Cancer Screening in Older Adults

Individualized Decision-Making and Communication Strategies

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KEYWORDS

• Older adults • Cancer screening • Mammogram • PSA test • Colon cancer • Lung cancer

KEY POINTS

- The benefits of cancer screening are uncertain in older adults due to lack of inclusion of adults older than 75 in most randomized controlled trials.
- There are several known harms of cancer screening in older adults, including risks of overdiagnosis, false positive results, and procedural complications from downstream diagnostic interventions that increase with decreasing life expectancy.
- Cancer screening recommendations should be individualized for older adults by accounting for overall health and life expectancy, values and preferences, and how these affect specific risks and benefits of cancer screening tests.
- Communicating screening recommendations should incorporate visual data when possible, provide context in terms of competing medical priorities, and use phrases considered more acceptable and easy to understand by older adults.

INTRODUCTION

National recommendations for cancer screening have changed significantly in recent years for older adults.[1] Changes have been related to an increased recognition that cancer screening decisions are often complex in adults who are older than 75 years. Although many older adults have substantial life expectancy and are in good health, most randomized controlled trials (RCTs) of cancer screening tests have not included adults older than 75.[2] Consequently, it can be unclear when it is appropriate to

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extrapolate potential benefits to individual older adults seen in clinic. Moreover, there is accumulating evidence of potential harms of cancer screening.[3] For example, older adults who are frail or who have many comorbid medical conditions may experience greater rates of complications from follow-up procedures to screening tests and be unaware of "diagnostic cascades" following positive tests. Overdiagnosis, or the diagnosis and treatment of a cancer that would not have caused symptoms during an individual's remaining lifetime, occurs more frequently among older adults with less than a 10-year life expectancy, potentially exposing them to the harms of testing and treatment (including surgeries, chemotherapy, and radiation) without benefits.[4] Moreover, in typical time-limited primary care settings, discussions about cancer screening may take time away from discussing interventions for treating known comorbid diseases, such as heart disease, or reducing polypharmacy.

In response to the need to balance the potential benefits and harms, cancer screening should not follow the "check-box" approach based solely on age. Rather, cancer screening is a medical procedure that requires thoughtful individualized decision making in older adults before undergoing testing. In practice, however, it can be challenging to communicate cancer screening recommendations while reconciling different, and often inconsistent, cancer screening guidelines. This can lead to both missed opportunities to refer older adults who would benefit from screening, and situations in which screening potentially leads to more harm than benefit. We therefore have 2 objectives in this article. First, we discuss a framework for individualized decision making for prostate, lung, breast, and colon cancer screening. Second, we provide guidance on how to communicate cancer screening recommendations, including recommendations to stop screening when appropriate.

APPROACH TO INDIVIDUALIZED DECISION MAKING

Individualized decision making involves accounting for the risks and benefits of cancer screening among older adults, as well as perspectives and values that influence their decisions.[5] We suggest a structured framework focused on 3 key areas to develop an individualized recommendation: (1) the person's overall health and estimated life expectancy, (2) individual preferences and values, and (3) how health, life expectancy, and individual preferences impact the potential benefits and harms of screening tests. We discuss each factor in more detail as follows.

Overall Health and Life Expectancy

Clinicians should make an assessment of a person's overall health and whether an individual has a life expectancy of at least 10 years, because the harms of screening outweigh the benefits for those with less than a 10 year life expectancy.[5] There are several potential approaches to estimating health and life expectancy. First, clinicians can use their clinical judgment to determine whether an individual is in the highest quartile, middle 2 quartiles, or lowest quartile of life expectancy for their age group and match this to life table data (**Fig. 1**).[5,6] These data, for example, show that women age 80 in the top or middle 2 quartiles might benefit from cancer screening, women age 85 need to be in the top quartile of health to potentially benefit, and women age 90 are unlikely to benefit in any quartile. In addition, most men older than 85 are unlikely to benefit from cancer screening. Approaches to determining the quartile of health for each person includes conducting a clinical examination to assess gait speed,[7] self-rated health, and/or the severity of multiple chronic medical conditions.[5] For example, persons diagnosed with moderate or severe dementia on average have less than a 10-year life expectancy and often cannot

