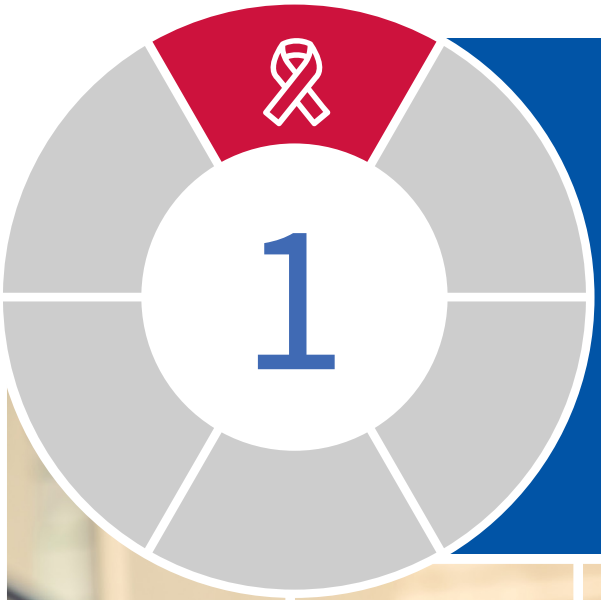
Nutrition, Physical Activity, Body Weight, and Cancer Survivorship

2022

A 6-Part Informational Series for Healthcare Teams



1 The Influence of Diet, Physical Activity, and Body Weight on Cancer Survivorship

INFLUENCE OF DIET, ACTIVITY, AND BODY WEIGHT ON CANCER PREVENTION AND SURVIVORSHIP

This is brief 1 of 6 in the ***Nutrition, Physical Activity, Body Weight, and Cancer Survivorship*** series for healthcare teams that work with cancer survivors.

An estimated 18% of cancer cases (almost 1 in 5) and 16% of cancer deaths are attributable to the combined effects of excess body weight, alcohol consumption, physical inactivity, and an unhealthy diet.[1] Aside from avoiding tobacco, mitigating these lifestyle factors are among the most effective strategies for reducing the risk of cancer.[2]

For cancer survivors, the evidence, although more limited than that for the development of cancer, suggests that lifestyle factors, such as body weight, physical activity, diet, and alcohol intake, may affect risk for recurrence and overall survival following diagnosis.

Nutrition and physical activity **recommendations** established recently by the American Cancer Society for the primary prevention of cancer[3] are broadly relevant to survivors undergoing treatment or post-treatment.

Table 1: ACS Nutrition and Physical Activity Recommendations

For most cancer survivors, especially those who are post-treatment, disease-free, or living with stable disease, it is reasonable for them to follow existing cancer prevention recommendations. **The American Cancer Society Guideline for Diet and Physical Activity for Cancer Prevention**, published in 2020, recommends the following:

Achieve and maintain a healthy weight throughout life.	Keep your weight within the healthy range and avoid weight gain in adult life.
Follow a healthy eating pattern at all ages.	A healthy eating pattern **includes**: • Foods that are high in nutrients in amounts that help you get to and stay at a healthy body weight • A variety of vegetables – dark green, red, and orange, fiber-rich legumes (beans and peas), and others • Fruits, especially whole fruits in a variety of colors • Whole grains A healthy eating pattern **limits or does not include**: • Red and processed meats • Sugar-sweetened beverages • Highly processed foods and refined grain products

Table 1: ACS Nutrition and Physical Activity Recommendations	
Be physically active.	• **Adults:** Get 150-300 minutes of moderate-intensity or 75-150 minutes of vigorous-intensity activity each week (or a combination of these). Getting to or exceeding the upper limit of 300 minutes is ideal. • **Children and teens**: Get at least 1 hour of moderate or vigorous-intensity activity each day. • **Inactivity.** Limit sedentary behavior such as sitting, lying down, watching TV, and other forms of screen-based entertainment.
It is best not to drink alcohol.	• People who do choose to drink alcohol should have no more than one drink per day for women or two drinks per day for men.

