

## NCCN

# Survivorship: Nutrition and Weight Management, Version 2.2014

## Clinical Practice Guidelines in Oncology

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### Abstract

Healthy lifestyle habits have been associated with improved health outcomes and quality of life and, for some cancers, a reduced risk of recurrence and death. The NCCN Guidelines for Survivorship therefore recommend that cancer survivors be encouraged to achieve and maintain a healthy lifestyle, including attention to weight management, physical activity, and dietary habits. This section of the NCCN Guidelines focuses on recommendations regarding nutrition, weight management, and supplement use in survivors. Weight management recommendations are based on the survivor's body mass index and include discussions of nutritional, weight management, and physical activity principles, with referral to community resources, dietitians, and/or weight management programs as needed. (*J Natl Compr Canc Netw* 2014;12:1396–1406)

### NCCN Categories of Evidence and Consensus

**Category 1:** Based upon high-level evidence, there is uniform NCCN consensus that the intervention is appropriate.

**Category 2A:** Based upon lower-level evidence, there is uniform NCCN consensus that the intervention is appropriate.

**Category 2B:** Based upon lower-level evidence, there is NCCN consensus that the intervention is appropriate.

**Category 3:** Based upon any level of evidence, there is major NCCN disagreement that the intervention is appropriate.

All recommendations are category 2A unless otherwise noted.

Clinical trials: NCCN believes that the best management for any cancer patient is in a clinical trial. Participation in clinical trials is especially encouraged.

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## Healthy Lifestyles: Nutrition and Weight Management

Healthy lifestyle habits, such as engaging in routine physical activity, maintaining a healthy diet and weight, and avoiding tobacco use, have been associated with improved health outcomes and quality of life. For some

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At the beginning of each NCCN Guidelines panel meeting, panel members review all potential conflicts of interest. NCCN, in keeping with its commitment to public transparency, publishes these disclosures for panel members, staff, and NCCN itself.

Individual disclosures for the NCCN Survivorship Panel members can be found on page 1406. (The most recent version of these guidelines and accompanying disclosures are available on the NCCN Web site at [NCCN.org](http://NCCN.org).)

These guidelines are also available on the Internet. For the latest update, visit [NCCN.org](http://NCCN.org).

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cancers, a healthy lifestyle has been associated with a reduced risk of recurrence and death.<sup>1-6</sup> Therefore, survivors should be encouraged to achieve and maintain a healthy lifestyle, including attention to weight management, physical activity, and dietary habits. Survivors should be advised to limit alcohol intake and avoid tobacco products, with emphasis on tobacco cessation if the survivor is a current smoker or user of smokeless tobacco. Clinicians should also advise survivors to practice safe sun habits as appropriate, such as using a broad-spectrum sunscreen, avoiding peak sun hours, and using physical barriers. Finally, survivors should be encouraged to see a primary care physician regularly and adhere to age-appropriate health screenings, preventive measures (eg, immunizations), and cancer screening recommendations.

The NCCN panel made specific recommendations regarding physical activity, weight management, nutrition, and supplement use, as discussed in more detail later. Although achieving all of these healthy lifestyle goals may be difficult for many survivors, even small reductions in weight among those who are overweight or obese or increases in physical activity among sedentary individuals are thought to yield meaningful improvements in cancer-specific outcomes and overall health.<sup>7</sup>

Weight gain after cancer diagnosis and treatment is common.<sup>8,9</sup> Most studies on weight and weight gain in survivors have been performed in breast cancer survivors, but some studies have also been performed in survivors of other cancers. Weight gain or being overweight or obese can exacerbate a survivor's risk for functional decline, comorbidity, and cancer recur-

Text cont. on page 1403.

