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Learning Objectives:

Upon completion of this activity, participants will be able to:

- Integrate into professional practice the updates to the NCCN Guidelines for Survivorship
- Describe the rationale behind the decision-making process for developing the NCCN Guidelines for Survivorship

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Survivorship, Version 1.2022

Featured Updates to the NCCN Guidelines

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ABSTRACT

The NCCN Guidelines for Survivorship are intended to help healthcare professionals who work with survivors to ensure that the survivors' complex and varied needs are addressed. The NCCN Guidelines provide screening, evaluation, and treatment recommendations for the consequences of adult-onset cancer and its treatment; recommendations to help promote physical activity, weight management, and immunizations in survivors; and a framework for care coordination. This article summarizes updates to the NCCN Guidelines pertaining to preventive health for cancer survivors, including recommendations about alcohol consumption and vaccinations.

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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.

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All recommendations are category 2A unless otherwise noted.

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

PLEASE NOTE

The NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) are a statement of evidence and consensus of the authors regarding their views of currently accepted approaches to treatment. **The NCCN Guidelines Insights highlight important changes in the NCCN Guidelines recommendations from previous versions. Colored markings in the algorithm show changes and the discussion aims to further the understanding of these changes by summarizing salient portions of the panel's discussion, including the literature reviewed.**

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The complete and most recent version of these NCCN Guidelines is available free of charge at NCCN.org.

Nutrition and Weight Management

GENERAL PRINCIPLES OF NUTRITION

- Assess dietary pattern for daily intake of fruits, vegetables, and ~~unrefined~~ whole grains, as well as red and processed meats, alcohol, and processed foods or beverages with added fats and/or sugars.
- Assess timing of meals and snacking habits, portion size, frequency of eating out, and use of added fats and/or sugars to foods or beverages.
- All survivors should be encouraged to:
  - Make informed choices about food to ensure variety and adequate nutrient intake.
  - Limit red meat intake to <18 oz per week and avoid processed meat.
  - Limit ~~refined sugars and~~ other highly processed foods.
  - Limit refined sugars to <6 tsp (25 g) for a 2000-calorie daily diet and <9 tsp (38 g) for a 3000-calorie daily diet. One medium cookie has about 2 tsp of sugar; a 12-oz can of a soft drink has about 10 tsp.
  - Eat a diet that is ~~at least 50%~~ predominantly plant-based, with the majority of food being vegetables, fruit, and whole grains.[a,b]
  - Track calorie intake.
    - ◊ Self-monitoring of ~~caloric density and~~ food and beverage intake has been shown to be an effective strategy for weight management.
    - ◊ Prolonged periods of fasting may impair adequate caloric and nutrient intake.
  - ~~Consume~~ Drink alcohol sparingly if at all.[c,d] Lower levels of alcohol consumption are associated with a lower risk of cancer.
- For patients desiring further recommendations for dietary guidelines:
  - Consider referral to a registered dietitian or nutritionist.
  - The USDA approximate food plate volumes (https://www.myplate.gov) are:
    - ◊ Vegetables and fruits should comprise half the volume of food on the plate
    - ◊ Vegetables: 30% of plate; fruits 20% of plate
    - ◊ Whole grains: 30% of plate
    - ◊ Protein: 20% of plate
- Recommended sources of dietary components:
  - Fat: plant sources such as olive or canola oil, avocados, seeds and nuts, and fatty fish[e]
  - Carbohydrates: fruits, vegetables, whole grains, and legumes
  - Protein: poultry, fish, legumes, low-fat dairy foods, and nuts
- ~~Currently there is no consensus either refuting or supporting the role of soy foods in cancer control. Thus, moderate consumption (3 or fewer servings per day) of soy foods is considered prudent.~~ While the risks and benefits of soy foods for cancer survivors have been debated for many years, most studies to date show that soy foods are beneficial in promoting overall health and survival, with the strongest evidence existing for the prevention of lung cancer and among breast cancer survivors at least 12 months post-diagnosis.[f]

[a] Recommendation for healthy food portion sizes can be found on the American Institute of Cancer Research (AICR) New American Plate website (https://www.aicr.org/cancer-prevention/food-facts/aicrs-new-american-plate) as well as the USDA "My Plate" website (www.myplate.gov).