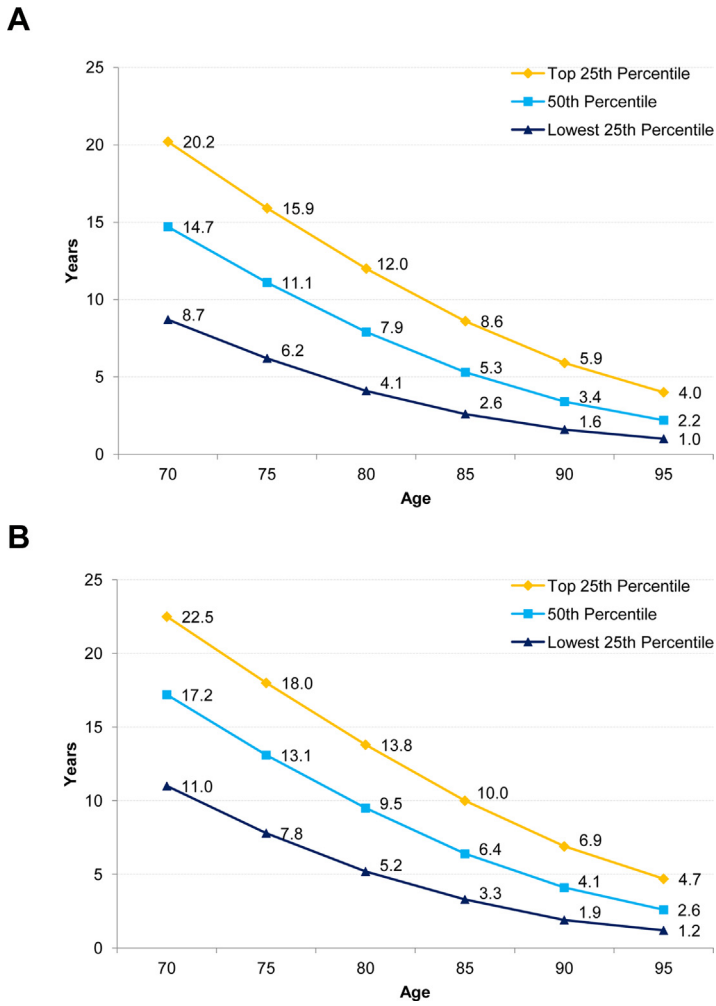

Fig. 1. Upper, middle, and lower quartiles of life expectancy for men and women at selected ages based on 2017 US life tables. (*A*) Life expectancy for men. (*B*) Life expectancy for women. (*Data is* derived from life expectancy tables in Arias E, Xu J. United States Life Tables, 2017. *National Vital Statistics Reports.* 2017;68(7).)

tolerate invasive downstream interventions. For another example, a 70-year-old with poorly controlled heart failure experiencing frequent hospitalizations is less likely to benefit from cancer screening, compared with a 77-year-old with well-controlled heart failure.

Second, clinicians can enhance their clinical judgment of estimated life expectancy by using online prognostic tools. A collection of prognostic calculators is provided online (see: eprognosis.org) that specifically estimate 10-year life expectancy (**Fig. 2**A).[8] These short online calculators include measures of age, medical conditions, functional disabilities, and health behaviors, such as smoking status, to provide percentage estimates of 10-year mortality. Having more than a 50% likelihood of 10-year mortality indicates an individual has less than a 10-year life expectancy and is unlikely to benefit from cancer screening.

Fig. 2. The ePrognosis Online Application. (*A*) ePrognosis Home Page for Prognostic Calculators, Cancer Screening, and Communication Strategies. (*B*) Breast Cancer Screening Prognostic Calculator and Decision Support Tool. Source: www.eprognosis.org (accessed July 23, 2020). After arriving to the Web site main page (*A*), users can choose the "Cancer Screening" option, which will prompt users to select the cancer screening test they would like decision support for. Options include breast cancer screening, colorectal cancer screening, or both. After selecting a cancer screening test, users can complete an online prognostic calculator and results of this prognostic calculator are integrated into a decision support tool with multiple visual representations of data to facilitate shared decision making. An example of part of the breast cancer screening decision aid is shown in (*B*).

