

Physical Function in Hospice Patients and Physiotherapy Interventions: A Profile of Hospice Physiotherapy

Sinead Cobbe, M.Sc. Clinical Therapies, B.Sc. (Physio)¹
and Norelee Kennedy, Ph.D., Grad Dip (Statistics) Prof Cert Teaching and Learning, B.Sc. (Physio)²

Abstract

Objective: There is a dearth of international research on hospice physiotherapy. This study aims to profile hospice physiotherapy in an Irish setting in order to inform practice internationally.

Design: The study design consisted of a retrospective chart audit over 6 months.

Setting: The study took place at a specialist palliative care inpatient unit (hospice) in Limerick, Ireland.

Participants: All patients were discharged (through death or discharge onwards) from January to June 2010.

Outcome measure: The Edmonton Functional Assessment Tool (EFAT-2) was used as an outcome measure.

Results: Sixty-five percent were referred for physiotherapy; 58% ($n=144$) were assessed and treated. A wide range of patients was referred (mean functional score 11, range 1–23, SD 5). Rehabilitation activities were widespread: 48% with more than one functional score recorded made improvements; 53% of physiotherapy patients were eventually discharged home; 47% of physiotherapy patients died, of whom 52% received physiotherapy in the last week of life. The median physiotherapy program lasted 11 days (range 1–186, SD 22) whereas the median number of treatments was four (range 1–99, SD 10). The most common interventions were gait re-education (67%), transfer training (58%), and exercises (53%). One third of treatment attempts were unsuccessful because of the unavailability/unsuitability of patients. Challenges for physiotherapists included frequent suspension of treatment and large functional fluctuations in patients.

Conclusion: There was a high referral rate to physiotherapy in this hospice. Functional changes in hospice patients were mapped, showing that physiotherapy involved both rehabilitative and quality of life/supportive measures. The most common treatments were physical activity interventions.

Introduction

IN THE LAST TWO DECADES, physiotherapy (in American terms, “physical therapy”) has been applied to patients with cancer and other terminal illnesses in hospices and palliative care units. The aim of physiotherapy in palliative care patients is “to minimise some of the effects which the disease or its treatment has on them.”¹ Principles of treatment for physiotherapists working with cancer^{2,3} and palliative care^{4–7} have been outlined. Physiotherapy is now regarded as part of the multidisciplinary palliative team, being included in standards for service provision in Britain and Ireland.^{8–10}

Historically, traditional physiotherapy techniques were adapted and tailored to palliative care patients. Treatments employed included mobility/transfer training, breathlessness programs, lymphedema treatments, exercise, pain relief, education, and psychological support.^{1,2,6,7,11–13} Evidence for

physiotherapy in palliative patients is emerging. Exercise improves strength/endurance and function or slows rate of decline in patients with advanced cancer.^{14–18} Breathlessness programs for lung cancer patients improve breathlessness, quality of life (QOL), and functional capacity and enhance coping mechanisms.^{19–21} They also benefit patients with advanced nonmalignant lung disease.²² Decongestive treatments for lymphedema can be adapted for palliative care patients.^{23–25} They reduce pain and dyspnea in hospice patients.²⁶

Physiotherapists are also involved in palliative rehabilitation, with evidence supporting this in both palliative and advanced cancer populations.^{27–31} Furthermore, specialized palliative physiotherapy resulted in superior improvements in function, pain, and fatigue, compared with routine physiotherapy in hospital-based palliative patients.³²

In Ireland, hospices traditionally were nursing-led facilities involved in end-of-life care. In the last decade they have

¹Physiotherapy Department, Milford Care Centre, Castletroy, Limerick, Ireland.

²Department of Physiotherapy, University of Limerick, Limerick, Ireland.

Accepted February 20, 2012.

developed into medically led acute palliative care units, providing symptom control, rehabilitation and end-of-life care for patients with terminal diseases. There is very little research internationally regarding hospice physiotherapy. Patients report treatment benefits such as symptom relief, psychological support, and improved function.³³ Utilization of physiotherapy was 26% in a Japanese unit in 1994³⁴ and 37% in an American unit in 2003.³⁵ In both facilities there was improved function in patients following physiotherapy, but neither used validated palliative scales. In contrast, in Michigan, utilization rate was 3% in palliative facilities in 2009.³⁶ Physiotherapy also benefits community-based hospice patients.³⁷ Very little else informs practice in this field.

The aim of this study was to evaluate physiotherapy practice in an Irish hospice in order inform practice internationally, and provide comparison for future hospice physiotherapy research. Functional changes in patients were recorded using a validated palliative care tool.

