

The Essence of Rehabilitation of Patients with Cancer

Kanser Hastalarında Rehabilitasyonun Önemi

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Summary

Cancer rehabilitation is a concept that is defined by the patient and involves helping a person with cancer to obtain maximum physical, social, psychologic, and vocational functioning within the limits imposed by the disease and its treatment. Attention to the functional problems of cancer patients is relevant at any point in the diagnostic and therapeutic continuum (e.g., from diagnosis to treatment planning, treatment, post-treatment, recurrence, and end of life) and rehabilitation interventions are appropriate for all of these individuals who are living with cancer. Rehabilitation is unlikely to restore a premorbid level of function but provide a reasonable degree of independence. The ultimate goal of cancer rehabilitation is to enhance the quality of life of the cancer patient. The options for delivering rehabilitation services to the patients with cancer diagnosis include inpatient rehabilitation, outpatient rehabilitation, consultation services during acute care, home-health therapy services or extended care facilities and palliative care services. In this article; the need, principles and the outcome of cancer rehabilitation are briefly reviewed. *Türk J Phys Med Rehab 2007;53:74-7.*

Key Words: Cancer rehabilitation, outcome

Özet

Kanser rehabilitasyonu, kanserli bir hastaya, hastalığın ve tedavilerin belirlediği sınırlar içerisinde maksimum fiziksel, sosyal, psikolojik ve mesleki fonksiyonların kazandırılmasına yardımcı olmak şeklinde tanımlanır. Kanser hastalarının tanı ve tedavilerinin her aşamasında (tanı, tedavi, tedavi sonrası, nüks ve terminal dönem) rehabilitasyon uygulamalarının yeri vardır. Kanser rehabilitasyonunda temel amaç kişinin yaşam kalitesinin artırılmasıdır. Bu hastalarda rehabilitasyon hizmetleri ayaktan hasta, yatan hasta, konsültasyon hizmetleri, evde terapi veya bakım merkezleri ve palyatif bakım ile sağlanabilir. Bu derlemede kanser rehabilitasyonu ihtiyaçları, temel ilkeleri ve sonuçları vurgulanmaktadır. *Türk Fiz Tıp Rehab Derg 2007;53:74-7*

Anahtar Kelimeler: Kanser rehabilitasyonu, son durum

Definition and the Need for Cancer Rehabilitation

Cancer has become a common condition and a source of significant disability. More than 8 million people in the United States have a history of cancer and more than 1 million new cancers are diagnosed each year (1). The incidence rates for all major cancers except stomach and cervical tumors have been increasing over the past four decades (2). The medical statistics of the cancer registry of the Ministry of Health in Turkey show that the incidence of cancer has significantly increased in the last 20 years (Graphic 1). The most frequent cancer is the lung cancer followed by breast cancer (3). The incidence of cancer in terms of age and gender in Turkey is given in Tables 1-3 and Graphic 2 (3).

The benefits of cancer research are enormous but there are still many challenges for cancer survivors. These individuals need to maintain functional independence and receive adequate symptom control when it is appropriate. Over the past two decades, cancer rehabilitation has received little attention but with the extended survivorship due to enhanced multimodal therapies attention is being increasingly directed to quality-of-life issues of these patients (4).

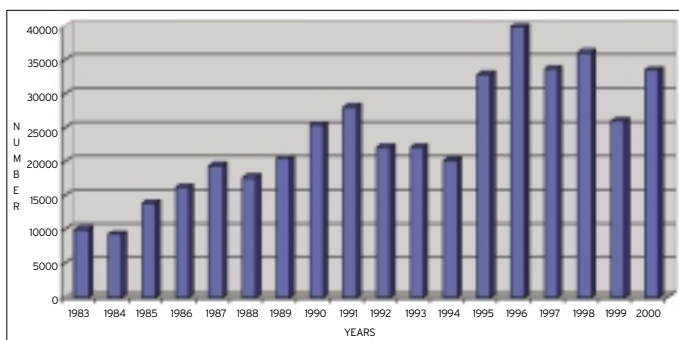
Contemporary cancer rehabilitation is a concept that is defined by the patient and involves helping a person with cancer to obtain maximum physical, social, psychologic, and vocational functioning within the limits imposed by the disease and its treatment (5). The ultimate goal is to improve multiple dimensions of life satisfaction. The options for delivering rehabilitation

services include inpatient rehabilitation, outpatient rehabilitation, consultation services during acute care, home-health therapy services or extended care facilities (6).