Individual Preferences and Values

It is important to understand a person's preferences for cancer screening and values that guide their decision making. Older adults should be asked, for example, about if they have undergone screening in the past and their experience with it. In general, clinicians can solicit perspectives on whether individuals prefer to have more medical information and testing done compared with a general preference to avoid medical testing. Individuals who feel they have other pressing health priorities might

reasonably feel a need to control these conditions before pursuing cancer screening.[9] In addition, preferences include the willingness to undergo downstream invasive diagnostic procedures with a realistic understanding of potential risks and benefits. The risks of prostate biopsies, lung biopsies, or colonoscopies, for example, may not be considered tolerable to some individuals. Other individuals may have experienced false positive tests requiring biopsies in the past, and be less willing to undergo such procedures again.[10] In addition, it can be helpful to have a general sense of willingness to undergo more invasive or major treatments, such as surgery or chemotherapy. Older adults who would not want or tolerate further workup or treatment after a positive screening test should not be screened.

Risks and Benefits of Individual Cancer Screening Tests

Individualized decisions should take into account the risks and benefits of individual cancer screening tests in the context of a person's health, life expectancy and preferences. We present a brief summary of evidence related to common cancer screening tests in older adults in which individualized decisions based on life expectancy are recommended (eg, breast, prostate, colorectal, and lung cancer screening) as well as in national guidelines. We discuss how to incorporate potential risks, benefits, and guidelines of each cancer screening test into individualized decision making. Risks and benefits are further summarized in **Table 1**.

BREAST CANCER SCREENING

Potential Benefits

Trial-based evidence of benefit in older women is uncertain because RCTs of mammography for breast cancer screening included few women older than 70. Only 1 of 8 RCTs examining mammography included a small number of women 70 to 74 years old and found no reduction in breast cancer–specific mortality in this age group. No trials have included women older than 75.[11] Observational studies have shown potential benefit of screening mammography in older women, including the detection of earlier-stage breast cancer and reduced breast cancer–specific mortality, particularly for women in better health (Charlson comorbidity scores <2 or living for a median of 10 years).[12–15] However, these results should be interpreted with caution, as they may reflect effects of length-time, lead-time, or selection bias rather than a benefit of cancer screening. Simulation models have been used to generate potential benefits of mammography among older women. These estimate 1 to 2 fewer breast cancer deaths per 1000 women in their 70s screened biennially for 10 years.[16,17] In addition, mammography may detect early cancers more frequently and more accurately (higher sensitivity and specificity) in older women.[18,19] Taken together, it is reasonable to extrapolate the modest benefits of mammography to older women who have at least a 10-year life expectancy.

Potential Harms

With 1 screening mammography test, false positive results occur in approximately 7% of women age 70 to 79, and 6.5% of women age 80 to 89, which often causes anxiety or downstream testing.[20] Biopsies are recommended in 1.8% of women age 70 to 79, and 1.6% of women age 80 to 89.[20] Breast biopsies more frequently detect cancer in older adults, but may be distressing or uncomfortable, particularly in women with dementia who may not understand what is being done to them. In model-based simulation studies of overdiagnosis, rates of overdiagnosis increase as routine cancer screening continues into older ages and for women with more comorbid medical

