Cancer Screening and Surveillance Testing for Older Adult Cancer Survivors

Presented by Nancy L. Keating, MD, MPH

ABSTRACT

In older adult cancer survivors, cancer screening and surveillance testing carry benefits and harms that depend on a variety of factors. Benefits of screening include early diagnosis and a lower risk of death from cancer. Harms include false-positive results, unnecessary biopsies, incidental findings, and overdiagnosis. The primary factor in deciding whether older adult cancer survivors should undergo screening or surveillance testing is life expectancy, but other factors also come into play, such as a patient’s health status, goals, and values. An individualized approach as well as shared decision-making are crucial when working with patients to make these important decisions.

The number of older cancer survivors in the United States has increased exponentially over the past 50 years—and only continues to increase—with the greatest growth in individuals older than 65 years. Although routine screening and surveillance testing for cancers in this population are crucial for many, they can be harmful to others. Many factors come into play when determining whether an older cancer survivor should undergo screening or surveillance testing, but according to Nancy L. Keating, MD, MPH, Professor, Medicine and Health Care Policy, Dana-Farber/Brigham and Women's Cancer Center, who presented at the NCCN 2022 Annual Conference, one rule should always be remembered: finding cancer is not actually the goal of screening or surveillance testing; preventing cancer death is.

Risks and Benefits of Screening and Surveillance Testing

According to Dr. Keating, a good screening (or surveillance) test for older adult cancer survivors has several hallmarks: it finds cancer before symptoms occur, it finds cancer that is easy to treat and cure when found early, it has minimal risks and few false-negative or false-positive results, and it decreases cancer mortality with minimal overdiagnosis.

“For cancer screening, the benefits are pretty clear. We’re looking for a lower risk of death from cancer, as well as diagnosis of cancer at an earlier stage, leading to less intensive treatments,” she explained. “But what are the harms? They include false-positive tests, unnecessary biopsies, incidental findings—which are more common with imaging modalities for screening—and overdiagnosis.”

Overdiagnosis occurs when screening finds subclinical cancers that would not have become overt before the patient died of other causes. There are 2 types of overdiagnoses: when a cancer never progresses (or may even regress), and when a patient has a limited life expectancy and dies of another cause sooner than the cancer would progress and symptoms would appear. “If an overdiagnosed cancer is treated, the patient is subjected to the harms of treatment without experiencing any benefit because the tumor would not have caused clinical harm if it were never detected,” Dr. Keating clarified.

Dr. Keating stated that when an abnormal cell begins growing, there is a proportional increase at which the cancer causes symptoms and eventually death. Very slow-growing and nonprogressive cancers are at the highest risk of overdiagnosis, whereas quickly growing cancers do not typically benefit from screening at all because disease progression is so fast that it occurs between screening intervals. Those with slow-growing cancers have the most potential to benefit from routine cancer screenings or surveillance.

Data from the Mayo Lung Project, in which patients were randomly assigned to screening with a chest radiograph and cytology or to the control group, further illustrate the potential harms of overdiagnosis. Screening led to a substantial increase in the number of cancer cases, but no decrease in deaths from cancer. “This is an example of overdiagnosis where the cancers were detected, but not in manner timely enough to interfere with the natural history of the disease,” she said.

To help individuals understand the benefits and harms of screening, decision tools have become increasingly available in the primary care setting for general screening populations. Figure 1 shows a decision tool for mammography screening from HealthDecision that illustrates a typical trajectory of 10,000 women aged ≥74...
years who are screened for breast cancer over the course of 10 years.3

**Identifying Older Adults Who May Benefit From Screening**

One modeling study found that for every 1,000 women screened for breast cancer, it takes approximately 10.7 years to prevent one breast cancer death.4 “The reason for this is that these cancers grow slowly over time, and you need time for interventions to actually produce a benefit,” Dr. Keating said. This understanding has led many recent guidelines to suggest stopping cancer screening when life expectancy is <10 years, she added.

The NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) for Older Adult Oncology take a similar approach in considering life expectancy in decisions about cancer screening. Life expectancy can be estimated from population life tables, which show median, 25th, and 75th percentiles of life expectancy by sex and age for older adults in the United States.5 Many older adults have a life expectancy of >10 years. For example, the median life expectancy for an 80-year-old woman is 9.5 years, but a woman in the healthiest quartile is likely to live another 13.5 years, suggesting she may live long enough to benefit from cancer screening.

According to Dr. Keating, another helpful tool in calculating life expectancy (or more specifically, the probability of a person living another 10 years) is called ePrognosis. This tool takes into account other factors besides age—such as activities of daily living and comorbid illness—to determine the benefit or risk of cancer screening. It is freely available at eprognosis.ucsf.edu and also through a smartphone app.

**Current Use of Screening Mammography for Older Women**

Analysis of data from the National Health Interview Survey showed that many women still undergo mammography screening even when the benefit is small.6 This study found that approximately 66% of women aged 75 to 79 years and about 40% of those aged ≥85 years reported having a mammogram in the past 2 years, many of whom had a life expectancy of <10 years. Analysis of the same data, adjusted by risk of death, demonstrate that approximately 35% of women who are not expected to live another 10 years are still undergoing routine screening mammography.