Healthy Dietary Patterns

Dietary factors are responsible for about 4% of all cancer cases.[1] Diet patterns that emphasize red and processed meats, starchy foods, refined carbohydrates, and sugary drinks are associated with an increased risk of developing cancer,[4] whereas diets based on a variety of fruits and vegetables, whole grains, legumes, fish or poultry, and fewer red and processed meats are associated with lower risk.[5]

The Diet Patterns Methods Project[6] is a multicenter study of dietary patterns and cause-specific mortality. It reported lower risks of cancer mortality among women (8%-17%) and men (17%-24%) whose diets were most concordant with four healthy dietary pattern scores. The four patterns included the Mediterranean Diet, the Dietary Approaches to Stop Hypertension (**DASH**) diet, the United States Department of Agriculture (**USDA**) Healthy Eating Index, and the Harvard Alternate Healthy Eating Index (**Harvard**). These healthy dietary patterns have also been associated with a lower risk of colorectal cancer[4, 7] and total cancer incidence.[5]

Cancer survivors who follow a healthy diet pattern have a 10-12% lower risk of dying from cancer or any cause.[5]

Physical Activity

Physical activity decreases the risk of cancers of the colon (but not rectum), female breast, endometrium, kidney, bladder, esophagus (adenocarcinoma), and stomach (cardia).[8]

Cancer patients who are physically active are less likely to have adverse effects and to die from their cancer than those who are inactive. Extended leisure-time sitting has also been associated with an increased risk of cancer death[9], whereas replacing sedentary time with even short durations of moderate to vigorous physical activity appears to reduce cancer mortality.[10, 11]

In 2019, the American College of Sports Medicine (ACSM) Roundtable Report on Physical Activity, Sedentary Behavior, and Cancer Prevention and Control reported that post-diagnosis physical activity was significantly inversely associated with cancer-specific and all-cause mortality among breast, colorectal, and prostate cancer survivors. The availability of data was limited for other cancers, with single studies suggesting the benefits of physical activity on mortality outcomes for survivors of kidney, lung, and esophageal cancers, non-Hodgkin lymphoma, childhood cancer, and malignant glioma.[12]

The ACSM also published detailed physical activity guidelines for cancer survivors, based on evidence for multiple cancer-related health outcomes, including anxiety, depression, fatigue, health-related quality of life, lymphedema, physical function, bone health, and sleep.[13] See Brief #3 Physical Activity for more information about physical activity recommendations for cancer survivors.

Aerobic and resistance training consistently show a benefit for cardiopulmonary fitness, muscle strength, body composition, and balance among cancer survivors.[14] For example, in a randomized controlled trial of breast cancer survivors, women assigned to moderate-intensity resistance and impact training experienced improvements in bone mass and lean muscle mass.[15]

Additionally, a meta-analysis of 78 exercise intervention trials showed that exercise interventions resulted in clinically meaningful improvements in quality of life that persisted after the completion of the intervention.[16]

Excess Body Weight

Excess body weight increases the risk of at least 13 different types of cancer and potentially negatively impacts breast cancer survival. An estimated 5% of cancers in men and 11% in women are attributed specifically to excess body weight.[1]

During cancer treatment, maintaining a healthy body weight might help to improve tolerance to treatments. And after treatment, evidence shows that a healthy lifestyle and body weight may increase survival and reduce the risks of new primary cancers.[17, 18] There is data that shows that excess body weight is associated with an increased risk of breast cancer recurrence.[19, 20], and similar evidence is accumulating for excess weight and other cancers.[21]

Consuming a nutrient-rich diet, having a physically active lifestyle, and maintaining a healthy body weight are all important factors for long-term health and reduced risk for cancer.[17]

Alcohol

Although there is insufficient evidence to support a specific recommendation about alcohol for cancer survivors, alcohol intake is an established cause of several types of cancer. Thus, avoiding alcohol is among the recommendations for cancer prevention and is relevant to reducing new cancer risk in cancer survivors.

An estimated 6% of cancer cases are attributed to alcohol consumption. Alcohol consumption increases the risk for cancers of the mouth, pharynx, larynx, esophagus (squamous cell carcinoma), liver, colorectum, female breast, and stomach.[2] In survivors, alcohol intake can also increase the risk of new primary cancer at these sites[22]. Additionally, studies of patients with head and neck cancer show that alcohol consumption is associated with higher all-cause mortality.[23]

It may be best for patients to avoid or limit alcohol if they are starting treatment that will put them at risk for mouth sores, such as head and neck radiation or many types of chemotherapy.[18] If alcohol is used during treatment, it should be minimized to prevent interactions with chemotherapeutic drugs and avoid the aggravation of treatment areas during radiation therapy.[19] For example, inflammation of the liver from alcohol during the time of treatment may affect the clearance of chemotherapeutic drugs and worsen toxicities.

