

The Utilization of Physical Therapy in a Palliative Care Unit

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ABSTRACT

Background: In the supportive oncology and palliative care settings, rehabilitation interventions are often overlooked and underutilized, despite high levels of functional disability in these patients. As a result, little is known about the utilization or effectiveness of rehabilitation interventions in palliative care populations.

Objective: To assess the utilization of physical therapy (PT) in a hospital-based palliative care unit, to characterize functional disabilities in patients who received PT, and to identify factors related to functional improvement following a course of PT.

Methods: Retrospective chart review of 100 patients (mean age 70 years, 97% male) discharged from the Milwaukee Veterans Hospital Palliative Care unit over 15 months. Activities of daily living (ADL) performance scores were recorded on admission, at 2 weeks, and at completion of the PT program and correlated with demographic and disease-related variables.

Results: Thirty-seven patients received a formal PT assessment, and 18 patients underwent PT. The most common functional disabilities in patients who received PT were deconditioning, pain, imbalance, and focal weakness. Ten patients demonstrated improvement in ADL function at 2 weeks. Six patients completed the course of PT. Albumin was significantly correlated with functional improvement. When controlling for albumin, patients with diagnosis of dementia were more likely to show improvement in functional status than patients without a dementia diagnosis.

Conclusion: PT assessment and utilization were uncommon in this group. When utilized, PT benefited 56% of patients. Factors related to functional improvement following a PT course were a higher albumin level and a diagnosis of dementia. Prospective trials of PT in palliative care patients are needed to better define response rate and predictors of response.

INTRODUCTION

PALLIATIVE CARE PATIENTS experience high levels of functional disability related to disease progression, deconditioning, pain, direct tumor effect, paraneoplastic syndromes, or local or systemic effects of cancer treatment and its complications.¹⁻⁹ One recent study has shown that

progressive functional decline and pain characterized the last 6 months of life of cancer patients.¹⁰ The impairment of physical function is a significant factor contributing to decreased quality of life of these patients.¹¹

Most palliative care patients express a desire to remain physically independent during their disease course,^{1,12} and maintaining or regaining phys-

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ical independence can be a reasonable goal for certain groups of palliative care patients. The concept of physical rehabilitation in palliative care is gaining more attention in the literature.¹³⁻¹⁶ The goal of rehabilitation in palliative care patients is, with appropriate provision of treatment, to eliminate or reduce disability by optimizing patients' functional status, physical independence, and quality of life.^{1,17} This type of rehabilitation is most appropriate for patients with advanced disease and very limited life span. There is some evidence that rehabilitation interventions improve functional status of palliative care patients. Yoshioka¹ demonstrated that 239 of 301 terminal cancer patients who received physical therapy (PT) experienced functional gains in transfers and ambulation. Scialla *et al.*¹³ also demonstrated that elderly patients with cancer-related asthenia improve both physical and mental function following inpatient rehabilitation. However, it is still difficult to predict which patients benefit most from rehabilitation and how long they can sustain functional gains.

Palliative care units are being recognized as units that not only provide supportive terminal care but also promote rehabilitation of patients with advanced malignancies and other terminal conditions.¹⁸⁻²⁰ The multidisciplinary approach to patient care in palliative units addresses this. Our interest was in studying the utilization of PT in a palliative care unit. The objectives of this study were to assess the utilization of PT in patients admitted to a hospital-based palliative care unit, to characterize disabilities in patients who have received PT, and to identify factors related to functional improvement following a course of PT.

METHODS

The study was a retrospective chart review of 100 consecutive patients discharged from the Milwaukee Veterans Affairs Medical Center (VAMC) Palliative Care Unit between October 1998 and December 1999. The Milwaukee VAMC is an urban academic affiliated tertiary medical center with 182 acute care and 127 extended care beds. The Palliative Care Unit is a 30-bed unit within the Extended Care Center, and it specializes in care of veterans with end-stage diseases (96% cancer), as well as those who are undergoing pal-

liative radiation therapy who expect to return to the community after completion of treatment. Patient referrals are made primarily by the Hematology-Oncology and Radiation Therapy services. The unit emphasizes a multidisciplinary team approach to patient care. Two academic internists with training in palliative care and a nurse practitioner with considerable experience and expertise in this field work together to provide medical care to the patients. The remaining members of the interdisciplinary team include a chaplain, a dietitian, six registered nurses, nine licensed practical nurses, four nurse aides, a nurse manager, a pharmacist, a psychologist, a recreation therapist, and a social worker, who all assess patients on admission. The team members meet weekly to discuss a plan of care and patients' progress. Either the physician or the nurse practitioner may make a request for physical therapy assessment at any time following admission. These requests are made on an as-needed basis, as determined by the judgment of the individual medical provider.

