



## Education

---

### *Education*

---

From the \*Ottawa Regional Cancer Centre, Ottawa, Ont.; the Departments of †Psychology and ‡Social Work, Ottawa Hospital, Ottawa, Ont.; and the §Department of Prevention and Rehabilitation, University of Ottawa Heart Institute, Ottawa, Ont.

*This article has been peer reviewed.*

CMAJ 1999;161:282-5

# Oncology Rehabilitation Program at the Ottawa Regional Cancer Centre: program description

**Roanne Segal,\* MD; William Evans,\* MD; Darren Johnson,\* MSc; Julie Smith,\* BSc; Salvatore P. Colletta,† PhD; Linda Corsini,‡ MSW; Robert Reid,§ PhD, MBA**

---

## Abstract

---

THE OTTAWA REGIONAL CANCER CENTRE OFFERS AN ONCOLOGY REHABILITATION PROGRAM to patients with cancer. Between January 1997 and December 1998, 254 patients with cancer participated in the program. This paper describes the program and its participants. The program's strengths, limitations and future directions are also discussed.

**M**any cancer patients live with significant morbidity caused by the disease and its treatment. The cancer diagnosis itself and treatment-induced fatigue, nausea, anxiety and depression may lead to a low mood state. Such patients face a decrease in health-related quality of life and a level of disability out of proportion with what might be expected.<sup>1-8</sup> Many patients require additional support for their psychosocial and physical needs.

Rehabilitation has been defined as the process by which a person is restored to an optimal physiological, psychological, social and vocational status.<sup>9</sup> Although rehabilitation programs for patients with clinical conditions such as heart disease are considered standard care,<sup>10</sup> the use of such programs for patients with cancer has been limited.

In January 1997 the Ottawa Regional Cancer Centre (ORCC) began to offer an Oncology Rehabilitation Program to patients with cancer. The primary goal of this program is to improve the quality of life, functional performance and psychosocial adjustment of patients with cancer who are undergoing active therapy. The purpose of this paper is to describe the Oncology Rehabilitation Program and its participants to date.

## Program description

### *Physical facilities*

The Oncology Rehabilitation Program is housed in a 600-m<sup>2</sup> facility at the ORCC. An indoor walking and jogging track, a group exercise area, free weights and an array of strength and aerobic training machines are available. Locker rooms, showers and change areas are located next to the rehabilitation area. Emergency equipment, including an emergency drug kit, a defibrillator, oxygen and a stretcher, is available within the rehabilitation facility. A cardiac arrest team based at the adjacent Ottawa Hospital — General Site is available to respond in medical emergencies.

### *Referral and preassessment*

Participants in the Oncology Rehabilitation Program are self-referred or are referred by allied health professionals and treating physicians.

The medical director of the program reviews in detail the patient's past and current medical conditions to determine his or her suitability for participation. Contraindications to participation include uncontrolled and unstable cardiac disease, active psychiatric conditions, and certain conditions related to the patient's cancer,



either from the primary tumour, from metastatic disease or from therapy. Specific oncologic conditions that might preclude participation relate to the extent of the tumour or the site of metastatic lesions (e.g., the skeleton) and include tumour-related syndromes such as coagulopathies. If the cancer has produced a complication or a change in the disease status, these issues become a priority and require a treatment intervention or decision prior to initiating or continuing the exercise program. If deemed appropriate, the patient is asked to undergo further testing (e.g., bone scanning or cardiac diagnostic procedures) to establish that there has been no recent progression of the disease and to rule out important comorbidity (such as cardiac disease or uncontrolled hypertension) that could affect the ability to exercise and the patient's response to the program.

If the patient is eligible for participation, an exercise specialist (an exercise physiologist with a relevant degree) completes a compulsory physical fitness assessment and an optional nutritional assessment and determines baseline values for health-related quality of life. Height, weight, the sum of skin folds from 4 sites (biceps, triceps, suprailiac and subscapular muscles), and optional muscle strength and endurance measures are recorded. Functional capacity is determined with a modified version of the Canadian Aerobic Fitness Test.<sup>11</sup> Health-related quality of life is assessed with the SF-36 health survey instrument developed at the New England Medical Center.<sup>12</sup>

### Programs available

After the preprogram assessment, each patient is given an individualized exercise program, which typically consists of cardiovascular or progressive resistance exercise training, or both. The individualized program details the appropriate frequency, intensity and duration of exercise, which are based on the medical evaluation, the patient's history, the baseline fitness measures and the patient's goals.