Resources and References

Resources – For Providers		
Source	**Resources**	**Link**
American Cancer Society	Survivorship Care Guidelines: Tools for Health Care Professionals	https://www.cancer.org/health-care-professionals/national-cancer-survivorship-resource-center/tools-for-health-care-professionals.html
CA: A Cancer Journal for Clinicians	American Cancer Society Guideline for Diet and Physical Activity for Cancer Prevention journal article	https://acsjournals.onlinelibrary.wiley.com/doi/full/10.3322/caac.21591
American College of Sports Medicine: Moving Through Cancer	Evidence-based Physical Activity resources	https://www.exerciseismedicine.org/eim-in-action/moving-through-cancer/
American Cancer Society	American Cancer Society Guideline for Diet and Physical Activity for Cancer Prevention webpage	https://www.cancer.org/healthy/eat-healthy-get-active/acs-guidelines-nutrition-physical-activity-cancer-prevention.html

Resources – For Patients		
Source	**Resources**	**Link**
American Cancer Society	Survivorship: During and After Treatment webpage	https://www.cancer.org/treatment/survivorship-during-and-after-treatment.html
American Cancer Society	Life After Treatment Guide	https://www.cancer.org/health-care-professionals/national-cancer-survivorship-resource-center/tools-for-cancer-survivors-and-caregivers.html
National Association of Chronic Disease Directors (NACDD)	Talk to Someone: Physical Activity and Nutrition Tool	https://simulations.kognito.com/ncsw/nutrition/
National Association of Chronic Disease Directors (NACDD)	Talk to Someone: Alcohol Use Tool	https://simulations.kognito.com/ncsw/alcohol/

Resources – For Patients		
Source	**Resources**	**Link**
American Cancer Society	Diet and Activity Guidelines to Reduce Cancer Risk infographic	**https://www.cancer.org/healthy/eat-healthy-get-active/acs-guidelines-nutrition-physical-activity-cancer-prevention/infographic.html**
American Cancer Society	Survivorship Care Plans	**https://www.cancer.org/treatment/survivorship-during-and-after-treatment/survivorship-care-plans.html**
American Cancer Society	Caregiver Support video series	**https://www.cancer.org/treatment/caregivers/caregiver-support-videos.html**
American Institute for Cancer Research (AICR)	Healthy Living Tips for Cancer Survivors infographic	**https://www.aicr.org/wp-content/uploads/2020/07/Healthy-Living-After-Cancer-Infographic.pdf**
American Cancer Society	Diet and Physical Activity Fact Sheet	**https://www.acs4ccc.org/nutrition-and-physical-activity-resources/**
American Institute for Cancer Research (AICR)	Cancer Survival: Take control of your health website	**https://www.aicr.org/cancer-survival/**
National Comprehensive Cancer Network (NCCN)	NCCN Guidelines for Patients: Survivorship Care for Healthy Living	**https://www.nccn.org/patientresources/patient-resources/guidelines-for-patients/guidelines-for-patients-details?patientGuidelineId=52**