[b] Encourage the use of healthy recipes from resources such as the American Cancer Society's "Find Healthy Recipes" website: http://www.cancer.org/healthy/eathealthygetactive/eathealthy/findhealthyrecipes/maindishes/index.

[c] Rock CL, Thomson CA, Sullivan KR, et al. American Cancer Society nutrition and physical activity guideline for cancer survivors. CA Cancer J Clin 2022;72:230-262.

[d] There are some cancers for which survivors should abstain from alcohol. These include liver, esophageal, ~~kidney,~~ breast, colon, and head and neck cancers. For some survivors, there may be an increased risk of certain cancers; however, data are limited, especially on risk of recurrence. Recommend ~~using~~ drinking alcohol sparingly, if at all. (Goding Sauer A, et al. Cancer Epidemiol 2021;71:101893.)

[e] ~~These foods are high in calories and should be limited if overweight or obesity is an issue~~. These types of fats should be prioritized over saturated fats and used in moderation in the context of weight loss strategies.

[f] American Institute for Cancer Research. Soy: Intake does not Increase Risk for Breast Cancer Survivors https://www.aicr.org/cancer-prevention/food-facts/soy/

SNWM-1

Overview

The number of cancer survivors in the United States increased from approximately 3 million in 1971 to >18 million in 2022.[1,2] These numbers are predicted to surpass 22 million by 2030.[3] This striking increase, particularly in long-term survivors, is generally attributed to rising cancer incidence rates (mainly resulting from a growing and aging population), earlier cancer detection, and better treatment.

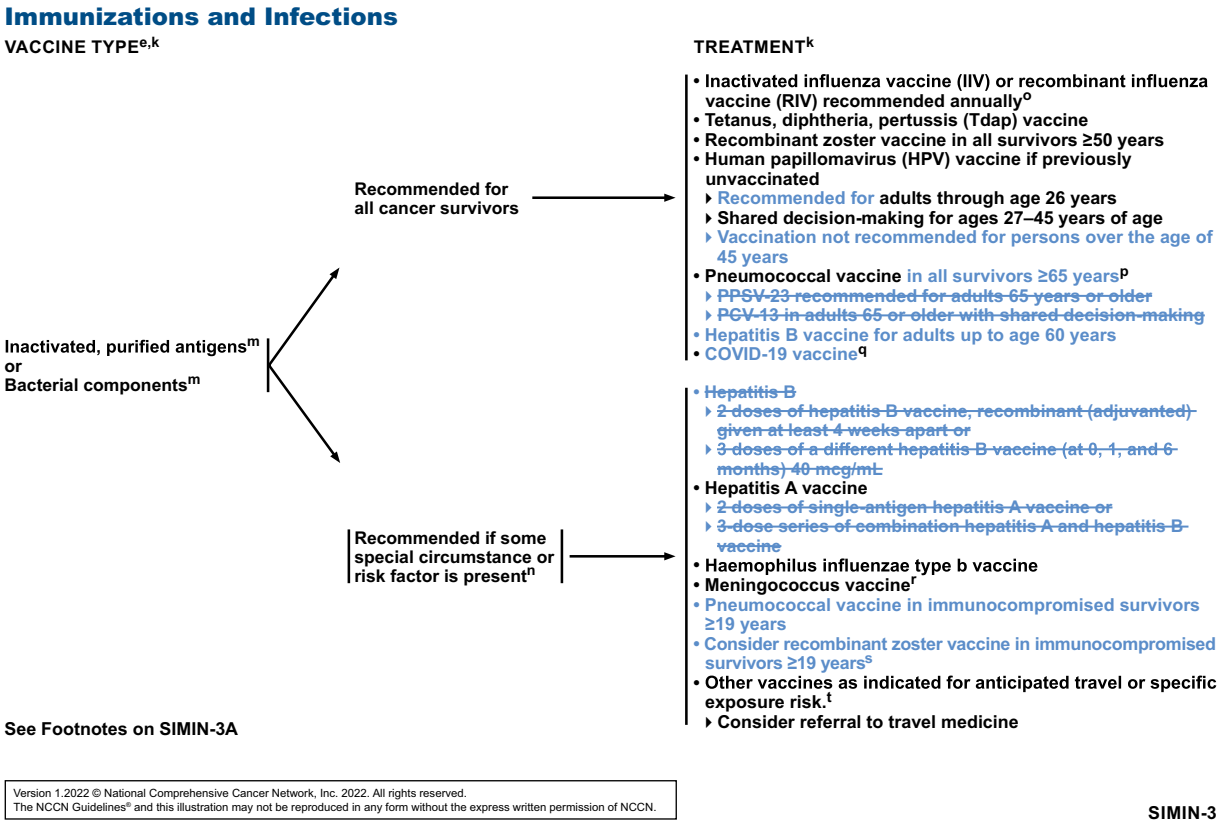
More than two-thirds of cancer survivors are aged >65 years, and the most common cancer sites are breast, prostate, melanoma, and colon/rectum, together accounting for approximately 58% of survivors.[2] Approximately 53% of survivors were diagnosed within the past 10 years, whereas approximately 18% have survived ≥20 years.

The NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) for Survivorship provide screening, evaluation, and treatment recommendations for many of the physical and psychosocial consequences of cancer and cancer treatment to aid healthcare professionals who work with survivors of adult-onset cancer. Guidance is also provided to help promote physical activity, a healthful diet and weight management, proper immunizations, and care coordination to ensure that all needs are addressed. The NCCN Survivorship Panel comprises a multidisciplinary panel of experts that includes at least one of each of the following: medical oncologist, radiation oncologist, surgical oncologist, hematologic oncologist, pediatric oncologist, bone marrow transplant clinician, gynecologist, urologist, cardiologist, neurologist, supportive care specialist, primary care physician (PCP), psychologist, psychiatrist, nutrition scientist, nurse, epidemiologist, social worker, and cancer survivor/patient advocate. The panel meets annually to discuss the latest data emerging in the field of survivorship and to decide on changes to the guidelines requested by panel members or other health professionals at NCCN Member Institutions (internal requests) or by outside individuals or groups (external requests).

Preventive health is important for the overall health and quality of life (QoL) of cancer survivors, and should include cancer screenings, surveillance for cancer spread or recurrence, immunizations, and adherence to healthy lifestyle behaviors. The panel members reviewed all of these topics at this year's panel meeting, and the areas with the most in-depth deliberations and most significant changes are discussed herein.

Healthy Lifestyles

Healthy lifestyle habits, such as engaging in routine physical activity, maintaining a healthy diet and weight,



engaging in healthy sleep habits, and avoiding cigarette/tobacco use, have been associated with improved health outcomes and QoL and decreased mortality in cancer survivors.[4–7] For survivors of certain cancers, a healthy lifestyle has been associated with a reduced risk of recurrence and death.[8–16]

Results of a recent ASCO survey indicated that more than half of survivors are affected by overweight or obesity, consume ≤2 servings of fruits and vegetables daily, and/or exercise ≤2 times each week.[17] In fact, another survey showed similar results and reported that only 7.6% of all survivors met all 6 health behavior recommendations (regarding physical activity, use of sunscreen, tobacco avoidance, minimizing alcohol, weight management, and PCP visits).[18] Analysis of data from the 2013–2017 National Health Interview Survey indicates that cancer survivors are less likely than those without a history of cancer to have a healthy body mass index (BMI; 31.6% vs 34.7%, respectively) or meet physical activity recommendations (14.2% vs 21.1%), although they are less likely to smoke (14.1% vs 16.8%) or engage in moderate/heavy drinking (18.8% vs 21.9%).[19] Some evidence suggests that cancer survivors' adherence to healthy lifestyles varies by race, with social determinants of health playing a role.[20,21] Unfortunately, adherence to practicing healthy behaviors, such as adhering to cancer screening recommendations, being physically active, not smoking, and limiting alcohol consumption, declined in the general population during the early part of the COVID-19 pandemic.[22–24] It is likely these behaviors worsened in many cancer survivors as well.

A growing body of evidence shows that interventions aimed at improving healthy lifestyles in cancer survivors can improve QoL, symptoms related to cancer and its treatment, and possibly cancer outcomes.[25–31]

Motivation to change health behaviors is often heightened among cancer survivors, especially close to the time of diagnosis.[32–35] In fact, in a recent survey, 72.8% of respondents reported changing their diet and/or exercise habits after diagnosis in hopes of improving cancer outcomes.[17] Data suggest that recommendations from the oncologist can carry significant weight for patients with cancer, yet many providers do not discuss healthy lifestyle changes with survivors.[17,32,36–38] Thus, the oncology team can play a key role by providing initial advice and making referrals to programs that are grounded in theory (eg, social cognitive theory or the theory of planned behavior).[39] Behavioral strategies used in these programs for improving

