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Weight Management and Exercise for the Cancer Survivor

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Abstract

This article describes current evidence-based guidelines for diet and physical activity for cancer survivors, specifically focusing on weight management. We also discuss practical interventions to help survivors undertake behavioral changes to manage their weight.

Background

Obesity is a known risk factor for development of many cancers (postmenopausal breast, colon, esophageal, thyroid, gallbladder, endometrial, kidney and pancreas) and potentially others. It also may contribute to recurrence, cancer-related and all-cause mortality (Fontham, Thun, Portier, Balch, Delancey, Samet, 2009; Dobbins, Decorby, Choi, 2013). In 2014, the American Association for Cancer Research (American Association for Cancer Research (AACR), 2014) reported that overweight/obesity is responsible for nearly 25% of incident cancers. A recent position statement by the American Society of Clinical Oncology (Ligibel et al., 2014) identified obesity as a health risk that is “quickly overtaking 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 which can increase cancer risk, e.g., the production of estrogen which increases the risk of breast and endometrial cancer.
- 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 which are prevalent in cancer survivors, such as diabetes and heart disease.

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 Table 1 (Rock et al., 2012). While the topmost 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.

In 2013, the American College of Cardiology, the American Heart Association, and the Obesity Society (American College of Cardiology/American Heart Association Task Force, The Obesity Society, 2014) published guidelines for managing overweight and obesity in adults. These guidelines recommend any one of the following methods to reduce food and calorie intake to achieve weight loss:

- 1200–1500 kcal/day for women and 1500–1800 kcal/day for men, or a 500–750 kcal/day energy deficit; or
- Use of an evidence-based diet that restricts certain food types (such as high carbohydrate foods, low-fiber foods or high fat foods) in order to create an energy deficit by reduced food intake.

The common theme among these methods is creating an energy (calorie) deficit in order to achieve weight loss. The actual method used should be individualized according to the patient's preference and adherence ability. These recommendations are based upon an expert panel review of 17 trials that were rated as fair to good quality to answer the question: "What is the comparative efficacy/effectiveness of diets of differing forms and structures (macronutrient content, carbohydrate and fat quality, nutrient density, amount of energy deficit and dietary pattern) in achieving or maintaining weight loss?" Select dietary approaches that are associated with weight loss as long as caloric restriction was also achieved include:

- Higher protein diet (25% of total calories from protein, 30% from fat and 45% from carbohydrate)
- Low-fat vegan-style diet (10–25% of total calories from fat)
- Lower-calorie diet with prescribed energy restriction
- Low-fat diet (<20% of total calories from fat)
- Low-glycemic load diet
- Mediterranean-style diet
- Lower-fat (<30% fat), high-dairy (4servings/day) diets with or without increased fiber and/or low-glycemic-index (low-glycemic load) foods
- American Heart Association Step I diet

Only a few studies to date have examined the effect of various dietary patterns in achieving weight loss in cancer survivors. These studies were conducted in breast cancer survivors and compared a low-carbohydrate versus low-fat diet regimen with calorie restriction. The CHOICE study by Thompson et al. (Thompson et al., 2012) compared the effects of these two dietary patterns on weight loss, body composition, 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/week weight loss. Both groups experienced statistically significant decreases in cholesterol, triglycerides and LDL cholesterol compared to the control (nonintervention) group. The low fat group saw a trend toward greater reductions in total and LDL cholesterol, while the low carbohydrate group had a statistically significant reduction in triglycerides. A similar forerunning study by Thomson et al. (Thompson et al., 2010) had comparable findings. This is an understudied area of nutrition, cancer and weight management but it does support the aforementioned obesity guidelines recommendation of various ways to achieve weight loss.

Physical Activity

Another key component for weight loss and especially 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, Friedenreich, Courneya, Siddiqi, McTiernan, Alfana, 2012). Most of these studies have focused on breast and colon cancer and found that the most active survivors had lower rates of death from their cancer, as well as from all other causes (Schmid & Leitzmann, 2014). Additionally, physical activity may result in additional benefits, such as cardiorespiratory fitness, lessening of fatigue and depression, and improvements in quality of life (Jones, Liang, Pituskin, Battaglini, Scott, Hornsby, & Haykowsky, 2011; Puetz & Herring, 2012; Brown et al., 2012; Ferrer, Huedo-Medina, Johnson, Ryan, Pescatello, 2011). Studies have also demonstrated beneficial changes in insulin, inflammation and immunity with physical activity (Ballard-Barbash, Friedenreich, Courneya, Siddiqi, McTiernan, & Alfana, 2012; Lee et al., 2013). These biomarkers may theoretically signify surrogate endpoints for cancer growth and recurrence. Exercise recommendations for cancer survivors are to include at least 150 minutes/ week of aerobic exercise and at least 2 days/week of strength training (Table 1). Unfortunately, adherence to the physical activity guideline is low with several studies finding only about 30–42% of cancer survivors engaging in the recommended level of exercise (Bellizzi, Rowland, Jeffery, & McNeel, 2005; Meyerhardt, Giovannucci, Holmes, Chan, Chan, Colditz, & Fuchs, 2006; Holmes, Chen, Feskanich, Kroenke, & Colditz, 2005). One study demonstrated that simply a recommendation to exercise from the oncologist resulted in increased physical activity (Jones, Courneya, Fairey, & Mackey, 2004). Providing this recommendation along with print materials and a pedometer can result in additional increases in activity (Vallence, Courneya, Plotnikoff, Yasui, & Mackey, 2007).

