Published in final edited form as:

Pract Radiat Oncol. 2014 ; 4(4): 247–253. doi:10.1016/j.prro.2013.09.005.

Supportive and palliative radiation oncology service: Impact of a dedicated service on palliative cancer care

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Abstract

Purpose—The American Society of Clinical Oncology has recommended tailoring palliative cancer care (PCC) to the distinct and complex needs of advanced cancer patients. The Supportive and Palliative Radiation Oncology (SPRO) service was initiated July 2011 to provide dedicated palliative radiation oncology (RO) care to cancer patients. We used care providers' ratings to assess SPRO's impact on the quality of PCC and compared perceptions of PCC delivery among physicians practicing with and without a dedicated palliative RO service.

Methods and materials—An online survey was sent to 117 RO care providers working at 4 Boston-area academic centers. Physicians and nurses at the SPRO-affiliated center rated the impact of the SPRO service on 8 PCC quality measures (7-point scale, “very unfavorably” to “very favorably”). Physicians at all sites rated their department's performance on 10 measures of PCC (7-point scale, “very poorly” to “very well”).

Results—Among 102 RO care providers who responded (response rate, 89% for physicians; 83% for nurses), large majorities believed that SPRO improved the following PCC quality measures: overall quality of care (physician/nurse, 98%/92%); communication with patients and families (95%/96%); staff experience (93%/84%); time spent on technical aspects of PCC (eg, reviewing imaging) (88%/56%); appropriateness of treatment recommendations (85%/84%); appropriateness of dose/fractionation (78%/60%); and patient follow-up (64%/68%). Compared with physicians practicing in departments without a dedicated palliative RO service, physicians at

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Conflicts of interest: None

the SPRO-affiliated department rated the overall quality of their department's PCC more highly ($P = .02$).

Conclusions—Clinicians indicated that SPRO improved the quality of PCC. Physicians practicing within this dedicated service rated their department's overall PCC quality higher than physicians practicing at academic centers without a dedicated service. These findings point to dedicated palliative RO services as a promising means of improving PCC quality.

Introduction

Approximately 20% to 40% of patients referred to radiation oncology clinics are treated to ameliorate pain and other symptoms of advanced, incurable cancer.^{1–4} These patients present with a distinct set of clinical care needs, including frequently requiring urgent management of complex cancer-related symptoms and oncologic emergencies (eg, spinal cord compression, bone metastases, superior vena cava syndrome) in coordination with other specialties (eg, medical and surgical oncology). Furthermore, as the primary goals of palliative radiation therapy (RT) are focused on optimizing patient quality of life, palliative cancer care (PCC) requires attention to patient values and goals.⁵ Therefore, palliative radiation oncology care not only requires technical application of palliative RT, but also capacity for urgent evaluation, coordination of care with other oncology and palliative care specialties, management of complex cancer-related symptoms and syndromes, and end-of-life patient and family communication.

Radiation oncology departments often structure clinical care by disease site to facilitate care coordination and improve quality of care for patient populations with distinct clinical needs. In light of the unique clinical needs of advanced cancer patients, dedicated clinical services may also benefit PCC within radiation oncology. Among the few institutions with dedicated services,^{6,7} limited data suggest that they help enable their department to meet the clinical care needs of palliative cancer patients.⁸ Given the large number of palliative cancer patients seen for RT and the American Society of Clinical Oncology's (ASCO) 2011 statement calling for improvement of palliative cancer care,⁵ further data are required to describe how dedicated palliative radiation oncology services impact the quality of palliative cancer care.

