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# Hospice Providers Awareness of the Benefits and Availability of Single-Fraction Palliative Radiotherapy

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Radiotherapy effectively palliates malignant sources of pain. However, once enrolled on hospice, patients are rarely referred for this treatment. To develop educational strategies that can improve access to care, a survey of hospice providers investigated potential misconceptions about its benefits and availability. Individual surveys were distributed to administrators, nursing directors, and medical directors at 16 licensed hospices within 25 miles of a radiation oncology facility. Ninety-three percent of hospice professionals stated radiotherapy provides pain relief and is appropriate for patients with more than 1 month of life expectancy. However, less than 1% of their cancer patients had been referred to a radiation oncologist over the past year, citing concerns about cost and travel burden. Whereas most medical directors (75%) were aware it is just as effective when delivered in a single fraction, very few administrators (22%) and nursing directors (21%) had this knowledge. Meanwhile, reluctance of a radiation oncologist to offer single-fraction palliative radiotherapy was experienced by 43%. Access to palliative radiotherapy for this unique population can be increased by improving education for hospice administrators and nursing directors and reminding radiation oncologists that single-fraction palliative radiotherapy is acceptable and ideal for patients with limited financial resources at the end of life.

## KEY WORDS

hospice care, palliative radiation, single fraction

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The majority of terminally ill cancer patients enrolled in hospice suffer from poorly controlled pain despite the frequent use of opioids.[1,2] Meanwhile, palliative radiation therapy (RT) represents an appealing alternative that can deliver highly effective antitumoral therapy to a focused area, is almost always able to shrink tumors, provides effective pain relief in 50% to 70% of patients, and is associated with minimal adverse effects that cannot be achieved with other medical treatments, including palliative chemotherapy,[3,4]

However, palliative RT is severely underutilized by hospice providers, and patients are rarely referred.[5,6] This phenomenon is associated with low daily hospice reimbursement rates, prohibitive costs, and the burden of travel for patients and caregivers that often consists of a minimum of 12 to 17 trips.[7] The number of trips typically required includes one for the consultation session, a separate planning session (simulation), and often 10 to 15 daily treatments.[8] Although there are no proven advantages to a more protracted course of therapy,[4] some radiation oncologists may even prescribe 15 or more daily treatments,[8] a practice that has inspired editorials questioning whether some are practicing reimbursement-based medicine instead of evidence-based medicine.[9]

Yet, palliative RT delivered in a single fraction can actually be just as effective as multiple fractions,[4,10] a well-known phenomenon that is supported by multiple phase III trials and national guidelines published by the American Society of Radiation Oncology[11] and the American College of Radiology.[12] Thus, we sought to study whether hospice professionals were aware of single-fraction palliative RT (SFPRT) and how this knowledge might influence access to care for patients with poorly controlled pain at the end of life who are enrolled in hospice and thus have limited financial resources.

## METHODS

### Survey

A 27-question survey was administered in person to hospice professionals and designed to take about 10 minutes to complete. The questions were adopted from a similar

2004 national pattern of care survey by Lutz et al that also focused on hospice professionals' perspectives about palliative RT.[6]

### Participants

The survey targeted hospices in 2 areas of regional importance to the authors, and a total of 16 of 19 contacted centers (84%) agreed to participate. Whenever available, an administrator, nursing director, and medical director at each center were solicited to complete the survey. Hospices were selected to be within 25 miles of a radiation oncology center affiliated with either the Virginia Commonwealth University Health System (Richmond, VA) or the University of Arkansas for Medical Sciences, (Little Rock, AR).

### Data Collection and Analysis

Responses were managed with REDCap (Research Electronic Data Capture), and descriptive statistics were performed using Microsoft Excel and REDCap. Given the limited number of responses, statistical comparisons of responses were considered underpowered to draw any meaningful conclusions and thus omitted.

## RESULTS

### Characteristics of Hospice Facilities

Between June 2011 and July 2012, professionals from 16 of 19 hospice centers responded to the survey request (11 for-profit centers and 5 nonprofit centers). A total of 28 respondents completed the face-to-face survey, with 17 (61%) from for-profit centers. The respondents included 9 administrators (32.1%), 14 nursing directors (50%), and 8 medical directors (28.6%). Three professionals noted dual titles.

The average patient census at each facility was 169 (range, 20-605) with an average estimated 36% diagnosed with cancer (range, 1%-90%). The mean survival from time of enrollment for cancer patients was estimated to be 3 months (range, 0-12 months). Additional demographic data are listed in Table 1.

