

Therapeutic rehabilitation of cancer patients. Why and what for?

*Prof. Marina F. Ballyuzek, MD PhD, Boris P. Stepanov, MD,
Anna K. Ionova, MD, Maria V. Mashkova, MD
Saint-Petersburg Clinical Hospital, Russian Academy of Sciences*



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ABSTRACT

Types of oncological rehabilitation and its objectives are described. It includes information on many manifestations of oncological diseases that an internist has to deal with, which are conditioned not only by the oncological process itself, but by the cancer treatment conducted, as well as the attitude of doctors and patients to cancer pathology. The specific characteristics of the “cancer disease” are described, as well as a combination of somatic disorders which depends on the ongoing or arrested tumor development. It is necessary for doctors to observe the cancer patients before, during and after treatment for complication of cancer or treatment over the life span.

KEY WORDS: cancer patients’ rehabilitation, oncological rehabilitation in therapists’ practice, paraneoplastic syndrome, cancer disease, somatic disorders accompanying oncological pathology

Correspondence:

Prof. Marina F. Ballyuzek, MD PhD
Department of Cardiology,
St. Petersburg Clinical Hospital of Russian Academy of Sciences
St. Petersburg, pr. Toreza 72, 194017, Russian Federation

Due to the introduction of high-technology methods, it has already become possible to radically cure many cancer patients, who would have been considered hopeless not so long ago. However, this often leads to patient's disability after extensive organ-removal surgeries combined with polychemo- and radiation therapies. Obviously, the increasing survival rate of cancer patients may mean that the coming years will see a dramatic increase in the number of disabled people in the remission stage, or those experiencing the heavy consequences of high-dose polychemotherapy (PHT) or radiation therapy (RT) in the periods between anti-cancer treatment sessions [1]. In this respect, the question arises as to who should deal with the cancer patient's problems after the surgeon and oncologist have done their part of the job. We think that this could be the task of a specialized oncological rehabilitation service.

It is widely recognized that rehabilitation of cancer patients should be all-inclusive, involving various treatment and impact methodologies. According to the current data, rehabilitation measures should begin at the diagnostic stage, continue in hospital and after discharge for minimum 1 to 5 years, which is the period determining many aspects of patients' life after radical treatment [2].

Currently, various directions for cancer patient rehabilitation have been identified and are being developed. Since the 1960's there have been attempts to attract attention to the necessity of behavioral psycho-social correction of cancer patients, by setting up support groups for them and their families, as well as by training and educating volunteers for taking care of such patient [3]. Since 1970's, due to the effort of numerous experts, a new direction, psycho-oncology, has been taking shape, which has united experts into the *International Psycho-Oncology Society* (IPOS). After analyzing the process of offering rehabilitation to cancer patients, J. Dietz (1981) singled out four rehabilitation types: preventive, restorative, supportive and palliative [1].

Cancer patient rehabilitation options are not restricted to psycho-social support; they are also determined by the objectives that were set by the *National Cancer Rehabilitation Planning Conference* [2], which involve a combination of treatment techniques aimed at:

- alleviating the symptoms in the post-operative period between the PHT courses and after the treatment, as well as pathological syndromes arising after debilitating surgeries
- treatment of asthenia of various genesis, restorative therapy between PHT courses, normalizing hematogenesis and protein deprivation, etc.

- treatment of various forms of systemic and organ deprivation, stimulation of humoral and neurohumoral immunity
- diagnosing and treatment of comorbidities
- implementation of rehabilitation measures alongside continuing PHT sessions.

Meanwhile, it is clear that the methods of cancer rehabilitation cannot be fully standardized. They are first and foremost determined by the combination of prognostic factors in each individual case. However, there are 3 rehabilitation groups tentatively distinguished at present: those with (a) favorable, (b) severe and (c) unfavorable prognosis. In the latter case, the task is to slow down the tumor process or use palliative treatment methods [1, 4, 5].

Based on these tasks, an Interdisciplinary Cancer Rehabilitation Team can include the following experts: physician, speech-language expert, rehabilitation nurse, social worker, physical therapist, psychologist, occupational therapist, chaplain, prosthetist-orthotist, nutritionist and recreational therapist and vocational counselor [6].

