Radiation therapy is used as definitive or adjuvant treatment for more than half of all people receiving cancer treatment. The process for the patient spans several months and is demanding physically, mentally, and logistically. Understanding the patient experience from start to finish is important for all oncology nurses, because adherence to the treatment regimen is integral and side effects can occur even after radiation treatment has completed.

AT A GLANCE

- Radiation therapy is used alone or with chemotherapy and/or surgery. Radiation kills cancer cells by altering the cancer cell's DNA to stop its ability to divide.
- The radiation therapy process can span several months and consists of consultation, a simulation appointment, and several weeks of treatment with weekly provider visits.
- There are common side effects that affect nearly all patients undergoing radiation therapy, as well as site-specific side effects. Side effects can occur early during active treatment or months after treatment has completed.

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Radiation Therapy

Understanding the patient experience

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Radiation therapy (RT) is one treatment approach for treating cancer, with most patients receiving RT alone or a combination of RT, surgery, and chemotherapy. More than half of all people with cancer are treated with RT for curative or palliative purposes (American Cancer Society [ACS], 2019). RT is delivered to the patient either through external-beam RT or internal brachytherapy. The RT regimen can span up to several months from consultation to completion; each step of the process will be described in this article, along with nursing implications.

Radiation Therapy Process

Treatment Simulation

The first step in the RT process is a consultation when the patient is evaluated for RT and decides to proceed. The next step is to return for a treatment-planning session, called a simulation. The purpose of this 30- to 60-minute appointment is to position the patient exactly as they will be during RT and then obtain images to finalize the treatment plans later. Patients may need special immobilization devices and skin markings to ensure exact treatment positioning (McQuestion, 2021). Examples of immobilization devices are thermoplastic masks, bite blocks, positioning pillows, and cradles, which are like bean bags vacuum-locked to conform to the patient's body. Permanent or temporary ink is marked on the patient's skin or immobilization device to align treatment. To place the ink, a very small device that penetrates only the epidermis is used, minimizing pain. Temporary ink markings are covered with a semipermeable or clear dressing to protect the markings (Cancer Research UK, 2020).

After the patient is positioned with any immobilization devices and markings, computed tomography images are obtained. Patients may need IV or oral contrast agents to optimize tumor images for RT planning by a team of medical dosimetrists, medical physicists, and radiation oncologists (McQuestion, 2021). Planning can take from a few hours to several days, depending on the complexity and urgency of the treatment. On simulation day, patients may receive a schedule for their RT treatments. One treatment session is also called a fraction (McQuestion, 2021).

External-Beam Radiation Therapy

For urgent or emergent clinical situations, treatment could begin the same day, but normally it will begin as many as two weeks later. The initial treatment appointment begins with a field localization, which is a trial run to ensure everything sets up in the treatment room exactly as in the simulation. RT is delivered using a linear accelerator, a megavoltage machine that generates ionizing radiation from electricity (McQuestion, 2021). Normally, RT is delivered by photons (x-ray beams), but proton therapy (using positively charged particles instead) is an alternative approach (McQuestion, 2021). Both methods work by damaging the cancer cell's DNA, stopping the ability to divide (ACS, 2019). Proton therapy is a type of precision RT that is highly effective in treating the tumor while sparing more healthy tissues and organs than photon therapy, but more research is needed to evaluate when it is warranted because of