A similar analysis was later conducted among breast cancer survivors. The study showed that half of women with a life expectancy of ≤5 years had a surveillance mammogram in the prior year (50% vs 80% for women with a life expectancy of >5 years).7

Although historically guidelines have recommended that women with a history of breast cancer continue annual mammography of any remaining breast tissue indefinitely, a better understanding of the natural history of cancer progression and the harms of routine surveillance testing suggests that this may not be the optimal strategy.

**NCCN Guidelines for Older Adult Oncology**

In regard to both cancer screening and surveillance testing, the NCCN Guidelines for Older Adult Oncology, Version 1.2021, consider factors such as a patient’s overall life expectancy, health status, goals, and values, as well as careful consideration of individual benefit versus harm (Figure 2).
Screening and Surveillance in Older Adult Survivors

**Screening and Surveillance Mammography for Older Patients After Treatment for Early-Stage Breast Cancer**

> "This is pretty similar to what we’re doing in the primary care setting. Patients with a life expectancy of <10 years are very unlikely to have a benefit from routine cancer screening, so a conversation about this can be helpful in preventing excessive screening and overdiagnosis," said Dr. Keating. "However, if a patient’s life expectancy is >10 years, then a discussion about the patient’s goals and values is important." The NCCN Guidelines approach routine surveillance testing for older adult cancer survivors with no evidence of disease in a similar fashion (Figure 3). "Here, [in the guidelines], the life expectancy cutoff is 5 years because of the concern that patients who have had a history of cancer might actually be at higher risk of a cancer recurrence, so surveillance testing might be beneficial," she noted. "If life expectancy is <5 years, patients are unlikely to benefit from routine cancer screening; recommend to stop screening unless signs or symptoms detected."

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**HIGHLIGHTS OF THE NCCN 2022 ANNUAL CONFERENCE**

> "If life expectancy is ≤5 years, patients are unlikely to benefit from routine surveillance testing unless signs or symptoms detected."

**Figure 2.** NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) for Older Adult Oncology, Version 1.2022: cancer screening for adult cancer survivors [OAO-I]. Is the patient a candidate for routine cancer screening considering overall life expectancy?

> "Assess goals and values: Are the patient’s goals and values consistent with wanting anti-cancer treatment, if cancer is detected? (See OAO-2)"

> "Yes → Recommend to stop routine surveillance testing unless signs or symptoms"

> "No → Engage in shared decision making"

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**Figure 3.** NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) for Older Adult Oncology, Version 1.2022: surveillance testing for older adult cancer survivors with no evidence of disease [OAO-J]. Is the patient a candidate for routine surveillance testing considering overall life expectancy?

> "Assess goals and values: Are the patient’s goals and values consistent with wanting anti-cancer treatment, if cancer is detected? (See OAO-2)"

> "Yes → Recommend to stop routine surveillance testing unless signs or symptoms"

> "No → Engage in shared decision making about continuing routine surveillance testing"

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> Refer to life table and eprognosis (See OAO-A).

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from surveillance testing for finding a recurrence or a new cancer. However, if life expectancy is >5 years, then a discussion with the patient about goals and values again is important.”

**Assessing Risk Through an Individualized Approach**

According to Dr. Keating, when it comes to discussions with patients about cancer screening and surveillance testing, shared decision-making is critical. At a minimum, this process involves an assessment of the individual’s risk of cancer (eg, a new cancer, a recurrence, or disease progression) and death from other causes, and a discussion of benefits and harms in that context. Afterwards, the discussion should assess the patient’s values and preferences, and finally, a shared decision should be reached that is consistent with the patient’s values and preferences.

In terms of assessing an individual’s risk, research is ongoing in several malignancies. Dr. Keating highlighted some recent work in breast cancer led by Rachel Freedman, MD, MPH, of Dana-Farber Cancer Institute. Dr. Freedman reviewed the literature to determine the likelihood of older women developing in-breast cancer events, based on cancer subtype and treatment, and found that previous hormone therapy reduces the risk for breast cancer. “She showed that many women who have been treated with endocrine therapy and/or radiation therapy, despite having a history of breast cancer, have a very low risk—1% to 2%—of in-breast events over 10 years,” said Dr. Keating. “What’s important to note is that this risk is substantially lower than the average risk of a 74-year-old woman without a history of cancer developing breast cancer in the next 10 years, which is approximately 4%.”

With input from patient and clinician focus groups, Dr. Freedman and colleagues developed an information guide that can be used to engage women in shared decision-making about surveillance mammography. Dr. Freedman will be publishing her information guide in the medical literature, and is planning a large, randomized clinical trial to assess its impact.

“One of the concerns with stopping mammography for women who are breast cancer survivors is fear of recurrence,” added Dr. Keating. “So providing this information to let them know that their actual risk of recurrence is quite low can be very reassuring.”

**Disclosures:** Dr. Keating has disclosed no relevant financial relationships.  

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**References**


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Accessed January 10, 2022. To view the latest version of these guidelines, visit NCCN.org.