Demographic data including age, gender, admission diagnosis, number of comorbidities, and length of stay were collected for each patient admitted to the palliative care unit. Patients who were referred for a PT evaluation were identified. The PT standardized initial assessment notes were reviewed for both description of patients' functional disabilities and recommendations for enrollment in a PT program. For patients enrolled in a PT program, the following data were obtained: presence of pain, diagnosis of dementia, diagnosis of depression, body mass index, hemoglobin level, serum albumin, and serum cholesterol. Diagnoses of dementia and depression were obtained from the psychologists' initial assessment notes. Presence of pain was obtained from the physicians, nurses, or nurse practitioner notes. A numeric pain assessment scale ranging from 0 (no pain at all) to 10 (worst pain imaginable) was utilized to assess presence and intensity of pain. Laboratory values were obtained from dates as close as possible to the initial PT evaluation note. Number of PT sessions, presence or absence of improvement during PT, completion of the PT program, or reasons for discontinuation were also recorded from the physical therapist notes.

Information on patients' ability to perform activities of daily living (ADL) was obtained from

TABLE 1. DEMOGRAPHIC VARIABLES OF PALLIATIVE CARE UNIT PATIENTS

<i>Variable</i>	<i>All patients (n = 100)</i>	<i>Patients who received PT (n = 18)</i>
Age (years) ^a	70 ± 8.9	73.3 ± 9.7
Gender (% male)	97	100
Race (% white)	81	100
Length of stay on unit (days) ^a	49.5 ± 50	76.5 ± 81.4
Number of comorbidities ^a	4.51 ± 2.17	6.3 ± 2.0
Admission ADL score ^a	8.89 ± 5.73	5.38 ± 4.60
Presence of pain (%)		61.1
Presence of dementia (%)		27.8
Presence of depression (%)		16.6
Body mass index (kg/m ²) ^a		22.5 ± 5.4
Hemoglobin (g/dl) ^a		11.3 ± 1.78
Serum albumin (g/dl) ^a		2.42 ± 0.64
Total cholesterol level (mg/dl) ^a		185.7 ± 48.0
Number of PT sessions ^a		14.6 ± 15.4

^aData are presented as the means ± SD.

the PT notes and the Minimum Data Set (MDS).²¹ The MDS is a comprehensive assessment tool measuring physical and psychological status of nursing home patients, and it was completed for each patient upon admission. Patients were scored 0 (independent), 1 (required assistance or supervision), or 2 (total dependence) depending on the level of assistance required to perform the ADL of bathing, dressing, walking, transferring, grooming, toileting, and eating. ADL performance scores were recorded at admission (Time 1), at 2 weeks (Time 2), and at completion of the PT program. Composite ADL scores ranged from 0 (total independence) to 14 (total dependence).

STATISTICAL ANALYSIS

Independent *t* tests were conducted to compare ADL scores at admission (both composite and component) for those who received PT versus those who did not. Correlations between composite ADL scores and the other demographic and medical variables described were examined for all subjects. Correlations between composite ADL scores on admission (Time 1), at the second week of PT (Time 2), and change from Time 1 to Time 2, and the other demographic and medical variables described were examined for those subjects who received PT. Finally, an analysis of covariance was used to examine the relationship of change in ADL score with dementia diagnosis and albumin level at admission. In all cases, alpha was set at $p \leq 0.05$.

RESULTS

Patients' characteristics are outlined in Table 1. Ninety-eight patients (98%) died during their stay on the palliative care unit. Two patients were discharged home. One patient died at home 10 days after discharge, whereas the other was readmitted to the same unit 40 days later, and died 52 days after the second admission.