The Supportive and Palliative Radiation Oncology (SPRO) service was initiated July 2011 at the Brigham and Women's Hospital and Dana-Farber Cancer Institute (BWH/DFCI) with the following goals: (1) improving clinical care for palliative cancer patients; (2) improving the system of care, including its departmental structure and interface with collaborating services; and (3) advancing PCC within radiation oncology through education and research. The SPRO team is comprised of a weekly rotating attending physician, resident, and nurse, as well as a dedicated nurse practitioner and administrative staff person. The service is structured by daily rounds, facilitated with an electronic patient database, and dedicated simulation appointment times. Inpatient consults are seen the same day, and out-patient consults are immediately triaged when received. Depending on the indication, outpatients may be seen the same day or up to several weeks later (eg, postoperatively). In the first year since its inception, SPRO staffed more than 700 consult requests with approximately three quarters of patients undergoing simulation and treatment at BWH/DFCI. We aimed to assess

the impact of the SPRO service on various aspects of PCC by the following: (1) querying BWH/DFCI care providers' perceptions of the impact of SPRO on PCC; and (2) comparing how physicians with and without a dedicated palliative radiation oncology service rate the quality of their department's PCC.

Methods and materials

Participants and survey

After receiving approval from the participating institutions' institutional review board, we emailed an anonymous, electronic survey to 87 radiation oncology attending physicians and residents at 4 Boston-area academic centers. Eligible academic centers included BWH/DFCI, Massachusetts General Hospital, Beth Israel Deaconess Medical Center and Boston Medical Center. Among the 4 centers, only BWH/DFCI has a dedicated palliative radiation oncology service (SPRO-affiliated department). The remaining 3 centers were grouped as academic departments without a dedicated service (nondedicated service departments). In addition, we invited 30 nurse staff at BWH/DFCI to participate in the survey. Between November 24, 2012 and March 6, 2013, 3 requests for participation were sent over 5 weeks. Survey respondents received a \$10 gift card. Of the 117 radiation oncology providers emailed, 25 and 30 were attendings and nurses, respectively, who worked at the SPRO-affiliated department, 34 were attendings who worked at 1 of the 3 nondedicated service departments, and 28 were residents who rated 1 of the 4 departments that they had rotated within the prior 6 months and that they felt most comfortable evaluating.

Radiation oncology attendings and nurse staff from the SPRO-affiliated department and residents who had rotated on SPRO rated the impact of the SPRO service on 8 PCC quality measures (see Fig 1A) using a 7-point scale from "very unfavorably" to "very favorably" and were provided the option of free text, open feedback. Nurse staff were additionally asked to rate the impact of SPRO on communication with nursing (7-point scale, "very unfavorably" to "very favorably"). Physicians from all 4 academic centers were asked to rate how well their department performed on 10 measures of PCC (see Fig 1B) on a 7-point scale from "very poorly" to "very well." Details on the construction and validation of our 41-question survey have been previously described.⁹ Responses to 13 of the 41 survey questions comprise the data presented here.

Quantitative analysis

Descriptive statistics were compiled as proportions, medians, and ranges for categorical variables and as means and standard deviations for continuous variables. Differences in demographic and clinical characteristics between physicians practicing with and without a dedicated palliative radiation oncology service were compared with χ^2 tests and t tests for categorical and continuous variables, respectively. We calculated an overall PCC quality score by summing the 10 PCC ratings for each physician. Average ratings of the 10 PCC measures and overall PCC quality score for the SPRO-affiliated and nondedicated service departments were compared using t tests. All analyses were conducted using R (version 2.15.2). The P values less than .05 were considered significant, and all tests were 2-sided.

Qualitative analysis

Open-ended feedback on SPRO was analyzed by extracting themes following triangulated procedures of interdisciplinary analysis.¹⁰ Responses were independently grouped into themes by 2 investigators (MSK, TAB). A final set of themes, subthemes, and subcategories emerged through an iterative process among 3 investigators (MSK, YDT, TAB). Two investigators (MSK, YDT) then independently coded each care provider's response. The interrater reliability score was high ($\kappa = 0.83$). Discrepant codes were discussed among the 2 coding investigators to achieve consensus.

