Obesity may contribute to development and recurrence of cancer, as well as cancer-related and all-cause mortality. This risk factor is also among the most preventable causes of cancer. This article describes current evidence-based guidelines for weight management and physical activity for cancer survivors. The authors also discuss practical interventions to help survivors undertake behavioral changes to manage their weight.

At a Glance

- Obesity is a risk factor for cancer development and recurrence.
- Cancer survivors should be encouraged to practice portion control and substitute foods, such as vegetables, fruits, and whole grains, for foods high in calories but of little nutritional value, such as desserts, soft drinks, potato chips, and fried foods.
- Cancer survivors should include a minimum of 150 minutes per week of aerobic exercise and two days per week of strength training.

Weight Management and Exercise for Cancer Survivors

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Obesity is a known risk factor for development of many cancers (e.g., postmenopausal breast, colon, esophageal, thyroid, gallbladder, endometrial, kidney, pancreas). It also may contribute to recurrence of cancer, as well as cancer-related and all-cause mortality (Dobbins, Decorby, & Choi, 2013; Fontham et al., 2009). The American Association for Cancer Research (AACR), 2014) reported that obesity is responsible for about 25% of incident cancers. A position statement by the American Society of Clinical Oncology (Ligibel et al., 2014) identified obesity as a health risk that can overtake tobacco as the leading preventable cause of cancer.

Various mechanisms have been proposed to explain the relationship between obesity and increased risk of cancer (National Cancer Institute [NCI], 2015). Fat cells produce hormones that can increase cancer risk. For example, the production of estrogen can increase the risk of breast and endometrial cancers. Obese individuals have increased levels of insulin and insulin-like growth factor, which may promote carcinogenesis. Obese individuals often have chronic, subacute inflammation, which has been associated with greater cancer risk. Fat cells produce hormones that may stimulate or inhibit cancer cell growth.

Evidence is also growing regarding the role of obesity in cancer recurrence and cancer-related mortality. Obesity is a known risk factor for the development of other comorbid illnesses, such as diabetes and heart disease, which are prevalent in cancer survivors (Ligibel et al., 2014).

Recommendations

Diet

Cancer survivors are often motivated to make positive health behavior changes after diagnosis and have questions regarding optimal diet and exercise regimens. The American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Survivors are summarized in Figure 1 (Rock et al., 2012). Although the primary guideline recommends that survivors achieve and maintain a healthy weight, it does not provide specific instruction on an optimal dietary pattern to achieve weight loss.

The American College of Cardiology, the American Heart Association, and the Obesity Society published guidelines for managing obesity in adults (American College of Cardiology/American Heart Association Task Force on Practice Guidelines, Obesity Expert Panel, 2014). These guidelines recommend 1,200–1,500 kcal per day for women and 1,500–1,800 kcal per day for men, or a 500–750 kcal per day energy deficit. They also recommend use of an evidence-based diet that restricts certain food types (e.g., high-carbohydrate foods, low-fiber foods, high-fat foods) to create an energy deficit by reduced food intake.

The common theme among these methods is creating an energy deficit to achieve weight loss. The actual method used should be individualized according to the patient’s preference and adherence ability. These recommendations are based on an expert panel review of 17 trials (American College of Cardiology/American Heart Association Task Force, Obesity Expert Panel, 2014) that were rated as fair to good quality to answer the following question: “What is the comparative efficacy or effectiveness of diets of differing forms and structures
Achieve and maintain a healthy weight.
- If overweight or obese, limit consumption of high-calorie foods and beverages, and increase physical activity to promote weight loss.

Engage in regular physical activity.
- Avoid inactivity, and return to normal daily activities as soon as possible following diagnosis.
- Aim to exercise at least 150 minutes per week.
- Include strength training at least two days per week.

Achieve a dietary pattern that is high in vegetables, fruits, and whole grains.
- Choose foods and beverages in amounts that achieve and maintain a healthy weight.
- Eat at least 2.5 cups of fruits and vegetables per day.
- Choose whole versus refined grains.
- Limit consumption of processed and red meat.

FIGURE 1. American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Survivors


To date, only a few studies have examined the effect of various dietary patterns in achieving weight loss in cancer survivors. These studies were conducted with breast cancer survivors and compared a low-carbohydrate versus low-fat diet regimen with calorie restriction. The CHOICE study by Thompson et al. (2012) compared the effects of these two dietary patterns on weight loss, body composition, and glucose and lipid levels (potential biomarkers for comorbid conditions, as well as the potential to affect breast carcinogenesis). Participants in both groups followed a structured diet and physical activity program to achieve a 1 lb per week weight loss. Both groups experienced statistically significant decreases in cholesterol, triglycerides, and low-density lipoprotein (LDL) cholesterol compared to the control group. The low-fat group saw a trend toward greater reductions in total and LDL cholesterol, and the low-carbohydrate group had a statistically significant reduction in triglycerides. The areas of nutrition, cancer, and weight management are understudied in general, but the studies by Thomson et al. (2010) and Thompson et al. (2012) support the obesity guidelines (American College of Cardiology/American Heart Association Task Force on Practice Guidelines, Obesity Expert Panel, 2014) for achieving weight loss and reducing obesity.