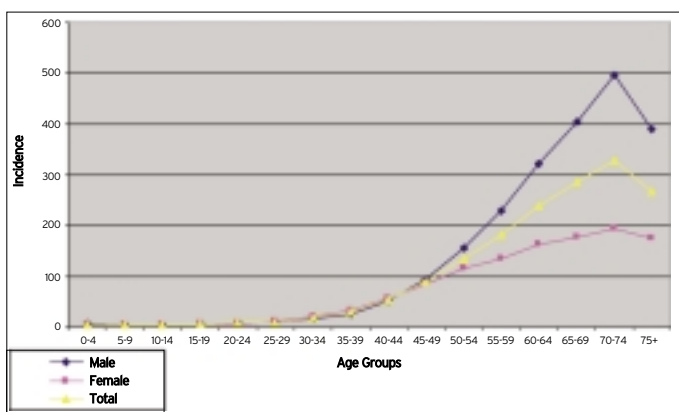
The 5-year survival rates for most tumors continue to improve due to earlier detection and treatment strategies. The 5-year survival rate for many cancer sites exceeds 50%. This is especially true for breast, larynx, prostate, and kidney tumors. On the other hand, tumors of stomach, esophagus, hepatic, pancreas, lung, nervous system, and leukemias/myeloma have lower 5-year survival rates (7). In patients with early stage cancer, normal life expectancy is anticipated but there can be sequelae from cancer treatments that impair functioning. Others live with active cancer for many years, with symptomatic problems controlled by surgery, hormones, chemotherapy or radiation therapy and for these individuals cancer might be considered as a chronic disease. For those individuals with advanced disease at the time of diagnosis, pain and functional impairment are common presenting problems that are direct results of the disease.

The importance of rehabilitation needs in patients with cancer has recently received increasing recognition. The need for cancer rehabilitation was first documented in 1978 by Lehman et al. (8) who studied 805 patients at cancer referral centers. 438 of the 805 patients (prevalence was more than 70% in breast cancer, lung cancer, and head and neck tumors) had physical medicine and rehabilitation problems and these problems occurred with all tumor types. In this study, 52% of the cancer patients had psychologic problems, 35% had general weakness, 30% had problems in activities of daily living (ADL), 25% had difficulties with ambulation, 7% had deficits in transfers, and 7% had deficits in communication. Ganz et al. (9) surveyed 500 patients with

colorectal, lung, and prostate cancer who had been living with cancer for over a year and found more than 80% reported gait problems, with 50% indicating that these problems were severe. Significant problems in ADL and vocational pursuits were also reported. In 1997, a cross-sectional study revealed that both ADL and instrumental ADL were significantly limited in cancer patients (10). In this study, 1647 of 9745 surveyed elderly indicated that they had a nondermatologic malignancy. Of these, 47% reported difficulty with ADLs, 38% had difficulty walking, 20% had difficulty bathing, and 21% had difficulty with transfers. Forty-nine percent had difficulty with instrumental ADLs such as heavy and light housework, shopping, and meal preparation. A recent study in 2003 showed that patients admitted to inpatient medical oncology units have many unmet, remediable rehabilitation needs that may not be recognized by nonrehabilitation physicians and clinical staff (11). In this study, rehabilitation needs assessment on admission showed deconditioning in 76%, mobility impairment in 58%, need for increased ROM in 42%, deficits in ADLs in 22% of the patients. Additionally, 13% of the patients needed recreational therapy. It was concluded that assessment of medical oncology patients be



Graphic 1. Numerical distribution of cancer notification reaching Cancer Registration Center in Turkey (1983-2000).