Participants can choose to attend a variety of supervised exercise classes or individual exercise sessions at the ORCC. Hour-long exercise classes are led by certified exercise leaders, and participants typically attend 3 classes a week for an average of 26 weeks. The exercise classes are structured into different levels, with a participant's exercise level depending on the workload achieved during exercise testing and his or her medical stability, as well as previous exercise training. Each class accommodates all levels of ability or exercise intensity; participants must adhere to their individual exercise prescription aimed at a specific intensity. Attendance at group exercise classes is monitored and recorded.

Approximately half of the participants choose to participate in a self-directed program at home or in community facilities with the guidance of the program's certified exercise specialists. Nutritional counselling is also available for people whose body mass index meets the definition of obesity and for people who wish to review their caloric intake and nutritional requirements.

## Program results

Between January 1997 and December 1998, 261 patients with cancer were referred to the Oncology Rehabilitation Program. Four people were deemed ineligible for participation because of severe thrombocytopenia (blood platelet count of less than  $1000 \times 10^9/L$ ; 1 patient), recent intracranial hemorrhage (1 patient), unstable angina (1 patient) and recent deep vein thrombosis with pulmonary embolus (1 patient). Fifteen patients (5%) required further testing to determine whether there had been recent progression of the cancer or to rule out important comorbidity. In 4 of these patients, the disease had progressed, and they were referred back to their treating oncologist (1 of these subsequently joined the program). Therefore, a total of 254 patients (Table 1) were admitted to the program in its first 2 years.

During that 2-year period, the ORCC provided treatment for 8423 new cases of cancer. In addition to the 261 patients referred for rehabilitation, 110 patients were recruited by the Oncology Rehabilitation Program to participate in a randomized controlled trial of exercise during adjuvant therapy in stage I and II breast cancer. Thus, in the first 2 years of operation of the Oncology Rehabilitation Program, just over 4% of the eligible cancer patients (371/8423) used the services of the program.

Most of the program participants (214 [84.3%]) were women, and approximately equal proportions were either working (78 [30.7%]) or on some form of disability leave (84 [33.1%]). About half of all participants (53.5%) reported that they had been involved in a program of regular physical activity before their diagnosis. The others (46.5%) reported no regular physical activity before participation in the Oncology Rehabilitation Program.

**Table 1: Demographic characteristics of 254 participants in the Oncology Rehabilitation Program, January 1997 to December 1998**

Characteristic	No. (and %) of participants*
<b>Mean age, yr (and SD)</b>	51.3 (11.1)
<b>Sex</b>	
Male	40 (15.7)
Female	214 (84.3)
<b>Post-secondary education</b>	168 (66.1)
<b>Employment status</b>	
Currently working	78 (30.7)
Unemployed	36 (14.2)
On disability leave	84 (33.1)
Retired	56 (22.1)
<b>Marital status</b>	
Single	27 (10.5)
Married	172 (67.7)
Divorced	27 (10.6)
Separated	15 (5.9)
Widowed	13 (5.1)

Note: SD = standard deviation.  
\*Except where indicated otherwise.



Information about the type of cancer by disease site, stage and treatment status of participants is provided in Table 2. Over the first 2 years, most participants (173 [68.1%]) were women with breast cancer. About 75% of all participants had stage 0 to stage II disease. Few patients with advanced or metastatic disease participated, although the number of such patients grew over the first 2 years, as staff gained experience with this patient population. Half of the patients (128 [50.4%]) participated while they were undergoing active treatment with chemotherapy or radiation therapy, or both. Almost 20% of participants had completed their active treatment more than 6 months previously, which indicates that the rehabilitation needs of patients do not disappear after completion of active medical therapy.