However, in practice, when establishing cancer rehabilitation service the question often arises as to who should be the chief coordinator in arranging this customized rehabilitation program for an individual patient. The logical answer is that it should be the rehabilitator. But who should the rehabilitator coordinate his efforts with during this ongoing long-term process? Is it only with the oncologist? Because aside from the high-tech, specialized, combined treatment of the malignant tumor itself, there are the possible patient's polymorbidity background as well as the very concept of "cancer disease" to be considered. The concept of this special form of pathology was formulated in the early 20th century by the Russian oncologist N.N. Petrov [7, 8]. He used this term to refer to a number of various general disorders in homeostasis and reactivity of the organism, which naturally develop in virtually all patients with malignant tumors at certain stages of the disease, irrespective of the localization and nature of the primary problem. The task of timely diagnosis and correct treatment both the comorbidities and the symptoms of the proper "cancer disease" can in many cases lie within the professional scope of therapeutic treatment.

Given that the "cancer disease" is a complex of somatic disorders, based on our ten-year experience at the Department of Therapy and Cardiology of the RAS Hospital at Saint-Petersburg, we suggest the following provisional classification of these disorders depending on their causes [9]:

- I. pathological conditions directly caused by the tumor process
- II. pathological conditions caused by the tumor treatment consequences
- III. pathological conditions with no direct connection to the localization of the primary tumor and/or its metastasis
- IV. pathological conditions arising in patients cured from cancer disease, which are mistakenly interpreted as cancer recurrence.

Within each of the above groups, the following causes are distinguished:

I. Pathological conditions directly caused by the tumor process:

1. Organ compression, their invasion or closure of lumen. The most typical clinical examples include: obstructive jaundice, intestinal obstruction, disorder of ventricular patency, bronchial obturation with atelectasis, obturative pneumonia or compression of lung tissue by pleural effusion, precava compression syndrome, development of uterine obturation with hydronephrosis and uro-obstructive pyelonephritis, etc. An exceptional role is played by the pain syndrome which is primarily due to the neoplasm manifestation.
2. Displacement of organ parenchyma with tumor masses: liver or respiratory failure due to displacement of parenchyma with tumor masses; pancytopenia due to metastatic affection of bone marrow; ossalgic syndrome due to dissemination of tumor in bones.
3. Pathological processes caused by tumor lysis are usually manifested by infection of the tumor and hemorrhage, while lysis of the tumor of the hollow organ can lead to its perforation.
4. Symptoms caused by functional changes in the organs affected by the tumor process. For instance, the dyspeptic syndrome, syndromes of malabsorption and maldigestion in combination with diarrhea, cough, hemoptysis, dyspnea, etc.

The pathological changes listed above are quite common and often come in combination with each other, which means that special therapeutic and surgical manuals are due. The main task of the therapist is timely and correct evaluation of the patient's condition, coordination and organization of interdisciplinary medical care. Quite often this helps "to return the patient on the road" of anti-tumor treatment in seemingly hopeless situations.

II. Pathological conditions caused by tumor treatment are also variable and not only require the so-called accompanying therapy aimed against the most frequent and dangerous PHT complications (neutropenia, anemia, nausea) [13], but also the prophylaxis and treatment of early and long-term cardiologic complications, which are less frequent but no less dangerous [10].

The manifestations of cardiac toxicity depend not only on the proper cancer treatment, but on such factors as the patient's age, previous cardio-vascular pathologies, risk of developing cardiovascular diseases [11]. For this reason, all patients suffering from cancer disease who have received PHT and RT should be dynamically observed by an expert cardiologist for many years after the treatment.

When administering symptomatic drug therapy, we should consider the possibility of severe, terminal complications. Moreover, besides the well-known complications, such as NSAID gastroenteropathy, there are much less common complications, which are no less severe but have clinical manifestations not immediately obvious for the oncologists in charge. For instance, we have observed a patient suffering from prostate cancer, who developed gastric candidiasis and gastric wall microperforation leading to an abscess into abdominal cavity, against the background of long-term glucocorticoid therapy on account of his neurological disorders due to metastatic affection in conditions of immunodeficiency.

III. Systemic pathological tumor manifestations, or the so-called paraneoplastic syndromes (PNS) caused by neoplasms but having no direct connection to the localization of the primary tumor and/or its metastasis.

The causes of PNS are various and difficult to diagnose, especially by narrow specialists. They include the following factors:

1. Production of various substances (hormones, some growth factors, cytokines, antibodies) by the so-called APUD tumor.
2. Absorption by the tumor of substances necessary for the organism.
3. Development of anti-tumor immune response of the autoimmune type.