In the FRESH START trial (Demark-Wahnefried, et al., 2007), 543 newly-diagnosed breast and prostate cancer survivors were randomized to either a sequentially-tailored mailed material intervention aimed at improving both diet and exercise behaviors or standardized print materials. Targeted behaviors in this study were exercise of 150 minutes/week, five or

more fruits and vegetables/day and restriction of total (<30%) and saturated (<10%) fat. The 10-month study found that the intervention resulted in significant increases in physical activity and fruit and vegetable consumption, and a decreased intake of total and saturated fat. Interestingly, even though the intervention was not aimed at weight loss, the intervention group experienced a significant loss of weight. This illustrates the potential synergistic effect diet quality, physical activity, and behavior change can have on weight management, even if weight management is not the primary objective.

Tools

Many cancer patients are motivated to make lifestyle changes upon the diagnosis of cancer, particularly of factors possibly linked to the development of cancer or progression. Health care providers should capitalize on this interest and educate survivors on the possible link between obesity in cancer as well as prevalent forms of comorbidity and, if indicated and desired, provide resources to assist patients in achieving and maintaining a healthy weight. Table 2 provides resources in these areas. Utilization of the 5-A approaches (Ask, Advise, Assess, Assist, and Arrange) (Agency for Healthcare Research and Quality, 2012) have been proven effective with behavior change in smoking cessation and may provide a framework for promoting weight management and a healthy lifestyle in cancer survivors (Alexander et al., 2011; Demark-Wahnefried et al., 2015).

The American Society of Clinical Oncology (ASCO) has developed a toolkit to provide information for health care providers and patients about the relationship between obesity and cancer. The toolkit also 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 obtained at <http://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. RD/RDNs may also obtain advanced training and certification specifically in oncology nutrition and become a Certified Specialist in Oncology Nutrition (CSO) (Kren, Michael, Johnson, Thiessen, & Busey, 2008). For exercise trainers, the American College of Sports Medicine developed the Certified Cancer Exercise Trainer program in 2009. This program provides exercise professionals cancer-related knowledge useful for practice, especially cancer treatment side effects which may impact exercise performance (American College of Sports Medicine, 2009). Referrals to these certified experts for more intensive education and interaction can benefit the patient, along with reinforcement by other health care providers on the interdisciplinary team.

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. But with the number of cancer survivors growing, integration of cancer treatment and overall long-term health promotion is increasingly important to both reduce the risk of recurrence as well as 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.

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Table 1

American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Survivors

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 2 days per week
Achieve a dietary pattern that is high in vegetables, fruits and whole grains <ul style="list-style-type: none">• Choose foods and beverages in amounts that achieve and maintain a healthy weight• Eat at least 2.5 cups fruits and vegetables/day• Choose Whole vs. refined grains• Limit consumption of processed and red meat

Table 2

Resources for Nutrition, Weight Management and Physical Activity

Area	Resource
Nutrition Weight Management	Academy of Nutrition and Dietetics http://www.eatright.org/find-an-expert
	American Cancer Society http://www.cancer.org/healthy/eathealthygetactive/takecontrolofyourweight/index American Institute for Cancer Research http://www.aicr.org/patients-survivors/
	American Society of Clinical Oncology Obesity Took Kit http://www.asco.org/practice-research/obesity-and-cancer
Physical Activity	American College of Sports Medicine http://certification.acsm.org/acsm-cancer-exercise-trainer (Cancer Exercise Trainer Certification)
	American College of Sports Medicine http://www.exerciseismedicine.org/ (Exercise is Medicine Campaign)
	LIVESTRONG at the YMCA http://www.livestrong.org/what-we-do/our-actions/livestrong-programs/ymca/ (12 week exercise program for cancer survivors)