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#### GENERAL PRINCIPLES OF HEALTHY LIFESTYLES

- All survivors should be encouraged to achieve and maintain a healthy lifestyle with attention to weight management (SNWM-2), physical activity (SPA-1\*), and healthy dietary habits (SNWM-1).
- Healthy lifestyle habits have been associated with improved overall health and quality of life. For some cancers, a healthy lifestyle has been associated with a reduced risk of recurrence and death.
- For a healthy lifestyle, all survivors should be encouraged to:
  - ▶ Achieve and maintain a healthy body weight throughout life (SNWM-2)
    - ◊ Pay attention to calories consumed versus calories expended via diet and exercise
    - ◊ Calculate and monitor BMI (SNWM-A\*)
  - ▶ Engage in physical activity regularly (SPA-1\*)
    - ◊ Avoid inactivity and a sedentary lifestyle
    - ◊ Strive for at least 150 min of moderate or 75 min of vigorous activity per week, spread out over the course of the week.
  - ▶ Maintain a healthy diet with high intake of fruits, vegetables, and whole grains (SNWM-1)
  - ▶ Minimize alcohol intake
    - ◊ Limit intake to 1 drink per day for a woman and 2 drinks per day for a man
  - ▶ Avoid tobacco products
    - ◊ Attempt tobacco cessation if currently smoking or using smokeless tobacco
  - ▶ Practice sun safety
    - ◊ Utilize a sunscreen with an SPF of at least 30 that protects against UVA and UVB rays and is water-resistant.
    - ◊ Apply generously and reapply every two hours or after swimming/excessive sweating
    - ◊ Consider using physical barriers whenever possible (ie, hats, shirts with sleeves, avoidance of direct sun during peak hours)
  - ▶ Follow-up with primary care physician regularly
    - ◊ Adhere to age-appropriate health screening, preventive measures (SIMIN-1\*), and cancer screening recommendations (see NCCN Clinical Practice Guidelines in Oncology for Detection, Prevention, and Risk Reduction, available online at NCCN.org)
- Routine use of dietary supplements is not recommended for the purposes of cancer control (SSUP-1)

\*Available online, in these guidelines, at NCCN.org.

HL-1

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GENERAL PRINCIPLES OF NUTRITION

