects?

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How long is each treatment?

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Will I need to isolate or take precautions at home?

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How will we monitor whether the treatment is working?

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Are there any other options, like clinical trials?

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## ABOUT THE RADIATION ONCOLOGY TEAM

Radiation Oncologists are doctors who oversee the care of each patient undergoing radiation treatment. Other members of the treatment team include radiation therapists, medical physicists, dosimetrists, radiation oncology nurses, medical assistants, social workers and nutritionists. To learn more about the role these professionals have in your treatment, visit [www.rtanswers.org/treatmentteam](http://www.rtanswers.org/treatmentteam).





# I Have Cancer. Now What?

Cancer diagnosis is chaotic, unpredictable, messy. Your cancer treatment shouldn't be. [RTAnswers.org](https://www.rtananswers.org) provides detailed information and resources for cancer patients and their caregivers, including:

- Treatment information by disease site.
- Videos walking you through the radiation therapy treatment process.
- Stories from patients and caregivers sharing their experiences from diagnosis and treatment to survivorship.
- A "Find a Radiation Oncologist" portal where you can search by city, state and disease site specialty for a radiation oncologist near you.

## **THE AMERICAN SOCIETY FOR RADIATION ONCOLOGY**

(ASTRO) is the largest radiation oncology society in the world, with more than 10,000 members who specialize in treating patients with radiation therapies. As the leading organization in radiation oncology, biology and physics, ASTRO's mission is to advance the specialty of radiation oncology through promotion of equitable, high-quality care for people with cancer, cultivating and educating a diverse workforce, fostering research and innovation, and leading policy development and advocacy.

Visit [www.astro.org](http://www.astro.org) for more information.

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