

## Improving the Quality of Palliative Radiotherapy: A Literature Review

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### Abstract

Palliative radiotherapy (PRT) is recognized for its efficacy in relieving cancer-related symptoms. However, the implementation of PRT faces various barriers that hinder its widespread use and may impact patient support during treatment. This literature review aims to provide a concise summary of potential solutions to overcome these barriers and enhance the quality of PRT. Proposed strategies include specialized training for supportive and palliative care specialists in PRT and palliative care training for radiation oncologists. Additionally, the introduction of dedicated pathways and organizational models for PRT is suggested. While evidence on innovative organizational models and training experiences remains limited, existing studies highlight the advantages of integrating PRT with supportive therapies. To actively contribute to this integration and better meet the needs of patients with advanced cancer, radiation oncologists should not only plan PRT but also assess and manage symptoms, rapidly refer patients to specialists for complex symptoms, and collaborate in multidisciplinary palliative care teams. Therefore, comprehensive education in palliative care during residency and continuous medical education is crucial. Adequate training for radiotherapy residents, including formal teaching, interactive methods, and exposure to palliative care services, should be incorporated into post-graduate radiotherapy schools.

**Keywords:** Palliative radiotherapy; Supportive care; Integration; Cancer patients; Advanced cancer; Pain management

### Introduction

Palliative radiotherapy (PRT) is known for its effectiveness in alleviating cancer-related symptoms while offering minimal side effects due to low radiation doses and cost-effective treatments [1]. Despite its benefits, numerous studies and clinical practices have identified several barriers that hinder the widespread adoption of PRT. These obstacles include challenges faced by advanced cancer patients in traveling to access radiotherapy centers, concerns regarding the duration of therapies, delays in consultations [2,3] and treatment, complicated referral processes, difficulties in reaching radiation oncologists (ROs), uncertainty in predicting prognosis leading to late PRT delivery, insufficient knowledge of PRT among palliative care specialists, and inadequate training of ROs in palliative care, leading to challenges in managing patients with complex advanced cancer cases. Additionally, logistical complexities introduced by the COVID-19 pandemic have further exacerbated these issues. Various solutions have been proposed to address these barriers, such as utilizing tools to improve prognosis prediction, providing training on PRT for palliative care experts and on palliative care for ROs, and implementing pathways and organizational models dedicated to PRT, ideally integrated with supportive care programs [4,5]. Rapid response PRT programs, where patient assessment and radiotherapy planning and delivery occur promptly (preferably on the same day), have also been suggested. While literature on the organization of PRT rapid response programs is abundant, evidence on organizational models and mutual training experiences remains scarce. This literature review aims to provide a succinct overview of available information pertaining to enhancing the quality of PRT through training initiatives, novel pathways, and organizational models.

### Method

The initial search on bibliographic databases yielded 188 papers that were potentially relevant for this analysis. Upon scrutinizing the titles and abstracts, 54 papers were chosen for full-text examination, as 113 papers were deemed unrelated to the review's subject, 5 were published in a language other than English, and 16 were either editorials or

reviews. After carefully evaluating the full-text papers, 22 were selected and incorporated into this review, while 32 papers were determined to be not pertinent to the topic of analysis. Chang et al. conducted a study that explored the effects of a multidisciplinary service model, known as Palliative Radiation Oncology Consult (PROC), within a radiotherapy department. The study utilized propensity score adjusted analysis and revealed significant outcomes following the implementation of PROC. The introduction of PROC resulted in a higher frequency of single fraction treatments, reduced hospitalization duration, and a notable increase in the utilization of specialty-level palliative care [6,7].

### Results

Similarly, Tseng et al. investigated the satisfaction levels of radiation oncologists (ROs) responsible for providing palliative treatments within a service exclusively dedicated to PRT, known as Supportive and Palliative Radiation Oncology (SPRO). The analysis indicated significantly higher satisfaction levels among ROs in departments with a dedicated PRT service compared to those without. Additionally, Job et al. examined the impact of a specific referral pathway tailored for patients undergoing PRT, termed Palliative Advanced Practice Radiation Therapist. The results demonstrated that patients in this dedicated pathway experienced shorter waiting times for PRT initiation and completed the treatment with fewer hospital visits. Moreover, LeGuerrier reported on the successful integration between supportive care and PRT, highlighting a planned integrated service that encompassed symptoms management alongside PRT evaluation. The service initially operated with two staff members working half a day

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a week, but after 11 years, it expanded to a full-fledged service with six staff members working five days a week. These studies collectively emphasize the positive impact of specialized units and pathways dedicated to PRT in enhancing patient care and outcomes [8].

**Barriers and implementing multidisciplinary care:** In real-world settings, studies have explored the use of palliative care in patients undergoing PRT and vice versa. Some studies have found that only a minority of patients receiving PRT also benefit from palliative care services, indicating a need for educational interventions for radiation oncologists (ROs). In contrast, other studies conducted in Saudi Arabia and Australia showed low utilization of PRT in inpatients with advanced cancer, with only a small percentage of patients being referred for PRT [9-14]. These findings highlight the challenges in integrating PRT with supportive therapies and the need for improved coordination and communication between different care providers.

