APHON

Association of Pediatric Hematology/Oncology Nurses

A HANDBOOK FOR FAMILIES

Radiation Therapy

ONCOLOGY SERIES

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RADIATION THERAPY

A Handbook for Families

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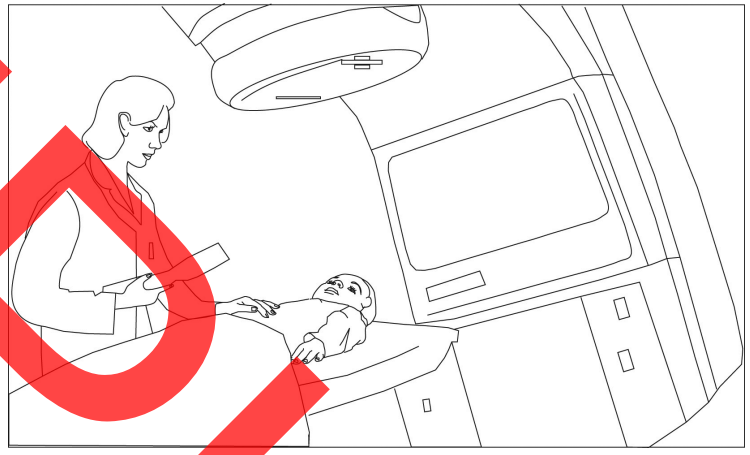
What is radiation therapy?

Radiation therapy is the precise delivery of high-energy X rays (ionizing radiation) to kill cancer cells. Radiation therapy works by damaging the DNA (genetic make-up) of cancer cells. Cancer cells then are not able to repair themselves and subsequently die.

Radiation therapy can be used to treat many different types of cancer. About 40%–60% of all cancer patients will receive radiation therapy during the course of their illness. It is used for solid tumors, including tumors of the brain, spinal cord, bone, and liver, as well as for cancers of the blood and lymphatic systems, such as leukemia and lymphoma. Radiation therapy can be used alone or in combination with surgery and/or chemotherapy. It also can be used in preparation for bone marrow transplant and as a curative treatment or palliative therapy when the goals of treatment are to improve quality of life and relieve symptoms such as pain, bleeding, and shortness of breath.



Will my child begin radiation the first day we see the radiation oncologist?

There is a series of steps that need to be completed before radiation therapy can begin.

1. Consultation

A radiation oncologist is a physician who specializes in taking care of patients who need radiation therapy. During the initial consultation, you also may meet other members of the radiation oncology team. The radiation oncologist will examine your child and review his or her medical history, including X rays, lab tests, and pathology reports. The radiation oncology team will consult with your child's other oncologists about the best plan to treat your child.

During this visit, you will discuss the plan for treatment, including how long therapy will last and any potential side effects your child may experience. The amount of radiation needed and the duration of treatment will be determined by the radiation oncologist. For many types of cancer, the radiation dose is based on previous research. If your child is registered on a clinical trial, the dose will be based on the recommendations of the protocol. Treatment times can range from 1 day to several weeks. After you and your child have had an opportunity to ask questions, a plan for treatment will be developed. In general, you will be asked to give written permission for your child to begin treatment.

2. Simulation

Radiation therapy requires a planning session before treatment can begin. The initial planning session is also called a *CT simulation* or *simulation*. The simulation is usually performed in the radiation oncology department using computed tomography (CT), positron emission tomography (PET), or magnetic resonance imaging (MRI) scans of the area to be treated. During the scan, special immobilization equipment may be used to help your child remain still and in the same position throughout the course of treatment. Immobilization equipment and devices ensure that the radiation dose is delivered only to the intended area. Depending on the area to be treated, immobilization equipment may include plastic, mesh masks that fit over the face; molds of the upper body, arm, or leg; bite blocks; or chin supports. Some children need sedation or anesthesia to help them remain still during the simulation and daily treatments. (Sedation or anesthesia also help to reduce fear or anxiety during the process.) The simulation process can last 1–2 hours.

3. Planning

The radiation oncologist creates a treatment plan that administers the maximum amount of radiation to the tumor while also protecting normal surrounding tissues. Planning can take several days from the time of the simulation to the day your child returns for treatment verification. During that time, the radiation oncologist and team are creating an individualized treatment plan based on your child's disease and specific requirements. No two treatment plans are exactly the same.

4. Treatment verification

After the treatment plan has been created, your child will need to visit the radiation oncology department for treatment verification. During treatment verification, your child will be placed in the proper treatment position with any necessary immobilization equipment or devices. The machine that delivers the radiation beam or linear accelerator will go through a final test to confirm the treatment plan is correct, and X rays will be taken to verify the treatment position. Treatment verification usually lasts less than an hour.

The radiation oncology team

Your child's treatment is planned, administered, and monitored by a multidisciplinary team of healthcare providers.

Radiation oncologist

Radiation oncologists are physicians who have completed an additional 4 years of training in radiation oncology and 1 year of medical or surgical internship after medical school. Radiation oncologists have specialized training and knowledge related to the planning and delivery of all forms of radiation therapy. Most are certified by the American Board of Radiology. Please ask your doctor if he or she is board certified in radiation oncology.