The characteristic feature of PNS is that they can be the first tumor manifestations, even before the local symptoms develop. Thus, recognizing these syndromes allows early diagnosing of an oncological disease, and with tumors secreting protein

substances we can control the tumor treatment based on these substances levels. Secondly, PNS development aggravates the patient's condition, preventing anti-tumor treatment. As a rule, PNS disappear after the tumor is cured and are renewed during the recurrence, but sometimes the syndromes do not disappear after the treatment stops, which is especially true of those having immune nature. In some cases, when the tumor is incurable, the PNS complications can only be stopped symptomatically. PNS are variable and divided into: systemic, gastro-intestinal, metabolic, endocrine, nephritic, hematological, coagulopathic, dermatological, neurological and mixed. They differ in occurrence and clinical significance [12]. One of the most significant PNS manifestations is the cachexia/anorexia syndrome, which is one of the main reasons for weight loss dramatically worsening the prognosis [12, 13]. Patients who have lost more than 10% of their body weight during the disease period have been reliably proved to have reduced survivability due to the added infections and slow wound repair. Besides, such patients have much worse chances for undergoing chemotherapy [12]. When treating this syndrome, it is essential to be aware of the peculiarities of metabolic disorders in cancer patients, as well as current methods of nutritional support [13].

One more common and metabolically significant disorder in cancer patients is the syndrome of protein-losing enteropathy [14]. In order to provide proper care for such patients it is necessary to know the details of how proteins are absorbed in the intestines, as well as the diagnostics and treatment methods in this case.

Paraneoplastic manifestations are often localized on skin. There are several kinds of dermatosis known that accompany malignant tumors; however, not all of them have the same diagnostic value. Among the dermatological PNS of most clinical value are the following: black acanthosis, erythema annulare centrifugum, dermatitis herpetiformis, prurigo in adults, nodal fever and panniculitis [12, 15]. Awareness of these "visual" dermal manifestations allows the internist to not only suspect the presence of the cancer disease but also suggest its possible localization.

In terms of changes in hematopoietic tissues and the homeostatic system, patients suffering from malignant tumors localized beyond these systems most frequently show the following manifestations: anemia, thrombocytopenia, erythrocytosis, thrombocytosis, eosinophilia, hyperleukocytosis, bone marrow plasmocytosis, lympho-adenopathy, hypercoagulation syndrome and Trousseau's syndrome (redundancy of thrombo-

genic factors caused by fibropeptide A produced by the tumor, which is manifested by paraneoplastic thrombosis and thrombophlebitis). A classic example in this case is erythrocytosis and thrombocytosis with kidney cancer [16]. It is also important to remember that with cancer patients, leukocytosis is not always caused by infection, and anemia by loss of blood. Understanding this requires revealing real causes of blood system disorders, and deciding whether therapy is needed at all, and if it is, what it should be.

A whole range of neoplasms originating from non-endocrine organs is accompanied by endocrine-like clinical pattern [12, 17]. We treated a patient with lung tumor whose first symptoms involved the syndrome of ectopic production of antidiuretic hormone (ADH), in combination with paraneoplastic nephropathy complicated by the nephritic syndrome. With this patient, even computer tomography did not reveal any tumor in his lungs at the debut stage, and only two months later, the second tomography allowed diagnosing him with lung cancer. In clinical practice, we also come across cancer diseases under the guise of fever [18–20] and rheumatism. The latter are manifested in various ways, by syndromes and syndrome complexes, similar to diffuse diseases in connective tissues, metabolic arthropathy and other bone and muscle tissue disorders [21–23]. The most typical and frequent PNS belonging to this group is assumed to be hypertrophic osteoarthropathy, caused by periostitis and bone structure neoplasms [24]. We have several times observed gastric cancer that had polyosteoarthritis symptoms.

Alongside rheumatologic syndromes, there are also nephritic and many neurological syndromes; all of them aggravate the cancer disease and hamper chemotherapeutic treatment [12, 25].

IV. Pathological conditions with no direct connection to the cancer disease, which are of "background" nature or arise in patients having cancer in their anamnesis. Unfortunately, in practice we see that experts in all fields are dependent upon the oncological diagnosis, so very often these pathological conditions are considered as recurrence of tumor and, consequently, the patient does not get any timely and adequate treatment, and sometimes no treatment at all. Unfortunately, this problem is not much discussed, even in special medical literature, because oncologists are primarily concerned with professional questions pertaining to their field. Meanwhile, clinical examples prove that under the guise of cancer, most grievous medical errors are made.