Results

Respondent and clinical practice characteristics

Of the 117 care providers contacted, 102 responded (response rate of 89% for physicians, 83% for nurses). Ten residents rated the SPRO-affiliated department while 18 rated 1 of the 3 departments without a dedicated service. Seventeen of the 28 residents previously rotated on SPRO and also rated the impact of SPRO on various measures of PCC (Table 1). There were no significant differences detected in physician or clinical practice characteristics between those who rated the SPRO-affiliated versus nondedicated service departments (Table 1).

Impact of SPRO on palliative cancer care

Large majorities of physicians (98%) and nurses (92%) indicated that SPRO favorably impacted the overall quality of PCC at BWH/DFCI (Figs 1A and 1B). Majorities of physicians and nurses also indicated that the following aspects of PCC were favorably impacted: overall quality of care (physician/nurse, 98%/92%); communication with patients and families (95%/96%); staff experience (93%/84%); time spent on technical aspects of PCC (88%/56%); appropriateness of treatment recommendations (85%/84%); appropriateness of dose/fractionation prescription (78%/60%); and patient follow-up (64%/68%). In addition to the 8 measures of PCC rated by all care providers, nurses also rated SPRO's impact on communication with nursing, with the majority (84%) indicating that SPRO improved communication.

A total of 26 respondents, including 8 nurses, 6 attendings, and 12 residents, provided free-text feedback on the SPRO service. Qualitative analysis of the open-ended responses revealed 2 distinct themes. The first, that SPRO improved palliative radiation oncology care, included subthemes such as improved quality of patient care ($n = 16$), improved resident education ($n = 3$), and improved staff experience ($n = 4$) (Table 2). The second theme focused on ongoing challenges encountered in palliative radiation oncology care related to patient care ($n = 6$) and staff experience ($n = 9$), including symptom management, communication about end-of-life care, and communication with nursing (Table 2).

Ratings of palliative cancer care with and without a dedicated palliative radiation oncology service

Compared with physicians whose department did not have a dedicated radiation oncology service, physicians from the SPRO-affiliated department on average had higher overall

ratings of PCC quality ($P = .02$), in addition to significantly higher ratings on multiple measures of PCC (Fig 2; Table 3).

Discussion

In this survey-based study, we evaluated the impact of a dedicated palliative radiation oncology service on various measures of PCC quality. Care providers from the SPRO-affiliated department indicated that the dedicated service favorably impacted multiple dimensions of PCC. Physicians practicing within a dedicated PCC service also had significantly higher ratings of PCC quality compared with physicians who practiced without a dedicated service. These results indicate that the presence of a dedicated palliative radiation oncology service such as SPRO favorably impacts PCC and suggest that dedicated services are a means of achieving the goals outlined in ASCO's recommendations for improving quality of advanced cancer patient care.⁵ Additionally, a dedicated service such as SPRO provides valuable PCC training for team members, including residents and fellows, another critical component of ASCO's recommendations for improving advanced cancer care.⁵ In a similar manner to how residents are trained by rotating through disease blocks, a dedicated PCC service provides the volume, structure, and expertise to train future radiation oncologists in PCC (eg, technical aspect of palliative RT, symptom management, patient-family communication), filling a current void in palliative care resident education.

To our knowledge, SPRO is the first dedicated palliative radiation oncology service in the US. Other dedicated palliative radiation oncology services have been created elsewhere, including in Canada. At the Rapid Response Radiotherapy Program (RRRP) in Toronto, the median time from referral to consultation was 4 days, and 82% of patients with metastatic bone pain and 69% of patients with brain metastases underwent consultation and simulation on the same day.⁷ Similarly, during the pilot of the Rapid Access Palliative Radio-therapy Program (RAPRP) in Edmonton, 89% of patients were prescribed a single fraction of RT for their painful bone metastasis, with treatment completion within the same day as their assessment.⁶ These care delivery models facilitate urgent RT and provide multidisciplinary care that addresses these patients' frequent somatic symptoms and psychosocial needs.¹¹ The success of these models is evidenced by not only the high proportion of patients who initiate (RRRP)⁷ or complete treatment within the same day of their evaluation (RAPRP),⁶ but also by the large proportion of satisfied patients and referring physicians.⁸

