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Cancer risk: Are we well behaved?

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Cancer contributes to approximately 13% (7.4 million) of all deaths worldwide [1], making cancer the leading cause of death across the globe. Based on Canadian data, 29% of deaths each year are estimated to be related to cancer [2]. Unfortunately, cancer deaths are projected to continue rising [1]. Preventing cancer is therefore a major worldwide public health concern.

Lifestyle factors such as tobacco use, unhealthy diet, physical inactivity, excess body weight, and alcohol consumption are well-documented modifiable cancer risk factors [3]. In North America, evidence suggests that 50%–75% of cancer deaths are caused by modifiable lifestyle behaviours [4]. Moreover, when smoking behaviour is removed, one third of cancer deaths are estimated to be attributable to poor nutrition, physical inactivity, and overweight or obesity [5–7].

Epidemiology studies reveal that people who are more physically active have a lower risk of certain cancers than do those who are sedentary [8]. For example, prospective cohort studies in postmenopausal women reveal a 10%–20% reduced risk of breast cancer in women who engage in a minimum of 3 hours of moderate-level physical activity weekly [9,10]. Two reviews summarizing the association between physical activity and colorectal cancer concluded that there is convincing evidence of a causal relationship between physical activity and colon cancer [11,12]. In addition, cohort studies have found that high levels of physical activity are associated with reduced risk for advanced prostate cancer and lung cancer when adjusted for smoking behaviour [13]. Furthermore, a recent meta-analysis that included prospective studies found that, compared with inactive women, physically active women had a reduced risk of endometrial cancer [14].

Taken together, the evidence to date reveals a clear and consistent message: engaging in regular physical activity has protective effects with respect to cancers of the colon and breast. Furthermore, evidence of protective effects for physical activity in the case of other cancers is building.

The American Cancer Society suggests that participating in regular physical activity—for example, a minimum of 45 minutes of moderate-to-vigorous physical activity 5 days per week—may help to reduce the risk of cancer development [15]. Although these guidelines are based on scientific evidence, the American Cancer Society cautions that the evidence used to create this general guideline is not definitive because the research is unclear with respect to the minimum intensity, duration, frequency, and type of physical activity needed to reduce cancer risk [15]. In addition, most data are limited to aerobic activity; very few studies have been published on the preventive effects of other forms of activity—for example, weight training, yoga, or tai chi [10]. Future research is needed to determine the minimum dose and optimal type or types of physical activity needed to yield site-specific cancer prevention effects [16].

Despite knowledge of physical activity's protective effects with regard to cancer, and a host of other chronic illness such as heart disease and diabetes, half of all Canadian adults are insufficiently active [17]. Engaging in regular physical activity is a complex behaviour that is influenced by factors such as personal motivation, health and mobility issues, and the social and physical environments in which people live [18]. At present, given the low percentages of regular exercisers in the population, physical activity as a cancer prevention strategy is underperforming. So here are several recommendations for increasing physical activity.

First, from both a cancer prevention and a behavioral standpoint, efforts need to be focused on increasing activity levels among children and youth. The 2010 annual report card from Active Healthy Kids Canada found that 87% of children and youth are not engaging in the recommended minimum of 90 minutes of physical activity daily [19]. As people age, the statistics do not get better. In fact, epidemiology data show a significant trend of decreasing physical activity levels during the transition from adolescence to adulthood [20]. Sedentary lifestyles are therefore being established in childhood and being maintained into adulthood. This situation is problematic, because

the cancer risk–reduction effects of physical activity are thought to accumulate over the course of a lifetime [11]. Thus, starting a pattern of regular physical activity early in life is likely to have the biggest effect in preventing cancer.

Second, it must be conveyed to adults who are not active that some physical activity is better than none. They can start by walking for 10 minutes, and then gradually increase that time up to 45 or more minutes most days of the week. They can walk with a friend or partner and can try new physical activities—for example, cycling, swimming, strength training—to promote enjoyment and prevent boredom.

In addition to engaging in structured or planned physical activity, people should be encouraged to be more active throughout the day. A study by Tremblay and colleagues [21] demonstrates that thermogenesis outside of exercise activity (for example, incidental movement such as walking up stairs) has health benefits and that people should be encouraged to move throughout the day. This simply means move more: for example, park the car farther away or take breaks from sedentary activities such as screen use to walk.

Finally, to improve physical activity levels, it is important to indentify individual and environmental factors associated with physical activity. For example, at the individual level, barriers to physical activity include lack of time and motivation and a lack of confidence in the ability to engage in physical activity. One way to help people overcome these barriers is to teach them the self-regulatory skills needed to adhere to physical activity: for example, self-monitoring, goal-setting, scheduling, and brainstorming barrier solutions. Substantial environmental barriers may also exist. Common environmental barriers include a lack of facilities and resources such as sidewalks and bicycle trails, or safe and convenient places to exercise. To help overcome such barriers, it is important that communities support healthy lifestyle choices by providing safe environments in which people have the opportunity to be physically active.