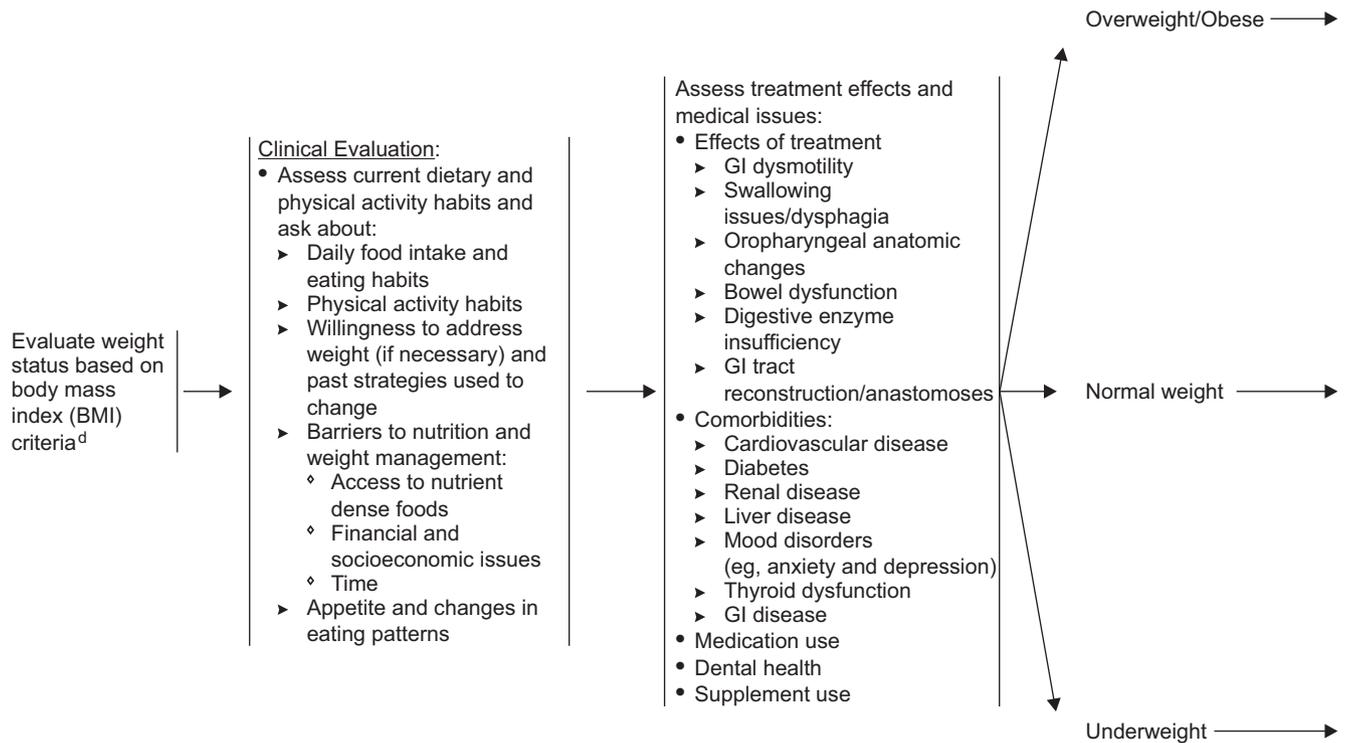
- Assess daily intake of fruits, vegetables, food/beverages with added fats/sugars, processed foods, red meat, alcohol use, and desserts
- Assess eating habits, including portion size, night grazing, snacking habits, and frequency of eating out
- Encourage informed choices about food to ensure variety and adequate nutrient intake
- Recommended composition of diet:
  - ▶ For most survivors, the USDA "MyPlate" recommendations (two-thirds plant sources, one-third animal sources) are sufficient ([www.choosemyplate.gov](http://www.choosemyplate.gov)).
    - ◊ Fat: 20%-35% of total energy intake, with saturated fat <10% and trans fat <3%
    - ◊ Carbohydrates: 45%-65% of total intake, with high intake of fruits, vegetables, and whole grains
    - ◊ Protein: 10%-35% of total intake and goal of 0.8 g/kg
- Recommended sources of dietary components:
  - ▶ Fat: plant sources such as olive or canola oil, avocados, seeds and nuts, and fatty fish<sup>a</sup>
  - ▶ Carbohydrates: fruits, vegetables, whole grains, and legumes
  - ▶ Protein: poultry, fish, legumes, low-fat dairy foods, and nuts
- Limit intake of red or processed meat
- Currently there is no consensus either refuting or supporting the role of soy foods in cancer control. Thus, moderate consumption of soy foods is considered prudent.

GENERAL PRINCIPLES OF WEIGHT MANAGEMENT

- Weight gain after cancer diagnosis and treatment is common; providers should discuss strategies to prevent weight gain for normal-weight and overweight/obese survivors.
- Weight gain can exacerbate risk for functional decline, comorbidity, and possibly cancer recurrence or death, and can reduce quality of life.
- Weight management should be a priority for all cancer survivors
  - ▶ Weight gain should be a priority for underweight survivors
  - ▶ Maintenance of weight should be encouraged for normal-weight survivors
  - ▶ Weight loss should be a priority for overweight/obese survivors
- Principles of weight loss:
  - ▶ Limit foods that are high in calories, particularly those that provide relatively few nutrients, such as sugar-sweetened beverages and food with added fats and sugars (eg, many desserts, fried foods, fast foods)
  - ▶ Substitute high-calorie foods with low-energy dense foods, such as water-rich vegetables, fruits, soups, and whole grains
  - ▶ Practice portion control by using smaller plates and restricting intakes to 1 serving
  - ▶ Make informed food choices through routine evaluation of food labels
- Referrals to registered dietitians, especially those who are Certified Specialists in Oncology Nutrition (CSOs) and members of the Oncology Nutrition Dietetic Practice Group of the Academy of Nutrition and Dietetics, should be considered.<sup>b</sup>
- No current evidence supports the use of weight loss supplements in cancer survivors.

<sup>a</sup>These foods are high in calories and should be limited if weight control is an issue.

<sup>b</sup>Many hospitals employ CSOs, and those in private practice can be accessed via the Academy of Nutrition and Dietetics locator at [www.eatright.org](http://www.eatright.org).

