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Review article

## Triage for palliative radiotherapy by clinical specialist radiation therapists: A scoping review

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### ABSTRACT

Patients who could benefit from palliative radiotherapy (PRT) may be in different phases of the cancer journey: they may have minimal symptoms and preserved functional status, or could be near end of life, with multiple complex care needs. Efficient triage at PRT referral is crucial to match patients with an appropriate provider and care setting as quickly as possible. Many centres have a dedicated PRT clinic, for which triage occurs by a Palliative Clinical Specialist Radiation Therapist (PCSRT). We performed an English-language literature search of 15 databases, without date limits, based on the PICO framework. After independent screening of titles and abstracts by two authors, relevant full text papers were reviewed. Twenty studies (15 publications and five abstracts) and one government report met inclusion criteria. Studies were published over a 21-year period by investigators from four countries. By identifying bottlenecks, screening out inappropriate referrals, and assessing patients in advance of consult, PCSRT triage decreased wait times by approximately 50%, on average, compared to standard pathways (range 30–82%). Increasing efficiency by pre-booking and coordinating appointments increases patient volumes and optimizes use of resources. A triage PCSRT serving a navigator role improves continuity of care, and in decreasing the number of handoffs, safety as well. Shifting triage to a PCSRT allows multidisciplinary team members to work to their maximum scope. In one clinic, after incorporation of PCSRT triage, use of on-call services decreased, as more patients were seen during daytime appointments, contributing to cost-savings.

### Introduction

Approximately half of patients diagnosed with cancer will develop metastatic disease [1]. Palliative radiotherapy (PRT) is an effective modality to reduce multiple symptoms of advanced cancer, including pain secondary to bone metastases, neurologic symptoms related to brain metastases, bleeding caused by friable or fungating tumours, and airway or gastrointestinal tract obstruction [2–3]. PRT accounts for 40–50% of the total workload of a radiotherapy department [3–4]. Patients who could benefit from PRT may be in different phases of the cancer journey: they may present relatively early in their disease trajectory with minimal symptom burden and preserved functional status, or could in fact be closer to the end of life with multiple complex psychosocial and advanced care planning needs [5].

Triage is defined as “the process of sorting people in need of medical attention in order to determine priority” [6]. Triage is important in the

setting of patients with advanced cancer who could potentially benefit from PRT [7]. Efficient triage performed at receipt of first referral is crucial to identify a patient’s clinical needs and urgency in order to match them with an appropriate provider and care setting with as little wait time as is reasonably achievable. In general, patients who require assessment for PRT can be seen in tumour site-specific outpatient clinics, on inpatient wards, or by Radiation Oncologists (ROs) in the on-treatment review area [7]. (Please note, the term Radiation Oncologist will be used throughout to encompass any physician specialist who prescribes radiation therapy, such as a Clinical Oncologist in the United Kingdom.) Triage to all of these settings most commonly occurs via an RO alone or nurse-physician dyad [5].

However, many cancer centres have a separate referral pathway to access infrastructure dedicated to delivery of PRT [2,8,9]. These programs, often referred to as “rapid access” clinics, are designed to facilitate same day assessment, simulation and treatment start for

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symptomatic patients, typically by a multidisciplinary team (MDT) [9–11]. Other aims include the provision of physical, practical, social, and emotional support, based on routine screening for care gaps, via streamlined referral to allied health providers (AHPs) [12–13]. These clinics often serve as a centralized point of access for patients who are not being followed at a tertiary cancer centre, because they are living in a remote or rural area, have poor performance status (PS), or are admitted to hospital or hospice elsewhere [5,14].

Triage of new patients referred to a rapid access clinic often takes place by a radiation therapist with advanced skills, extensive training, and experience with this patient population. [These professionals are known by many titles depending on region or country, including Consultant Radiographer, Advanced Therapeutic Radiographer, or Advanced Practice Radiation Therapist, but in this work will be termed ‘Palliative Clinical Specialist Radiation Therapist’ (PCSRT)]. A PCSRT is able to take on clinical and non-clinical tasks normally performed by others [10,15]. However, an in-depth analysis of outcomes achieved by a PCSRT at this position in the PRT care path has not previously been reported.

The purpose of this scoping review was to describe the roles, responsibilities and impact of involvement of a PCSRT in the triaging of referrals for PRT.

## Methods

A literature search was completed, without limitations on publication date, in July 2022. Eight databases were accessed (MEDLINE [Ovid]; EMBASE; Cochrane Library; PubMed; PubMed Central; CINAHL; MEDLINE [Ebsco]; and Web of Science). Gray literature was searched in seven additional databases: AHS Insite; OAIster; [ClinicalTrials.gov](http://ClinicalTrials.gov); ASCO; ESMO; Google; and Google Scholar. Eligibility criteria included: peer-reviewed studies (full papers/conference abstracts) or government reports; published in English; direct comparison of the PRT triage process between the standard pathway and the pathway with PCSRT participation; one or more explicitly stated endpoint; at least one quantitative outcome reported.