The protective effects for physical activity with respect to cancer are convincing. Moreover, the significance of physical activity in cancer prevention is multi-dimensional, in that leading a physically active lifestyle may have a domino effect on other modifiable factors related to cancer. For example, becoming more physically active can lead to weight loss and healthier eating habits. Recent evidence suggests that exercise may help to reduce or even eliminate smoking behaviour [22]. However, most of the population forgoes this benefit because they chose to lead a sedentary lifestyle. A few strategies for increasing physical activity have been highlighted: encourage young people to become more active, understand that some activity is better than none, teach and practice self-regulatory skills, and support an environment that promotes active lifestyle choices.

CONFLICT OF INTEREST DISCLOSURES

There are no conflicts of interest.

REFERENCES

1. World Health Organization (WHO). Cancer [Web resource]. Fact sheet 297. Geneva, Switzerland: WHO; 2011. [Available online at: http://www.who.int/mediacentre/factsheets/fs297/en/index.html; cited November 19, 2010]
2. Canadian Cancer Society's Steering Committee. *Canadian Cancer Statistics 2010.* Toronto: Canadian Cancer Society; 2010.
3. Canadian Cancer Society and the National Cancer Institute of Canada. *Canadian Cancer Statistics 2005.* Toronto: Canadian Cancer Society; 2005.
4. United States, National Institutes of Health, National Cancer Institute (NCI). Cancer Trends Progress Report—2009/2010 Update [Web page]. Bethesda, MD: NCI; 2010. [Available at: http://progressreport.cancer.gov/trends-glance.asp; cited November 10, 2010]
5. Krauss RM, Eckel RH, Howard B, *et al.* American Heart Association Dietary Guidelines Revision 2000: a statement for healthcare professionals from the Nutrition Committee of the American Heart Association. *Circulation* 2000;102:2284–99.
6. United States, Department of Health and Human Services and Department of Agriculture (USDA). *USDA Dietary Guidelines for Americans.* 5th ed. Washington, DC: USDA; 2000.
7. McGinnis JM, Foege WH. Actual causes of death in the United States. *JAMA* 1993;270:2207–12.
8. United States, National Institutes of Health, National Cancer Institute (NCI). Physician Data Query database: Cancer Prevention Overview [Web resource]. Bethesda, MD: NCI; 2010. [Available at: http://www.cancer.gov/cancertopics/pdq/prevention/overview/HealthProfessional; cited November 10, 2010]
9. United States, Department of Health and Human Services (DHHS), Physical Activity Guidelines Advisory Committee. Physical Activity Guidelines Advisory Committee report, 2008. Washington, DC: DHHS; 2008.
10. McTiernan A, Irwin M, Vongruenigen V. Weight, physical activity, diet, and prognosis in breast and gynecologic cancers. *J Clin Oncol* 2010;28:4074–80.
11. Friedenreich CM, Thune I. Review of physical activity and prostate cancer risk. *Cancer Causes Control* 2001;12:461–75.
12. Slattery ML. Physical activity and colorectal cancer. *Sports Med* 2004;34:239–52.
13. World Cancer Research Fund and American Institute for Cancer Research. *Food, Nutrition, Physical Activity, and the Prevention of Cancer: A Global Perspective.* Washington, DC: American Institute for Cancer Research; 2007.
14. Renehan AG, Tyson M, Egger M, Heller RF, Zwahlen M. Body-mass index and incidence of cancer: a systematic review and meta-analysis of prospective observational studies. *Lancet* 2008;371:569–78.
15. Byers T, Nestle M, McTiernan A, *et al.* on behalf of the American Cancer Society 2001 Nutrition and Physical Activity Guidelines Advisory Committee. American Cancer Society Guidelines on nutrition and physical activity for cancer prevention: reducing the risk of cancer with healthy food choices and physical activity. *CA Cancer J Clin* 2002;52;92–119.

16. Rogers CJ, Colbert LH, Greiner JW, Perkins SN, Hursting SD. Physical activity and cancer prevention pathways and targets for intervention. *Sports Med* 2008;38:271–96.
17. Canadian Fitness and Lifestyle Research Institute. *Physical Activity Monitor: Facts and Figures*. Bulletin 2. Physical Activity Levels of Canadians. Ottawa, ON: Canadian Fitness and Lifestyle Research Institute; 2009. [Available online at: http://72.10.49.94/media/node/82/files/PAM2008FactsFigures_Bulletin02_PA_among_CanadiansEN.pdf; cited October 25, 2010]
18. Katzmarzyk PT. Physical activity, sedentary behavior, and health: paradigm paralysis or paradigm shift? *Diabetes* 2010;59:2717–25.
19. Active Healthy Kids Canada. *Health Habits Start Earlier Than You Think: The Active Healthy Kids Canada Report Card on Physical Activity for Children and Youth.* Toronto, ON: Active Healthy Kids Canada; 2010. [Available online at: http://www.activehealthykids.ca/ecms.ashx/2010ActiveHealthyKidsCanadaReportCard-shortform.pdf; cited November 25, 2010]
20. Gilmour H. Physically active Canadians. *Health Rep* 2007;18:45–65.
21. Tremblay MS, Esliger DW, Tremblay A, Colley R. Incidental movement, lifestyle-embedded activity and sleep: new frontiers in physical activity assessment. *Can J Public Health* 2007;98(suppl 2):S208–17.
22. Taylor AH, Ussher MH, Faulkner G. The acute effects of exercise on cigarette cravings, withdrawal symptoms, affect and smoking behaviour: a systematic review. *Addiction* 2007;102:534–43.

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