Graphic 2. Incidence of cancer cases according to age groups and sex (Turkey 2000).

Table 1. The most frequent five cancers in Turkey (Male-2000).

Organs	No of Cases	Percentage (%)	Incidence Per (100.000)
Lung	5387	26.96	15.68
Stomach	1493	7.47	4.35
Bladder	1359	6.80	3.96
Prostate	1152	5.77	3.35
Larynx	1086	5.43	3.16
Other	9505	47.57	27.67
Total	19982	100.00	58.18

Table 2. The most frequent five cancers in Turkey (Female-2000).

Organs	No of Cases	Percentage (%)	Incidence Per (100.000)
Breast	3354	24.96	10.02
Stomach	836	6.22	2.50
Skin	797	5.93	2.38
Lung	692	5.15	2.07
Ovary	634	4.72	1.89
Other	7124	53.02	21.29
Total	13437	100.00	40.16

Table 3. The most frequent five cancers in Turkey (2000).

Organs	No of Cases	Percentage (%)	Incidence Per (100.000)
Lung	6079	18.19	8.97
Breast	3477	10.40	5.13
Stomach	2329	6.97	3.43
Skin	1832	5.48	2.70
Bladder	1582	4.73	2.33
Other	13548	40.54	19.98
Total	33419	100.00	49.29

enhanced by consultations with rehabilitation physicians and there was an obvious underuse of rehabilitation services. The reasons for underuse of rehabilitation services are reported as failure to identify functional impairments by acute care staff, lack of appropriate rehabilitation referral, lack of awareness of rehabilitation services and lack of knowledge among family members (11).

Cancer patients might have several problems that rehabilitation approaches are needed (12). These include fatigue and weakness, pain, mobility and self-care problems, lymphedema, myofascial pain, cognitive and communication deficits, bony metastatic disease, bony instability, brain metastasis, spinal cord metastasis, paraneoplastic neuromuscular syndromes, peripheral neuropathy, acute and late adverse effects of radiation therapy, adverse effects of chemotherapy, nutrition, dysphagia and speech deficits, sensory loss, wound and healing, bowel and bladder dysfunction, sexual function, dysfunction complications of disuse and bed rest, and deconditioning. We will give some brief examples of what rehabilitation professionals can offer to the patients with these problems (2,7,12). For instance, fatigue is the most distressing phenomenon experienced by cancer patients; therapeutic exercise training, diet therapy, sleep therapy, cognitive therapy and pharmacological therapy could be helpful. Endurance training which also considers the safety issues normalizes the physical condition and performance. Improvement of physical performance has also secondary benefits such as improved psychosocial status. Lymphedema is an important sequela of cancer treatment. Current rehabilitation treatment of this sequela include education of patients in precautions, positioning, exercise, compression garments and bandages, pneumatic pumps and lymphatic massage. Cancer patients with bone metastases frequently develop functional problems but appropriate rehabilitation interventions might help these individuals to become unnecessarily or prematurely bed-bound or dependent in ADLs. The principles of neurorehabilitation for patients with traumatic brain injury, stroke, and traumatic spinal cord injury are also appropriate for persons with brain and spinal cord tumors. These include the prevention of medical complications, treatment of medical problems such as pain, spasticity, and neurogenic bowel and bladder and the improvement in mobility and ADLs. It must be recognized that in these patients the durations for interventions might be shorter and the functional goals must be well defined. Lower motor deficits and sensory deficits may occur in advanced cancer from tumor invasion anywhere in the neural axis or may complicate anticancer treatment; in these patients therapeutic exercise, instruction in compensatory strategies and appropriate use of assistive devices help to enhance independence. Deconditioning which is characterized by generalized weakness and exertional intolerance is a common problem in cancer patients. Nutritional supplementation along with graded aerobic exercise might help functional restoration.