### Access to Radiation Oncology Services

Only 7 of the 16 hospices reported any referrals for palliative RT over the past 12 months. This represented an average of 1.4 patients per facility per year (range, 0-6 referrals), providing an estimate of 20 patients of a census of nearly 3000 (<1%). Of the 7 referring centers, 4 were for-profit, and 3 were nonprofit. Radiation oncology consult and treatment costs were reported to have been usually paid for by the referring hospice, with 2 facilities noting partial payment by a patient's private insurance.

Access to a radiation oncologist was reported as "adequate" by 57% of respondents. This included 88% of medical directors, 56% of administrators, and 26% of nursing directors. The majority of professionals (86%) denied difficulties communicating with a radiation oncology team, and 66% felt radiation oncologists communicated well with patients and their families.

### Awareness of Palliative Radiation Benefits

The majority of hospice professionals believed that palliative RT is appropriate for patients with a life expectancy of 1 to 3 months (93%) or 4 to 6 months (96%). The perceived average number of days for radiation to take full effect was 16 (range, 3-180 days). There was 100% agreement by respondents that palliative RT can decrease narcotics usage. In addition, 100% of hospice professionals acknowledged that RT has the potential to eliminate narcotics requirements all together. Hospice professionals generally agreed that palliative RT had various roles other than for bone pain, but less than half (40.7%) felt sufficiently trained to identify these situations.

**TABLE 1 Demographics of Survey Respondents**

| Question | Frequency | % |
|---|---|---|
| Title[a] | | |
| Medical director | 8 | 28.6 |
| Nursing director | 14 | 50.0 |
| Administrator | 9 | 32.1 |
| Geographic area | | |
| Little Rock, Arkansas | 8 | 50.0 |
| Richmond, Virginia | 8 | 50.0 |
| Financial arrangement | | |
| For-profit | 17 | 60.7 |
| Nonprofit | 11 | 39.3 |
| Average daily patient census | | |
| 0-50 | 2 | 12.5 |
| 50-100 | 4 | 25.0 |
| 100+ | 10 | 62.5 |
| Estimated % cancer patients enrolled | | |
| 1-10 | 3 | 18.8 |
| 10-50 | 6 | 37.5 |
| 50+ | 7 | 43.8 |

[a]*Multiple professional roles were identified by several respondents*

## Awareness of Single Fraction Palliative Radiotherapy

The minimum perceived number of treatments required for successful palliative RT ranged from 1 to 15 (average, 4). Respondents reported observing palliative RT treatments for hospice patients ranging from 4 to 30 with an average of 12. A course of 10 or more treatments had been observed by 66% of respondents, whereas 24% had witnessed more than 10 treatments prescribed.

Only 39% of respondents reported awareness that a single fraction of radiotherapy was an option for palliation. This included 22%, 21%, and 75% of surveyed administrators, nursing directors, and medical directors, respectively (Figure). Of the 7 respondents who were aware of SFPRT, 43% had experienced reluctance by a radiation oncologist to offer this treatment. The majority of respondents (64%) thought that SFPRT would be less expensive (Table 2), and 83% believed it would not have more adverse effects than longer courses.

## Barriers to Referral

A course of 10 treatments was estimated by respondents to cost an average of $11 000 (range, $1000-30 000), whereas a single treatment was perceived to cost $2900 (range, $300-15 000). Of the 7 hospices that had made radiation oncology referrals, the recalled cost of single-fraction delivery ranged from $1000 to $6000, whereas nonreferring hospices estimated a cost range of $300 to $15 000. When hospice professionals were asked if a flat rate of $2000 might influence their decision to refer a patient for palliative RT, 58% stated it would increase their probability of referring. The influence of a $2000 flat rate on increasing the probability of referral was more notable for nonprofit (73%) versus for-profit agencies (41%) (Table 2).

An open-ended question was also asked for comments about barriers to referral for palliative RT, beyond cost. The most common response was "transportation," followed by "frailty of patient" and "limitations in accessing care." In a separate comment section, respondents expanded challenges of transportation stemming from the number of radiation treatments and/or requirement for transportation by ambulance. Additional barriers are listed in Table 3.