NUTRITION AND WEIGHT MANAGEMENT ASSESSMENT<sup>c</sup>

<sup>c</sup>Coordination with primary care physicians and other involved providers is recommended.

<sup>d</sup>For body mass index, see SNWM-A; available online, in these guidelines, at NCCN.org.

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NUTRITION AND WEIGHT MANAGEMENT INTERVENTIONS<sup>e</sup>

- Discuss “General Principles of Nutrition” (see SNWM-1)
- Discuss “General Principles of Weight Management” (see SNWM-2)
- Discuss “General Principles of Physical Activity” (see SPA-1\*)
- Discuss portion control<sup>f</sup>
- Refer to community resources
- Refer to dietitian or weight management programs for individualized help as needed<sup>g</sup>
- Consider evaluation for bariatric surgery or pharmacologic therapy<sup>h</sup> as appropriate (if obese or morbidly obese)<sup>f</sup>

- Discuss “General Principles of Nutrition” (see SNWM-1)
- Discuss “General Principles of Physical Activity” (see SPA-1\*)
- Reinforce maintenance of normal body weight throughout lifetime

- Discuss “General Principles of Nutrition” (see SNWM-1)
- Discuss increasing frequency of feeding<sup>f</sup>
- Discuss avoiding fluid intake with meals
- Assess smoking status and offer smoking cessation assistance as appropriate
- Assess dental health and risk factors for poor oral intake
- Assess swallowing, taste/smell disorders, and GI motility as appropriate
- Consider referral to dietitian for individualized counseling

\*Available online, in these guidelines, at NCCN.org.

<sup>e</sup>Coordination with primary care physicians and other involved providers is recommended.

<sup>f</sup>Modification of diet and dietary components should be done on an individual basis.

<sup>g</sup>Strongly consider for survivors with negligible weight loss from diet and exercise interventions.

<sup>h</sup>The safety and efficacy of these drugs in cancer survivors is unknown. Lifestyle modifications is preferred over pharmacologic therapy.

SNWM-4

#### GENERAL PRINCIPLES OF SUPPLEMENT USE

- Supplement use is not recommended for most survivors, except in instances of documented deficiencies, inadequate diet, or comorbid indications (eg, osteoporosis, ophthalmologic disorders, cirrhosis).
- Few data exist to support the use of vitamins or other dietary supplements for the purposes of cancer control, recurrence, or prevention.
- Taking vitamin supplements does not replace the need for adhering to a healthy diet. All efforts should be made to obtain nutrients from dietary intake.<sup>a</sup>
- Providers should assess supplement use at regular intervals. Ask about reasons for supplement use and supplement ingredients.<sup>b</sup>
- Survivors of certain cancers are at risk for vitamin deficiencies based on their cancer treatment. Deficiencies should be assessed and repleted as needed (eg, see GAST-6 from the NCCN Clinical Practice Guidelines in Oncology for Gastric Cancer; to view the most recent version of these guidelines, visit [NCCN.org](http://NCCN.org)).

<sup>a</sup>Referral to registered dietitians, especially those who are Certified Specialists in Oncology Nutrition (CSOs) should be considered for guidance in supplement use, if deemed necessary.

<sup>b</sup>Consider use of available resources for information on supplements (See SURV-B 2 of 2; available online, in these guidelines, at [NCCN.org](http://NCCN.org)).

SSUP-1

Text cont. from page 1397.

rence or death, and can reduce quality of life.<sup>8,10–17</sup> For example, a systematic review and meta-analysis of studies in survivors of breast cancer found a correlation between higher body mass index (BMI) and higher risk of total and breast cancer–specific mortality.<sup>12</sup> Additionally, a recent meta-analysis showed that this risk for increased breast cancer mortality is predominantly confined to the premenopausal and perimenopausal, estrogen receptor (ER)–positive population.<sup>18</sup> A retrospective study of stage II and III colon cancer survivors enrolled in National Surgical Adjuvant Breast and Bowel Project (NSABP) trials from 1989 to 1994 showed that survivors with a BMI of 35 kg/m<sup>2</sup> or greater had an increased risk of disease recurrence and death.<sup>2,5</sup> In addition, some evidence suggests that weight loss or gain increases mortality risk in survivors, suggesting that weight maintenance is optimal.<sup>19</sup>