Stages and the Principles of Cancer Rehabilitation

Rehabilitation needs in specific tumor types might be different but the principles of rehabilitation programs are common. The rehabilitation goals of cancer patients are similar to those of patients with impairments caused by other diseases. They include obtaining independent mobility and independence in basic ADL, with or without assistive devices. Rehabilitation goals can be further defined according to when they are applied in the different stages of the disease (1,2). In preventive rehabilitation therapy the goal is to achieve maximal function in patients considered to be

cured or in remission. Supportive and restorative rehabilitation therapy are for patients whose cancer is progressing and the goals include providing adaptive self-care equipment, range of motion exercises and bed mobility techniques and all other preventive measures for the adverse consequences of immobility. The goals of palliative rehabilitation therapy are to improve or maintain comfort and function during the terminal stages of the disease. The application of orthoses, modalities, and assistive equipment can be useful as an adjunct to pharmacological pain management. There might occasionally be a need to change the rehabilitation interventions as the patients goes through the different stages of the disease. In the rehabilitation of patients with cancer there are definitely factors that can affect the achievement of rehabilitation goals (1). These factors include reduced life expectancy, extensive comorbidity, degree of pain interference, dynamic lesions, potential for rapid progression, demands and investment for concurrent antineoplastic therapy and nutritional needs. In addition to these factors, desire of the patient to spend time with loved ones, level of financial and domestic resources, vocational mandates to preserve insurance coverage, acceptance of the terminal status by the family and willingness to receive palliative care are also important (1).

Outcome of Cancer Rehabilitation

Rehabilitation is unlikely to restore a premorbid level of function but provides a reasonable degree of independence. Clinical experience suggests that application of fundamental principles of rehabilitation medicine improves the care of patients with cancer. But the development of evidence-based body of knowledge will ensure that these patients receive appropriate rehabilitation interventions.

The literature in this field demonstrate the need for cancer rehabilitation and the valuable contribution it can make to patients' functional status and quality of life. In 1991 O'Toole and Golden reported on 70 cancer patients admitted to a free standing rehabilitation hospital (13). They reported that 14% of their patients could ambulate independently on admission, while at discharge 80% were independent or needed supervision with ambulation. Bladder continence rose from 38% at admission to 87% at discharge. Patients were reevaluated 90 days postdischarge. Nineteen patients had died and 14 were lost to follow-up; but of the remaining 37, 20 had maintained or improved their functional level. Yoshioka (14) reported on a prospective six year study involving 301 terminal cancer patients in an inpatient hospice in Japan. The interventions was bedside or gym physical therapy consisting of appropriate positioning, range of motion, therapeutic exercise, bathing, bed mobility, transfers, modalities, swallowing training, and pneumatic compression. Of the 239 patients with ADL disturbances, the average transfer and locomotion score on the Barthel mobility index (maximum score=47) significantly increased from 12.4 to 19.9, for a mean increase of 7.5. Bedside or gym physical therapy worked best when there was good pain control, strong patient motivation and desire for improvement, and the ability to exercise or participate in physical therapy. Forty-six patients were able to go home for varying time periods because of improved ADL. Three months after patients' death, a satisfaction survey was sent to the families. Of the 169 responders, 98% were satisfied with hospice care, 78% were satisfied with the rehabilitation and 63% found rehabilitation program to be effective. Marciniak et al. (15) showed that patients with various cancers undergoing inpatient rehabilitation at a freestanding university-affiliated rehabilitation hospital achieved significant functional