Immunizations and Infections

FOOTNOTES FOR SIMIN-3

[e] See Vaccines Contraindicated or to Be Used With Caution in Actively Immunocompromised Survivors or In Close Contacts of Immunocompromised Survivors (SIMIN-A).
[k] For dosing and schedule, See General Principles of Vaccines in Cancer Survivors (SIMIN-B).
[m] Inactivated or purified antigens or bacterial components should be administered beginning at least 3 months after cytotoxic chemotherapy or radiation therapy and 6 months after HCT (a dose of inactivated influenza vaccine can be given as early as 4 months after HCT, but a second dose should be considered in this situation).
[n] These vaccines should be considered if there are unique circumstances such as functional or anatomic asplenia or in a survivor's lifestyle, upcoming travel, or local epidemic or risks that merit their use. Please consult with an infectious disease or travel medicine specialist. Vaccination precautions for survivors who had cellular therapy can be found on SIMIN-B.
[o] See Principles of Influenza Vaccine(s) (SIMIN-C).
[p] See General Principles of Vaccines in Cancer Survivors (SIMIN-B).
[q] Recommendations regarding COVID-19 vaccines are continually changing (https://www.cdc.gov/coronavirus/2019-ncov/vaccines/stay-up-to-date.html). For guidance about COVID-19 vaccine usage in patients with cancer, please see NCCN: Cancer and COVID-19 Vaccination https://www.nccn.org/docs/default-source/covid-19/2021_covid-19_vaccination_guidance_v3-0.pdf?sfvrsn=b483da2b_60.
[r] Recommended in high-risk patients or those with functional or anatomic asplenia. Committee on Infectious Diseases. Recommendations for serogroup B meningococcal vaccine for persons 10 years and older. Pediatrics 2016;138:e20161890.
[s] Anderson TC, et al. MMWR Morb Mortal Wkly Rep 2022;71:80-84.
[t] For travel-related vaccine recommendations, see the Centers for Disease Control and Prevention website at https://wwwnc.cdc.gov/travel.

SIMIN-3A

healthy behavior practice in survivors include approaches aimed at improving self-efficacy (the belief that one can perform the actions of new activity and maintain this practice by addressing barriers and planning for behavior change) and self-monitoring (maintaining records of behavior with the goal of improved self-regulation).[40,41] Other strategies used in behavior change programs may include problem-solving therapy (a brief form of cognitive-behavioral therapy focused on specific behavior change) and motivational interviewing (exploring thoughts, wants, and feelings to shift ambivalence and overcome barriers that thwart change).[42–46] Several trials, using varying modes of delivery (eg, print materials, telephone counseling), show support for these strategies in the survivor population.[47–56]

Alcohol Consumption

Alcoholic beverages (as well as the ethanol contained in them and the acetaldehyde produced in the body from them) are classified as Group 1 human carcinogens by the International Agency for Research on Cancer (IARC) based on their association with an increased primary risk of several types of cancer, including esophageal cancer, hepatocellular carcinoma, head and neck cancers (larynx, pharynx, oral cavity), female breast cancer, and colorectal cancer.[57] The mechanisms by which alcohol causes cancer are not completely known, but likely involve DNA damage from the metabolic product acetaldehyde, the generation of reactive oxygen species, and an increase in estrogen levels.[58,59] Even light drinking can moderately increase the risk of cancer, and the more alcohol consumed, the higher the risk of developing an alcohol-associated cancer.[60–65] This risk appears to be strongest in individuals aged <40 years.[66] In fact, approximately 4.1% of new cancers diagnosed globally in 2020 were attributable to alcohol consumption, corresponding to roughly 742,000 cases, although this may be an underestimate.[67,68] In the United States, the proportion of cancers attributable to alcohol ranges on a state level from 2.9% (Utah) to 6.7% (Delaware).[69]

Some evidence suggests that low alcohol consumption may be associated with improved health outcomes overall in populations with elevated risk for cardiovascular disease.[66] However, the benefits of low-to-moderate alcohol consumption for cardiovascular risk have likely been overestimated, with newer analyses suggesting that alcohol consumption increases cardiovascular risk.[70–73]

