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Do Diet, Physical Activity, and Weight Management Affect Cancer Risk?

The American Institute for Cancer Research and the World Cancer Research Fund recently published the *Second Expert Panel Report on Food, Nutrition, Physical Activity, and the Prevention of Cancer: A Global Perspective*.¹ The publicity surrounding this report has included unsubstantiated claims that changes in diet, physical activity, and weight management can have short-term effects in reducing the risk of cancer. This is unsupported by scientific evidence and is based on a misunderstanding of how cancer develops.

The fundamental process of cancer is a mutation in the genetic material that regulates the function and growth of cells. Most cells in the body constantly grow and divide, making copies of their DNA, a process with an inherent risk of error. This increases as people age. Some risk factors increase the chance of a copying error at cell division or cause damage (mutation) to the genetic material of mature cells. The body has a variety of protective mechanisms that usually prevent damaged cells from surviving to become cancer, but occasionally these mechanisms fail. Cancer develops over many years, as the result of the cumulative actions of many risk factors and exposures. No single event or exposure causes cancer, and no single factor can prevent it. Genetic predisposition may contribute, possibly by making some people more vulnerable than others to behavioral, lifestyle, or environmental risk factors.

Nutrition may influence the lifetime risk of developing cancer by contributing specific nutrients that confer resistance to cell damage, by contributing constituents or contaminants that increase vulnerability to cell damage, or by contributing to obesity. Physical activity appears to influence cancer risk mainly through its effects on weight management, and possibly also through its effects on the secretion of some hormones. Obesity may affect cancer risk through its effects on hormonal factors that regulate cell proliferation and differentiation.

A lifestyle consistent with the recent recommendations, if adopted in early childhood and pursued consistently throughout life, might reduce the risk of some cancers slightly, but the total effect on cancer risk is likely to be small. The Expert Panel reviewed evidence about 61 dietary, physical activity, and weight management factors on the risk of 18 kinds of cancer, or more than 1,000 associations. They found strong evidence for a protective effect in less than 1% of associations tested and strong evidence for increased risk in only

¹ World Cancer Research Fund / American Institute for Cancer Research. *Food, Nutrition, Physical Activity, and the Prevention of Cancer: A Global Perspective*. Washington DC: AICR, 2007.

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2% of associations tested. They found modest evidence for protective effects in 2% and modest evidence for increased risk in 2%. They found suggestive but weak evidence for protective effects in 3% and suggestive but weak evidence for increased risk in 3% of associations tested.

Even these identified domains of protection or increased risk attributed to nutrition, physical activity, or weight management are likely to have only a small effect on cancer relative to other risk factors. To put this in perspective, tobacco and alcohol use are documented to cause far more cancer throughout the body than could be attributed to all the proposed nutritional, physical activity, and weight factors combined.

Most of the Expert Panel's lifestyle recommendations have long been known to be healthful. Diet, physical activity, and weight management have beneficial effects on reducing risks of heart disease, stroke, and diabetes that can be measured relatively soon after changes are adopted. The recommendations should be supported for these reasons. However, it is not appropriate to promote these lifestyle recommendations to reduce the risk of cancer in the short term among adults.

There are much stronger evidence-based approaches to cancer reduction, including the cessation of tobacco use and the use of appropriate screening and early detection strategies. These remain the cornerstone of cancer prevention and control.

Please visit our website at www.cancer.mt.gov

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