Admission diagnoses are outlined in Table 2. Cancer was the most common admission diagnosis (71%). Lung cancer (28%), gastrointestinal cancer (12%), genitourinary cancer (12%), hematological malignancies (4%), and head and neck cancer (3%) were the most prevalent malignancies. Other common conditions were end-stage renal disease (6%), stroke (6%), and end-stage lung disease (6%). All patients who received PT had a primary cancer diagnosis.

Figure 1 outlines referrals and utilization of PT in 100 palliative care patients. Thirty-seven pa-

TABLE 2. ADMISSION DIAGNOSIS OF PALLIATIVE CARE UNIT PATIENTS (N = 100)

<i>Diagnosis</i>	<i>%</i>
Cancer	71
End-stage renal disease	6
Stroke	6
End-stage lung disease	6
Gangrene	3
End-stage liver disease	3
End-stage dementia	3
Anoxic encephalopathy	1
Trauma	1

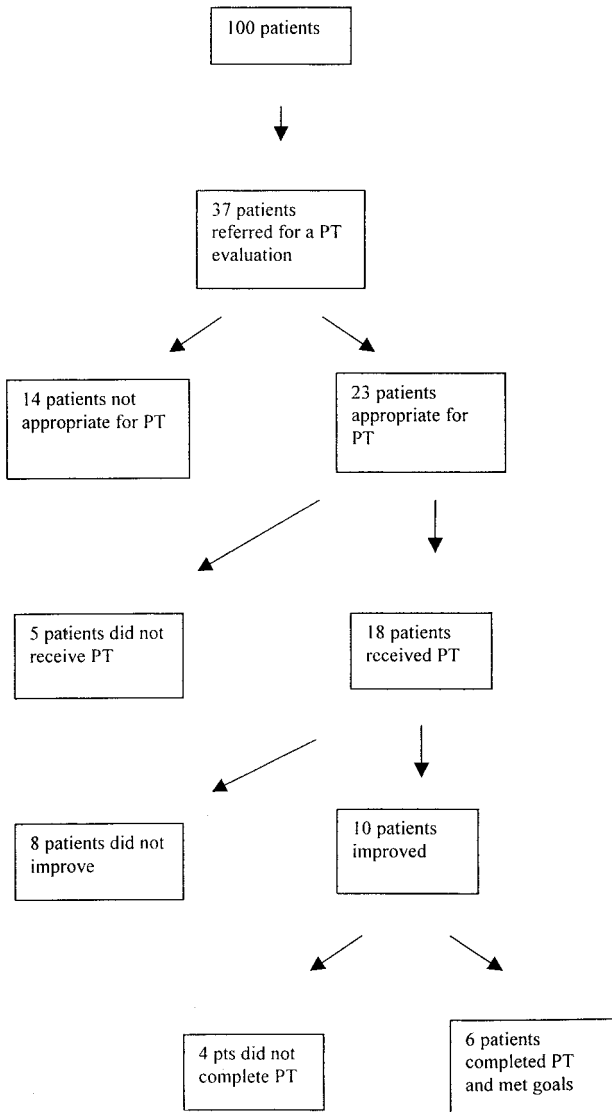


FIG. 1. Utilization of PT by palliative care unit.

tients (37%) were referred for and received a PT evaluation. Of those, 14 patients were not appropriate for enrollment in a PT program because of extreme debilitation (71.4%) and severe pain (28.6%). PT was recommended for the remaining 23 patients (62.2% of those referred), and 18 patients (48.6% of those referred) received PT. Of those five patients in whom PT could not be initiated, nonparticipation was the result of death in four cases and in one case the patient declined to participate.

The most prevalent functional disabilities in the 18 patients who underwent PT were deconditioning (77%), pain (11%), poor balance (6%), and focal weakness (6%).

Ten of the 18 patients who received PT demon-

strated improvement in ADL total scores by the second week of the program. Six of the 18 patients who received PT completed the prescribed course of PT and met their goals. Four patients discontinued PT before meeting their goals, two at the request of the patient or a family member, one due to worsening pain, and one due to generalized weakness.

