



Ontario

Cancer Care Ontario

Action Cancer Ontario



Cancer Risk Factors in Ontario

Physical Activity



PHYSICAL ACTIVITY

Risk factor/exposure	Cancer	Direction of association	Magnitude of risk*	Strength of evidence ^a
Physical activity	Colon	↓	0.92 ^b	Convincing
	Breast (post-menopausal)	↓	...	Probable
	Endometrium	↓	...	

Sources: ^aWCRF/AICR, 2007; ^bWCRF/AICR, 2011

* Relative risk (RR) for every 5 METs-hour/day increase in physical activity.

...Magnitude of risk not shown in table if strength of evidence is “probable” or “limited.”

Background

- » Physical activity is any movement using skeletal muscles. It can be classified according to type (occupational, household, active transportation, recreational/leisure-time), and by intensity based on energy expenditure (vigorous, moderate, light or sedentary).²⁴
- » Total physical activity levels are determined by frequency, intensity and duration; one hour of light physical activity may therefore result in the same amount of total energy used as 20 minutes of vigorous activity.²⁴
- » Sedentary behaviour describes activities involving prolonged sitting, reclining or lying down that are characterized by low energy expenditure (e.g., watching television or using a computer). It is considered distinct from physical inactivity, which represents the absence of physical activity;⁵⁶ therefore, a person may be physically active but still have prolonged periods of sedentary time.

- The evidence is now convincing that physical activity reduces the risk of colon cancer and probably cancer of the breast (post-menopausal) and endometrium, independently of other factors, such as body fatness.^{24,38,47,57}
- In reviews and [meta-analyses](#), risk was reduced by 20%–25% for colon cancer,^{10,58,59} 20%–30% for breast cancer,⁶⁰ and 20%–30% for endometrial cancer^{61–63} when comparing those with the highest levels of physical activity to those with the lowest levels.
- Epidemiologic evidence demonstrates an inverse [dose-response](#) relationship between physical activity and cancer risk, with higher levels of physical activity (within the range of activity examined) associated with decreasing cancer risk.²⁴
- All types of physical activity (occupational, household, transport, recreational) appear to reduce cancer risk.²⁴
- The minimum amount of physical activity for cancer protection is difficult to determine because of differences in measurement and classification among studies. Most studies have examined physical activity with respect to energy expenditure or duration, but few provide sufficient details to evaluate the effect of intensity.²⁴

- The relationship between physical activity and cancer risk may be modified by several factors:
 - For breast cancer, a greater relative benefit of physical activity is observed for women without a family history of breast cancer, women with a normal body mass index (although benefits are seen within all levels of body mass index), parous women and non-Caucasian women.⁶⁰
 - For colon cancer, some evidence suggests that physical activity may have a stronger effect for men than for women.³⁸
- Interest in the potential risk of cancer associated with sedentary behaviours, independent of being physically inactive, is emerging. The few studies that have examined a potential association between sedentary behaviours and cancer risk have generally shown positive associations with colorectal, endometrial, ovarian and prostate cancer.⁵⁶

BIOLOGIC MECHANISMS

- Physical activity may directly protect against cancer through several biologic mechanisms, including promoting healthier levels of circulating hormones and a healthy body weight.⁵⁷ Specifically:
 - Physical activity may protect against colorectal cancer by decreasing inflammation, reducing insulin levels, reducing insulin resistance, improving endogenous steroid hormone metabolism and reducing transit time through the gastrointestinal tract.
 - Physical activity may protect against breast cancer by improving endogenous steroid hormone metabolism, possibly strengthening the immune system, and reducing levels of circulating estrogens and androgens.
- Physical activity may also indirectly protect against cancers associated with body fatness, including colorectal cancer and post-menopausal breast cancer, through its role in maintaining energy balance and body fatness.²⁴