The PICO framework was used to determine key search words and eligible publications as follows:

Population = palliative cancer patients;  
 Intervention = triage by PCSRT;  
 Comparison = standard pathway;  
 Outcome = evidence of impact of PCSRT involvement eg differences in wait times.

Key search terms were identified and compared to the Medical Subject Headings. Search terms included: “palliative radiation oncology”, “palliative radiotherapy”, “palliative care”, “radiation oncology”, “triage”, “priority”, “prioritization”, “pre-screen”, “pre-book” and “pre-consult” (search 1). Boolean operators (and, or, not) were used to combine search terms, and “exp” was applied to search for sub-categories within the key term. An additional search was performed within the same databases/registries containing the terms: “palliative radiation oncology clinic”, “palliative radiation oncology program,” or “rapid access clinic” (search 2). All key search terms were applied to title and abstract fields. After review of initial results of both searches independently by the two authors, duplicates were removed, and full text papers were retrieved and further analyzed for relevance. Reference lists of included papers were evaluated for additional pertinent publications.

## Results

### PCSRT triage process

After performing both searches and removal of duplicate records,

232 titles were screened for relevance. 54 full reports were assessed for eligibility, with 21 ultimately included: 15 manuscripts; 5 conference abstracts; and 1 government report (Fig. 1; Table 1).

The PCSRT assesses referrals for completeness, redirects inappropriate referrals, follows up on missing information and may request diagnostic imaging [16]. The past chart is reviewed, including pathology reports and previous PRT [17]. Referrals are occasionally misdirected, inappropriate or unwarranted [16]. This can result in significant wasted time for patients/caregivers and staff, unnecessary use of resources and creation of backlogs in the system [16]. If additional information is required before the appointment can be made, the referring clinician is contacted. Liaising with other clinicians may also be needed [18–19]. Thorough review at this stage avoids unnecessary appointments for patients, improves workflow and resource utilization [16]. Complex or atypical cases can be reviewed at this point with an RO [17].

The evaluation of urgency may be informed by a pre-consult phone call to obtain more detail on current symptoms, PS, medication use, social situation, and practical needs [8]. Some programs also use this opportunity to complete formal, validated patient reported quality of life (QOL) questionnaires. For example, at one centre’s rapid access program, the ‘Edmonton Symptom Assessment System (revised)’ (ESAS-r), the ‘Canadian Problem Checklist’ (CPC) and the ‘European Quality of Life – 5 Dimensions’ (EQ5D) questionnaires are completed at this point [12,20]. The ESAS-r is an 11-point numeric rating scale encompassing symptoms of pain, tiredness, nausea, depression, anxiety, drowsiness, appetite, shortness of breath and overall feeling of well-being [20]. The CPC screens for unmet needs within 21 psychological, practical, and physical dimensions, including social/familial, and informational. The EQ5D asks patients to evaluate their overall QOL in mobility, self-care, usual activities, pain/discomfort, and anxiety/depression domains [12]. This extensive pre-assessment is not completed for patients referred for PRT through the usual tumour site-specific pathways at this centre, who are triaged by an RO or RO-nurse pair [7].

Overall, advantages of triage by PCSRT are: improving access to care by decreasing patient wait times at multiple points between referral and PRT start; increasing patient throughput; increasing patient volume; improving continuity of care; improving patient satisfaction; task-shifting decreasing the workload of other team members; early activation of the MDT and referrals to allied health providers (AHPs); and optimizing resource utilization (Table 2).

### Impact of PCSRT involvement in triage

#### Decreasing wait times

The first description of therapeutic radiographers improving wait times as a result of involvement in triage was published in 2001 [21]. 127 patients accessing PRT via their centre’s routine pathway were compared to 127 patients treated via a new Fast-Track Palliative Care Initiative. Wait time from referral to simulation was 11.6 days on average for the standard pathway versus 3.5 days in Fast-Track, and 94% (47/50) surveyed expressed satisfaction with the wait time experienced [21]. In Brisbane, between October 2014 and March 2015, of 150 patients referred for PRT, 48 were triaged directly by a PCSRT [2]. All patients triaged by the PCSRT were contacted on the day of referral, either in person or by phone, for assessment. Average referral to consult time decreased from 2.3 days via the standard pathway to 1.4 days with PCSRT involvement. In addition, there was an overall decrease in the number of hospital visits per patient [2]. In Toronto, Canada, a PCSRT triaging 24 new referrals compared to 120 referrals not triaged by a PCSRT reduced the interval from consult to PRT start from 8 days to 5 days [22]. Patients referred for PRT in London were triaged by a consultant radiographer for routine, fast-track or emergency consultation. The interval between decision to treat and PRT start decreased by 82% on average, from 14 days to 3 days for volume-planned patients [10]. In a PCSRT-facilitated Bone Metastases Clinic (BMC) in Ontario,

