

## Does Physical Exercise Help to Prevent Cancer Recurrence?

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### Introduction

The utility of physical exercise in promoting and maintaining health is well known [1]. A recent systematic review reported a trend toward increased survival with high levels of physical exercise in patients diagnosed with cancer [2]. Physical exercise can facilitate treatment optimization and management in cancer patients. A position paper by the International Society for Exercise and Immunology posited that regular exercise may decrease the risk of developing cancer and improve cancer survival after diagnosis [3].

Physical exercise has important effects on the development and progression of many cancers [3] and has been found to play a role in the prevention of cancer [4]. The American College of Sports Medicine recommends 150 min/week of moderate-intense aerobic exercise or 75 min/week of vigorous exercise, with strength training 2-3 times/week comprising 8-10 exercises of 10-15 repetitions/set with at least one set per session [5].

Physical exercise has attracted increased interest in the rehabilitation of cancer patients as it has been found to play a role in the prevention of certain cancers, including breast and colon cancers [4].

Many recent studies have reported that physical exercise has utility in preventing cancer recurrence [6-9]. However, the effect of physical exercise on preventing the incidence of certain types of cancer has yet to gain the same level of clinical acceptance [10]. Physical exercise has repeatedly been shown to prevent recurrence among breast cancer survivors [11-19]. The findings of these studies suggested that high physical activity levels are associated with a significantly decreased risk of breast cancer mortality or overall mortality. Breast cancer patients with higher physical activity levels may have improved prognosis with a lower risk of recurrence and death than sedentary survivors. Physical exercise can help women physically recover from treatment and potentially prevent cancer recurrence. It also appears to reduce the risk of cancer recurrence and mortality in colon cancer patients [20,21]. A previous study reported that physical exercise has preventative effects only in breast and colon cancer patients. Accordingly, physical activity may not only improve physical function but also decrease the risk of recurrence and extend survival.

Physical exercise in cancer patients has potential benefits in reducing the risk of cancer recurrence. However, despite evidence that physical exercise may extend survival, the specific biologic mechanisms that underlie this benefit remain unclear. Physical exercise can have both positive and negative effects on the functional capacity of the immune system. It is generally associated with improved immune function and anti-inflammatory responses. Many immune parameters improve following exercise; however, knowledge on the effects of exercise on immune function in cancer patients remains limited as intense physical exercise causes a temporary suppression of

many parameters of immune function [22-24]. Physical exercise can reduce inflammation, both acute and chronic immune responses, that can contribute to cancer risk. Although previous studies suggest the utility of physical exercise, further research is required to fully determine the levels of physical exercise required to provide these benefits. Physical exercise may alter events underlying cancer initiation and/or progression via the modulation of circulating growth factors and cytokines. It may also help prevent cancer recurrence and cancer-related death. Physical exercise has proven benefits for cancer patients not only by improving fitness and providing higher quality of life but also by reducing recurrence rates and extending survival.

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