Here is one more clinical example from our own experience: *Successful surgery was performed on a woman, 45 years old, who was admitted with acute weight deficit, in the condition of protein and caloric deficiency and with symptoms of ongoing intestinal obstruction. The patient was refused admittance to a number of city hospitals as well as the clinic where she had had gastric cancer surgery a year earlier. We had a problem explaining to the relatives that the patient needed urgent surgery, because they had been unequivocally told that only symptomatic treatment was possible in her case. Nevertheless, during the operation adhesive obstruction was revealed, with no signs of the tumor process. As a result of successful surgery and after correcting some metabolic disorders through intensive nutritive support, the patient was effectively discharged.*

One more demonstration of therapeutic rehabilitation of the “condemned” cancer patients is the following **clinical example**:

A woman of 65, who had several years earlier undergone treatment of breast cancer, was admitted to one of the city hospitals on account of increasing weakness and dyspnea; X-ray examination revealed double-sided exudate into the pleural cavities, while cytological examination of the pleural liquid suggested presence of adenocarcinoma cells. The patient was discharged with a reference to the oncologist. During examination at our hospital, atrial fibrillation was revealed, as well as high D-dimer level, signs of pulmonary hypertension on the echocardiogram; multispiral CT with contrasted pectoral organs revealed direct signs of double-sided thromboembolism. The thromboembolism was caused by thrombosis of deep veins in her lower limb, which occurred after a lengthy car trip. Conducting the required therapy resulted in the resolution of embolism and pleuritis. No signs of recurrence of cancer were revealed.

Unfortunately, oncologists are often focused on diagnosing and treating the malignant tumor itself, and are in no hurry to recommend their patients to contact other experts, and therapists in particular. The patients themselves, experiencing the burden of their oncologic diagnosis, are not inclined to think about any other health problems. Thus it often happens that, unless the rehabilitation program is started immediately, and by a team including a therapist, the patients comes under internists' observation too late, at the last stages of the disease.

The analysis of the work experience of our clinic shows that out of the 980 cancer patients that have received treatment at the therapeutic department during the last ten years, only 231

patients (23.6%) have been admitted on direct reference from oncological institutions; out of the latter, 198 (85.7%) were in the terminal or pre-terminal stage. This only serves to prove that both the oncologist and the cancer patient, who is under the pressure of his diagnosis, do not have any intention to go beyond treating the malignant pathology. Meanwhile, in 51 patients (25.8%) with such seemingly prominent stages of the disease, the grievousness of their condition was not so much caused by the tumor process, but rather by a comorbid pathology, which allowed them, after the corresponding treatment, to return to the cancer treatment they had been taking. With 19 patients (9.6%), there was no active oncological process revealed at all.

Thus, in our opinion, in the resolution of a fossilized medical error proclaiming that “oncological patient is the oncologist's patient”, the main role should belong to internists as experts, who possess a wider range of medical knowledge and are able to evaluate all the nuances of the clinical symptomatics, conduct the necessary differential diagnostics and collectively choose an adequate treatment strategy.

The main task of the entire complex of treatment and rehabilitation measures is to restore the patients' ability to continue special anti-tumor therapy, improve their life quality in physical and psychological terms and, in the best case, to achieve complete recovery. That is why cancer patients should not be deprived of the opportunity to get complex medical help, including rehabilitation.

It should be emphasized that not only do disabled patients need rehabilitation, but also those at the I–II stages of the disease, who have undergone radical treatment, because the cancer diagnosis is always stressful, while the treatment involved is often damaging for health.

In summary, we would like to stress once more, that, unfortunately, rehabilitation of cancer patients is taking a lot of time to develop as a separate scientific and social trend. Meanwhile, today this problem demands urgent solution and more attention not only in the Russian Federation, but in many other countries of the world.

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Authors' contributions:

Idea & design of the article – Marina F. Ballyuzek.
Clinical data collection – Marina F. Ballyuzek, Boris P. Stepanov, Anna K. Ionova, Maria V. Mashkova.
Analysis of the data – Marina F. Ballyuzek, Boris P. Stepanov.
Writing the manuscript – Marina F. Ballyuzek, Maria V. Mashkova.