

---

# Exercise:

## A Prescription for Cancer Patients

Already recognized for its powerful influence on human wellness, exercise has been identified as an invaluable asset for the cancer recovery process.

By Aly Abdulla, BSc, MD, LMCC, CCFP, DipSportMed,  
and Faiza Abdulla, CDA

---

The benefits of exercise are being promoted for healthy individuals, are becoming the mainstay of cardiac rehabilitation, and are being promoted as the wellness option for our aging population.<sup>1</sup>

There has been such tremendous advances in these categories that exercise is now being promoted as an asset in the field of cancer recovery. Subjectively speaking, many initial skeptics scoffed at the development of an exercise regimen in the milieu of chemotherapy, doctor's appointments, and vacillating psyches.

Fatigue, nausea, tiredness, too little time, imminence of death, a weak immune system, pain, depression and anxiety, have all been cited as reasons against the introduction of exercise regimens for cancer patients. In fact, the above conditions have all become the very reasons why exercise is so valuable for the cancer recovery process.

This article will look at a review of two well-known clinical studies on this topic, the benefits of exercise in cancer recovery and the development of an exercise regimen for cancer patients.

---

## Exercise for Cancer Patients



### Clinical Trials

Prior to the mid-1980s, there was very little information on the topic of exercise and cancer. The focus during that time in oncology management was surgery, radiation, chemotherapy and palliative care. We wanted to cut the cancer out, poison it, or fry it with radiation, or accept the defeat and painlessly allow life to slip away. We have come a long way since those reactionary days. Winningham

was involved in the early work of aerobic interval training in cancer survivors.<sup>2</sup> His intent was to ameliorate the symptoms of the treatment protocols and improve patients' functioning. His program, eponymously called the WAIT protocol (Winningham Aerobic Interval Training), involved individualized aerobic exercise regimens for cancer survivors post therapy.<sup>2</sup> He found a remarkable improvement in functional status.<sup>2</sup> Durak went on to develop a modified



Dr. Abdulla is medical director and sports medicine specialist, Kingsway Health Centre, Toronto, Ontario.



Ms. Abdulla is executive director, Kingsway Health Centre, Toronto, Ontario.

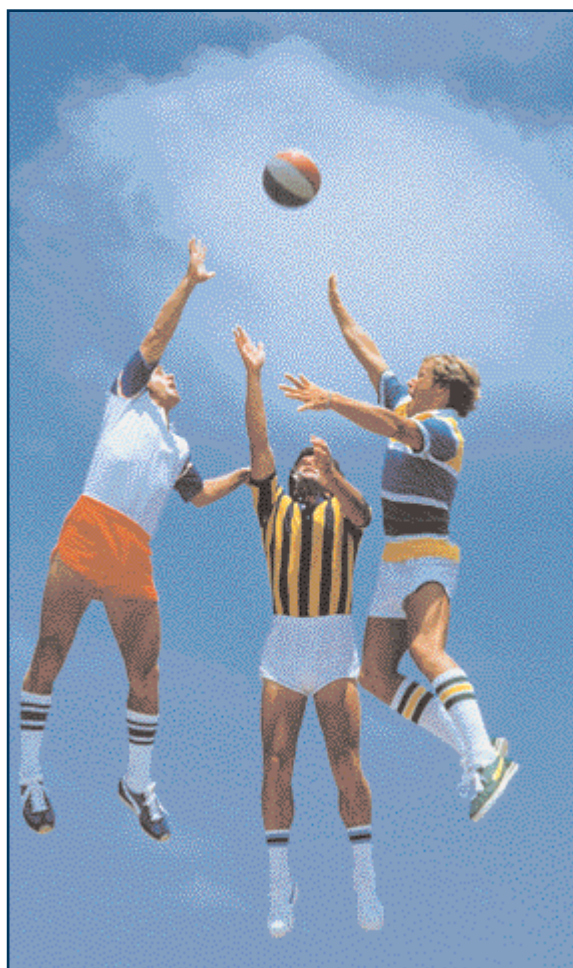
---

strength-training program in the same type of population to improve function and quality of life.<sup>3,4</sup> In fact, Durak's patient groups, with only stage 1 to stage 2 cancers, improved their strength, endurance, and their well-being scores.<sup>3,4</sup> These two examples of well-developed clinical studies in a burgeoning field are merely the tip of the proverbial iceberg as we review the benefits of exercise in cancer patients' recovery. The primary focus of this type of research was focused on cancer survivors and the promotion of "the healthy lifestyle".<sup>5</sup>

### Benefits

The two clinical trials discussed above and the next few listed below initially dealt with the most obvious correlations to exercise and cancer patients in their post-treatment course. The goals of exercise in the rehabilitation phase of cancer survivors in these trials were as follows:

- The amelioration of symptoms, such as nausea, by better tolerating medications;<sup>2,6</sup>
  - Reducing tiredness and fatigue (caused by low cell counts, asthenia, reduced cardiovascular and pulmonary function, muscle weakness and atrophy) by improving energy levels;<sup>7</sup>
  - Pain reduction through muscular strengthening;<sup>3-4,7</sup>
  - Dealing with depression and anxiety symptoms (like body image concerns, decreased self-esteem, difficulty sleeping, loss of the sense of control, and social isolation) through a sense of belonging;
  - Pro-active self-determination, the ability to enjoy life a better quality of life.<sup>8-10</sup>
- The next level of sophistication dealt with



**There is evidence that physical activity improves the immune system in healthy individuals.**

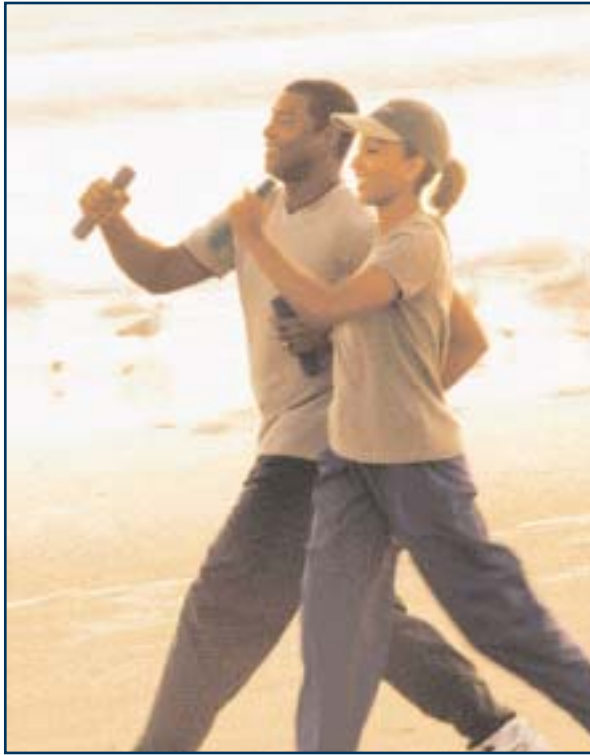
whether there was a change in the immune system and/or the hormonal levels and how this affected the survival rates of cancer patients.<sup>11-15</sup>

There is evidence that physical activity improves the immune system in healthy individuals.<sup>16-18</sup> Peters and colleagues<sup>11</sup> were able to demonstrate that moderate aerobic exer-



---

## Exercise for Cancer Patients



**As we have seen, most exercise regimens for the cancer population are based on an aerobic program involving either walking or the use of a stationary bike.**

cise was able to improve immune system function in the cancer group by positively improving the function and activity of natural killer cells. Pederson<sup>12</sup> postulated that exercise, over the long term, improved and increased specific immune system agents that had a protective effect on the whole body. In the area of exercise and hormone alterations, Kramer<sup>13</sup> has discussed regular exercise as a

way of maintaining normal body fat and, therefore, modulating circulating estrogen levels. The hypothesis involves lower circulating estrogen, and, therefore, lower risk of estrogen-dependent cancers, such as breast cancer.<sup>13-15</sup> Both of these new areas of research will further assist in the development of health and fitness programs for the cancer population.

### **Exercise Regimen**

As we have seen, most exercise regimens for the cancer population are based on an aerobic program involving either walking or the use of a stationary bike.<sup>2,6-15</sup> This is an excellent starting point and the authors would like to further define this component of the exercise regimen.

As well, the authors would like to incorporate the strength-training work of Durak<sup>3,4</sup> and the American College of Sports Medicine's Manual for exercise prescription for a "frail" population.<sup>1,19</sup>

All exercise regimens should involve at least the following components, as follows:

1. Aerobic/endurance training—this is an excellent warm-up and cool-down component and should last for 15-20 minutes in total. The author likes to provide many options for activities to pique interest, such as treadmills, stationary bike, step machines, rowing machines, swimming, walking, aerobics, etc.

It is best to stay with one activity for at least a few weeks to ascertain progress. The intensity of training is dependent on the individual's capacity. The best method to determine this is by the "talk" test. That is, the level of exertion at which the client can comfortably talk throughout the exercise time is a good



starting point. They should not be exhausted at the end of the exercise. Once this is managed for a few sessions, then it is time to progress slowly to 60% to 70% of the maximum heart rate, calculated as 220 minus age multiplied by 60%, for example, or to 60% to 70% of volitional fatigue level.

The authors realize that this may be non-specific, but the goal of this program is consistency, therefore, don't make things especially difficult or defeating.

2. Flexibility and range of motion exercises—this is a good second part and should last about 10 to 15 minutes.

A comprehensive regimen of stretching all major joints should include neck, back, shoulders, groin, hips, knees, calves, and wrists/ankles. Details of this

is well presented in the first reference.<sup>1</sup>

Yoga and Tai Chi are excellent examples of all-inclusive stretching programs.