In a large survey, 56.5% of cancer survivors self-reported currently consuming alcohol, with 34.9%

exceeding moderate drinking levels and 21.0% reporting binge drinking behaviors.[74] Another population-based study found that cancer survivors are more likely to be former drinkers and less likely to be current drinkers when compared with individuals without a history of cancer.[75] Surveys of the general population have found differences in alcohol consumption by race, with the highest prevalence of consumption in White individuals, the highest prevalence of abuse/dependence in Native Americans, and the highest vulnerability to alcohol-related health consequences in Black individuals and Native Americans.[76] Disparities in alcohol consumption also exist in sexual and gender minorities, with data showing increased use and misuse by LGBTQ+ individuals.[77–79]

Increasing evidence shows that pre–cancer-diagnosis drinking is associated with worse cancer outcomes for certain cancer types.[5] For example, prediagnosis alcohol consumption is associated with increased mortality in survivors with esophageal cancer.[80–82] Similar results are seen in survivors with gastric cancer.[83]

Although evidence is limited, alcohol consumption during cancer treatment may be associated with increased adverse effects, higher toxicity, dose reductions, and missed appointments. For example, heavy alcohol use may be associated with increased cardiotoxicity in patients receiving trastuzumab for breast cancer, and complication rates during chemotherapy may be higher in patients who drink.[84,85] Furthermore, patients report an altered sensitivity to alcohol during receipt of chemotherapy, and may experience greater cognitive declines.[86,87] Interestingly, however, habitual alcohol consumption may be associated with a lower incidence of chemotherapy-induced nausea and vomiting.[88] Overall, more research is needed to more clearly define the risks of alcohol consumption during cancer treatment.[89]

Data on the association between postdiagnosis alcohol consumption and the risks of recurrence and death are more limited, but a 2016 meta-analysis of cohort studies did find that postdiagnosis alcohol consumption was associated with an increased risk for cancer recurrence and overall mortality.[5] This effect likely varies by disease site, with the strongest evidence for increased risks in prostate and head and neck cancers.[64,68,90–95]

Panel Discussion

The panel discussed the data presented earlier and concluded that there is no safe level of alcohol; the more an individual drinks, the higher their risk of primary cancer. Although data are limited on the risk of recurrence in cancer survivors, panel members pointed out that survivors are also concerned with the risk of subsequent primary cancers, for which there are some data.[96–98] In addition, it was noted that some evidence supports the premise that alcohol increases mortality in cancer survivors.[5]

The panel noted that there is an evidence gap regarding the risks of light and occasional drinking specifically. The risks of light/occasional drinking may be too small to measure in most cases, especially in never smokers.[62,99] However, the panel noted that, due to the linear effects of alcohol on the risk for many cancer types, there is no theoretical safe level of drinking.[61,100–103] Overall, the panel consensus was that even the limit often given (1 drink per day for females and 2 drinks per day for males) is too high based on the available evidence.

The panel discussed recent, relevant guidelines from other organizations and noted that, in 2018, ASCO concluded that *excessive* exposure to alcohol should be minimized as a cancer-prevention strategy.[89] Later that year, a report published by the World Cancer Research Fund (WCRF) found strong evidence that alcohol consumption is a cause of cancer of the mouth, pharynx and larynx, esophagus (squamous cell carcinoma), liver, colorectum, breast (premenopause and postmenopause), and stomach, and states, "For cancer prevention it's best not to drink alcohol."[104] The WCRF report also found that alcohol is protective against kidney cancer, but that the benefit is far outweighed by the risk of other cancers. The 2020 American Cancer Society (ACS) Guideline for Diet and Physical Activity for cancer prevention states, "It is best not to drink alcohol. People who do choose to drink alcohol should have no more than 1 drink per day for women or 2 drinks per day for men."[105] The 2022 Nutrition and Physical Activity Guideline for Cancer Survivors, which were published by ACS after the panel meeting, are unchanged.[106] Moreover, the 2020–2025 Dietary Guidelines for Americans recommend that, "adults of legal drinking age can choose not to drink, or to drink in moderation by limiting intake to 2 drinks or less in a day for men and 1 drink or less in a day for women, when alcohol is consumed. Drinking less is better for health than drinking more."[107]