## Assessment of the program

### Strengths

Several strengths of the Oncology Rehabilitation Program have been recognized. The ORCC is fortunate to have a large, well-equipped exercise facility on site to accommodate the Oncology Rehabilitation Program. The program is individualized so that the particular needs of each patient (e.g., weight loss, fatigue or strength loss) can be addressed. In addition, the individualized program may be carried out in the home, in a community setting or under staff supervision at the ORCC. The results thus far show that patients with a variety of cancers at various stages

of illness (including some with advanced disease) can safely participate in a program of structured physical activity; no adverse events have been recorded. The program appeals equally to patients who report being active and those who were inactive before their diagnosis. The rehabilitation facility and classes have served as an informal forum where people with cancer can obtain support from peers and the program staff. Participants frequently mention that the program gives them a greater sense of control and makes them feel more actively involved in their cancer treatment and its outcomes.

Experiences from other oncology rehabilitation programs have been reported previously. In those studies, physical activity had a salutary effect on key physical and psychological components of health-related quality of life, including state anxiety, depression, general mood, self image, weight gain, functional capacity and degree of nausea.<sup>13-17</sup> Aerobic exercise is useful in preventing loss of physical performance in cancer patients after myelotoxic chemotherapy and may reduce chemotherapy-related complications and length of stay in hospital after peripheral blood stem cell transplantation.<sup>18-20</sup>

### Limitations

Program limitations must also be identified. The evidence base for rehabilitation in patients with many types and stages of cancer remains poor or nonexistent. As a result, guidelines for exercise prescription are limited in scope.<sup>21-24</sup> Although the program appeals equally to previously physically active and inactive patients, it currently attracts only a small portion of the total population of patients with cancer. There is a need to better accommodate patients who are working or who are returning to work during treatment. Accessibility issues (such as travel distance, the cost of parking and the lack of child care facilities) have discouraged some patients from becoming involved.

### Future directions

Structured rehabilitation has the potential to blunt some of the negative side effects of cancer treatment, particularly reduced functional capacity and health-related quality of life. To obtain new information about the best way to provide these services and to objectively evaluate the Oncology Rehabilitation Program, we are now conducting a clinical trial to compare the effects of home and supervised exercise with usual care in patients with stage I and II breast cancer receiving adjuvant therapy.

To date, efforts have focused primarily on exercise training and activity prescription. Plans are also under way to expand the program to address other areas such as modification of risk factors (through such means as nutrition education, weight control and smoking cessation) and psychosocial and vocational evaluation and counselling.

Competing interests: None declared.

**Table 2: Type of cancer, stage and treatment status of the 254 program participants**

Variable	No. (and %) of participants
<b>Type of cancer</b>	
Breast	173 (68.1)
Gynecological	13 (5.1)
Genitourinary	10 (3.9)
Hematological	17 (6.7)
Lung	11 (4.3)
Gastrointestinal	10 (3.9)
Other	18 (7.1)
<b>Disease stage</b>	
0	19 (7.5)
I	62 (24.4)
II	109 (42.9)
III	23 (9.1)
IV	38 (15.0)
<b>Treatment status</b>	
Pretreatment	34 (13.4)
On treatment	128 (50.4)
Post-treatment	
< 6 mo	43 (16.9)
6-12 mo	15 (5.9)
> 12 mo	34 (13.4)