3. Progressive strength training—this is the component involved in strengthening major muscle groups through specific exercises using various apparatus. The most common equipment is free weights and bands, but if possible a Cybex unit. This section should last about 25 to 35 minutes and train progressively from 40% to 60% of the one repetition maximum (1RM)—the maximum weight that can be lifted for one repetition. The program should consist of one set of exercises for each major muscle group, for example chest, shoulders, legs, calves, arms, etc., with eight to 12 repetitions for each exercise.

## Authors' Advice

Start with an evaluation of the individual's exercise ability and knowledge of the various components. Ask about their goals. Suggest following the program three to four times a week. Record this information in the medical file. Set up an initial program that allows for slow improvement. This initial phase should last two to four weeks. Meet with the patient often in the beginning to evaluate the program, review techniques, prevent injuries and solve any problems. The next phase of improvement requires creativity to keep motivation levels high and encourage perseverance to attain goals. Record new goals which involve progression of intensity, length, frequency, speed, and weight levels. Allow for some flexibility. This phase of improvement should last two to six months. The last phase is the maintenance program which should last a lifetime. The ideal is to develop an hour-long program that can be done daily. At this point most individuals are motivated and educated enough to follow and develop their own program.

## Conclusion

Exercise has had a profound effect on the lives of many sectors of the population, from athletes to the elderly to cardiac rehabilitation patients and now to cancer patients. As the benefits of exercise for this ignored group of individuals become more apparent, so does the interest in developing exercise programming. An example of an integrated exercise regimen that has been used successfully in cancer patients has been presented in this article. As research and reports uncover the physiological basis that accompanies the improved quality of life felt by cancer patients in exercise programs, it is the

authors' opinion that as time goes by, more and more cancer protocols will integrate exercise. 

## References

1. Abdulla AS, F Abdulla: Prescribing exercise for the elderly. *Cdn J Diag* 2000; 17(10): 133-41.
2. Winningham ML, MacVicar MG: The effect of aerobic exercise on patient reports of nausea. *Onc Nurs Forum* 1988; 15(4): 447-50.
3. Durak EP, Lily PC: The application of a total conditioning program with cancer patient—Effects on strength and endurance. *J Strength Cond Research* 1998; 12(1): 3-6.
4. Durak EP: The use of exercise in the cancer recovery process. *ACSM's Health Fit J* 2001; 5(1): 6-10.
5. Coureya KS: Exercise Interventions during the Cancer Treatment: Biopsychosocial Outcomes. *Exer Sport Sci Rev* 2001; 29(2):60-4.
6. Dimeo RC, Tilmann MHM, Bertz H, et al: Aerobic exercise in the rehabilitation of cancer patients after high dose chemotherapy and autologous peripheral stem cell transplantation. *Cancer* 1997; 79: 1717-22.
7. Kolden G, Staruman T, Woods T, et al: Exercise is associated with improved physical and mental health in women with breast cancer. *Brit Cancer Res Treat* 1999; 57(1): 131.
8. Spiegel D, Bloom J, Kraemer J, et al: Effect of psychological treatment on survival of patients with metastatic breast cancer. *Lancet* 1989; 14:888-91.
9. Segar M, Katch VL, Garcia A, et al: Aerobic exercise reduces depression and anxiety and increases self-esteem among breast cancer survivors. *Onc Nurs Forum* 1998; 20: 317-21.
10. Courneya KS, Friedenreich SM: Physical exercise and quality of life following cancer diagnosis—A literature review. *Ann Behav Med* 1999; 21(2):1-10.
11. Peters C, Liotzerich H, Niemeier B: Influence of moderate exercise training on natural killer (NK) cell cytotoxicity and personality traits in cancer patients. *Anticancer Res* 1994; 14(3A):1033-6.
12. Pederson BK, Ullum U: Natural killer (NK) cell response to physical activity—possible mechanism of action. *Med Sci Sport Exer* 1994; 26(2):140-6.
13. Kramer MM, Wells CL: Does physical activity reduce risk of estrogen dependent cancer in women? *Med Sci Sport Exer* 1996; 28(3):322-34.
14. Bernstein LS, Ross RK, Lobo RA, et al: The effects of moderate physical activity on menstrual cycle patterns in adolescence—Implications for breast cancer prevention. *Brit J Cancer* 1987; 55(6):681-5.
15. Bernstein L, Henderson BE, Hanisch R, et al: Physical exercise and reduced risk of breast cancer in young women. *J Natl Cancer Inst* 1994; 86(18):403-8.
16. Nieman DC, Henson DA, Gusewitch G, et al: Physical activity and immune function in elderly women. *Med Sci Sport Exer* 1993; 25:823-31.
17. Nieman DC, Buckley KS, Henson DA, et al: Immune function in marathon runners versus sedentary controls. *Med Sci Sport Exer* 1995; 27:986-92.
18. Pedersen BK, Tvede N, Christensen LD, et al: Natural killer cell activity in peripheral blood of highly trained and untrained persons. *Int J Sport Med* 1989; 10:129-31.
19. Durstine LJ, King AC, Painter PL, et al (editors): *ACSM's resource manual for Guidelines for exercise testing and prescription*. Second edition. Williams & Wilkins, Indianapolis, Indiana, 1993.