# Palliative Radiation Therapy: The Role of Radiation Therapy in Palliative and End-of-Life Care

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**BACKGROUND:** Radiation therapy (RT) remains one of the main pillars of cancer treatment, alongside systemic therapy and surgery. More than half of people with cancer will receive RT at some point during their treatment trajectory. Although RT contributes to cure in a substantial number of patients, more than half of patients treated with RT are treated with palliative intent. RT plays an integral role in alleviating symptoms, preserving function, and improving quality of life for patients with cancer.

**OBJECTIVES:** The aim of this article is to provide information on the role of RT in palliative and end-of-life care.

**METHODS:** A review of the literature and professional guidelines on palliative RT was performed.

**FINDINGS:** This article provides foundational information for nurses on indications for palliative RT, possible side effects and toxicities associated with palliative RT, and challenges and barriers that may be encountered when considering palliative RT. Nursing implications, including the importance of a palliative approach to care, are discussed.

**KEYWORDS**
palliative care; radiation therapy; quality of life; symptom management

**DIGITAL OBJECT IDENTIFIER**
10.1188/22.CJON.628-635



**THE ORIGINS OF RADIATION ONCOLOGY CAN BE TRACED BACK** to the discovery of x-rays by Wilhelm Roentgen in the 19th century (American Cancer Society, 2014; Lutz, 2019). Although early uses of x-rays had been for diagnostic purposes, by the early 20th century, radiation began to be used to treat cancer (American Cancer Society, 2014).

The precise mechanisms that lead to cell death from radiation have not been fully elucidated, but it is widely accepted that radiation therapy (RT) damages cancer cells directly and indirectly (Cothran & Martin, 2022; Spencer et al., 2018). Direct damage occurs when ionizing radiation deposits energy in the tissues it passes through, causing damage to DNA and inhibiting cell division and replication (Baskar et al., 2012). Indirect damage to cancer cells occurs when free radicals, generated when cellular water is broken down by radiation, cause DNA damage (Baskar et al., 2012; Wang & Tepper, 2021). Damage to DNA can lead to mitotic catastrophe and, ultimately, cell death. In addition, radiation can affect the processes of the cell cycle needed for cell growth, cell senescence, and apoptosis (Baskar et al., 2012; Sia et al., 2020).

RT remains one of the main pillars of cancer treatment, and it has been estimated that about half of all patients with cancer will receive RT as part of their treatment (Cothran & Martin, 2022; Thompson et al., 2018). RT is typically used as a local treatment, but the use of RT to treat oligometastatic disease—particularly with stereotactic ablative RT—is being studied, with preliminary results suggesting that treating all metastatic sites with radiation may lead to improved survival (Lutz, 2019; Palma et al., 2020).

## Background

RT can be used before (neoadjuvantly) or after (adjuvantly) other types of treatment, such as surgery or chemotherapy, as either the primary modality of treatment or as a treatment intended to relieve symptoms (Lutz, 2019). There are two main types of RT: external beam RT and internal RT (Chaput & Regnier, 2021). Behrend (2015), McQuestion et al. (2021), and Miller and Scherbak (2021) provide more detailed descriptions of RT as a cancer treatment.

The purpose of this article is to discuss the role of RT in palliative and end-of-life care. This article provides a brief overview of the importance of integrating palliative care (PC) in oncology, as well as a review of palliative RT indications, potential side effects and toxicities associated with palliative RT, and a discussion of barriers to and challenges associated with palliative RT. Finally, implications for oncology nurses are discussed.