Methods

A retrospective chart evaluation was conducted on all discharges (from death or discharge onwards) between January and June 2010 from Milford Hospice, Limerick, Ireland. This 30-bed specialized palliative care unit serves a population of 360,000 within a 70 km radius of Ireland’s fourth largest city. The physiotherapy bed-to-staff ratio is 15:1, approximating the 12:1 ratio recommended³² for specialist palliative physiotherapy. The multidisciplinary team is led by two consultant physicians in palliative medicine. It includes nursing, physiotherapy, occupational therapy, dietetics, speech therapy, social work, chaplaincy, music therapy, art therapy, and complementary therapy. Interdisciplinary collaboration is integral to patient care, but this aspect is not the focus of this study. Criteria for acceptance for physiotherapy are: 1) medical referral, 2) patient consent, 3) functional needs conducive to treatment, 4) needs that can be met with quality of life/supportive measures. This is a public/voluntary funded service with free access to all; therefore medical insurance criteria do not influence treatment decisions.

Outcome measure

Physical function is an important marker in palliative care. Functional tools such as the Karnofsky Performance Scale (KPS), Palliative Performance Scale, and Eastern Cooperative Oncology Group Performance Status scale (ECOG) are widely used in palliative medicine. However, these tools are not sensitive enough to capture the functional changes in palliative patients clinically observed by physiotherapists, leading to difficulty for researchers. Laakso et al.³² used an adapted version of the Functional Independence Measure (FIM); however, published validation studies are warranted. Kaasa et al.³⁸ found that traditional functional tools, such as the Barthel Index and the FIM, were not sensitive enough to detect changes in poorly functioning palliative patients and therefore devised the Edmonton Functional Assessment Tool for physiotherapists and occupational therapists. It correlates with KPS ($r=0.79$) and ECOG ($r=0.85$), and detects change over time.³⁸ The second version of the Edmonton Functional Assessment Tool (EFAT-2)³⁹ measures 10 domains that may affect function: communication, pain, mental status, dyspnea, balance, mobility, locomotion, daily activities, fatigue, and motivation (See

Appendix). Scoring is from 0 to 30, low scores indicating higher function and vice versa. Internal reliability was 0.86 using Cronbach’s α , and all items except pain correlated significantly with the overall score. It discriminated between groups of patients discharged to different locations: ANOVA was significant $p < 0.001$.³⁹ Intra-class correlation was 0.97 indicating good inter-rater reliability.⁴⁰ In this study, patients were measured by the treating physiotherapists upon referral to physiotherapy, twice weekly thereafter where practicable, and upon discharge.

Coding

Diagnoses were coded by the primary researcher (SC) as malignant (cancer diagnosis) or nonmalignant. Treatments described in palliative physiotherapy literature^{1,2,6,7,11–13} were synthesized and arbitrarily coded by SC into nine categories: gait re-education (prescription of walking aids, walking practice), transfer training (patient training, advice to staff), exercise (aerobic, resistance, balance exercises, passive movements, positioning), respiratory (breathlessness management, pulmonary rehabilitation), pain relief (heat, ice, manual therapy, electrical modalities), psychological support (supportive discussions, relaxation), patient education, education of family/caregivers, and lymphedema treatments.

Interventions were counted as treatments when explicitly documented as belonging in one of the nine treatment categories. Direct patient–therapist interactions, but not involving treatment, were recorded as “calls” to the patient. “Calls” included patients who declined physiotherapy, patients for whom physiotherapy was deemed inappropriate, and direct attempts to treat the patient, which were not possible for other reasons. Interruptions to ongoing treatment are a salient feature of hospice physiotherapy. This section was included to determine the extent of its occurrence.

Data analysis

Data were recorded from patient charts as outlined in Table 1, and compiled using Windows Excel. Numeric calculations, frequencies, means, and ranges were tabulated using Excel. Functional fluctuation was measured as follows: EFAT-2 score indicating highest function minus EFAT-2 score

TABLE 1. DATA COLLECTED FROM MULTIDISCIPLINARY NOTES

<i>From medical notes</i>	<i>From physiotherapy notes</i>
Data extracted:	Data extracted:
Admission date	Date physiotherapy commenced ^a
Primary diagnosis	EFAT-2 on initial assessment ^b
Discharge date	EFAT-2 scores during treatment and on discharge
Referral or not to physiotherapy	Number of treatments ^c
Discharge date	Number of non-treatment “calls”
Death or discharge home	Types of treatments used
	Last treatment date for those who died

^aDate physiotherapy commenced was date of first treatment, not first contact.

^bEFAT-2 on initial assessment was made on day 1 or 2 of treatment, to ease patient burden.

^cMore than one treatment in a single day was counted as one treatment.

EFAT-2, Edmonton Functional Assessment Tool.

indicating lowest function. Percentage of functional improvement was computed adapting a formula employed by Yoshioka³⁴ for the Barthel Index, comparing highest function with function on initial assessment:

(EFAT-2 score for highest function– EFAT-2 on initial assessment) / (30 – EFAT-2 on initial assessment) (%).

Statistical Package for Social Services was used for to analyze inter-group differences.

Results

From January to June 2010 there were 251 discharges (from death or discharge onwards), involving 195 persons, as 56 were repeat discharges. Table 2 provides demographic information. All further results are presented on the number of discharges, not persons. Median hospice stay was 10 days (range 1–185, SD 19). End-of-life care was provided for 54% of patients; the remaining 46% received symptom control and/or rehabilitation. Physiotherapists were involved for both subgroups. Results involving functional scores have incomplete data (See Fig. 1) because routine scoring by physiotherapists was not possible because of the frequent suspension of treatment as described subsequently.