The language in the 2021 version of the NCCN Guidelines for Survivorship was, "Consume alcohol sparingly if at all," and there was an associated footnote remarking that there are some cancers of which survivors should abstain from alcohol, including liver, esophageal, kidney, and head and neck cancers. In general, the panel felt that the recommendation struck the right balance, but there was some question as to the strength of the data behind the list of cancers included in the footnote. The panel agreed that kidney cancer should be removed from the list, based on data that alcohol may even be protective against primary kidney cancer development.[108] The panel believed the data for the other cancers were strong enough to include, although it was noted that alcohol has a stronger association with certain types of head and neck cancer than others. One panel member noted that most of the data on the risks of alcohol for head and neck cancers

predate the HPV-mediated oropharyngeal cancer era, and alcohol may have less of an effect on risk of recurrence in HPV-mediated disease.[109,110] Furthermore, there was some concern that the evidence of alcohol's risk on head and neck cancer has been confounded by the risks of smoking. The panel noted that some studies controlling for smoking found an independent effect of alcohol.[111,112] However, in one study, the effect was not significant among individuals with lower levels of alcohol use.[112]

Panel members also considered the question of whether breast and colorectal cancers should be added to the list of cancers in the footnote. The IARC added breast and colorectal cancers to the list of alcohol-associated cancers in 2010.[57] Although some data suggest that drinking has no impact on breast cancer–specific outcomes, other data suggest that alcohol consumption is associated with increased mortality in breast cancer survivors, particularly heavy drinking and drinking by postmenopausal survivors.[5,96,113–119] For colorectal cancer, some studies show an association between light/moderate alcohol consumption and lowered risk of and improved survival from the disease.[120–123] However, other studies show that drinking, especially heavy consumption, increases risk.[120,124,125]

Despite the clear risks of alcohol consumption, panel members emphasized that alcohol may be relevant to QoL for some survivors, and asking survivors to completely abstain may alienate some survivors and work against efforts to decrease the volume of alcoholic consumption. Aiming for moderation or reduction in alcohol use is more realistic for some survivors than full abstention. At the same time, the panel felt strongly that they must follow the data and make sure that healthcare providers and survivors are aware of the risks. One panel member stated that survivors should be informed about the known risks so they may make decisions to balance their risks with the benefits they get from alcohol and consider making other changes to decrease their overall health risks (eg, eating healthier and being physically active).

Following these discussions and review of the data, the panel agreed on minimal changes to the main recommendation, while adding additional information (see SNWM-1, page 1082): "Drink alcohol sparingly if at all. Lower levels of alcohol consumption are associated with a lower risk of cancer." The panel removed kidney cancer from the footnote and added breast and colorectal cancers, with the addition of the caveat that data are limited, especially on risk of recurrence.[69]

Immunizations

Cancer survivors may be at elevated risk for infection because of immune suppression associated with previous cancer treatments, such as chemotherapy, radiation, corticosteroids, certain surgeries, and stem cell transplantation. In fact, antibody titers to vaccine-preventable diseases decrease after certain cancer treatments.[126–129]

Many infections in survivors can be prevented by the use of vaccines. However, data from the Behavioral Risk Factor Surveillance System found that 42% of survivors did not receive an influenza vaccination in 2009, and 52% reported never receiving a pneumococcal vaccination.[130] Analysis of the SEER-Medicare database showed that survivors of breast cancer aged ≥65 years were less likely to receive an influenza vaccination than matched noncancer controls.[131] A separate analysis of the SEER-Medicare database by another group found similar results.[132] However, other studies show that certain cancer survivor populations have higher rates of influenza vaccination than the general population or noncancer controls.[133–135]

Vaccines represent a unique challenge in cancer and transplant survivors, because they may or may not trigger the desired protective immune responses due to possible residual immune deficits.[136–138] In addition, certain vaccines, such as those that are live attenuated (ie, MMR, oral typhoid, yellow fever, rotavirus, intranasal influenza, and varicella), are contraindicated in actively immunosuppressed survivors because of an increased risk of developing the disease and/or prolonged shedding of the live organism given in the vaccine.