**Integrating palliative radiotherapy in multidisciplinary patients management:** In contrast to the challenges mentioned above, other studies have reported successful organizational-care models that integrate PRT into multidisciplinary patient management. For instance, the IMMA study demonstrated that a multidisciplinary management program involving ROs and anesthesiologists for cancer patients with pain led to a significant decrease in inadequate pain management. Similarly, an integrated management model for patients with brain metastases, involving a multidisciplinary team including palliative care and radiotherapy services, resulted in improved outcomes and proper use of PRT. Other studies that involved multidisciplinary palliative cancer care teams showed comparable overall survival rates and improved symptom control, side effects, and quality of life in patients receiving PRT. Moreover, a home care experience in Italy for terminally ill cancer patients utilized a team of ROs, nurses, and psychologists to provide supportive care and PRT when needed.

Overall, these studies highlight the importance of overcoming real-world barriers to the integration of PRT with supportive and palliative therapies. Successful implementation of multidisciplinary care models has shown promising results in improving patient outcomes and enhancing the proper use of PRT in the context of advanced cancer care. Further research and collaborative efforts are needed to foster the integration of PRT with supportive and palliative care to provide comprehensive and effective patient-centered treatments. In real-world settings, studies have explored the use of palliative care in patients undergoing PRT and vice versa. Some studies have found that only a minority of patients receiving PRT also benefit from palliative care services, indicating a need for educational interventions for radiation oncologists (ROs) [15]. In contrast, other studies conducted in Saudi Arabia and Australia showed low utilization of PRT in inpatients with advanced cancer, with only a small percentage of patients being referred for PRT. These findings highlight the challenges in integrating PRT with supportive therapies and the need for improved coordination and communication between different care providers.

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of PRT [16]. Other studies that involved multidisciplinary palliative cancer care teams showed comparable overall survival rates and improved symptom control, side effects, and quality of life in patients receiving PRT. Moreover, a home care experience in Italy for terminally ill cancer patients utilized a team of ROs, nurses, and psychologists to provide supportive care and PRT when needed.

**Innovative organizational models to overcome logistical barriers:** In the context of logistical limitations imposed by the COVID-19 pandemic and the need for prolonged outpatient management, innovative organizational models have been proposed to improve the delivery of PRT. For example, Cellini et al. developed the NORMALITY clinical care model, which aims to shorten hospital stays and facilitate patient access to PRT [17]. The model incorporates teleconsultation and remote patient assessments through interactive video calls, allowing for efficient PRT planning and treatment initiation on the same day. Additionally, PRT rapid response programs, such as the Palliative radiation oncology consult (PROC) and the Supportive and palliative radiation oncology (SPRO), have shown promising results in terms of improved treatment utilization and patient satisfaction [18,19]. These organizational models emphasize the importance of multidisciplinary collaboration and patient-centered care to optimize the integration of PRT with other supportive and palliative treatments. Overall, innovative organizational models and multidisciplinary care approaches have the potential to overcome real-world barriers to the integration of PRT with supportive and palliative therapies [20]. By fostering improved communication and collaboration among care providers, these models can enhance patient outcomes and ensure the effective utilization of PRT in the management of advanced cancer. Continued research and implementation of such models are essential to further improve the quality of patient care in the context of PRT and advanced cancer management.

## Discussion and Conclusion

In this narrative review, we have presented a concise overview of the existing evidence on enhancing the quality of palliative radiotherapy (PRT) through integration with supportive care. It is important to acknowledge the limitations of this analysis, including the retrospective nature of most included reports, the variability in methods and endpoints, and the inability to conduct quantitative analysis. Additionally, the lack of detailed information on PRT dose and fractionation in many studies is notable. Despite these limitations, the reviewed literature consistently demonstrates the advantages of integrating PRT with supportive care. Studies investigating dedicated radiotherapy units or services for PRT indicate that specialized services can improve the timeliness and adequacy of PRT, leading to increased satisfaction among team members [19,20]. On the other hand, analyses of common clinical practice scenarios suggest that patient referrals between PRT and palliative care can be limited without specific interventions. However, integrating PRT into the multidisciplinary management of cancer patients appears to improve pain and symptom management, appropriate use of PRT, and overall patient and family satisfaction. Furthermore, when implemented with innovative organizational models, PRT can facilitate outpatient or home care management.

These findings underscore the importance of active participation by radiation oncologists (ROs) in the integration of PRT with palliative care to provide comprehensive support to patients with advanced cancer. ROs should not only proficiently plan PRT but also possess the skills to assess and manage symptoms and stress, make timely referrals to specialists for complex symptoms, and actively engage

in multidisciplinary palliative care teams. Consequently, enhancing training in palliative care during residency and continuous medical education is vital. Particularly, radiotherapy residents need effective training to equip them with the ability to deliver comprehensive palliative care throughout their professional careers. This training should encompass formal instruction of adequate duration, innovative and interactive teaching methods, exposure to palliative care services, and education on advanced palliative care. By investing in improved training, ROs can effectively contribute to the integration of PRT with supportive care, ultimately providing enhanced patient-centered treatments and improving outcomes for individuals facing advanced cancer. In summary, while the evidence from the studies on the integration of PRT with other palliative and supportive therapies is primarily based on retrospective analyses with low levels of evidence, a consistent pattern emerges. All the reports uniformly demonstrate clear advantages that result from the integration of PRT with supportive care.

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## Conflict of Interest

Author declares no conflict of interest.

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