Table 1
Benefits and harms of cancer screening among older adults

Screening	Harms	Benefits
Breast cancer screening (Mammography)	*Overdiagnosis*: Model-based simulations of overdiagnosis suggest rates increase with age, with rates ranging 12%–29% for women 74 y old, 17%–41% for women 80 y old, and 32%–48% for women 90 y old.[21,22] The harms of overdiagnosis increase with age due to cancer-related treatment toxicity.[23] *False positive recall following mammography*: Cumulative probability of 7% in adults age 70–79 and 6.5% in women age 80–89.[20] False positives are less common in older women. *Biopsies*: Biopsy rate of 1.8% in women age 70–79 and 1.6% in women age 80–89.[20] *Other:* Anxiety, distress from false positives, financial impact of screening	*Breast cancer–specific mortality reduction*: No RCTs showing mortality reduction in women >70. Observational studies suggest benefit for women in good health, although results may reflect lead-time, length-time, or selection bias.[12–15] Mammography is more accurate in detecting cancer in older adults.[18,19] Simulation models indicate 1–2 fewer breast cancer deaths per 1000 women in their 70s screened biennially for 10 y.[16,17] Women should have >10-y life expectancy to extrapolate the benefits of screening seen at younger ages, which may outweigh harms of screening.
CRC screening	*Overdiagnosis*: Low risk, ranging 0.1%–6% of screen-detected cases.[2,4,40] *False positives requiring colonoscopies*: Up to 23% over 10 y of annual FOBT testing.[36] *Sigmoidoscopy procedural complications*: inadequate depth, perforation in 0.1 per 1000 sigmoidoscopies.[37] *Colonoscopy procedural complications*: Gastrointestinal adverse events (26 in 1000), perforation (1 in 1000), post-polypectomy bleeding (3.6 in 1000), severe cardiac or pulmonary events (12.1 in 1000) and death (1 in 1000).[38]	*CRC-specific mortality reduction*: 11%–53% CRC-specific mortality reduction with annual FOBTs[28–32]; 35% mortality reduction from sigmoidoscopies every 3–5 y.[33] No RCTs for colonoscopy, but observational studies suggest 50% reduction in incident CRCs and 50%–63% reduced CRC mortality in adults >75 y old.[34] Older adults with >10-y life expectancy are more likely to experience benefits > harms.
	Colonoscopy prep: dizziness, abdominal pain, fecal incontinence, and nausea, and individuals can experience confusion and falls with sedation post-procedure.[39]	*CRC prevention*: removal of colonic adenomas can reduce CRC incidence. Lag-time to benefit of removal of adenomas of 10 y.[35]

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Table 1
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Screening	Harms	Benefits
Prostate cancer screening (prostate-specific antigen [PSA] tests)	*Overdiagnosis*: Approximately 40%–60% of screen-detected cancers based on RCT data; 24 cases of overdiagnosis for 1 case of avoided prostate cancer death for age 50–69. Overdiagnosis rate increases with older age, as does cancer-treatment adverse effects including bowel dysfunction, urinary incontinence, erectile dysfunction, and premature death.[76] *False positives requiring biopsy*: 30%–40% of PSA tests.[71] *Biopsy-related complications*: anxiety, moderate to severe pain (7%) during and immediately after the procedure, moderate to severe hematuria (6%), infection requiring hospitalization (0.4%–1.3%), and hospitalizations (7%).[72–74] *Other*: Anxiety, distress from false positives	*Prostate cancer–specific mortality reduction*: RCTs of PSA screening have provided limited evidence of benefit in men >70 y old, and have not included men >75 y old. Men should have a life expectancy of at least 10–15 y to potentially experience benefits > harms from screening.
Lung cancer screening (low-dose tomography [LDCT])	*Overdiagnosis*: Can occur in 3%–9% of screen-detected cancers.[47–49] Overdiagnosis rates increase with older age and limited life expectancy. *False positives*: 39% of people in the LDCT group had at least 1 positive test result and 96% of positive results were false positives.[49] *Biopsy-related complications*: 8%–20% rate of complications after invasive diagnostic procedures.[50–52] *Other*: Burden of nodule tracking, radiation, anxiety.	*Lung cancer–specific mortality reduction*: Two RCTs of LDCTs indicate a 20%–24% lung cancer–specific mortality reduction among adults age 55–80 with >30 pack year smoking history and either currently smoke or quit within the past 15 y.[47–49] Older adults should have a 10-y life expectancy to potentially experience benefits > harms of screening.

Definitions: Overdiagnosis: detection of a cancer that would never progress to cause symptoms in a person's lifetime, which can lead to overtreatment (surgery, radiation, chemotherapy) that provides no benefits and only adverse effects.