Population referred to physiotherapy

Sixty-five percent ($n=162$) of patients were referred to physiotherapy; 8% deteriorated clinically before assessment;

therefore, 58% ($n=144$) were assessed and included in the audit. Seventy-eight percent of those not referred ($n=69$) had a hospice stay of ≤ 4 days. This reflects our hospice culture of referring to physiotherapy once symptoms are controlled, unless precluded by obvious medical or psychological factors. The broad acceptance criteria allowed all patients to be accepted for treatment. Each received at least 1 intervention, although 26 patients had no need for further treatment after their first. Functional levels of referred patients are outlined in Figure 2. On initial assessment, function of those who eventually died was significantly poorer than those who survived (Mann–Whitney U test: $U=1009$, two-tailed $p<0.001$).

Rehabilitation activities

Ninety patients had at least one further functional score to compare with their function on initial assessment; 48% ($n=43$) made at least temporary improvements in function during their physiotherapy program. Average improvement was three points on the EFAT-2 scale (15.7% improvement). Fifty-three percent ($n=76$) of physiotherapy patients survived admission and were discharged from the hospice. Function on discharge was compared with function on initial assessment for 46 patients (61% data); 50% ($n=23$) made gains during their physiotherapy program, 28% ($n=13$) remained static, and 22% ($n=10$) deteriorated (range –10 to +12 points, median 0).

Physiotherapy for patients who subsequently died

Forty-seven percent ($n=68$) of physiotherapy patients died in the hospice. Patients were discharged when they could not tolerate treatment or when there was no further QOL benefit achievable; 52% of this population ($n=35$) were treated with physiotherapy within a week of death (median 7 days, range 1–81). Dying patients did not have function recorded upon discharge from physiotherapy, as most were too unwell. They recorded statistically higher functional fluctuations (in this case declines) during their program than those who survived (Mann–Whitney U test: $U=753.5$, $N_1=43$, $N_2=51$, two-tailed $p=0.009$). See Figure 3. Five patients died before being discharged from physiotherapy.

Characteristics of hospice physiotherapy

Characteristics of physiotherapy provided and treatments utilized are displayed in Table 3. The median physiotherapy program lasted 11 days, but was frequently suspended because of sudden clinical changes, priority given to other therapies, and conflicting desires of the patient, such as visitors and social activities. One in three attempted treatments were not possible, registering as a “call.” Physical activity interventions were most commonly used. Large variations in function (upwards, downwards, and frequently both) were frequently observed during patients’ physiotherapy programs. Average fluctuation was six points on the EFAT-2 scale (range 2–26, SD 5). Functional fluctuations are displayed in Figure 3.

Discussion

General information and referral rate

This study illuminates the diverse nature of physiotherapy in an Irish hospice, which provides both end-of-life care and symptom control/rehabilitation. On admission, it is not

TABLE 2. PATIENT CHARACTERISTICS

Characteristics	Number of patients	Percentage
Total admissions for 2010	545	
Total discharges for 2010	544	
Number of discharges January to June 2010	251	
Number of individuals	195	100%
Gender		
Male	96	49%
Female	99	51%
Age:		
Range 33-94, Median 70, SD 12.7		
Cancer Diagnoses:	180	92.3%
Lung	29	14.8%
Bowel	23	11.6%
Gynecological	20	10.2%
Other gastrointestinal	19	9.7%
Breast	19	9.7%
Prostate	19	9.7%
Brain	10	5.1%
Urological	9	4.6%
Head and neck	8	4.1%
Lymphoma	6	3.1%
Others	10	5.1%
Unknown	8	4.1%
Non malignant diagnoses:	15	7.8%
Heart failure	6	3.1%
Motor neuron disease	3	1.5%
Multiple sclerosis	3	1.5%
Friederik’s ataxia	1	0.5%
Respiratory failure	1	0.5%
Other medical	1	0.5%