**TABLE 2 Hospice Professionals' Knowledge About Single-Fraction Palliative Radiation Therapy**

| Question | % Answering Yes |
|---|---|
| Have you ever heard about "single-fraction" palliative radiotherapy | 39.3 |
| Have you experienced any reluctance by radiation oncologists to use single fraction? | 42.9 |
| Do you think a single fraction of radiotherapy may be less effective? | 18.2 |
| Do you think a single fraction is more toxic than the more traditional 10- to 15-d course? | 16.7 |
| Do you think a single fraction will be less expensive? | 63.6 |
| Would you be more likely to refer a hospice patient with painful bony metastases if a single fraction was available and cost only $2000? | 57.7 |
| Would you consider modifying your intake procedures to identify and encourage referral of patients with single-fraction palliative radiotherapy? | 88.0 |

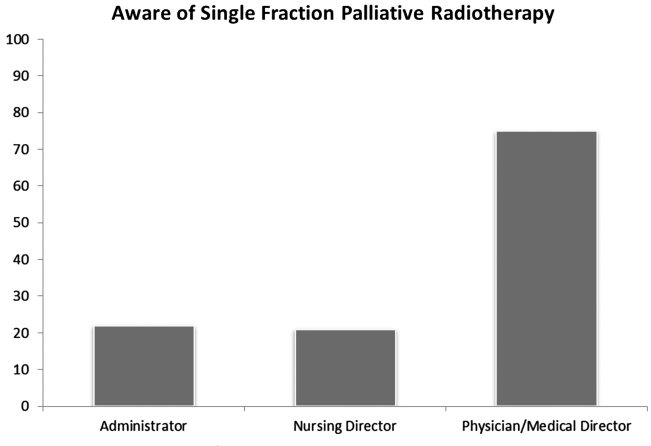


**FIGURE.** Percentage of respondents who are aware that palliative radiotherapy can be delivered in a single fraction.

## DISCUSSION

Most cancer patients enrolled in hospice have severe pain, and 75% to 90% are on opioids on the last day of life.[1,13] Unfortunately, opioids do not slow tumor growth and may be ineffective. When pain is poorly controlled, and opioid doses are increased, patients may develop debilitating adverse effects that can contribute to further deterioration in quality of life. This can include nausea, abdominal cramping, constipation, cognitive impairment, and hallucinations.

Meanwhile, palliative RT is able to relieve pain in 50% to 70% of patients and can eliminate the need for opioids in 10% to 30% of cases.[4] This alternative approach, although more clinically effective than opioids, is unfortunately rarely used for hospice patients because of the expense and travel burden of multiple visits.[5] Meanwhile, SFPRT is now well known to have equivalent benefits for pain relief and may be the most ideal approach for this patient population.[11,12] Thus, given the limited resources of hospice agencies,

**TABLE 3 Barriers[a] to Referral for Palliative Radiation Therapy (RT)**

| | Respondents |
|---|---|
| Transportation—costs, availability, and number of treatments | 15 |
| Access—another doctor, another trip to appointment | 6 |
| Patient frailty | 4 |
| Lack of experience | 1 |
| Treating early enough to ensure benefit | 1 |
| No. of treatments | 1 |
| Family getting false hope | 1 |
| Patient and doctor communication | 1 |
| Radiation oncologists will not do single-fraction therapy | 1 |
| Hospice delays | 1 |
| Adverse effects | 1 |

[a] *''Other than cost, what is the no. 1 barrier to referring an appropriate patient for palliative RT?'' was asked as an open-ended question, leading to overlapping responses.*

SFPRT could be a preferred strategy for patients at the end of life, particularly for those with less than 6 months to live. However, findings from this study corroborate prior reports that have demonstrated an unwillingness of many radiation oncologists to offer SFPRT, even for patients enrolled in hospice.[6,14]

Unfortunately, as in earlier reports demonstrating less than 10% of hospice agencies utilize radiotherapy in any of their cancer patients,[6] very few patients (<1%) from the surveyed agencies were referred for palliative RT over the past year. The paucity of referrals was multifactorial but surprisingly not attributed to a lack of education about the benefits of RT. There was almost unanimous agreement that palliative RT is appropriate for cancer hospice enrollees with a life expectancy of greater than 1 month and has the ability to reduce opioid usage. Most also reported good communication with radiation oncology teams and felt radiation oncologists communicated well with patients and their families.

