

Disclosures

- . Employer:
 - . Covenant Medical Group
 - . Covenant Health, Providence St. Joseph Health

Covenantl-lealth & Joe Arrington Cancer Research & Treatment Center

Objectives

- Describe how radiation therapy works, when it is used, and understand the treatment planning and delivery processes.
- Understand current evidence-based strategies of integrating radiation therapy into the care of patients with breast cancer.
- Recognize modern radiation therapy techniques that maximize the therapeutic ratio by minimizing treatment-related toxicities.

Introduction

- Radiation therapy is the use of various forms of radiation to safely and effectively treat cancer and other diseases.
- About two-thirds of all cancer patients will receive radiation therapy as part of their treatment.
- The first patient was treated with radiation therapy in 1896, just two months after the discovery of the X-ray.
- Rapid technological advances began in the early 1950s, with the invention of the linear accelerator.
- Planning and treatment delivery advances have enabled radiation therapy to be more effective and precise, while decreasing the severity of side effects.



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How Does Radiation Therapy Work?

- Radiation therapy works by damaging the DNA within cancer cells, destroying their ability to reproduce and causing the cells to die.
- When the damaged cancer cells are destroyed by radiation, the body naturally eliminates them.
- Normal cells can be affected by radiation, but they can repair themselves in a way cancer cells cannot.



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When is Radiation Used?

- . The best treatment plan for each patient is frequently determined by a team of doctors, including a radiation oncologist, a medical oncologist, and a surgeon.
- . Sometimes radiation therapy is the only treatment a patient needs.
- . Other times, it is combined with other treatments, such as surgery and chemotherapy.



Tumor boards meet to discuss comprehensive patient treatment plans





- To cure cancer:
 - · Destroy tumors that have not spread to other body parts.
 - Reduce the risk that cancer will return after surgery or chemotherapy.
 - Shrink the cancer before surgery.
- . For palliation (to reduce symptoms):
 - Shrink tumors affecting quality of life, like a lung tumor that is causing shortness of breath.
 - Alleviate pain or neurologic symptoms by reducing the size of a tumor.





Types of External Radiation Therapy





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Permanent vs. Temporary Implants

Permanent implants release small amounts of radiation over a period of several months

- Example: low-dose-rate prostate implants ("seeds")
- Patients receiving permanent implants may be minimally radioactive and should temporarily avoid close contact with children or pregnant women.

Temporary implants are left in the body for several hours to several days

- Patient may require hospitalization during the implant depending on the treatment site.
- Examples include low-dose-rate gynecologic implants and high-dose-rate prostate or breast implants.

Radiopharmaceuticals

- Radiopharmaceuticals are radioactive medications (radioisotopes) that are used to diagnose or treat cancer.
- . These medications can be delivered orally (in pill form), intravenously (injected into a patient's vein), or interstitially (inserted into a cavity in the body).
- Every radiopharmaceutical is designed to travel to a different part of the body. Once it has arrived at its destination, it will release radioactive agents to destroy the tumor cells.



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Side Effects of Therapy

- Most side effects begin during the second or third week of treatment. Doctors, APPs, and nurses may prescribe medications to help with these side effects.
- Side effects, like skin redness, are generally limited to the area receiving radiation.
- Fatigue is a common side effect for all cancer patients.
- Side effects may last for several weeks after the final day of treatment.



Side effects vary based on apatient's medical profile or diagnosis























Referral

- . A cancer is diagnosed.
- . The diagnosing or referring physician reviews potential treatment options with patient.
- . Treatment options may include radiation therapy, surgery, chemotherapy, or a combination.



It is important for apatients to ask their referring physician about all possible treatment options available to them

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Consultation

- Radiation oncologist discusses the radiation therapy treatment options with patient.
- A treatment plan is developed.
- Care is coordinated with other members of patient's oncology team.





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Treatment Planning

- The radiation oncologist works with the medical physicists and dosimetrists to create an individualized treatment plan for the patient.
- The treatment is mapped out in detail including the type of machine to be used, the amount of radiation that is needed, and the number of treatments that will be given.