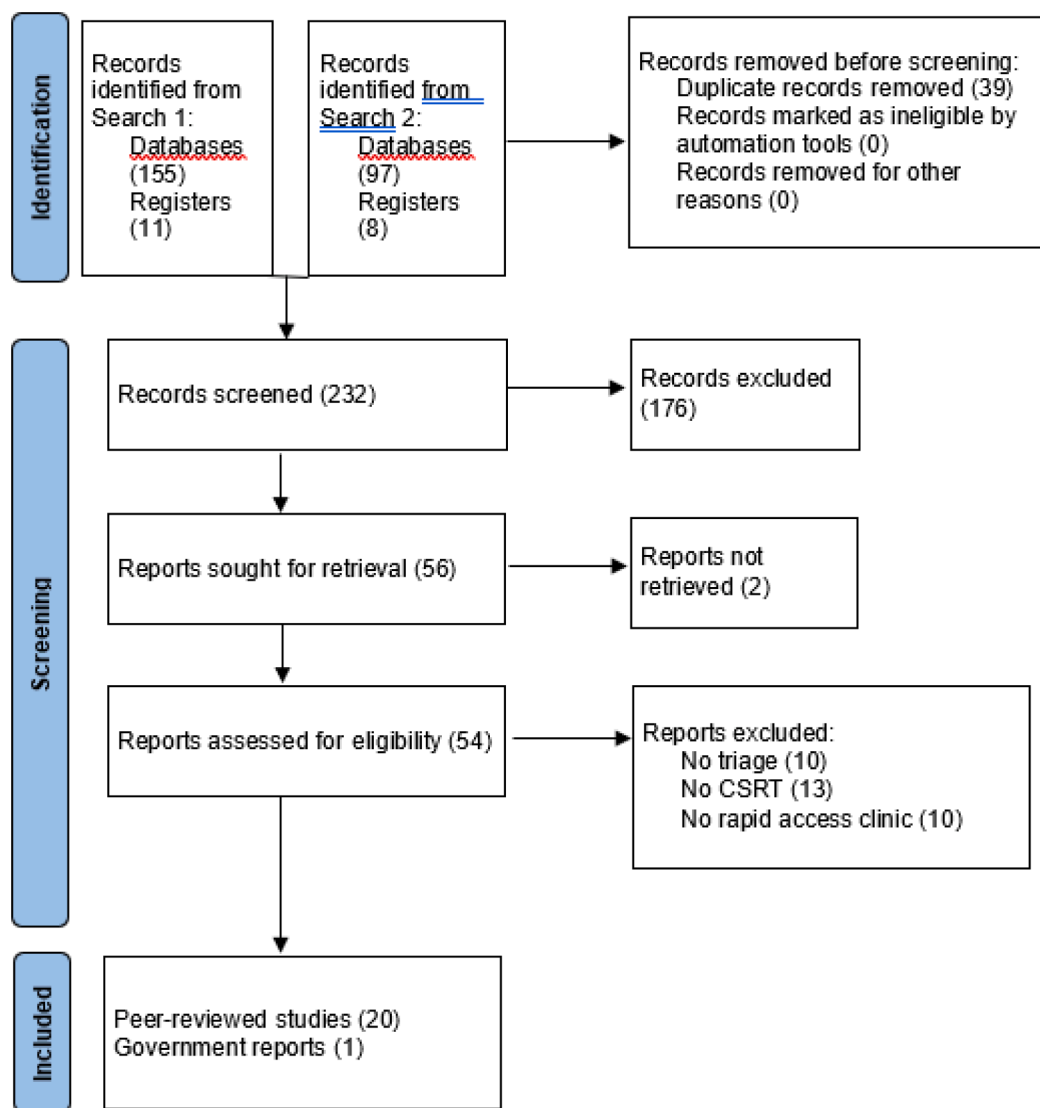


Fig. 1. PRISMA flow diagram.

referral to consult time decreased to 4.8 days, compared to 6.8 days for patients seen outside the BMC. Interval between referral to PRT start and consult to PRT start were reduced by 32% and 39%, respectively, in comparison to the standard pathway [17]. When compared to patients seen in regular oncology clinics, the PCSRT-led Rapid Response Clinic reduced waiting time by at least 60% [11] (Table 2).

*Increasing patient throughput and volumes*

Throughput is defined as the time it takes for patients to move from one point to another on a care path [23]. PCSRT triaging of referrals contributes to efficiency of throughput in large part by pre-booking and coordinating appointments. One Ontario rapid access clinic PCSRT increased the proportion of patients seen within 2 days of referral by 13.4%; an RO achieved a 2.5% increase during the same period [17]. In the same clinic, the proportion triaged by the PCSRT seen within 1 day increased by 12.5% compared to a RO whose consult volume in fact decreased by 3.2% [17]. In an Ontario process improvement project, urgent palliative patients were assigned to the care of a PCSRT, nurse practitioner or RO. The patients managed by PCSRTs were treated within 5 days of consultation, versus 8 days without PCSRT involvement. In addition, the number of patients meeting target treatment start times increased by 18% (57% to 75%) with PCSRT involvement [17]. PCSRT triage also increased the number of treatment starts occurring on

the same day as simulation, from 74% to 88% in one study [17] and an increase of 60% in another [11]. The Brisbane PCSRT significantly decreased the number of visits per patient to the department and increased the proportion treated on the same day [2]. 39% of patients were treated within 2 days of referral via PCSRT involvement in triage versus 17% of patients referred through the standard pathway [2]. Overall, PCSRTs help decrease “in-hospital time” for palliative patients [17] (Table 2).