Eight of the 18 who received PT showed no evidence of functional improvement at any time during the course of the PT program, resulting in early termination of PT. In all eight cases, the reason for discharge from the PT program was generalized weakness.

The relationship between functional status and other measures was examined by correlating ADL scores (at admission, 2 weeks, and discharge from the PT program) with the following variables: age, length of stay on the palliative care unit, receiving a PT evaluation, receiving PT, number of sessions of PT, and presence or absence of improvement. Patients who were more functionally independent on admission (those with lower ADL scores) had a longer length of stay on the unit ($r = -0.40$, $p < 0.001$). Greater functional independence on admission was also associated with increased probability of receiving a PT evaluation ($r = -0.37$, $p < 0.001$) and of actually receiving PT ($r = -0.36$, $p < 0.05$). The relationships between composite ADL scores at Time 1 (admission), Time 2 (second week of the PT program), and the change from Time 1 to Time 2, as well as demographic variables (age, number of comorbidities, presence of pain, diagnosis of depression, diagnosis of dementia, body mass index, hemoglobin level, albumin level, cholesterol level, number of PT sessions) were examined for those subjects who underwent PT. A higher albumin level was associated with greater improvement in ADL scores from Time 1 to Time 2 ($r = 0.58$, $p < 0.05$). When the improvement associated with albumin was held constant, change in ADL scores from Time 1 to Time 2 was also associated with a diagnosis of dementia. An analysis of covariance controlling for albumin showed that patients with a dementia diagnosis improved slightly from Time 1 to Time 2 ($M = 1.12$), whereas patients without a dementia diagnosis deteriorated slightly from Time 1 to Time 2 [$M = -1.22$; $F(1,14) = 5.05$, $p < 0.05$; multiple $R = 0.72$].

Independent t tests were performed to compare scores of each ADL component on admission between patients who received PT and those

who did not. Patients who received PT differed from patients who did not receive PT on the basis of component ADL scores for bathing ($t = 2.91, p < 0.01$), dressing ($t = 3.38, p < 0.01$), toileting ($t = 2.81, p < 0.01$), eating ($t = 2.54, p < 0.05$), grooming ($t = 3.21, p < 0.01$), but not transferring ($t = 1.68, p = 0.10$) or walking ($t = 1.40, p = 0.17$). Patients who received PT were more functionally independent in the bathing, dressing, toileting, grooming, and eating components of the ADL scores. Independent t tests comparing age, gender, number of comorbidities, and length of stay revealed no differences between patients who received PT and those who did not.

DISCUSSION

From these data, less than 40% of patients admitted to the palliative care unit were referred for a PT evaluation. Referrals to the physical therapist were made by the physician or the nurse practitioner providing medical care to the patient, and the number of referrals was probably affected by the physician's or the nurse practitioner's perception of patients' functional disabilities, the clinicians' previous experience and satisfaction with PT services, and their subjective assessment of patients' rehabilitation potential. Correlation analysis showed that patients' functional status on admission influenced the number of referrals to PT. Patients who were more functionally independent on admission had a higher probability of receiving a PT evaluation and of actually receiving PT. It was also interesting to note that more than 60% of patients who were referred for a PT consultation were considered by the physical therapist to be eligible to receive PT, indicating that the medical providers' judgment about patients' rehabilitation potential was generally valid, as well as not overly restrictive. It is unknown what proportion of patients would have qualified to receive PT if every patient had received a PT evaluation.

The data showed that patients who were more functionally independent on admission had a longer length of stay on the unit and lived longer. This finding emphasizes the importance of functional status assessment when determining disease prognosis in palliative care patients. It is well known that functional status can be correlated with the outcome of the underlying disease in cancer and geriatric populations.²²⁻²⁷ Cancer pa-

tients have high levels of functional disability, and with disease progression, functional status continues to decline.¹⁻⁹ The last 6 months of life for patients with cancer is typically characterized by functional decline, severe pain, and confusion.¹⁰ Deconditioning and pain were the most common problems encountered in study patients who received PT, and generalized weakness excluded almost 40% of patients from participating in a PT program. Generalized weakness is a common problem in cancer rehabilitation,³ and it can occur as a result of multiple factors, such as the following: mechanical effects caused by the primary tumor or its metastases in the central or peripheral nervous system; paraneoplastic syndrome; the effect of treatment including radiation, chemotherapy, and surgery; nutritional problems associated with cancer; complications from immobilization; and related psychological problems. In almost 70% of patients who received PT, increasing weakness was the most common reason for premature discharge from the PT program.