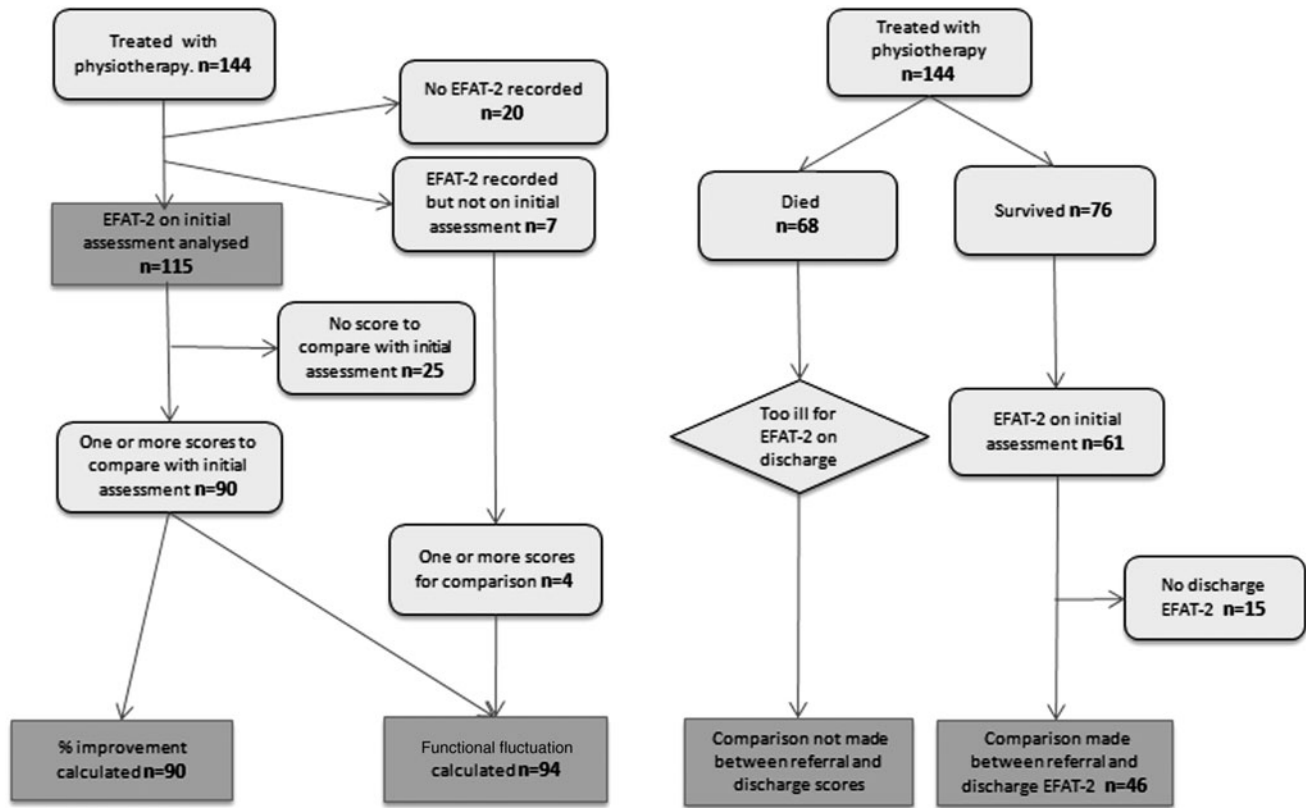


FIG. 1. Data loss with functional scoring.

always obvious whether or not the patient will survive; therefore, treatment approach evolves over time.

Referral rate to physiotherapy was high (65%) compared with Yoshioka³⁴ and Montagnini et al.³⁵ who had rates of 26% and 37%, respectively. This may reflect the expanded role of physiotherapy since those earlier studies were done, better availability of physiotherapy in this unit, or, perhaps, a different culture of utilization in this hospice. It is sharply at odds with the rate of 3% in palliative facilities in Michigan.³⁶ In the United States, it is usually necessary for treatments to conform to insurance company criteria,⁴¹

which may impact negatively on utilization rates. The latter study population had only 53% cancer patients, compared with 88% in this study, which might also explain the variation.

In terms of functional level, a wide variety of patients were referred from fully independent to bed-bound. This contrasts with Montagnini et al.,³⁵ who found that patients with higher physical function were more likely to be referred. This suggests cultural differences in hospice physiotherapy between the two units, and possibly between countries with different health care systems.