gains across various diagnostic categories. More than half of the patients in this study had primary intracranial tumors. Patients with less social support, pain, and/or metastatic disease also showed significant improvements although this was less than patients who had none of the above. Patients who received radiation made the greatest functional improvement compared with those who did not receive radiation or had not completed radiation before rehabilitation. Patients with lung cancer had the least improvement. Mc Kinley et al. (16) investigated individuals with spinal cord tumors admitted to a spinal cord injury rehabilitation unit at a tertiary university medical center and found that these patients also achieved significant functional gains and maintained these gains up to three months after discharge. In a prospective study conducted at Mayo Clinic significant functional gains were observed in hospitalized cancer patients who received interdisciplinary rehabilitation services (Cancer Adaptation Team) services on a consultation basis (17). Pulyodil et al. (18) demonstrated the beneficial effect of comprehensive rehabilitation on functional outcome in children with residual disabilities after treatment of their primary brain tumors. Sliwa. (19) reported a case with paraneoplastic subacute cerebellar degeneration who experienced improvements in all functional activities after comprehensive inpatient rehabilitation and this case was suggested as a testimony to the value of rehabilitation in paraneoplastic syndrome. The efficacy of postacute brain injury rehabilitation for patients with primary malignant tumors was also shown before (20). In a study of hospice patients, Wallston et al. (21) reported that 22% of the patients with terminal cancer wished to be physically able to do as they chose even in the last three days of life. Answers to questionnaires showed that more than half of patients with terminal cancer complained about problems in performing ADLs and that about 88% of patients had a strong desire for mobility. Scialla et al (22) retrospectively examined the medical records of 110 weak, elderly inpatients with cancer asthenia at an acute care rehabilitation hospital who were transitioning from curative treatment toward palliative care. Their data suggested that physical and cognitive functioning may improve after comprehensive inpatient rehabilitation. In a recent study, 72 cancer survivors with different diagnoses were studied to examine the effects of a multidimensional 15-week rehabilitation program on cancer-related fatigue and rehabilitation was found effective in reducing fatigue (23). These studies definitely have limitations but they all address the role of rehabilitation in cancer patients and raise questions for future research.

Cancer is the second-leading cause of death in many countries and life time risk for an individual varies between 38% and 47% (24). These statistics show the need for comprehensive cancer rehabilitation programs. Depending on the above studies, we state that almost all individuals with cancer can benefit from rehabilitation evaluation and rehabilitation interventions. We suggest that musculoskeletal and cardiovascular models must be the basic approaches in the rehabilitation of these patients. There is an underuse of rehabilitation services for cancer patients across the world. In our country rehabilitation services for cancer patients are also limited. The reasons of this fact include the following suggestions; failure to identify functional impairments by the acute care staff, lack of appropriate rehabilitation referrals, lack of awareness of rehabilitation services, and lack of knowledge about such services among family members. In USA, the attempts to develop cancer rehabilitation services in many centers have been successful. There are indications that a strong administrative commitment and a strong communication with both medical and

surgical oncology departments are needed (25,26). A consultation service, followed by outpatient services and an inpatient rehabilitation service, need to be developed. The team approach helps to overcome challenges and expand such services. Additionally, educational and research activities should be initiated in order to implement a successful cancer rehabilitation program.