Patients moving more efficiently through the care pathway positively impacts accessibility and therefore overall capacity [11]. This is also achieved by early identification of inappropriate referrals, since patients who are not candidates for PRT, who are asymptomatic, or who do not wish to have it, are saved from attending an unnecessary clinic visit [17,24]. This decreases wait time for appropriately referred patients and increases the proportion of patients who actually proceed to simulation (sim) and treatment start [17]. A PCSRT in one Ontario centre identified incomplete and inappropriate referrals at triage reducing the proportion of those patients seen in clinic from 13.7% to 3% [17]. Incorporating PCSRT triage helped increase patient volumes in another rapid access clinic, increasing the number of patients treated from 270 in 2014 to approximately 750 in 2017 [19] (Table 2).

**Table 1**

Clinical programs and settings described by included studies. <sup>^</sup>Abstract. <sup>\*\*</sup>Government report.

Program	Setting	Reference
Fast Track Palliative Care Initiative	Edinburgh, UK	21
Palliative Radiotherapy Service	Liverpool, UK	24
Fast Track for Palliative Radiotherapy	Derby and Burton, UK	10
Direct referral to PCSRT	Brisbane, AUS	2
Direct referral to PCSRT	Brisbane, AUS	8
Cancer Care Ontario	Multiple sites <sup>^</sup> , Ontario, CAN	17 <sup>**</sup>
Rapid Access Radiotherapy Program	Kelowna, BC, CAN	30 <sup>**</sup>
Rapid Response Radiotherapy Program	Sunnybrook, Toronto, CAN	22
Cancer Care Ontario	Multiple sites <sup>^</sup> , Ontario, CAN	32 <sup>**</sup>
Cancer Care Ontario	Multiple sites <sup>^</sup> , Ontario, CAN	28 <sup>**</sup>
Rapid Response Clinic	Newmarket, Ontario, CAN	11 <sup>**</sup>
Rapid Response Clinic	Newmarket, Ontario, CAN	26
Cancer Care Ontario	Multiple sites <sup>&amp;</sup> , Ontario, CAN	23
Cancer Care Ontario	Multiple sites <sup>&amp;</sup> , Ontario, CAN	15
Orthopedic Radiation Oncology Clinic	Hamilton, Ontario, CAN	29 <sup>**</sup>
Palliative Radiation Oncology Program	Edmonton, Alberta, CAN	7
Palliative Radiation Oncology Program	Edmonton, Alberta, CAN	19
Rapid Access Palliative RT Program	Ottawa, Ontario, CAN	27
Cancer Care Ontario	Multiple sites <sup>&amp;</sup> , Ontario, CAN	16
Cancer Care Ontario	Multiple sites <sup>&amp;</sup> , Ontario, CAN	18
National Cancer Centre	Singapore	25

<sup>\*</sup>Ottawa, Odette Cancer Centre (Toronto), Princess Margaret Hospital (Toronto), Durham, Barrie, St Catharine's.

<sup>^</sup>Ottawa, Odette Cancer Centre (Toronto), Princess Margaret Hospital (Toronto), Hamilton, Kingston.

<sup>&</sup>Not specified.

**Enhancing patient satisfaction and continuity of care**

When patients are introduced to the PCSRT during first contact at triage, the PSCRT remains the one consistent link in the consult to sim to treatment process [19]. PCSRTs serve as an invaluable first, and continual, point of contact during what can be a confusing pathway [8,17,21,25]. This initial contact also alleviates practical concerns patients may have about the first visit to clinic [19]. The PCSRT navigates and coordinates the care schedule. This improves continuity and consistency by decreasing the number of patient handoffs, minimizing opportunities for miscommunication and error, and addressing patient concerns in a timely manner [15,16,19,22].

PCSRT involvement also contributes to patient satisfaction during PRT [17]. One pre/post satisfaction study described 215 patient surveys over a one-year period between 2009 and 2010 [18,26]. 56 surveys were completed prior to PCSRT involvement while 159 were completed post-PCSRT involvement. The involvement of a CSRT within the care pathway was associated with increased patient satisfaction across all nine questions measured via a 5-point Likert scale. Overall satisfaction with health care averaged 4.5/5 with the PCSRT involved compared to 4.2/5 for patients without the PCSRT involved [18] (Table 2). The lack of negative impact on patient satisfaction with PCSRT involvement was also reported by investigators in Australia [8].