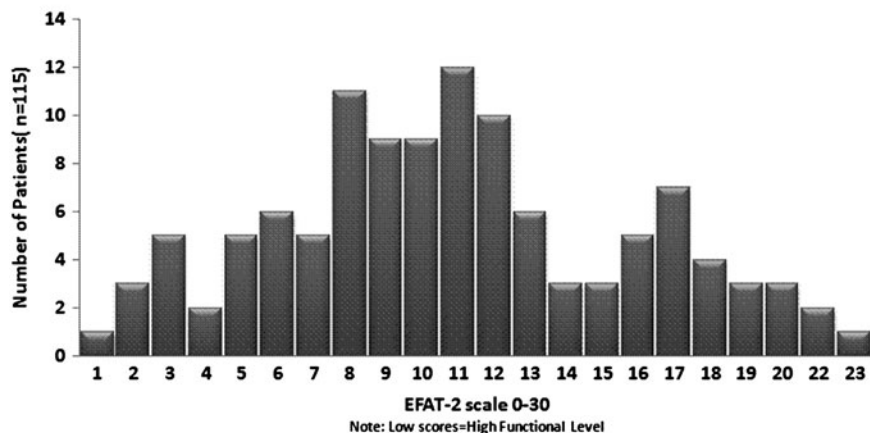
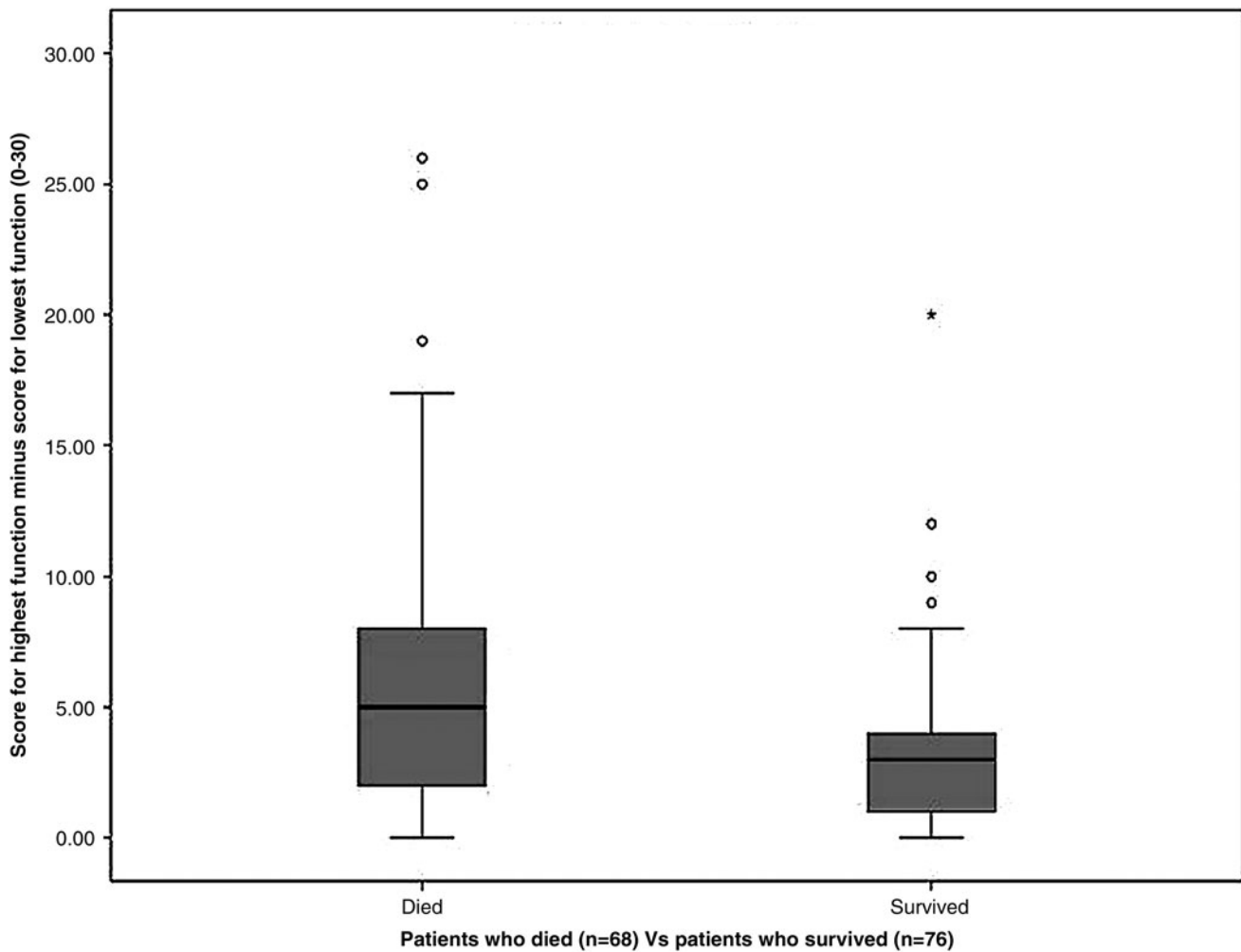


FIG. 2. Functional level on initial assessment.



Note: Fluctuation measured extent and not direction of change.
Mean functional fluctuation for patients who died 6.465
Mean functional fluctuation for patients who survived 3.294

FIG. 3. Maximum functional fluctuation.

Rehabilitation activities

EFAT-2 was successful in capturing functional changes in hospice patients, but disease-specific tools should be considered for non-cancer patients. Functional changes cannot be solely attributed to physiotherapy, as other therapies and medical treatment were concurrent.

Rehabilitation was a major activity; 48% of those with ≤ 2 functional scores recorded made at least temporary improvement compared with function on referral. This is comparable with Montagnini et al.³⁵ who found that 56% of patients made functional gains with physiotherapy. Average improvement in this study was 15.7% compared with 27% recorded by Yoshioka.³⁴ Because referral rate was higher in this study, a larger population of dying patients were possibly included, contributing to the lower average improvement. Use of different functional tools may also have contributed to the difference.

Over half of physiotherapy patients survived their hospice admission and were discharged from the unit. Upon

discharge, patients recorded varying degrees of functional improvement and decline, highlighting the vagaries of rehabilitating a declining population. Traditionally, rehabilitation should produce functional improvement after intervention, but this is not always realistic in palliative care. Rehabilitation-in-reverse is a more appropriate model.⁴¹ This involves rehabilitating along each step of patients' decline until rehabilitation is no longer appropriate/desirable.