References

1. DeLisa JA. History of cancer rehabilitation. *Cancer* 2001;92:970-4.
2. Gillis TA, Gaden FH. Principles of cancer rehabilitation. In: Braddom RL, editor. *Physical Medicine & Rehabilitation*. 2nd ed. Philadelphia: W. B. Saunders; 2000. p. 1305-18.
3. T.C Sağlık Bakanlığı Kanselerle Savaş Dairesi Başkanlığı, *Kanser Bildirimlerinin Değerlendirilmesi*, 1983-2000.
4. Ganz PA. Quality of life and cancer rehabilitation. *Cancer Rehabilitation In the New Millennium: Opportunities and Challenges*. Memorial Sloan-Kettering Cancer Center, New York, June 4-5, 1999.
5. Ganz PA. The status of cancer rehabilitation in the late 1990s. *Mayo Clin Proc* 1999;74:939-40.
6. DeLisa JA. Cancer rehabilitation 20 years later. *Cancer Rehabilitation In the New Millennium: Opportunities and Challenges*. Memorial Sloan-Kettering Cancer Center, New York, June 4-5, 1999.
7. Gerber LH, Vargo M. Rehabilitation for patients with cancer diagnosis. In: DeLisa JA, Gans BM, editors. *Rehabilitation Medicine*. 3rd ed. Philadelphia: Lippincott-Raven Publishers, 1998. p. 1293-319.
8. Lehmann JF, DeLisa JA, Warren CG, deLateur BJ, Bryant PL, Nicholson CH. Cancer rehabilitation: assessment of need, development, and evaluation of a model care. *Arch Phys Med Rehabil* 1978;59:410-9.
9. Ganz PA, Coscarelli Schag CA, Heinrich RL. Rehabilitation. In: Haskell CM, editor. *Cancer Treatment*. Philadelphia: W. B. Saunders, 1990. p. 883-92.
10. Stafford RS, Cyr PL. The impact of cancer on the physical function of the elderly and their utilization of health care. *Cancer* 1997;80:1973-80.
11. Movsas SB, Chang VT, Tunkel RS, Shah VV, Ryan LS, Millis SR. Rehabilitation needs of an inpatient medical oncology unit. *Arch Phys Med Rehabil* 2003;84:1642-6.
12. Gerber LH. Cancer rehabilitation into the future. *Cancer* 2001;92:975-9.
13. O'Toole DM, Golden AM. Evaluating cancer patients for rehabilitation potential. *West J Med* 1991;155:384-7.
14. Yoshioka H. Rehabilitation of the terminal cancer patient. *Am J Phys Med Rehabil* 1994;73:199-206.
15. Marciniak CM, Sliwa JA, Spill G, Heinemann AW, Semik PE. Functional outcome following rehabilitation of the cancer patient. *Arch Phys Med Rehabil* 1996;77:54-7.
16. McKinley WO, Conti-Wynken AR, Vokac CW, Cifu DX. Rehabilitative functional outcome of patients with neoplastic spinal cord compression. *Arch Physical Med Rehabil* 1996;77:892-5.
17. Sabers SR, Kokal JE, Girardi JG, Falk Phillipott CL, Basford JR, Therneau TM, et al. Evaluation of consultation-based rehabilitation for hospitalized cancer patients with functional impairment. *Mayo Clin Proc* 1999;74:855-6.
18. Philip PA, Ayyangar R, Vanderbilt J, Gaebler-Spira DJ. Rehabilitation outcome in children after treatment of primary brain tumor. *Arch Physical Med Rehabil* 1994;75:36-9.
19. Sliwa JA, Thatcher S, Jet J. Paraneoplastic subacute cerebellar degeneration: functional improvement and the role of rehabilitation. *Arch Physical Med Rehabil* 1994;75:355-7.
20. Sherer M, Meyers CA, Bergloff P. Efficacy of postacute brain injury rehabilitation for patients with primary malignant tumors. *Cancer* 1997;80:250-7.
21. Walston KA, Burger C, Smith RA, RJ Baugher. Comparing the quality of death for hospice and non-hospice cancer patients. *Med Care* 1988;26:177-82.
22. Scialla S, Cole R, Scialla T, Bednarz L, Scheerer J. Rehabilitation for elderly patients with cancer asthenia: making a transition to palliative care. *Palliative Med* 2000;14:121-7.
23. van der Weert E, Hoekstra-Weebers J, Otter R, Postema K, sanderman R, van der Schans C. Cancer related fatigue: Predictors and effects of rehabilitation. *Oncologist* 2006;11:184-96.
24. American Cancer Society cancer facts and figures. Atlanta: American Cancer Society, 1993.
25. Grabis M. Integrating cancer rehabilitation into medical care at a cancer hospital. *Cancer* 2001;92:1055-7.
26. Schmidt KD. Cancer rehabilitation services in a tertiary care center. *Cancer* 2001;92:1053-4.