**Resource optimization**

The task-shifting that occurs when PCSRTs take on the role of triaging allows ROs to focus on other aspects of patient care [17,19]. This is becoming more essential, since contemporary palliative patients are requiring both more complex RT techniques and more episodes of retreatment, which both result in additional time pressure for ROs [22,25]. Redistribution of work within the MDT renders it more efficient [16]. Delegation of clinical and non-clinical tasks from physicians to PCSRTs releases the ROs from these tasks, leaving them additional time

**Table 2**

Summary of outcomes related to participation of PCSRT triage for palliative radiotherapy. <sup>\*</sup>This publication notes for these outcomes that gains achieved by the PCSRT were greater than those achieved by physicians during the same period. <sup>¥</sup>Patients classified as 'urgent'. Abbreviations: MDT – multidisciplinary team; PCSRT – Palliative Clinical Specialist Radiation Therapist; PRT – palliative radiotherapy; pts – patients; physio – physiotherapy.

Outcomes & Metrics	Standard Pathway (No PCSRT)	PCSRT Involvement	Centre [Reference]
<b>Wait Times</b>			
Consult, planning and PRT start all on same day	9%	31%	Brisbane, AUS [2]
Referral -> Simulation	11.6 days	3.5 days	Edinburgh, UK [21]
	6.8 days	4.8 days	Hamilton, CAN [17]
Referral -> Consult	3.2 days	1.4 days	Brisbane, AUS [2]
	4–5 days	1–2 days	Newmarket, CAN [11]
	1 days	0.5 days	Singapore <sup>*</sup> [25]
	2.8 days	1.7 days	Hamilton, CAN [17]
Consult -> PRT start	8 days <sup>¥</sup>	5 days <sup>¥</sup>	Kingston, CAN [17]
Referral -> Planning	5.3 days	1.6 days	Brisbane, AUS [2]
CT Simulation -> PRT start	3.9 days	2.3 days	Toronto, CAN [17]
	13–14 days	4–6 days	Derby, UK [10]
	NR	↓ by 7 days	Ontario, CAN [28]
Decision to treat -> PRT start	5.3 days	2.6 days	Toronto, CAN [17]
	5.3 days	2.6 days	Ontario, CAN [17]
Referral -> PRT start	9.6 days	6.5 days	Hamilton, CAN [17]
	8.1 days	3.5 days	Brisbane, AUS [2]
<b>Patient Throughput &amp; Volumes</b>			
Referral -> Consult	Proportion seen within ≤ 2 days: ↑ 2.5% by RO ≤1 day: ↓3.2% by RO	Proportion seen within ≤ 2 days: ↑ 13.3% ≤1 day: ↑ 12.5%	Toronto, CAN [17]
	57% of urgent pts seen within target timelines	75%	Kingston, CAN [17]
	15%	33%	Brisbane, AUS [2]
Same Day Simulation and Treat	NR	PCSRT ↑ 60%	Newmarket, CAN [11]
	NR	PCSRT ↑ 12%	Ontario, CAN [17]
Consult -> Planning Time	55 min	43 min	Kingston, CAN [17]
Total Visits to Department for PRT	≤2 visits: 50%	≤2 visits: 94%	Brisbane, AUS [2]
Total Patients Seen	270 patients/year	750 patients/year	Edmonton, CAN [19]
Inappropriate Referrals Seen in Clinic	13.7%	3%	Odette, CAN [17]
<b>Satisfaction</b>			
Patient Satisfaction with Care Received	Standard Pathway (No PCSRT) NR	PCSRT Involvement 47/50*; 50/50**	Centre [Reference] Edinburgh, UK [21]

(continued on next page)

Table 2 (continued)

Patient Throughput & Volumes	Standard Pathway (No PCSRT)	PCSRT Involvement	Centre [Reference]
	NR	4.8/5.0*	Ontario, CAN [11]
	4.2/5.0	4.5/5.0	Ontario, CAN [18]
	NR	100% (13/13) agreed that quality of care was improved	Edinburgh, UK [21]
Medical staff/ Frontline stakeholders	NR	83% (29/35) agreed the PCSRT role is valuable	Ontario, CAN [32]
Resource Optimization	Standard Pathway (No PCSRT)	PCSRT Involvement	Centre [Reference]
Triage workload	NR	Saved RO 30 min per patient	Edmonton, CAN [19]
History Taking workload	NR	Saved RO 20 min per patient	Ontario, CAN [11]
Impact on medical staff in terms of overall management	NR	100% (13/13) agreed management of palliative pts was easier	Edinburgh, UK [21]
	8.2%	46.4%	Edmonton, CA [7]
Early activation of MDT	NR	14% referred for prosthetics & 10% referred for physio	Hamilton, CA [29]

\*Proportion satisfied with length of time they waited for treatment.

\*\*Proportion rating the care received as excellent, very good or good.

^Patient rating of their experience with a PCSRT.

to focus on patients with greater needs [17]. Some centres have deployed the PCSRT primarily in an inpatient setting, expediting the PRT process via assessment and triage of inpatients prior to involvement of the RO [25,27,28].