Abbreviations: CRC, colorectal cancer; FOBT, fecal occult blood test; RCT, randomized controlled trial.

Data from Refs.[2,4,12–23,28–40,47–52,71–74,76]

conditions.[21,22] One simulation study estimated rates of overdiagnosis ranging 12% to 29% for women who stop biennial screening at 74 years old, 17% to 41% for women who stop at 80 years old, and 32% to 48% for women who stop screening at 90 years old.[22] The harms of overdiagnosis are especially relevant to older women given the increased risks of cancer-related treatment toxicity with age.[23]

Guidelines

The American Cancer Society (ACS) recommends women ≥55 have biennial screening if they have a life expectancy ≥10 years, and the ACS does not have an age cutoff to stop screening.[1] The US Preventive Services Task Force (USPSTF) recommends biennial mammograms for women 55 to 74 years, and that current evidence is insufficient about screening women ≥75 years old.[24]

Individualized Decisions

Among older women with less than a 10-year life expectancy, we recommend discussions about stopping mammography and prioritizing preventive care toward treating known health conditions or health behaviors. When older women have at least a 10-year life expectancy, we suggest discussing risks and benefits of mammography and reaching a shared decision. The harm of overdiagnosis in older women may be of most concern,[25] and so we suggest explanations of risks using concrete numbers and visual presentations of data (**Fig. 2**B).[8] The ACS recommends decision aids be used to assist in shared decision making, and a peer-reviewed decision aid with visual representations of data specific to women age 75 to 84 and ≥85 years old is available and was recently tested in an RCT.[26,27]

COLORECTAL CANCER SCREENING

Potential Benefits

Several trials have demonstrated colorectal cancer (CRC)-specific mortality benefits in older adults. Among trials of guaiac-based fecal occult blood tests (FOBTs), hereafter referred to as FOBT and distinct from fecal immunochemical tests (FIT), 4 RCTs included a combined 50,144 participating adults age 70 to 80 years old.[2] Three European trials found reductions in CRC-specific mortality of 11% to 16%,[28–30] and a large US trial found reductions of 22% to 32% overall, with a 53% reduction among adults >70 years old.[31,32] For sigmoidoscopies, the Prostate, Lung, Colorectal, and Ovarian (PLCO) cancer screening trial included 20,726 adults older than 70 years, and found a 35% reduced CRC mortality for adults age 65 to 74 when screened every 3 to 5 years.[33] For colonoscopies, considered the definitive test for detection of CRC and precancerous lesions, there are no published RCTs. However, one large prospective cohort study found adults older than 75 had a 50% reduction in incident CRC diagnoses in both the proximal and distal colon if >5 years since the last endoscopy and 63% reduction if <5 years from last endoscopy.[34] In addition, colonoscopies prevent CRC in addition to early detection of CRC, and the CRC-specific mortality lag-time to benefit of both prevention and early detection is approximately 10 years.[35]

Potential Harms

False positives can occur with FOBT or FIT screening tests; Hubbard and colleagues[36] estimated up to 23% of individuals receiving annual FOBT screenings over a 10-year period had at least 1 false positive. In cases of sigmoidoscopy, perforation (0.1 per 1000 sigmoidoscopies) is a rare complication and there can be challenges achieving adequate depth in older adults.[37] Colonoscopies have higher rates of adverse events in adults 65 or older, and include gastrointestinal adverse events (26 in 1000), perforation (1 in 1000), post-polypectomy bleeding (3.6 in 1000), severe cardiac or pulmonary events (12.1 in 1000), and death (1 in 1000).[38] Challenges with bowel prep in older adults are common and include dizziness, abdominal pain, fecal incontinence, and nausea, and individuals can experience confusion and falls with sedation post-procedure.[39] There are limited data on overdiagnosis in CRC screening, especially

because CRC screening contributes to prevention of CRC. The possibility of overdiagnosis appears to be lower compared with other cancer screening tests. Autopsy studies show a rate of 2% to 3% of individuals have undiagnosed CRC unrelated to cause of death,[2] RCT data on FOBTs suggests a rate of approximately 6% in those 40 to 60 years old,[4] and a population-based study in Germany found a rate of approximately 1% in older adults.[40]