REFERENCES

1. Islami F, Goding Sauer A, Miller KD, et al. Proportion and number of cancer cases and deaths attributable to potentially modifiable risk factors in the United States. CA: a cancer journal for clinicians. 2018;68(1). doi:10.3322/caac.21440
2. American Cancer Society. Cancer Facts & Figures 2021. Published 2021. Accessed December 29, 2021. **https://www.cancer.org/research/cancer-facts-statistics/all-cancer-facts-figures/cancer-facts-figures-2021.html**
3. Rock CL, Thomson C, Gansler T, et al. American Cancer Society guideline for diet and physical activity for cancer prevention. CA: A Cancer Journal for Clinicians. 2020;70(4):245-271. doi:10.3322/caac.21591
4. Grosso G, Bella F, Godos J, et al. Possible role of diet in cancer: systematic review and multiple meta-analyses of dietary patterns, lifestyle factors, and cancer risk. Nutrition reviews. 2017;75(6). doi:10.1093/nutrit/nux012
5. Schwingshackl L, Bogensberger B, Hoffmann G. Diet Quality as Assessed by the Healthy Eating Index, Alternate Healthy Eating Index, Dietary Approaches to Stop Hypertension Score, and Health Outcomes: An Updated Systematic Review and Meta-Analysis of Cohort Studies. Journal of the Academy of Nutrition and Dietetics. 2018;118(1). doi:10.1016/j.jand.2017.08.024
6. Liese AD, Krebs-Smith SM, Subar AF, et al. The Dietary Patterns Methods Project: synthesis of findings across cohorts and relevance to dietary guidance. The Journal of nutrition. 2015;145(3). doi:10.3945/jn.114.205336
7. Steck SE, Guinter M, Zheng J, Thomson CA. Index-based dietary patterns and colorectal cancer risk: a systematic review. Advances in nutrition (Bethesda, Md). 2015;6(6). doi:10.3945/an.115.009746
8. World Cancer Research Fund, American Institute for Cancer Research. Diet, Nutrition, Physical Activity and Cancer: a Global Perspective. A Summary of the Third Expert Report. Published 2021. Accessed December 29, 2021. **https://www.wcrf.org/wp-content/uploads/2021/02/Summary-of-Third-Expert-Report-2018.pdf**
9. Cormie P, Zopf EM, Zhang X, Schmitz KH. The Impact of Exercise on Cancer Mortality, Recurrence, and Treatment-Related Adverse Effects. Epidemiologic reviews. 2017;39(1). doi:10.1093/epirev/mxx007
10. O'Donovan G, Lee IM, Hamer M, Stamatakis E. Association of "Weekend Warrior" and Other Leisure Time Physical Activity Patterns With Risks for All-Cause, Cardiovascular Disease, and Cancer Mortality. JAMA internal medicine. 2017;177(3). doi:10.1001/jamainternmed.2016.8014
11. Patel AV, Maliniak ML, Rees-Punia E, Matthews CE, Gapstur SM. Prolonged Leisure Time Spent Sitting in Relation to Cause-Specific Mortality in a Large US Cohort. American journal of epidemiology. 2018;187(10). doi:10.1093/aje/kwy125
12. Patel AV, Friedenreich CM, Moore SC, et al. American College of Sports Medicine Roundtable Report on Physical Activity, Sedentary Behavior, and Cancer Prevention and Control. Medicine and science in sports and exercise. 2019;51(11). doi:10.1249/MSS.0000000000002117
13. Campbell KL, Winters-Stone KM, Wiskemann J, et al. Exercise Guidelines for Cancer Survivors: Consensus Statement from International Multidisciplinary Roundtable. Medicine and science in sports and exercise. 2019;51(11). doi:10.1249/MSS.0000000000002116
14. Speck RM, Courneya KS, Mâsse LC, Duval S, Schmitz KH. An update of controlled physical activity trials in cancer survivors: a systematic review and meta-analysis. Journal of cancer survivorship : research and practice. 2010;4(2). doi:10.1007/s11764-009-0110-5
15. Winters-Stone KM, Dobek J, Nail L, et al. Strength training stops bone loss and builds muscle in postmenopausal breast cancer survivors: a randomized, controlled trial. Breast cancer research and treatment. 2011;127(2). doi:10.1007/s10549-011-1444-z
16. Ferrer RA, Huedo-Medina TB, Johnson BT, Ryan S, Pescatello LS. Exercise interventions for cancer survivors: a meta-analysis of quality of life outcomes. Annals of behavioral medicine : a publication of the Society of Behavioral Medicine. 2011;41(1). doi:10.1007/s12160-010-9225-1
17. Rock CL, Thomson C, Gansler T, et al. American Cancer Society guideline for diet and physical activity for cancer prevention. CA: A Cancer Journal for Clinicians. 2020;70(4):245-271. doi:10.3322/caac.21591
18. American Cancer Society. Nutrition and Physical Activity During and After Cancer Treatment: Answers to Common Questions. Cancer.org. Published June 9, 2020. Accessed December 29, 2021. **https://www.cancer.org/treatment/survivorship-during-and-after-treatment/be-healthy-after-treatment/nutrition-and-physical-activity-during-and-after-cancer-treatment.html**
19. Protani M, Coory M, Martin JH. Effect of obesity on survival of women with breast cancer: systematic review and meta-analysis. Breast cancer research and treatment. 2010;123(3). doi:10.1007/s10549-010-0990-0
20. Patterson Re, Cadmus La, Emond Ja, Pierce Jp. Physical activity, diet, adiposity and female breast cancer prognosis: a review of the epidemiologic literature. Maturitas. 2010;66(1). doi:10.1016/j.maturitas.2010.01.004
21. Amling Cl. The association between obesity and the progression of prostate and renal cell carcinoma. Urologic oncology. 2004;22(6). doi:10.1016/j.urolonc.2004.10.004
22. Nielsen SF, Nordestgaard BG, Bojesen SE. Associations between first and second primary cancers: a population-based study. CMAJ. 2012;184(1):E57-E69. doi:10.1503/cmaj.110167
23. Schwedhelm C, Boeing H, G H, K A, L S. Effect of diet on mortality and cancer recurrence among cancer survivors: a systematic review and meta-analysis of cohort studies. Nutrition reviews. 2016;74(12). doi:10.1093/nutrit/nuw045