To our knowledge there are no available data on how palliative radiation oncology care is delivered within the US, but indirect findings suggest that palliative radiation oncology practices require quality improvement. The frequent use of protracted RT regimens for patients with uncomplicated bone metastases,¹² even close to death,¹³ suggests that radiation oncologists often do not follow evidence-based guidelines or tailor treatment courses to patient life expectancy. At the same time, training in general palliative cancer care competencies (eg, patient/family communication, prognostication), such as those outlined within the ASCO 2011 Statement,⁵ may be lacking. Data from Harvard-affiliated radiation oncologists indicated that only 25% had received any training in prognostication in advanced cancer, and only 23% of those trained perceived their training as adequate.⁹ Furthermore, patients frequently misunderstand the goals of their palliative RT,¹⁴ suggesting

that radiation oncologists may not adequately engage in end-of-life communication with patients. Finally, PCC research within radiation oncology is underrepresented. Between 2001 and 2010, only 4.3% of all American Society of Radiation Oncology abstracts focused on PCC,¹⁵ far below PCC representation in radiation oncology clinical practice.

In addition to improving clinical care for advanced cancer patients, dedicated palliative oncology care services present an opportunity to advance education and research in symptom-management, patient-family communication, evidence-based practice, and technical aspects of treatment. Indeed, care providers practicing within the BWH/DFCI SPRO service noted improvements in communication with patients and time spent on technical aspects of treatment. Our respondents' open-ended feedback also demonstrated how a dedicated service can identify and address challenges in PCC delivery, a process critical to advancing PCC. Ongoing initiatives within the SPRO service include creating a more robust curriculum in general palliative care competencies (eg, symptom management, end-of-life communication) and improving nursing communication.

While our study has several strengths including a high response rate and employing multiple methods to assess the impact of a dedicated radiation oncology service, there are important limitations to note. We only surveyed physicians from 4 Boston-based academic hospitals. Therefore, our results may not be generalizable to other US radiation oncology departments or nonacademic hospitals. Physician and nurse ratings of PCC quality are only one subjective assessment of SPRO's impact. These results require further confirmation with other subjective measures including patient and referring physician satisfaction, and objective measures such as time to consultation and treatment and dose fractionation prescriptions. Lastly, SPRO may not be an appropriate model for all radiation oncology institutions; given the resources required for a dedicated service, a sufficient patient volume is needed to support its presence.

Conclusions

Implementation of a service dedicated to palliative radiation oncology clinical care, the Supportive and Palliative Radiation Oncology service, was associated with improved palliative cancer care based on care provider ratings on 8 measures of palliative cancer care and higher average ratings of overall palliative cancer care quality by physicians from the SPRO-affiliated versus nondedicated service departments. These results point to palliative radiation oncology service models as a feasible and promising means of improving the quality of palliative cancer care by addressing the unique and complex dimensions of palliative cancer care delivery.

References

1. Janjan NA. An emerging respect for palliative care in radiation oncology. *J Palliat Med.* 1998; 1:83–88. [PubMed: 15859875]
2. Huang J, Zhou S, Groome P, Tyldesley S, Zhang-Solomans J, Mackillop WJ. Factors affecting the use of palliative radiotherapy in Ontario. *J Clin Oncol.* 2001; 19:137–144. [PubMed: 11134206]
3. Coia LR, Hanks GE, Martz K, Steinfeld A, Diamond JJ, Kramer S. Practice patterns of palliative care for the United States 1984–1985. *Int J Radiat Oncol Biol Phys.* 1988; 14:1261–1269. [PubMed: 2454905]