Physiotherapy for patients who subsequently died

Forty-seven percent of physiotherapy patients died during their stay. Over half were treated with physiotherapy in the last week of life, suggesting that physiotherapy benefits QOL in this population. QOL or satisfaction measures are more likely to reflect physiotherapy input in this subgroup⁴ and should be considered in future studies. Results suggest that hospice physiotherapists might benefit from communication skills training to deal with dying patients and their families.

TABLE 3. CHARACTERISTICS OF PHYSIOTHERAPY PROGRAM

No. patients assessed and treated	144
Length of physiotherapy program in days	median 11, range 1–186, SD 22
Total no. attempted interventions	1349
Total no. treatments	909 (67% of attempts)
Total no. non-treatment “calls”	440 (33% of attempts)
No. treatments to each patient	median 4, range 1–99, SD 10
No. “calls” to each patient	median 2, range 0–30, SD 4
Numbers and percentages of patients receiving each treatment:	
Gait re-education	97 (67%)
Transfer training	83 (58%)
Exercises	77 (53%)
Patient education	26 (18%)
Pain treatments	25 (17%)
Respiratory treatments	22 (15%)
Psychological support	20 (14%)
Family education	11 (8%)
Lymphedema treatments	9 (6%)

Treatments utilized

The most common treatments used by physiotherapists were mobility interventions including gait training, transfer training, and exercise, in common with Yoshioka.³⁴ They were also widely used by physiotherapists in Michigan.³⁶ Mobility training, therefore, appears to be the prime role of the physiotherapists in palliative care units. Pain-relieving treatments including heat, ice, manual therapy and transcutaneous electrical neuromuscular stimulation (TENS) were used on 17% of patients. Interferential current and ultrasound were available but not used. In the Michigan study,³⁶ therapists used heat, ice, massage, traction, and ultrasound. Despite primary medical control of pain, physiotherapists, therefore, continue to have a role in pain relief for hospice patients. However, little evidence underpins their use, and research is required to examine their efficacy.

Use of patient education was low at 18%. This is surprising, as education can be considered a core element of palliative physiotherapy. Similarly, psychological support has been identified as a significant benefit of therapy by palliative patients^{33,42,43} but recorded use was low. Relaxation was not used at all, being normally conducted by complementary, art, and music therapists. Physiotherapists in general routinely educate patients, but this is poorly documented.⁴⁴ The authors propose that education and psychological support are frequent, routine aspects of hospice physiotherapy but remain underdocumented. This requires further research.

Education of family was only documented in 8% of cases. This is in stark contrast to Drouin et al.,³⁶ who found that family education was the most common treatment used. In American settings, medical insurance criteria can restrict the number of physiotherapy visits; therefore, family education possibly becomes a more appropriate therapy goal.

Respiratory treatments were not commonly used (15%), as breathlessness and excess secretions were primarily controlled pharmacologically. This compares with 1%³⁴ and 3%³⁶

in other studies. Results show considerable underutilization of physiotherapy respiratory skills, and measures to address this have been instituted in our hospice. Similarly, lymphedema treatments were not commonly used in this hospice (6%). This compares with 5%³⁴ and 10%³⁶ in other studies, but contrasts with much higher use in our community-based hospice patients.

Future studies should compare patterns of treatment usage to establish if our results follow international trends, or are individual to the unit. Comparison of services restricted by insurance criteria or resources needs to be conducted with services, such as ours, where staffing levels approach the recommendation for specialized palliative physiotherapy,¹⁴ and treatment is restricted only when the patient no longer has treatment needs.

Challenges for hospice physiotherapists

Hospice physiotherapists rely heavily on clinical judgement for treatment decisions, as there is relatively poor evidence for many of their interventions. Possible contraindications to treatment have constantly to be weighed against potential benefits. The eventual outcome of treatment (death or discharge) is often not predictable, which challenges goal setting and discharge planning. Conditions can shift dramatically from day to day. In this study, large functional fluctuation in patients was the norm. Physiotherapy goals, therefore, change constantly, and treatments are adjusted on a daily basis.

In this study, physiotherapy was frequently suspended, and resulted in a high proportion of non-treatment “calls.” Physiotherapy is clearly not always a priority for patients. Respecting patient choice and allowing for interruptions requires considerable flexibility. This also poses problems for data collection if the treating physiotherapist records the data.

Limitations of study and future recommendations

This study was descriptive; therefore, conclusions cannot be inferred to other hospices. However, it offers a basis for comparison with future hospice physiotherapy research. Being retrospective, it did not examine the efficacy of physiotherapy. Prospective studies are necessary to investigate this and identify predictors of improvement. Patients with non-malignant diseases were a significant minority; therefore, results do not reflect their care. Physiotherapy for this population should be investigated independently.

We did not examine the factors that contributed to functional loss, including the relative contribution of the various domains in EFAT-2. This detail could be included in future studies. Further studies should also investigate the factors that interrupt treatment, and the discharge location of survivors. Physiotherapy is rarely used in isolation from other disciplines. Studies into hospice rehabilitation should ideally be multidisciplinary.