Without PCSRT involvement in triage, MDT services are not always accessed in a predictable way or available when patients present with unexpected same-day needs. This can lead to workflow challenges for the clinic as well as MDT members [19]. Recognizing needs early, during review of referral information and the triage phone call by the PCSRT, allows coordination of required MDT members in advance of the consult visit [7,8,17,18]. Having MDT members review responses to standardized questionnaires ahead of time enhances: communication; problem detection; symptom management; workflow; team cohesiveness; and patient outcomes [17]. Understanding patient needs before consult also allows MDT members to schedule patients instead of seeing them ad hoc [19]. The patient therefore gets connected to supportive care that will improve QOL as soon as possible [19]. The PCSRT can also identify needs that are best served by engaging community resources [17]. Along with responding to patient’s current needs, this helps to anticipate problems and try to prevent future complications [25]. Pre-screening contributed to 46.4% of rapid access patients being referred to allied health providers versus 8.2% of standard pathway patients in one centre [7] (Table 2). In the weekly Orthopedic Radiation Oncology Clinic in Hamilton, Ontario, CSRT triage and navigation resulted in 38% of patients receiving weight-bearing restrictions, 14% referred for prosthetics and 10% for physiotherapy [29].

Standard protocol in many centres is to pre-book sim and first PRT appointments on the basis of information available at the time of referral, to improve patient access and clinical efficiency [10,17,19]. However, there is a risk that pre-booked appointments, without comprehensive triage, go unfilled. In one review of 1058 rapid access consultations, only 820 actually received PRT, resulting in 238 (22.5%) unused sim appointments [15]. Hoegler et al (2015) also report that

effective patient triage is essential to avoid unfilled simulation and treatment bookings [30]. 304 patients attended rapid access clinic appointments during a two-year period where 91% (276/304) were appropriately pre-scheduled for downstream appointments, but 9.2% were not. This resulted in 98 h of prebooked sim and 39.2 h of pre-booked treatment time going unused [30]. After one PCSRT identified a need to have dedicated time slots on planning equipment, two hours were saved in the planning process, on average [17]. Another PCSRT incorporated systemic changes in the booking pathway for patients with impending or established spinal cord compression that reduced on-call RT resource utilization [16]. Use of on-call services also decreased in the Rapid Response Clinic after addition of PCSRT triage, with more patients seen during daytime appointments, resulting in safer care in addition to cost-savings [11].

## Discussion

This review summarizes the available evidence for patient- and system-level improvements after incorporation of PCSRT triage of referrals for palliative radiotherapy. Triage is considered a core clinical competency of a CSRT, supplemented by discussion of atypical, complex or challenging cases with an RO if necessary [17]. PCSRT triage decreases wait times across the care pathway, increasing patient throughput, improving continuity, and facilitating time efficiencies, which combine to build capacity, decrease inappropriate referrals, and enhance patient satisfaction. Overall, PCSRT involvement at triage reduces the time required for patients to move between referral, consult, treatment and discharge, by addressing systematic pressures, gaps and bottlenecks [17,31]. PCSRTs achieve these outcomes largely by developing service enhancement initiatives and by assisting with, or assuming responsibility for, activities that were traditionally done by ROs [15,17].

PCSRTs therefore need to demonstrate a high level of autonomy and skill in formulating clinical decisions and appropriate patient management plans [15]. They need to think creatively and critically while working both autonomously and collaboratively [27]. The overlap of their professional skills with other team members’ facilitates more flexible distribution of tasks; this ensures all health professions within the team work to their full scope of practice [15,17,24]. PCSRTs help improve communication both within the cancer centre MDT and outside it, as they must frequently collaborate with referring providers. They also act as navigators and mentors [18–19].

Integral to PCSRT triage is implementation of systematic screening for care needs prior to clinic visits, which has been incorporated into the workflow of many ‘rapid access’ programs [7,14,19]. Thus, comprehensive patient assessment starts even before the in-person visit, assessing physical and cognitive condition, psychosocial and functional status. Activation of the MDT proactively during the triage process for patients with bone metastases helped decreased symptom distress in one rapid access clinic [13]. Of 82 patients attending 106 clinic visits, the total number of MDT recommendations was as follows: pharmacy – 71, Occupational Therapist – 51, Registered Dietician – 24 and Social Worker – 12. Screening of patients prior to clinic decreased short-term symptom distress and improved patients’ ability to tolerate sim and PRT [13].

There are some limitations to the conclusions which can be drawn from this literature review. Most of the papers reviewed provided overviews of programs in which PCSRTs are involved, and their resulting impact, through quality improvement initiatives. Data reported varies somewhat between different cancer centres, as do the tasks and responsibilities of the particular PCSRT. A specific PCSRT role often evolves to address service gaps and needs in a particular location [15,17,22]. While five highly relevant conference abstracts were included [11,28,30,32], unfortunately full manuscripts of these projects were never published. There are challenges associated with identifying effects specific to an individual role within a team [17]. The balance of data from Ontario relied significantly on self-report [23]. Data are scarce

which directly support improved clinical outcomes [23]. Additionally, some outcomes take time to materialize, even if interventions are effective, and may not (yet) have been captured in the publications available [17]. Continued evaluation and dissemination of data supporting the effectiveness of the PCSRT role is required, to aid in recognition of how these roles can be incorporated in other settings [24]. Additionally, it is not always possible to retrieve all existing evidence for a given topic, as many studies never reach publication [33]. Selective publication of studies based on the nature and direction of results, commonly called 'publication bias', is a widely recognized limitation of literature reviews [33]. However, significant efforts were made to be as complete as possible in the search for relevant data, including review of multiple databases and reference lists. Further research is also important to increase consistency and standardization across care settings where possible [24].