National Guidelines

Several tests are recommended for CRC screening, including high-sensitivity FOBT, FIT, multitarget stool DNA test, sigmoidoscopy, computed tomography colonography, and colonoscopy. The USPSTF recommends routine screening for adults age 55 to 75 years old, and to consider screening as an individualized decision for adults age 76 to 85 years old.[41] The ACS recommends routine screening starting at age 45, that screening continue until age 75 for individuals with more than 10 year life expectancy, that clinicians individualize decisions for adults age 76 to 85, and discourage screening for individuals older than 85 years.[42]

Individualized Decisions

Among individuals with less than a 10-year life expectancy, CRC screening should be discouraged, as the procedural risks of colonoscopy, either as a screening test, or as a diagnostic test for positive noncolonoscopy CRC screening tests, likely outweigh the benefits. We discuss communication strategies because many older adults remain enthusiastic about continuing screening even when the tests are low-value and unlikely to help them live longer.[43] CRC screening has the greatest potential for benefit among older adults if they never were screened before, they are healthy enough to undergo treatment of colorectal cancer, and/or they have at least a 10-year life expectancy. In these individuals, before an FOBT or FIT, it is important to discuss the risk of a false positive and whether individuals would be willing to undergo a colonoscopy in the event of a positive result. For colonoscopies, individuals should receive information about the procedural risks as well as the burdens of bowel prep, sedation, and need for arranging transportation in the context of an older adult's health. Decision aids are effective at improving knowledge and reducing decisional conflict,[44] and decision aids are available that are tailored to CRC screening in older adults (see **Fig. 2**B).[45]

LUNG CANCER SCREENING

Potential Benefits

Several trials have evaluated the benefits of lung cancer screening using chest radiographs or low-dose computed tomography (LDCT) among adults age 55 to 74 years. For chest radiographs, the PLCO trial found no lung cancer mortality benefit among 154,942 adults age 55 to 74 years with no eligibility requirement regarding smoking.[46] In contrast, the National Lung Cancer Screening Trial (NLST) in the United States examined the efficacy of LDCT in 53,454 participants age 55 to 74 years with a history of at least 30 pack years of smoking who were current smokers or had quit in the past 15 years. This trial found a 20% relative reduction in lung cancer mortality compared with chest radiographs alone after 6.5 years of follow-up. Extended follow-up found an overall Number Needed to Screen (NNS) of 303 to prevent 1 death from lung cancer after a lag-time of 11 years.[47] In addition, the Dutch-Belgian Lung Cancer Screening (NELSON) Trial of LDCT was conducted on 15,792 current or former smokers (quit <10 years ago) age 50 to 74 years old who had smoked at least 15 cigarettes per

day for 25 years or 10 cigarettes per day for 30 years. This trial found a 24% reduction in lung-cancer–specific mortality at 10-year follow-up.[48]

Potential Harms

False positive results are common with LDCT screening; in the NLST, 39% of people in the LDCT group had at least 1 positive test result and 96% of positive results were false positives.[49] After positive tests, most individuals had follow-up imaging, 4.2% had surgical procedures, 2.2% had biopsies, and there was an 8.5% to 9.8% complication rate after invasive diagnostic procedures.[50,51] Complication rates after invasive procedures may be higher among the general population of older adults compared with the specialty centers in the NLST. One retrospective study of 344,510 individuals aged 55 to 77 years undergoing diagnostic pulmonary procedures showed complication rates of 22% (more than twice that of NLST).[52] Moreover, false positive results and complications from diagnostic interventions are higher among older adults and among those in worse health compared with those who are younger or healthier.[53–55] The reported rates of overdiagnosis ranged from 3% in the NLST trial with extended follow-up to 8.9% in the NELSON trial, although this is an area of active study.[47,48,56] Additional harms include radiation exposure, financial strain, and anxiety from false positive results.[51]

National Guidelines

The USPSTF and ACS recommend annual LDCT for lung cancer screening in adults 55 to 74 years old (or up to 80 in USPSTF guidelines) who have a 30 pack year history and currently smoke or quit within the past 15 years.[57,58] Guidelines suggest avoiding screening in older adults with a short life expectancy (<10 years) or comorbidities that would make curative surgery or cancer-directed therapies not a reasonable option.