Fifty-six percent of patients who received PT demonstrated functional improvement early in the course of the program (second week), and in 33% of patients the functional improvement was carried on through the whole program with the PT goals being met. These results can be compared with those of other studies that have addressed functional improvement following rehabilitation in cancer patients. In a study of rehabilitation of 239 hospice patients, Yoshioka¹ demonstrated a 27% improvement rate (defined as the percentage of potential improvement that is actually achieved) in mobility scores measure using the Barthel Mobility Index. Sabers *et al.*² demonstrated an improvement in the Barthel Mobility Score in 63% of hospitalized cancer patients who received interdisciplinary rehabilitation. In this study, 46% of patients were being treated with palliative rather than curative intent. Marciniak *et al.*⁴ demonstrated significant functional gains in cancer patients in a comprehensive inpatient rehabilitation unit. Cole *et al.*²⁸ demonstrated functional improvements using the Motor Functional Independence Measure (FIM) in cancer patients undergoing inpatient rehabilitation. In Cole's study, patients who were judged by an oncologist as able to achieve more aggressive treatment goals tended to make larger FIM-Motor Measure gains than those with less aggressive treatment goals.

The current report shows that functional improvement in patients who received PT was asso-

ciated with higher levels of serum albumin. Albumin has been used as a marker of nutritional status and predictor of life expectancy in palliative care patients.²⁹⁻³⁰ Our finding provides some evidence that albumin can also be used as a marker of potential functional improvement of rehabilitation in palliative care patients. Another interesting finding related to functional improvement following PT was that when controlling for albumin, patients with a diagnosis of dementia were more likely to show improvement in functional status than patients without a dementia diagnosis. These cognitively impaired individuals were more functionally impaired than their cognitively intact peers, but were able to make functional gains with sustained PT in a structured environment. Without such intervention, they may not have been able to demonstrate such improvement. Therefore, cognitive impairment should not necessarily be considered an impediment to rehabilitation in palliative care settings. Rather, functional abilities in the cognitively impaired may be lost prematurely, and these individuals seem to benefit more from the structure of the PT regimen than their non-cognitively impaired peers.

The study was limited by its retrospective nature. It is possible that the patients displayed functional improvement for reasons other than PT, such as a temporary improvement in their disease status, nutrition, or psychological status, or because of preexisting group differences that were not measured. This study was conducted in a VA inpatient setting with a predominantly white male geriatric population, which limits the ability to generalize these findings to other populations. Because referrals for PT were made based on the subjective view of the medical provider, rather than on any standardized criteria, it is difficult to judge how subtle factors such as selection bias may have affected this study. Although the primary goal of PT (and indeed all interventions) in a palliative care setting is to improve patients' quality of life, no measures of well-being or quality of life were taken, nor was the therapist's role in educating the patient and the family on a daily basis assessed. Finally, the low number of subjects in this study limits the conclusions that can be drawn from a failure to detect differences between groups statistically. Important differences associated with receiving a referral for PT or benefiting from PT may have gone undetected.

Future studies are suggested from these data. A PT evaluation for each patient admitted to the pal-

liative care unit should be explored. Identifying more sensitive and reliable functional assessment instruments that can detect subtle changes in functional status in palliative care patients may prove useful. Utilizing the maximum range of PT interventions to effect change is another promising focus of research. A randomized PT interventional trial in palliative care patients would be the next step to refine causal relationships among variables such as nutritional status, PT, and subjective quality of life.

In summary, PT referrals were uncommon in this group of palliative care patients. Eighteen of 100 patients were enrolled in a PT program. Deconditioning and pain accounted for close to 90% of the functional disabilities in the patients who underwent PT. When utilized, PT did benefit 56% of patients. Factors related to functional improvement following a course of PT were a higher albumin level and a diagnosis of dementia. Prospective randomized controlled trials of PT in palliative care patients are needed to better define response rate and predictors of response.

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