Next steps include evaluation of the current role of the Palliative Radiation Therapist position at our centre, with a view to optimizing and refining tasks in relation to literature-supported best practices detailed above. Responsibilities within the care path of patients referred for consideration of palliative radiotherapy will be reassessed. Our planned first step is to enhance the role in triage specifically with regard to reducing unnecessary referrals as we work towards redistribution of resources and appropriate prioritizing of patients.

## Conclusions

PCSRT involvement in triage of cancer patients requiring palliative radiotherapy improves access to care, increasing patient throughput and volume, improves continuity of care, accomplishes task-shifting, proactively activates the MDT and optimizes resource utilization. PCSRTs have the advanced knowledge, skills and judgement to successfully contribute to holistic evaluation and care of palliative cancer patients within a multidisciplinary environment.

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## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## References

- Thavarajah N, Wong K, Zhang L, et al. Continued success in providing timely palliative radiation therapy at the Rapid Response Radiotherapy Program: a review of 2008–2012. *e206 e11 Curr Oncol* 2013;20(3). <https://doi.org/10.3747/co.20.1342>.
- Job M, Holt T, Bernard A. Reducing radiotherapy waiting times for palliative patients: the role of the advanced practice radiation therapist. *J Med Radiat Sci* 2017;64:274–80. <https://doi.org/10.1002/jmrs.243>.
- Gorman D, Balboni T, Taylor A, Krishnan M. The supportive and palliative radiation oncology service: a dedicated model for palliative radiation oncology care. *J Adv Pract Oncol* 2015;6(2):135–40. <https://doi.org/10.6004/jadpro.2015.6.2.5>.
- Stavas M, Pagan J, Varma S, et al. Building a palliative radiation oncology program: from bedside to B.E.D. *Pract. Radiat Oncol* 2017;7(3):203–8. <https://doi.org/10.1016/j.prro.2016.09.006>.
- Fairchild A, Hill J, Alhumaid M, et al. Palliative radiotherapy delivery by a dedicated multidisciplinary team facilitates early integration of palliative care: a secondary analysis of routinely collected health data. *S51 S5 J Med Imag Radiat Sci* 2022;53(2 Suppl). <https://doi.org/10.1016/j.jmir.2022.01.003>.
- Collins English Dictionary. <https://collinsdictionary.com> (Accessed January 23, 2023).
- Hill J, Alhumaid M, Ghosh S, et al. Comprehensive assessment during palliative radiotherapy consultation optimizes supportive care for patients with advanced breast cancer. *Supp Care Cancer* 2022;30(10):8339–47. <https://doi.org/10.1007/s00520-022-07246-5>.
- Roos D, Job M, Holt T. Establishing a palliative Advanced Practice Radiation Therapist role: A viable alternative to a Rapid Access Palliative Radiation Therapy clinic in Australia. *J Med Imag Radiat Oncol* 2022;66(1):117–28. <https://doi.org/10.1111/1754-9485.13332>.
- Fairchild A, Pituskin E, Rose B, et al. The rapid access palliative radiotherapy program: blueprint for initiation of a one-stop multidisciplinary bone metastases clinic. *Supp Care Cancer* 2009;17(2):163–70. <https://doi.org/10.1007/s00520-008-0468-3>.
- Fisher S. The role of the Consultant Radiographer in facilitating rapid access to palliative radiotherapy. *Radiography* 2021;27(4):994–9. <https://doi.org/10.1016/j.radi.2021.03.005>.
- Rozanec N, Loudon J, Moyo E, Cho C, Wells W. The rapid response clinic: a reflection on five years. *J Med Imag Radiat Sci* 2018;49(3): S5;Abstr.
- Watson L, Delure A, Qi S, et al. Utilizing patient reported outcome measures in ambulatory oncology in Alberta: digital reporting at the micro, meso and macro level. *J Pat Report Out* 2021;5(Suppl 2):97. <https://doi.org/10.1186/s41687-021-00373-3>.
- Pituskin E, Fairchild A, Dutka J, et al. Multidisciplinary team contributions within a dedicated outpatient palliative radiotherapy clinic: a prospective descriptive study. *Int J Radiat Oncol Biol Phys* 2010;78(2):527–32. <https://doi.org/10.1016/j.ijrobp.2009.07.1698>.
- Dennis K, Harris G, Kamel et al. Rapid Access Palliative Radiotherapy Programmes. *Clin Oncol* 2020;32(11):704–12. [10.1016/j.clon.2020.08.002](https://doi.org/10.1016/j.clon.2020.08.002).