4. McCloskey SA, Tao ML, Rose CM, Fink A, Amadeo AM. National survey of perspectives of palliative radiation therapy: role, barriers, and needs. *Cancer J*. 2007; 13:130–137. [PubMed: 17476142]
5. Peppercorn JM, Smith TJ, Helft PR, et al. American Society of Clinical Oncology statement: toward individualized care for patients with advanced cancer. *J Clin Oncol*. 2011; 29:755–760. [PubMed: 21263086]
6. 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. *Support Care Cancer*. 2009; 17:163–170. [PubMed: 18566840]
7. de Sa E, Sinclair E, Mitera G, et al. Continued success of the rapid response radiotherapy program: a review of 2004–2008. *Support Care Cancer*. 2009; 17:757–762. [PubMed: 19184124]
8. Chow E, Wong R, Vachon M, et al. Referring physicians' satisfaction with the rapid response radiotherapy programme. Survey results at the Toronto-Sunnybrook Regional Cancer Centre. *Support Care Cancer*. 2000; 8:405–409. [PubMed: 10975690]
9. Tseng YD, Krishnan MS, Sullivan AJ, Jones JA, Chow E, Balboni TA. How radiation oncologists evaluate and incorporate life expectancy estimates into the treatment of palliative cancer patients; a survey-based study. *Int J Radiat Oncol Biol Phys*. 2013; 87:471–478.
10. Malterud K. Qualitative research: standards, challenges, and guidelines. *Lancet*. 2001; 358:483–488. [PubMed: 11513933]
11. 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; 78:527–532. [PubMed: 20100640]
12. Gripp S, Mjartan S, Boelke E, Willers R. Palliative radiotherapy tailored to life expectancy in end-stage cancer patients: reality or myth? *Cancer*. 2010; 116:3251–3256. [PubMed: 20564632]
13. Guadagnolo BA, Liao KP, Elting L, Giordano S, Buchholz TA, Shih YC. Use of radiation therapy in the last 30 days of life among a large population-based cohort of elderly patients in the United States. *J Clin Oncol*. 2013; 31:80–87. [PubMed: 23169520]
14. Chen AB, Cronin A, Weeks J, Chrischilles E, Malin J, Hayman J, Schrag D. Patient beliefs about palliative radiation therapy in incurable lung cancer. [Abstract]. *Int J Radiat Oncol Biol Phys*. 2012; 84(3):S1.
15. Jones JA, Lutz S. Trends in symptoms control and palliative care abstracts at ASTRO 2001 to 2010. [Abstract]. *Int J Radiat Oncol Biol Phys*. 2011; 81:S645.

Figure 1. Stacked bar chart of (A) physician and (B) nurse ratings on the impact of the Supportive and Palliative Radiation Oncology service on various aspects of radiation oncology care delivery.

Figure 2.

Stacked bar chart of physician ratings on 10 measures of palliative cancer care by presence or absence of a dedicated palliative radiation oncology service. RT, radiation therapy.

Table 1

Characteristics of respondents (n = 102) ^a among physicians by presence or absence of a dedicated palliative radiation oncology service (n = 77) and among physicians and nurses who rated the impact of the SPRO service on palliative cancer care (n = 66)

Characteristics	Dedicated service (n = 34)	Nondedicated service (n = 43)	P value
I. Characteristics of physicians (n = 77)			
Demographic characteristics, n (%)			
Clinical training			
Attending	24 (71)	25 (58)	.37
Resident	10 (29)	18 (42)	
Nurses	—	—	—
Sex ^b			
Male	22 (67)	24 (56)	.47
Female	11 (33)	19 (44)	
Clinical practice characteristics			
Consultations with palliative intent			
Mean proportion of patient consultations, % (SD)	31% (21)	31% (19)	.97
Mean proportion seen in an inpatient setting, % (SD)	36% (30)	39% (30)	.66
Mean palliative consultation time, min (SD)	76 (39)	66 (30)	.19
Years post completion of clinical training, mean (SD) ^b	12.9 (11.0)	15.5 (10.7)	.42
Workload			
Fulltime clinical	16 (67)	22 (88)	.14
Fulltime research	6 (25)	3 (12)	
Parttime	2 (8)	0	
II. Characteristics of clinicians rating the SPRO service (n = 66)			n (%)
Clinical training			
Attending			24 (36)
Resident			17 (26)
Nurses			25 (38)
Sex ^b			
Male			25 (38)
Female			39 (58)

SPRO, Supportive and Palliative Radiation Oncology service.