#### **Nutrition and Weight Management Assessment**

The BMI of survivors should be evaluated at regular intervals. A BMI of 18.5 to 24.9 kg/m<sup>2</sup> is considered ideal. It is important to inform patients of their weight status, particularly if they are underweight (BMI < 18.5), overweight (BMI = 25.0–29.9), or obese (BMI ≥ 30.0), and discuss the importance of interventions to attain a normal body weight. Current dietary and physical activity habits and potential barriers to physical activity or a healthful diet of those in high-risk groups should be ascertained either by the oncologist or other appropriate allied health personnel (eg, nurses, dietitians). In addition, effects of cancer treatment and other medical issues should be assessed and addressed as necessary.

#### **Weight Management for Survivors**

Providers should discuss strategies to prevent weight gain for normal and overweight/obese survivors. Clinicians should reinforce the importance of maintaining a normal body weight throughout life and stress that weight management should be a priority for all cancer survivors. Regardless of BMI, all survivors should be advised about nutrition (see “General Principles of Nutrition,” see SNWM-1) and physical activity recommendations (see “Physical Activity,” available online, in these guidelines, at NCCN.org [MS-26]).

#### **Recommendations for Normal-Weight Survivors:**

In addition to discussing nutrition (see “General Principles of Nutrition,” see SNWM-1) and physical activity (see “Physical Activity,” available at NCCN.org [MS-26]), clinicians should reinforce the

importance of maintaining a normal weight throughout life in survivors with a BMI in the normal range.

#### **Recommendations for Overweight/Obese Survivors:**

Survivors with a BMI in the overweight (BMI = 25.0–29.9) or obese (BMI ≥ 30.0) range should be engaged in discussions about nutrition, weight management, and physical activity, as outlined in these NCCN guidelines. In addition, clinicians should specifically discuss portion control and refer overweight/obese survivors to appropriate hospital-based or community resources. Referrals can also be made to a registered dietitian, especially those who are certified specialists in oncology nutrition (CSOs) or members of the Oncology Nutrition Dietetic Practice Group of the Academy of Nutrition and Dietetics. Diet, exercise, and behavioral modification are the cornerstones of weight management; however, in cases of morbid obesity, pharmacologic agents or bariatric surgery can be considered, with appropriate referral to primary care and other providers. Of note, the safety and efficacy of weight loss drugs or bariatric surgery in cancer survivors is currently unknown.

**Recommendations for Underweight Survivors:** Survivors with a BMI in the underweight (BMI < 18.5) range should be engaged in discussions about nutrition. In addition, advising underweight survivors to increase their frequency of eating and to avoid fluid intake with meals may help with weight gain. Furthermore, smoking status, dental health, swallowing and taste/smell disorders, and gastrointestinal motility should be assessed and addressed as appropriate. Referral to a registered dietitian for individualized counseling should also be considered.

#### **Nutrition for Survivors**

Systematic reviews and meta-analyses of observational studies have shown that healthy dietary patterns are associated with a decreased risk of primary cancer development.<sup>20–23</sup> A population study in England with more than 65,000 participants found that daily consumption of 7 or more servings of fruit and vegetables reduced cancer incidence by 25% (hazard ratio, 0.75; 95% CI, 0.59–0.96).<sup>24</sup>