- Harnett N, Bak K, Zychla L, et al. Defining advanced practice in radiation therapy: a feasibility assessment of a new healthcare provider role in Ontario. *Canada Radiogr* 2019;25(3):241–9. <https://doi.org/10.1016/j.radi.2019.02.007>.
- Lavergne C, Rozanec N, Harnett N. The palliative clinical specialist radiation therapist: a CAMRT White Paper. *J Med Imag Radiat Sci* 2021;52(4):636–49. <https://doi.org/10.1016/j.jmir.2021.08.016>.
- Cancer Care Ontario. clinical specialist radiation therapist demonstration project – summative report. Accessed January 23, 2023, [https://www.cancercareontario.ca/sites/ccocancercare/files/assets/H-CSRT\\_CSRTDemonstrationReport.pdf](https://www.cancercareontario.ca/sites/ccocancercare/files/assets/H-CSRT_CSRTDemonstrationReport.pdf); 2010.
- Rozanec N, Lavergne C, Harnett N. A Canadian experience of palliative advanced practice radiation therapy TIPS: training, implementation, practice and sustainability. *Tech Innov Patient Supp Radiat Oncol* 2021;17:89–96. <https://doi.org/10.1016/j.tipsro.2021.01.003>.
- LeGuerrier B, Huang F, Spence W, et al. Evolution of the radiation therapist role in a multidisciplinary palliative radiation oncology clinic. *J Med Imag Radiat Sci* 2019;50(1):17–23. <https://doi.org/10.1016/j.jmir.2018.07.005>.
- Watanabe S, Nikolaichuk C, Beaumont, et al. A multicenter study comparing two numerical versions of the Edmonton Symptom Assessment System in palliative care patients. *J Pain Symp Manage* 2011;41(2): 456–68. [10.1016/j.jpainsymman.2010.04.020](https://doi.org/10.1016/j.jpainsymman.2010.04.020).
- Blyth C, Anderson J, Hughson W, Thomas A. An innovative approach to palliative care within a radiotherapy department. *J Radiother Pract* 2001;2(2):85–90. No DOI available.
- D'Alimonte L, Holden L, Turner A, et al. Advancing practice, improving care the integration of advanced practice radiation therapy roles into a radiotherapy department: a single institution experience. *J Med Imag Radiat Sci* 2017;48(2): 118–21. <https://doi.org/10.1016/j.jmir.2017.02.073>.
- Harnett N, Bak K, Lockhart E, et al. The Clinical Specialist Radiation Therapist (CSRT): a case study exploring the effectiveness of a new advanced practice role in Canada. *J Med Radiat Sci* 2018;65(2):86–96. <https://doi.org/10.1002/jmrs.281>.
- Fitzpatrick C, Javor J, Zywine C, et al. Advancing roles of healthcare professionals in palliative radiotherapy. *Clin Oncol* 2020;32(11):753–7. <https://doi.org/10.1016/j.clon.2020.07.024>.
- Wong S, Sin S, Lim L, et al. The implementation of an advanced practice radiation therapy program in Singapore. *Tech Innov Patient Supp Radiat Oncol* 2021;17: 63–70. <https://doi.org/10.1016/j.tipsro.2021.02.002>.
- Rozanec N, Smith S, Wells W, et al. Patient satisfaction with the role of a Clinical Specialist Radiation Therapist in palliative care. *J Radiother Pract* 2017;16:226–231. No DOI available.
- Linden K, Renaud J, Zohr, et al. Clinical Specialist Radiation Therapist in Palliative Radiation Therapy: Report of an Orientation, Training, and Support Program. *J Med Imag Radiat Sci* 2019;50(4):543–50. [10.1016/j.jmir.2019.08.009](https://doi.org/10.1016/j.jmir.2019.08.009).
- Lavergne C, Javor J, Sze S et al. Implementation of the Palliative Clinical Specialist Radiation Therapist improves access to care for patients referred for palliative radiation therapy. *J Med Imag Radiat Sci* 2018;49:S2, Abstr. No DOI available.
- Blain J, Singh R, Ishkanian A, McCloy R. Identifying a niche: Development of the Orthopedic Radiation Oncology Clinic. *J Med Imag Radiat Sci* 2019;50:S2, Abstr. No DOI available.
- Hoegler D, Rose T. Resource implications of a rapid access radiotherapy program. *Radiat Oncol* 2015;116(Suppl 1):S32-S33. Abstr 89. No DOI available.

- [31] Johnstone C. Palliative radiation oncology programs: design, build, succeed! *Ann Palliat Med* 2019;8(3):264–73. <https://doi.org/10.21037/apm.2018.12.09>.
- [32] Linden K, Sze S, Lavergne C, et al. The impact of Palliative Clinical Specialist Radiation Therapists on quality of care in Ontario. *J Med Imag Radiat Sci* 2018;49: S1–15, Abstr. No DOI available.
- [33] Cochrane Colloquium Abstracts. What dissemination bias really means and how we can tackle it. <https://abstracts.cochrane.org/2015-vienna/what-dissemination-bias-really-means-and-how-we-can-tackle-it>. (Accessed April 18, 2).