Panel Discussion

The panel received several internal requests for the guidelines to include a more explicit recommendation for COVID-19 vaccination. The 2021 NCCN Guidelines contained only a footnote directing readers to NCCN's separate *Cancer and COVID-19 Vaccination* guidance document, which provides recommendations to help cancer care providers make informed decisions on how to protect their patients from COVID-19.[139] This document is updated continually by NCCN's Advisory Committee on COVID-19 Vaccination and Pre-exposure Prophylaxis as vaccine options become available. The committee includes experts in hematology, oncology, infectious disease/vaccine development, and medical ethics. The NCCN Survivorship Panel discussed that they continued to believe that NCCN's Advisory Committee was best equipped to keep up with the rapidly changing guidance. However, panel members expressed that they wanted to ensure it was clear in the guidelines that cancer survivors should receive the COVID-19 vaccine. The panel uniformly believes that the vaccines are safe and beneficial for cancer survivors. Therefore, the panel decided to include the COVID-19 vaccine in the list of vaccines recommended for all cancer survivors (see SIMIN-3, page 1083). Due to the fluid nature of COVID-19 vaccine recommendations, the panel continues

to refer to NCCN's *Cancer and COVID-19 Vaccination* document for specific guidance (see SIMIN-3A, page 1084).

Other internal requests were regarding 2 new FDA approvals of the 20-valent pneumococcal conjugate vaccine (PCV20) and the 15-valent pneumococcal conjugate vaccine (PCV15). These vaccines have a broader spectrum of strain coverage compared with the previous PCV13 vaccine, though fewer than the older PPSV23 vaccine. Data suggest that they are safe and effective.[140,141] Furthermore, the added serotype coverage is expected to have a large impact on disease burden in the United States and globally.[142,143] At the time of the panel meeting, the CDC's Advisory Committee on Immunization Practices (ACIP) had not yet released recommendations regarding the new vaccines. Panel members brought up possible issues of accessibility, cost, and insurance coverage, but the panel consensus was to follow ACIP's recommendations when they were available. They were published not long after the panel meeting,[144] and the recommendations were included in the 2022 NCCN Guidelines (see SIMIN-3, page 1083). Of note, the panel now includes a recommendation for pneumococcal vaccine in immunocompromised survivors aged ≥19 years.

An external request was for the panel to expand the recommendations for use of the recombinant zoster vaccine (RZV) based on the recent expansion of the FDA label to include use of RZV in certain immunocompromised adults aged ≥18 years. A randomized phase III study of patients aged ≥18 years who were posttransplant for multiple myeloma or other diagnoses (including lymphomas, leukemias, and solid tumors) showed that RZV was effective at reducing the incidence of herpes zoster.[145] A separate phase III study showed that RZV is safe and effective in immunocompromised patients aged ≥18 years with hematologic malignancies.[146] The vaccine has also been shown to be immunogenic in patients aged ≥18 years with solid tumors receiving immunosuppressive chemotherapies.[147] The ACIP had not yet released updated guidance on RZV at the time of the panel meeting, and the panel agreed to follow those recommendations when they were available. ACIP published its updated RZV guidance in January 2022,[148] so the panel added "Consider recombinant zoster vaccine in immunocompromised survivors ≥19 years" in the 2022 NCCN Guidelines (see SIMIN-3, page 1083).

The panel also received a request to recommend that RZV can be given to patients *during* chemotherapy. Several panel members discussed that they wait to give immunizations until after chemotherapy, usually waiting for lymphocyte counts to recover. It was acknowledged, however, that this approach is controversial, and some providers do vaccinate patients during chemotherapy. Regardless of these points, the panel noted that this request was not relevant to these survivorship guidelines, and they declined to add any recommendations on timing of vaccine administration in relation to chemotherapy.

In April 2022, ACIP published updated guidance on hepatitis B vaccination, now recommending universal vaccination of adults aged 19 to 59 years.[149] Vaccination of adults aged ≥60 years who are at risk for hepatitis B virus infection is also recommended. In postmeeting correspondence, the panel agreed to move hepatitis B vaccination from the "Recommended if some special circumstance or risk factor is present" section to the "Recommended for all cancer survivors" section (see SIMIN-3, page 1083).

Of note, all of the dosing and timing recommendations were removed from SIMIN-3 and consolidated into the tables on the appendix pages of the guidelines (see SIMIN-B in the full version of these guidelines, available at NCCN.org).

Conclusions

Preventive health is a critical aspect of the comprehensive care of cancer survivors. Survivors should be made aware of healthy lifestyle recommendations and the possible impact a healthy lifestyle can have on their overall health, QoL, cancer-related adverse effects, and cancer outcomes. In particular, cancer survivors need to be aware of the risks posed by alcohol consumption so they can make appropriate, informed choices. In addition, survivors should receive all recommended immunizations to protect themselves from vaccine-preventable diseases.

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