Results involving functional scores may contain subset bias, as there was considerable data loss. Routine functional scoring by physiotherapists was not possible when treatment was suspended, or when it added to patient burden. For similar studies, it is suggested that other team members be trained in functional scoring so that it can be conducted twice weekly, including in the absence of physiotherapy. Functional scoring should be part of hospice discharge policy for

survivors, and proxy history-led discharge scores should be considered in unwell/dying patients.

Conclusion

This study provides a profile of current physiotherapy activity in an Irish hospice, providing a basis for comparison with future hospice physiotherapy research. It also illuminates the role of the hospice in palliative rehabilitation. A validated palliative care functional tool was used. Rate of referral to physiotherapy was high, and patients of all functional levels were referred. Rehabilitation activities played a major role, but therapists also treated dying patients to within a day of death. Treatments employed were primarily physical activity interventions but various other interventions were also utilized.

Unique challenges for physiotherapists included a constantly fluctuating clinical picture, frequent changes to discharge planning, and regular suspension of treatment. There were difficulties with routine functional scoring. Research needs were identified.

Ethical approval

Permission for the study was granted by the ethics committee of the Mid Western Regional Hospital, Limerick in August 2009.

Acknowledgments

This study was funded by the Irish Hospice Foundation and Milford Care Centre. The researchers acknowledge the assistance of the physiotherapy staff in Milford Care Centre, Ms. Ruth O' Shaughnessy for administrative assistance, Dr. Jean Saunders for statistical advice, and Drs. Marian Conroy and Feargal Twomey for their feedback.

Author Disclosure Statement

No competing financial interests exist.

References

- Association of Chartered Physiotherapists in Palliative Oncology: *Guidelines for Good Practice*. London: Chartered Society of Physiotherapy, 1993.
- Chartered Society of Physiotherapy: *The Role of Physiotherapy for People with Cancer- CSP Position Statement*. London: Chartered Society of Physiotherapy, 2003.
- Bancroft M: Physiotherapy in cancer rehabilitation: a theoretical approach. *Physiotherapy* 2003;89:729-733.
- Cobbe S, Kennedy N: Framework for measurement of physiotherapy in palliative cancer care. *Physiother Ireland* 2009;30: 41-46.
- Pizzi M, Briggs R: Occupational and physical therapy in hospice. *Top Geriatr Rehabil* 2004; 20: 120-130.
- Doyle L, Mc Clure J, Fisher S: The contribution of physiotherapy to palliative medicine. In: Doyle D, Hanks G, Churney N, Calman K (eds): *Oxford Textbook of Palliative Medicine, 3rd ed*. New York: Oxford University Press, 2005, pp. 1050-1056.
- Jolliffe J, Bury T: *The Effectiveness of Physiotherapy in the Palliative Care of Older People*. London: Chartered Society of Physiotherapy, 2002.
- National Institute for Health and Clinical Excellence, Department of Health: *Improving Supportive and Palliative Care for Adults with Cancer. Executive Summary*. London: National Institute for Health and Clinical Excellence. Department of Health, 2004.
- National Advisory Committee on Palliative Care, Department of Health and Children: *Report of the National Advisory Committee on Palliative Care*. Dublin: National Advisory Committee on Palliative Care, Department of Health and Children, 2001.
- National Council for Palliative Care: *Fulfilling Lives. Rehabilitation in Palliative Care*. London: National Council for Palliative Care, 2000.
- Gray R: The role of physiotherapy in hospice care. *Physiother Pract* 1989;5:9-16.
- Rashleigh L: Physiotherapy in palliative oncology. *Aust J Physiother* 1996;42:307-312.
- Robinson D: The contribution of physiotherapy to palliative care. *Eur J Palliat Care* 2000;7: 95-98.
- Lowe S, Watanabe S, Corneya K: Physical activity as a supportive care intervention in palliative cancer patients: a systematic review. *J Support Oncol* 2009;7:27-34.
- Beaton R, Pagdin-Friesen W, Robertson C, Vigar C, Watson H, Harris S: Effects of exercise on persons with metastatic cancer: a systematic review. *Physiother Can* 2009;61: 141-153.
- Jones L, Eves N, Waner E, Joy A: Exercise therapy across the lung cancer continuum. *Curr Oncol Rep* 2009;11:255-262.
- Temel J, Greer J, Goldberg S, Vogel P, Sullivan M, Pirl W, Lynch T, Christiani D, Smith M: A structured exercise program for patients with advanced non-small cell lung cancer. *J Thorac Oncol* 2009;4:595-601.
- Buss T, de Walden-Galuszko K, Modlinska A, Osowicka M, Lichodzigewska-Niemeirko M et al: Kinesitherapy alleviates fatigue in terminal hospice cancer patients- an experimental control trial. *Support Care Cancer* 2010;18:743-749.
- Connors S, Graham S, Peel T: An evaluation of a physiotherapy-led non-pharmacological breathlessness programme for patients with intrathoracic malignancy. *Palliat Med* 2007;21:285-287.
- Syrett S, Taylor R: Non-pharmacological management of breathlessness: a collaborative nurse-physiotherapist approach. *Int J Palliat Nurs* 2003;9:150-156.
- Hately J, Laurence V, Scott A, Baker R, Thomas P: Breathlessness clinics within specialist palliative care settings can improve the quality of life and functional capacity of patients with lung cancer. *Palliat Med* 2003;17:410-417.
- Bausewein C, Booth S, Gysels M, Higginson I: Non-pharmacological interventions for breathlessness in advanced stages of malignant and non-malignant diseases. *Cochrane Database Syst Rev* 2008;2:CD005623.
- The Management of Lymphoedema in Advanced Cancer and Oedema at the End of Life*. International Lymphoedema Framework and Canadian Lymphoedema Framework. International Lymphoedema Framework [online], lympho.org/link.php (Last accessed May 28, 2012).
- Todd M: Understanding lymphoedema in advanced disease in a palliative setting. *Int J Palliat Nurs* 2009;15:474-480.
- Honnor A: Understanding the management of lymphoedema for patients with advanced disease. *Int J Palliat Nurs* 2009;15:162-169.
- Nieland P, Klaschik L, Clemens K: Evaluation of physiotherapeutic management of lymphatic oedema in palliative care patients. In: *Proceedings of the 12th Conference of the*