However, palliative RT was simply perceived as too expensive and burdensome. Most had observed more than 10 treatments delivered, and some even believed 15 treatments were the minimum required for it to control malignant causes of pain. Whereas 75% of medical directors were aware of SFPRT as an equally effective but more affordable option, less than one-quarter of hospice administrators and nursing directors reported this knowledge. In a related finding, 58% of all respondents stated they would not only be more willing to refer patients if the total cost could be reduced to $2000, but 78% would also alter their intake process to better identify those who could benefit from palliative RT.

The findings in this survey are similar to prior studies sponsored by the American Academy of Hospice and Palliative Medicine, the American Society of Radiation Oncology, and the American Society of Clinical Oncology.[6,15] Those surveys also showed that palliative care professionals recognized the effectiveness of RT but that rarely were any hospice patients ever referred. Disappointingly, a decade later similar barriers to referral are relatively unchanged: Low daily Medicare reimbursement, transportation, and a perception that radiation oncologists are unwilling to deliver reduced-fraction treatments.[6,16]

The issue of cost as a barrier represents a complex one that involves factors involving both direct and indirect costs.[17] Regardless of how effective palliative RT can be, hospice agencies have limited financial ability to refer patients who might benefit from this expensive treatment.[18] The current 2012 Medicare Hospice Benefit per diem is $153 for general home care and $158 for inpatient respite, with an approximate $25 000 cap.[18] With a perceived cost of $11 000 for a course of palliative RT and erroneously considered to be as high as $15 000 for a single-fraction treatment, referrals would seem nearly impossible. A recent report using Medicare claims data estimated the mean expenditures for a single or multiple fraction course of palliative radiotherapy at $1873 versus $4967, respectively.[8] Nonetheless, the actual billable costs, which are not dissimilar depending on private versus Medicare payer, are ultimately difficult to reduce if radiation oncologists are unwilling to offer shorter courses, including SFPRT, which would be the most affordable.

Ultimately, surveyed hospice professionals recognize the benefit of palliative RT and wish to increase referrals. The data presented here suggest that increased awareness and availability of SFPRT could help make that happen. It is likely that increased dialogue and interaction between radiation oncologists and hospice professionals can illuminate the challenges that hospice patients and agencies face and hopefully increase a willingness among radiation oncologists to offer the simpler course of SFPRT. At our institution, we currently offer a simple same-day evaluation and delivery of a single fraction of palliative radiotherapy for any patient enrolled on hospice and can often get them in and out of the clinic within 4 hours.[19] General satisfaction has been high among patients and local area hospice agencies, and we have been pleased with the feedback received when presenting and discussing our experience at local and national meetings.

**TABLE 4 Tumor-Related Symptoms That Can Be Palliated With Radiotherapy**

| |
|---|
| Earlier intervention increases the likelihood of complete symptom relief |
| • Poorly controlled pain |
| • Dyspnea |
| • Dysphagia |
| • Hemoptysis |
| • Vaginal bleeding from pelvic malignancies |
| • Skin ulceration and bleeding |
| • Blindness from ophthalmologic metastasis |
| The following symptoms require emergent attention for radiotherapy to be effective |
| • Weakness related to new spinal cord compression[a] |
| • SVC syndrome |

*Abbreviation: SVC, superior vena cava.*
*[a]Complicated spine metastasis is considered best treated with multiple treatments.*

## Limitations

As this survey was conducted in only a small number of facilities, limited to 2 regional areas, the results may not accurately represent the perceptions of hospice professionals across the country. We recognize that this study could be strengthened with additional survey participants. However, the real focus and call to action should be to design trials evaluating infrastructure that can improve communication and education to ensure those managing cancer patients at the end of life are aware of the best options for symptom control. Fortunately, some radiation oncology programs have already begun to systematically encourage their physicians to consider SFPRT more often.[20] Finally, Table 4 provides an expanded list of tumor-related symptoms that can be palliated with radiotherapy.

# CONCLUSIONS

Hospice professionals are well aware about the benefit of palliative RT, but concerns about the cost and burden of travel, as well as a perceived reluctance of radiation oncologist to offer SFPRT, remain barriers that have not changed over the past decade. Whereas the majority of hospice medical directors are aware of SFPRT, less than one-quarter of hospice administrators and nursing directors were knowledgeable about this less burdensome, more affordable, and equally effective option.

Encouraging dialogue between radiation oncologists and hospice professionals may help illuminate the challenges that hospice patients and agencies face, increase radiation oncologists' willingness to offer SFPRT, and provide opportunities to educate those who work within hospice agencies about this single-day treatment. Taken together, this could increase patients' access to this simple, safe, and effective palliative treatment.

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