Physical Activity

A key component for weight loss and maintenance of weight loss is physical activity. Many studies have suggested an inverse relationship between physical activity after a cancer diagnosis and mortality (Ballard-Barbash et al., 2012). Most of these studies have focused on breast and colon cancers. One study revealed that most active cancer survivors had lower rates of death from their cancer, as well as from all other causes (Schmid & Leitzmann, 2014). In addition, other studies have reported that physical activity may result in additional benefits, such as cardiorespiratory fitness, decreased fatigue and depression, and improvements in quality of life (Brown et al., 2012; Ferrer, Huedo-Medina, Johnson, Ryan, & Pescatello, 2011; Jones et al., 2011; Puettz & Herring, 2012). Studies have also demonstrated beneficial changes in insulin, inflammation, and immunity with physical activity (Ballard-Barbash et al., 2012; Lee et al., 2013). These biomarkers may signify surrogate endpoints for cancer growth and recurrence.

Exercise recommendations for cancer survivors include at least 150 minutes per week of aerobic exercise and at least two days per week of strength training. Unfortunately, adherence to the physical activity guidelines is low. Several studies reported that only 30%–42% of cancer survivors engaged in the recommended level of exercise (Bellizzi, Rowland, Jeffery, & McNeel, 2005; Holmes, Chen, Feskanich, Kroenke, & Colditz, 2005; Meyerhardt et al., 2006). Jones, Cournaya, Fairey, and Mackey (2004) showed that a recommendation to exercise from the oncologist resulted in increased physical activity. Providing this recommendation along with print materials and a pedometer can result in additional increases in activity (Vallence, Cournaya, Plotnikoff, Yasui, & Mackey, 2007).

In the FRESH START trial by Demark-Wahnefried et al. (2007), 543 newly diagnosed patients with breast and prostate cancers were randomized to either a sequentially tailored mailed material intervention aimed at improving diet and exercise behaviors or use of standardized print materials. Targeted behaviors in this study were exercise for 150 minutes per week, consumption of five or more fruits and vegetables per day, and restriction of total (less than 30%) and saturated (less than 10%) fat. The 10-month FRESH START study found that the intervention resulted in significant increases in physical activity and fruit and vegetable consumption, as well as a decreased intake of total and saturated fat. Of note, although the intervention was not aimed at weight loss, the intervention group experienced a significant loss of weight. This illustrates the potential synergistic effect that diet, physical activity, and behavior change can have on weight management, even if weight management is not the primary objective.

Tools

Many patients with cancer are motivated to make lifestyle changes after a diagnosis of cancer, particularly related to factors linked to the development of cancer or possible progression or recurrence. Healthcare providers should capitalize on this interest and educate survivors on the possible links between obesity, cancer,
and prevalent forms of comorbidity. If indicated and desired, providers should provide resources to assist survivors in achieving and maintaining a healthy weight. Use of the 5 A’s (Ask, Advise, Assess, Assist, and Arrange) approach has proven effective with behavior change in smoking cessation and may provide a framework for promoting weight management and a healthy lifestyle in cancer survivors (Agency for Healthcare Research and Quality, 2012; Alexander et al., 2011; Demark-Wahnefried et al., 2015).

The American Society of Clinical Oncology has developed a toolkit to provide information to healthcare providers and patients about the relationship between obesity and cancer. The toolkit includes resources to help providers address weight management, including assessment of weight status, strategies to help patients achieve behavior change, links to nutrition and exercise resources, and information regarding insurance coverage of weight management services. This toolkit can be found at www.asco.org/practice-research/obesity-and-cancer.

The registered dietitian (RD) or registered dietitian nutritionist (RDN) is recognized as the most well-trained individual to deliver oncologic nutrition care. RDs and RDNs may also obtain advanced training and certification specifically in oncology nutrition and become a Board Certified Specialist in Oncology Nutrition through the Commission on Dietetic Registration of the Academy of Nutrition and Dietetics (Kren, Michael, Johnson, Thiessen, & Busey, 2008). For exercise trainers, the American College of Sports Medicine (2009) developed the Certified Cancer Exercise Trainer® program. This program provides exercise professionals with cancer-related knowledge useful for practice, particularly cancer treatment side effects that may affect exercise performance (American College of Sports Medicine, 2009). Referrals to these certified experts for more intensive education and interaction, along with reinforcement by other healthcare providers on the interdisciplinary team, can benefit the patient.

Conclusion

More research is needed on the effect of purposeful weight loss, specific dietary patterns, and exercise on cancer outcomes, as well as optimal interventions to promote behavior change. With the growing number of cancer survivors, integration of cancer treatment and overall long-term health promotion is increasingly important to reduce the risk of recurrence and the risk of other diseases. The entire oncology care team should seize the opportunity to promote and encourage behavioral and lifestyle changes in cancer survivors.

References