Data also suggest that healthy dietary patterns (as characterized by plant-based diets that have ample amounts of fruits, vegetables, and whole grains, with limited quantities of red and processed meats and refined grains and sugars) are associated with a decrease in cancer recurrence and improved out-

comes in survivors.<sup>25,26</sup> In survivors of stage III colon cancer, a diet consisting of more fruits, vegetables, whole grains, poultry, and fish, and less red meat, refined grains, and concentrated sweets was found to be associated with improved outcomes in terms of cancer recurrence and death, and in overall survival.<sup>27</sup> Recent analysis of a stage III colon cancer adjuvant therapy trial found that higher dietary glycemic load (associated with high intakes of refined starches and sugars) was associated with an increased risk of recurrence and mortality in survivors.<sup>28</sup> The link between red and processed meats and mortality in survivors of nonmetastatic colorectal cancer has been further supported by recent data from the Cancer Prevention Study II Nutrition Cohort, in which survivors with consistently high intakes of red and processed meat had a higher risk of colorectal cancer-specific mortality than those with low intakes (relative risk, 1.79; 95% CI, 1.11–2.89).<sup>29</sup> For survivors of noncolorectal cancers, the evidence linking a healthy diet with better outcomes is less robust. A study of 1901 survivors of early-stage breast cancer found that a diet higher in fruit, vegetables, whole grains, and poultry and lower in red and processed meats and refined grains resulted in a decreased risk of overall death and death from non-breast cancer causes, but was not associated with risk of recurrence or death from breast cancer.<sup>30</sup>

All survivors should be encouraged to make informed choices about food to ensure variety and adequate nutrient intake. Recommendations regarding the composition of a healthy diet and food sources for those components are included in the guidelines. In general, a healthy diet is rich in plant sources, such as fruits, vegetables, whole grains, legumes, olive or canola oil, avocados, seeds, and nuts. Fish and poultry are recommended, whereas red and processed meats should be limited. Processed foods and foods and beverages with added sugars and/or fats should also be limited. In addition, survivors should be advised to limit alcohol intake to 1 drink per day for females and 2 drinks per day for males. Currently, no consensus regarding the role of soy foods in cancer control exists. Several large studies have found no adverse effects on breast cancer recurrence or total mortality related to the intake of soy foods.<sup>31–33</sup> In fact, trends toward decreased recurrence and mortality were observed. The NCCN panel therefore considers moderate consumption of soy foods to be prudent.

The NCCN Survivorship Panel supports the following recommendations for a nutritious diet:

- For most survivors, recommending the US Department of Agriculture “My Plate” guidelines (two-thirds plant sources, one-third animal sources per day; [www.choosemyplate.gov](http://www.choosemyplate.gov)) is sufficient:
  - Fat: 20% to 35% of total energy intake with saturated fat less than 10% and trans fat less than 3%
  - Carbohydrates: 45% to 65% of total intake, with high intake of fruits, vegetables, and whole grains
  - Protein: 10% to 35% of total intake and goal of 0.8 g/kg
- Recommended sources of dietary components:
  - Fat: plant sources such as olive or canola oil, avocados, seeds and nuts, and fatty fish
  - Carbohydrates: fruits, vegetables, whole grains, and legumes
  - Protein: poultry, fish, legumes, low-fat dairy foods, and nuts
- Limit intake of red or processed meat

### Supplement Use in Survivors

Numerous systematic reviews and meta-analyses have assessed the role of various vitamins or other dietary supplements for the purposes of primary cancer prevention, cancer control, or recurrence prevention.<sup>34–46</sup> No clear evidence supports an effect of dietary supplements in cancer prevention, control, or recurrence, although a few exceptions may warrant further studies.<sup>47,48</sup> Despite the lack of data supporting supplement use, as many as 81% of survivors take some vitamin or mineral dietary supplements, often without disclosing this information to their physicians.<sup>49</sup>

Thus, the NCCN panel recommends that providers ask survivors about supplement use at regular intervals. The panel also notes that supplement use is not recommended for most survivors, except in instances of documented deficiencies (eg, survivors of gastric cancer), inadequate diet, or comorbid indications (eg, osteoporosis,<sup>50</sup> ophthalmologic disorders,<sup>51</sup> cirrhosis<sup>52,53</sup>). Survivors should be advised that taking vitamin supplements does not replace the need for adhering to a healthy diet. If deemed necessary, referral to a registered dietitian, especially a CSO, should be considered for guidance in supplement use.

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## Survivorship: Nutrition and Weight Management, Version 2.2014

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