Individualized Decisions

LDCT may be of most benefit when an older adult is at high risk of lung cancer (calculators available),[59–61] has a smoking history comparable to the NLST or NELSON trials, and has a low risk of a competing cause of death.[62] Older adults should be counseled about the possibility of frequent follow-up nodule tracking, false positive results, including lesions detected by LDCT in the thyroid and other organs, and downstream diagnostic or therapeutic medical interventions. Medicare currently requires shared decision making between individuals and their clinicians, although in practice such conversations seem to rarely occur.[63,64] The lack of shared decision making may be expected, as lung cancer screening is relatively new and clinicians may be less comfortable discussing risks and benefits. This highlights the need for more informational content or decision aids that balance the risks and benefits of lung cancer screening. A decision support pamphlet developed by the Department of Veterans Affairs is available to help educate adults about the risks and benefits of LDCT screening.[65]

PROSTATE CANCER SCREENING

Potential Benefits

RCTs of prostate-specific antigen (PSA) screening have provided limited evidence of benefit in men $\geq$70 years old. The US PLCO trial examined annual PSA screening over 6 years in 76,685 men aged 55 to 74 years (approximately 10,000 men older than 70),[66] and found no prostate cancer mortality reduction even at 15 years of follow-up, although there were high rates of contamination in the control arm.[67] The European

Randomized Study of Screening for Prostate Cancer (ERSPC) trial randomized men 50 to 74 years to PSA screening every 2 to 4 years and the control group received no PSA screening.[68] Results indicated an overall 20% reduction in prostate cancer–specific mortality after a lag-time of 13 years[69]; however, benefits of screening were found only among men 55 to 69 years at randomization. In addition, a recent UK trial of a single PSA screening test was conducted in 419,582 men 55 to 69 years old and found no prostate cancer–specific mortality benefit after 10 years of follow-up.[70]

Potential Harms

False positive results are common after PSA tests (30%–40% of tests) and can lead to both anxiety and unneeded prostate biopsies.[71] Prostate biopsies are associated with anxiety, moderate to severe pain (7%) during and immediately after the procedure, moderate to severe hematuria (6%), infections requiring hospitalization (0.4%–1.3%), and hospitalizations (7%).[72–74] In addition, overdiagnosis represents a significant harm because prostate cancers detected through PSA screening are typically slow growing and may remain asymptomatic during an individual's lifetime; in the ERSPC and PLCO trials, it is estimated that 40% to 60% of screen-detected cancers were cases of overdiagnosis.[75,76] Using the ERSPC data, there were approximately 24 cases of overdiagnosis for every 1 prostate cancer–related death prevented after 14 years of follow-up. Overdiagnosis of prostate cancer is associated with anxiety during watchful waiting for low-risk cancers and adverse effects from cancer-directed treatments (including prostatectomy, androgen deprivation therapy, and radiation), which include bowel dysfunction, urinary incontinence, erectile dysfunction, premature death, and others.[77]

National Guidelines

The most recent USPSTF guidelines encourage men 55 to 69 years to make an individualized decision about PSA screening after discussion with a clinician, and men older than 70 not to be screened.[78] The ACS recommends men older than 50 with at least a 10-year life expectancy have an opportunity to make an informed decision about whether to be screened after receiving information about the uncertainties, risks, and potential benefits of PSA screening.[1]

Individualized Decisions

PSA screening in men older than 70 should be rare and considered only in men with at least a 10-year to 15-year life expectancy after a shared decision. Short-term harms from prostate biopsies should be discussed, as should the substantial harm of overdiagnosis in older men using easy to understand language and visual data. Decision aids are available, and a recent systematic review of 19 decision aids found reductions in decisional conflict to screen. However, there was little evidence that decision aids facilitate shared decision making or impact screening choice.[79]