- European Association of Palliative Care*, May 18–21, 2011; Lisbon, Portugal. Newmarket: Williams Press, 2011 p. 207.
27. Tang V, Harvey D, Park Dorsay J, Jiang S, Rathbone M: Prognostic indicators in metastatic spinal cord compression: using functional independence measure and Toshuhashi scale to optimise rehabilitation planning. *Spinal Cord* 2007;45:671–677.
 28. Kendig T, Ramaker J, Samuels F: Management of a patient with lung metastases requiring prolonged mechanical ventilation: rehabilitation and recovery of function. *Rehabil Oncol* 2008;26:3–14.
 29. Tang V, Rathbone M, Park Dorsay J, Jiang S, Harvey D: Rehabilitation in primary and secondary brain tumours: impact of functional outcomes on survival. *J Neurol* 2008;255:820–827.
 30. Ruff R, Ruff S, Wang X: Persistent benefits of rehabilitation on pain and life quality for nonambulatory patients with spinal epidural metastasis. *J Rehabil Res Dev* 2007;44:271–278.
 31. Scialla S, Cole R, Scialla T, Bednarz L, Schever J: Rehabilitation for elderly patients with cancer asthenia: making the transition to palliative care. *Palliat Med* 2000;14:121–127.
 32. Laakso L, McAuliffe A, Cantlay A: The impact of physiotherapy intervention on functional independence and quality of life in palliative patients. *Cancer Forum* 2003;27:15–20.
 33. Dahlin Y, Hewe S: Patients' experiences of physical therapy with palliative cancer care. *J Palliat Care* 2009;25:12–20.
 34. Yoshioka H: Rehabilitation for the terminal cancer patient. *Am J Phys Med Rehabil* 1994;73:199–206.
 35. Montagnini M, Lodhi M, Born W: The utilization of physical therapy in a palliative care unit. *J Palliat Med* 2003;6:11–17.
 36. Drouin J, Martin K, Onowu N, Berg A, Zuellig L: Physical therapy utilization in hospice and palliative care settings in Michigan: a descriptive study. *Rehabil Oncol* 2009;27:3–8.
 37. Mueller K, Decker I: Impact of physical therapy intervention on patient-centered outcomes in a community hospice. *Top Geriatr Rehabil* 2011 2–9.
 38. Kaasa T, Loomis J, Gillis K, Bruera E, Hanson J: The Edmonton Functional Assessment Tool: preliminary development and evaluation for use in palliative care. *J Pain Symptom Manage* 1997;13:10–19.
 39. Kaasa T, Wessel J: The Edmonton functional assessment tool: further development and validation for use in palliative care. *J Palliat Care* 2001;17:5–11.
 40. Kaasa T, Wessel J, Darrah J, Bruera E: Inter-rater reliability of formally trained and self-trained raters using the Edmonton Functional Assessment Tool. *Palliat Med* 2000;14:509–17.
 41. Briggs R: Models for physical therapy practice in palliative medicine. *Rehabil Oncol* 2000;18:18–21.
 42. Belchamber C, Gousy M: Rehabilitative care in a specialist palliative day care centre: a study of patients' perspectives. *Int J Ther Rehabil* 2004;11:425–433.
 43. Martlew B: What do you let the patient tell you? *Physiotherapy* 1996;82:558–565
 44. Gahimer J, Lyons L, McAtee S, Utterback E: Documentation of patient education in physical therapy practice: are physical therapists documenting what they are teaching? *J Phys Ther Educ* 1997;11:7–10.

Address correspondence to:

Sinead Cobbe, M.Sc. Clinical Therapies, B.Sc. (Physio)
Milford Care Centre
Castletroy
Limerick LKO
Ireland

E-mail: sineadcobbe@gmail.com