

# Formalized exercise program for paediatric and young adult cancer survivors

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## REVIEW

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## ABSTRACT

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Survival rates of childhood cancer patients has steadily increased through the years, making it necessary to develop strategies aimed at long term improvements to quality of life. This paper presents a formalized exercise program for paediatric cancer survivors, based on current risk-based exercise recommendations, with the primary goal of helping families return to a normal life that emphasizes overall wellness and physical activity.

### Background

Children tend to respond better to anti-cancer treatments, including chemotherapy. Research indicates that proper nutrition and regular physical activity will help a paediatric cancer survivor continue to grow and develop properly, however, at present, there is no standard of care with regards to this subject.

### Aims

To create a fun and supportive atmosphere that encourages movement and healthy eating for the participants while increasing participant knowledge regarding proper nutrition and exercise.

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### Key Words

Paediatric cancer survivor, cardiovascular, chemotherapy

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### What this review adds:

#### 1. What is known about this subject?

Research indicates that proper nutrition and regular physical activity will help a paediatric cancer survivor continue to grow and develop properly.

#### 2. What new information is offered in this review?

Practical knowledge and skills related to exercise and nutrition, creating a clearer standard of care for children undergoing cancer.

#### 3. What are the implications for research, policy, or practice?

Implementation of this program will help families return to a normal life, emphasizing overall health and wellness.

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### Introduction

Cancer can be a very trying time in an individual's life. Along with anxiety about the future, patients must deal with surgeries, treatment schedules, medications, doctor's visits, missed time from work, fatigue, and side effects. Further, treatments such as chemotherapy can be accompanied with harmful side effects that can be both physical and psychosocial.<sup>1</sup> More than two decades of literature support the link between healthy lifestyles and cancer recovery. Though this research is scarce, what is available is promising. Both exercise and nutrition counselling help to improve the quality of lives of individuals during and after cancer recovery. Specifically, exercise has been reported to decrease treatment related side effects, improve treatment tolerance, decrease health care costs, and decrease the risk of recurrence for certain types of cancers.<sup>1-3</sup> Nutrition interventions have been shown to produce similar results, helping individuals maintain positive nutrient balances during treatment.<sup>4</sup>

The research in the areas of exercise and cancer is minimal, and when gauging child populations, the research is even

more limited. When a child is diagnosed with cancer, it presents a host of unique challenges. Typically, the type of cancers that develop in children are different than those that develop in adults, in that they are often the result of a DNA mutation rather than environmental or life style risk factors.<sup>5</sup> Children also tend to respond better to anti-cancer treatments than adult populations, including chemotherapy. However, long-term side effects are common in children, often requiring follow-up care and lifestyle intervention for the rest of their lives. These long-term co-morbidities include learning difficulties, heart disease, and diabetes.<sup>6-8</sup>

Research indicates that proper nutrition and regular physical activity will help a paediatric cancer survivor continue to grow and develop properly.<sup>9</sup> On a practical level, clinicians are faced with the challenge of making exercise recommendations that can be broadly applied, yet specific enough to be followed accurately. Therefore, parental involvement and education is key. At present, there is no standard of care with regards to this subject. Typically, parents are presented with a thick booklet at the beginning of therapy listing all the potential side and late effects of treatment. However parents report feeling too overwhelmed at diagnosis to even read the booklet. Those who do read the booklet report feeling unequipped to help their children avoid such negative effects.

Therefore, the purpose of this paper is to propose a formalized exercise program for paediatric cancer survivors, based on current risk-based exercise recommendations, with the primary goal of helping families return to a normal life that emphasizes overall wellness and physical activity. When a child is treated for cancer, the entire family is affected. Parents know they should help their child make healthy choices during their recovery, but often do not know how to do so. Yet, not making healthy choices negatively impacts every aspect of the child's life – educationally, physically, emotionally, and socially.

### **Proposed Program**

During this 4-week program, the children are led in structured exercise training. Simultaneously, their caregivers are enrolled in a class where they are taught current exercise guidelines for childhood cancer survivors, become informed about healthy nutrition practices, and have the opportunity to discuss questions with a paediatric oncology consultant. Activities include vegetable gardening, interactive cooking demonstrations, tips on eating healthy on a budget, fitness demonstrations, yoga classes, and more.

**Goals:** The overall goals/objectives of this program are as follows:

- To educate and empower families to make healthy lifestyle choices.
- To create a fun and supportive atmosphere that encourages movement and healthy eating for the participants.
- To increase participant knowledge regarding proper nutrition and exercise.

**Activities:** There are two components to this program – exercise and education. Childhood cancer survivors, and siblings, where appropriate, participate in guided exercise that focuses on overall body movement. Cardiovascular, muscular, and flexibility training are incorporated in a supportive group setting, allowing the children to have fun while remaining active. Each class contains an education component that focuses on a different health topic. While the children are in their exercise class, their caregivers have the opportunity to participate in an educational session to learn about the basics of health and nutrition. They are given practical tips to learn how to help their family be the healthiest they can be. Table 1 shows breakdown of the 4-week class and topics.

The program concludes with a family cooking demonstration during week 4, where children and parents together will prepare and cook a healthy meal that will be enjoyed with the group.

### **Conclusions**

Managing impairments and cancer-related symptoms is a lifelong battle for paediatric cancer survivors. At present, few studies have demonstrated the feasibility of exercise interventions on child and adolescent cancer survivors.<sup>8</sup> The proposed program presents an easy-to-implement, formalized exercise program for paediatric cancer survivors. It is expected that proper implementation of this program will help families return to a normal life, emphasizing overall health and wellness while increasing physical activity levels in a fun way. More randomized, controlled trials implementing this program will allow the program to become more developed to meet the needs of these child and young adult cancer survivors. Further, continued implementation and testing of the program will increase the program's validity and reliability.

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### PEER REVIEW

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### CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

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**Table 1: Breakdown of the 4-week class and topics**

	Children Educational Topics	Caregiver Educational Topics
Week 1	Vegetable gardening	Exercise guidelines
Week 2	Yoga	Healthy eating on a budget
Week 3	Building strength	Paediatric oncology professional questions
Week 4	Cooking demonstration	Cooking demonstration