COMMUNICATING CANCER SCREENING RECOMMENDATIONS

Individualized decision making has been a recommended strategy for improving cancer screening decisions for nearly 2 decades.[5] Yet, overscreening remains common among older adults with limited life expectancy.[39,80] Conversely, screening may not be offered to older adults with inadequate prior screening (as in CRC or cervical cancer screening) or with greater than 10-year life expectancies despite potential benefit. One possible contributor to overscreening is that individuals tend to overestimate the benefits of screening and underestimate the potential harms.[81,82] This may contribute

to misplaced enthusiasm for screening or requests of health providers for screening tests when they may no longer be in the patient's best interest.[80] In response, health providers might feel uncomfortable managing these expectations or having difficult conversations about life expectancy, and even order investigations they know to be unnecessary.[83] Clinicians similarly may overestimate benefits of tests,[84] or may have difficulty translating statistical or highly numerical concepts in ways that are understandable to individuals. Finally, there are limitations in time for clinicians to incorporate estimates of life expectancy into recommendations or to have careful shared decisions with older adults. Consequently, it is essential to have insight into strategies that can enhance effective communication of cancer screening recommendations.

A recent systematic review discussed several strategies to improve discussions of risks and benefits of medical tests.[85] First, using visual displays of data can improve accurate recall of conversations and comprehension among adults. Visual displays of cancer screening risk are available online (see: eprognosis.org, see **Fig. 2**) and are in several decision aids specific to older adults.[8,26] Second, it can be helpful to provide context for cancer screening outcomes in relation to competing medical priorities or risks. For example, in an individual with poorly controlled heart disease, a discussion might contextualize that interventions to control heart disease will help the individual live longer and better than cancer screening tests. Third, we suggest avoiding positive framing, or framing testing results as gains rather than losses, as it is associated with increased acceptance of harmful interventions. Positive framing can be reduced by asking questions about individual values and preferences before discussing the risks and benefits of medical tests so as to frame testing outcomes in the context of what is important to that person.

When clinicians recommend screening, this recommendation should include a clear plan for reevaluating the need to continue screening at specified time points and an explanation of what might make cancer screening less of a priority in the future. Providing anticipatory guidance might lead to more comfort with eventual stopping of cancer screening when harms outweigh the benefits.

If clinicians feel that stopping cancer screening is most appropriate for an individual, there are several phrases that can be used to improve acceptability of the recommendation and comprehension of the reasoning. For example, a survey of older adults found that phrases such as "your other health issues should take priority," "this [screening test] is not recommended for you by medical guidelines," or "you are at high risk for harms from [this screening test]," are preferred to phrases such as "you may not live long enough to benefit from [screening]."[86] Similarly, discussing that the "risks outweigh the benefits" when considering their overall health status may be more acceptable than using the term "life expectancy." Of note, although some clinicians or older adults might find it acceptable to not offer cancer screening tests when the harms clearly outweigh potential benefits,[87] we suggest open and shared decisions.

SUMMARY

Cancer screening recommendations for older adults should be individualized to account for overall health, life expectancy, values and preferences, and how these impact the risk-benefit ratio of individual cancer screening tests. Moreover, there are strategies that clinicians should consider to best communicate these recommendations, address misperceptions, and align treatment goals between clinicians and older adults. By combining the process of individualized decision making with thoughtful communication, we may be able to shift current screening trends toward

ensuring older adults who may benefit have the opportunity to be screened, and those in whom harms outweigh the benefits avoid harmful screening.

CLINICS CARE POINTS

- Cancer screening recommendations should be individualized for older adults by accounting for overall health and life expectancy, values and preferences, and how these affect specific risks and benefits of cancer screening tests.
- The benefits of cancer screening are uncertain in older adults due to lack of inclusion of adults older than 75 in most RCTs.
- Harms of cancer screening in older adults include the risk of overdiagnosis, false positive results, and procedural complications from downstream diagnostic interventions.
- Older adults with less than a 10-year life expectancy are unlikely to benefit from cancer screening and may be more likely experience harms of testing.
- Communicating screening recommendations should incorporate visual data when possible, provide context in terms of competing medical priorities, and use phrases considered more acceptable and easy to understand by older adults.

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