## References

1. Blasco T, Bayes R. Adaptation to illness in cancer patients: a preliminary report. *Eur J Psychol Assess* 1992;8(3):207-11.
2. Bliss JM, Robertson B, Selby PJ. The impact of nausea and vomiting upon quality of life measures. *Br J Cancer* 1992;19(Suppl):514-22.
3. Aaronson NK. Assessment of quality of life and benefits from adjuvant therapies in breast cancer. *Recent Results Cancer Res* 1993;127(201):201-10.
4. Busch P, Schwendener P, Leu RE, von Dach B, Castiglione M. Life quality assessment of breast cancer patients receiving adjuvant therapy using incomplete data. *Health Econ* 1994;3(4):213-20.
5. Carlsson M, Hamrin E. Psychological and psychosocial aspects of breast cancer and breast cancer treatment. A literature review. *Cancer Nurs* 1994;17(5):418-28.
6. Greer S. Psychological response to cancer and survival. *Psychol Med* 1991;21(1):43-9.
7. Kurtz ME, Kurtz JC, Given CW, Given B. Loss of physical functioning among patients with cancer. *Cancer Pract* 1993;1(4):275-81.
8. Watson M, Greer S, Rowden L, Gorman C, Robertson B, Bliss JM, et al. Relationships between emotional control, adjustment to cancer and depression and anxiety in breast cancer patients. *Psychol Med* 1991;21(1):51-7.
9. World Health Organization Expert Committee on Disability Prevention and Rehabilitation. *Rehabilitation of patients with cardiovascular disease: report of a WHO expert committee*. no 270 of *Technical reports series*. Geneva: The Organization; 1964.
10. American Association of Cardiovascular and Pulmonary Rehabilitation. *Guidelines for cardiac rehabilitation programs*. Champaign (IL): Human Kinetics; 1991.
11. Jett M. *Canadian standardized test of fitness: operations manual*. Ottawa: Fitness and Amateur Sport Canada; 1986.
12. Ware JE, Donald-Sherbourne C. The MOS 36-item short form health survey (SF-36): conceptual framework and item selection. *Med Care* 1992;30(6):473-83.
13. Goodwin P, Esplen MJ, Butler K, Winocur J, Prichard K, Brazel S. Multidisciplinary weight management in locoregional breast cancer: results of a phase II study. *Breast Cancer Res Treat* 1998;48:53-64.
14. Mock V, Burke MB, Sheehan P, Creaton EM, Winningham ML, McKenney S, et al. A nursing rehabilitation program for women with breast cancer receiving adjuvant chemotherapy. *Oncol Nurs Forum* 1994;21(5):899-907.
15. Shea B, Kleban R, Knauer CJ. Breast cancer rehabilitation. *Semin Surg Oncol* 1991;7(5):326-30.
16. Winningham ML. Walking program for people with cancer. Getting started. *Cancer Nurs* 1991;14(5):270-6.
17. Young MS, Sexton DL. A retrospective investigation of the relationship between aerobic exercise and quality of life in women with breast cancer. *Oncol Nurs Forum* 1991;18(4):751-7.
18. Dimeo F, Bertz H, Finke J, Fetscher S, Mertelsmann R, Keul J. An aerobic exercise program for patients with haematological malignancies after bone marrow transplantation. *Bone Marrow Transplant* 1996;18:1157-60.
19. Dimeo F, Fetscher S, Lange W, Mertelsmann R, Keul J. Effect of aerobic exercise on the physical performance and incidence of treatment related complications after high-dose chemotherapy. *Blood* 1997;90(9):3390-4.
20. Dimeo F, Tilmann MHN, Bertz H, Kanz L, Mertelsmann R, Keul J. Aerobic exercise in the rehabilitation of cancer patients after high dose chemotherapy and autologous peripheral stem cell transplantation. *Cancer* 1997;79:1717-22.
21. Hicks JE. Exercise for cancer patients. In: Basmajian JV, Wolf SL, editors. *Therapeutic exercise*. Baltimore: Williams and Wilkins; 1990. p. 351-69.
22. Mock V. The benefits of exercise in women with breast cancer. In: Dow KH, editor. *Contemporary issues in breast cancer*. Sudbury (ON): Jones and Bartlett; 1996. p. 99-106.
23. Winningham ML, MacVicar MG, Burke CA. Exercise for cancer patients: guidelines and precautions. *Phys Sports Med* 1986;14:125-34.
24. Winningham ML. Exercise and cancer. In: Goldberg L, Elliot DL, editors. *Exercise for prevention and treatment of illness*. Philadelphia: FA Davis Company; 1994. p. 301-15.

**Reprint requests to:** Dr. Roanne Segal, Ottawa Regional Cancer Centre, 501 Smyth Rd., Ottawa ON K1H 8L6; fax 613 247-3511; [Roanne\\_Segal@cancercare.on.ca](mailto:Roanne_Segal@cancercare.on.ca)