^aForty-one physicians were included in assessments I and II; 36 physicians were included only in assessment I; 25 nurses were included only in assessment II.

^bMissing responses: Rating of department's care delivery: sex (n = 1), training (n = 3); SPRO's impact: sex (n = 2).

Table 2

Qualitative feedback ^a on the supportive and palliative radiation oncology service by care provider type (n = 26)

	Nurses (n = 8)	Residents (n = 6)	Attending (n = 12)	Total
SPRO improves palliative radiation oncology care, n				
Improved quality of patient care	4	9	3	16^b
Increased continuity of care ^a	0	1	0	1
Improved efficiency/flow of care ^a	1	0	2	3
Improved clinical discussions about patients ^a	1	0	0	1
Improved treatment decision making ^a	1	0	1	2
Great learning environment for patients ^a	0	1	0	1
Improved resident education	0	3	0	3
Improved resident experience ^a	0	2	0	2
Greater time to focus on palliative care ^a	0	3	0	3
Improved staff experience	0	3	1	4^c
Members have clear roles and responsibilities ^a	0	0	1	1
Recommended model for other radiation oncology institutions	0	3	0	3
Important service	1	6	3	10
Ongoing challenges in palliative radiation oncology care, n				
Patient care	4	2	0	6
Symptom management in patients with frequent symptom-management needs ^a	2	0	0	2
Communication with patients about end-of-life care ^a	1	0	0	1
Increase attention to the “whole” patient as part of SPRO care ^a	1	0	0	1
Standardize various aspects of clinical care (eg, dose fractionation schedules) ^a	1	2	0	3
Staff experience	6	2	1	9
Ensure rotating residents’ clinical responsibilities are solely with SPRO ^a	0	1	0	1
Communication with nursing ^a	5	0	0	5
Consider having dedicated SPRO attendings ^a	0	2	0	2
SPRO is a busy service with high demands on staff ^a	2	0	1	3

SPRO, Supportive and Palliative Radiation Oncology service.

^aBold headers indicate main themes, regular type indicates subthemes, and italics indicate subcategories. In some cases, a single response was coded among multiple subcategories. Therefore, the number of respondents for a subtheme may be less than the sum of responses within the associated subcategories.

^bTen responses reflected the subtheme of “improved quality of patient care” but did not reflect one of the subcategories below.

^cThree responses reflected the subtheme of “improved staff experience” but did not reflect one of the subcategories below.

Table 3

Comparison of radiation oncologists' ratings of their department's palliative cancer care delivery according to presence or absence of a dedicated palliative radiation oncology service

Palliative cancer care measure	Dedicated service ^a	Nondedicated service ^a	<i>P</i> value
Time to consultation	6.7	6.2	<.01
Time to first treatment	6.4	6.0	.08
Time spent with patient in consultation	6.4	5.7	<.01
Communication with other care providers	6.5	5.5	<.001
Time spent on technical aspects of initiating treatment ^b	6.3	5.9	.052
Communication with patient and his family ^c	5.9	5.5	.09
Appropriate overall treatment recommendations ^d	6.1	5.7	.09
Appropriate dose/fractionation schedule ^e	5.7	5.2	.069
Attention to cost	4.4	4.3	.7
Radiation therapy follow-up	4.0	4.3	.47
Overall palliative cancer care quality score	58.3	54.3	.02

^aThe 7-point scale was converted into a numeric value (1 = "very poorly" to 7 = "very well") and average scores were calculated among physicians with a dedicated palliative radiation oncology service and those without. A higher average means higher ratings.

^bFor example, treatment planning and reviewing images.

^cFor example, communication of treatment recommendations and family meetings.

^dFor example, no treatment, role of different treatment modalities, treatment based on patient's prognosis, values, and goals.

^eFor example, adherence to level 1 evidence.