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Mammography in Older Breast Cancer Survivors: Can We Ever Stop?

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Abstract

Importance—Approximately 4–5% of breast cancer survivors will develop a new ipsilateral or contralateral cancer (“in-breast event”) over the 5 years following diagnosis, and annual surveillance mammography is recommended for those with residual breast tissue. The risk for such in-breast events persists over time, though increasing age at cancer diagnosis and treatment with hormonal therapy are associated with lower risk, and most older breast cancer survivors will ultimately die from non-breast cancer related causes. Specific guidelines for surveillance strategies in older patients are limited. Prospective data on the benefits and harms of surveillance mammography in this population are lacking, and most of the evidence is derived from observational, retrospective data, often in the general population.

Observations—We review the current recommendations for breast cancer screening and surveillance for older patients, the current evidence for ipsilateral and contralateral breast cancer risks in older breast cancer survivors, and suggested approaches for discussions about surveillance mammography with older patients. We recommend individualized decision-making for surveillance breast imaging in older breast cancer survivors, with consideration of the following strategy for women age 70: one-time imaging 6–12 months after completion of local therapy

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followed by annual or biennial surveillance mammography for healthy women and cessation of mammography in patients whose life expectancy is <5–10 years, regardless of age. Decisions on mammographic surveillance should also incorporate whether hormonal therapy is being administered, whether one's anticipated life expectancy is extraordinary, and whether one's individual risk for in-breast events is higher (or lower) than for average-risk breast cancer survivors.

Conclusions and Relevance—We propose re-framing discussions around surveillance mammography in older breast cancer survivors and to consider cessation, while taking into account life expectancy, the estimated risk for subsequent in-breast events and patient preferences.

Introduction

Breast cancer is a disease of aging. Approximately 40,000 women aged 70–79 and 30,000 women age 80 develop breast cancer annually,^{1,2} and for those age 70, the probability of developing breast cancer over the next ten years is 1 in 27 (3.7%).² Although most breast cancers in older women are lower-risk and most older breast cancer patients die of other causes,^{3–5} nearly 19,000 breast cancer deaths occur annually in women age 70, accounting for 47% of all breast cancer deaths in the U.S.⁶

Past recommendations for annual screening mammography for women age 40 have been recently challenged by new and significantly revised national guidelines. The American Cancer Society (ACS)⁷ and the United States Preventative Services Task Force (USPSTF)⁸ now recommend biennial screening for average-risk women and encourage individualized shared decisions about when to begin screening and at what frequency. Clear guidance is lacking regarding decisions about screening for older women, largely because of a lack of available prospective data on how mammography impacts breast cancer mortality in this population.

Even fewer data are available to guide recommendations on surveillance mammography for older breast cancer survivors. This is particularly problematic for clinicians caring for an aging U.S. population with increasing numbers of older patients who will develop cancer.⁹ Once a breast cancer is diagnosed, current guidelines encourage annual surveillance mammography for all patients with residual breast tissue and do not specifically tailor follow-up strategies. Further, studies have consistently shown that the risk of second breast cancer events in survivors does not plateau with time, suggesting that there may be continued benefit of mammography indefinitely.^{10,11} Explicit guidance on how to approach surveillance in older or frail breast cancer survivors is lacking. Further, the limited data regarding surveillance in older cancer survivors across all cancers is now widely recognized as a significant research gap and priority.¹²

We review existing guidelines for breast cancer screening and surveillance for older women, the risks for subsequent in-breast events in older breast cancer survivors, and the expected benefits and risks of surveillance breast imaging. In this context, we propose potential alternative surveillance strategies for older breast cancer survivors.

Current Recommendations for Mammographic Screening in Older Women

The primary benefit of screening is a reduction in breast cancer mortality, estimated to be 14–33% for women aged 50–74, with minimal data available to guide screening in those age 75 because of a lack of inclusion of these women in prospective, breast cancer screening trials.^{7,8,13–15} The most recent screening recommendations from national and international societies (Table 1) have aimed to better reflect and balance the potential benefits and harms of screening mammography with maximization of improvements in breast cancer mortality and minimization of the risks of screening.^{16,17} These recommendations recognize the value of screening programs but also the importance of a personalized approach that incorporates a woman’s cancer risk as well as her preferences regarding the relative benefits and harms of screening.^{17,18}

The benefits of mammography are strongly correlated with age. Women who benefit the most from a breast cancer mortality perspective are those aged 50–69¹⁵ (Relative Risk [RR] for death for women aged 50–59 receiving mammography vs. not = 0.86 [95% CI=0.68–0.97] and RR for women aged 60–69 receiving mammography vs. not = 0.67 [95% CI=0.54–0.83]).¹⁵ For women aged 70–74, data are limited, although a recent meta-analysis reported a RR=0.80 (95% CI=0.51–1.28) for breast cancer mortality with mammography.¹⁵ The harms of screening mammography have also been well described and include false positives and unnecessary biopsies, distress regarding additional testing, and over-diagnosis.^{19–23} It is at the extremes of age where the harms may be greatest and benefits are least (i.e. youngest patients) or for whom the balance of risk-to-benefit is unknown (i.e. older patients), and where the guidelines provide limited direction for providers and patients.

Current breast cancer screening guidelines in older women are conflicting. The USPSTF states that for women age 75, “*current evidence is insufficient to assess the balance of benefits and harms of screening.*”⁸ This lack of clarity is largely based on the limited numbers of women over age 70 in screening studies,²⁴ and the non-significant reduction in breast cancer mortality with mammography among these women. No randomized control trials in screening populations have included women age 75. Current guidelines from the National Comprehensive Cancer Network (NCCN)²⁵ recommend annual screening mammography for most women, specifically stating that “*with the high incidence of breast cancer in the elderly population, the same screening guidelines used for women who are age 40 are recommended. Clinicians should always use judgment when applying screening guidelines.*”²⁵ The evidence for screening mammography in older women was thoughtfully reviewed by Walter and Schonberg,²⁶ who concluded: “*For women with less than a 5–10 year life expectancy, recommendations to stop screening mammography should be framed around increased harms and the need to refocus health promotion on interventions likely to be beneficial over a shorter timeframe. For women with life expectancy of >5–10 yrs, the decision about whether potential benefits of screening outweigh harms is a value judgment that requires a realistic understanding of screening outcomes.*”²⁶ The newest guidelines from the ACS⁷ have provided similar guidance regarding cessation of screening, stating: “*women aged 55 should have biennial screening and women should continue screening mammography as long as their overall health is good and they have a life expectancy of 10*

years or longer."¹⁶ It is not clear if any of these guidelines have impacted the rates of mammography in the oldest patients.

Current Recommendations for *Surveillance* Mammography in Older Breast Cancer Survivors

Recommendations for surveillance mammography in breast cancer survivors from the ACS and American Society of Clinical Oncology (ASCO) recommend annual mammography in all breast cancer survivors with residual breast tissue.²⁷ For older patients, these recommendations lack information regarding the balance of harms and benefits of surveillance mammography; the number of false positives is less well defined than in screening populations and may be underemphasized in practice due to concerns for a higher risk of second breast cancers and local recurrences. Recently revised 'Older Adult Oncology' NCCN guidelines address surveillance in older breast cancer survivors, noting that decisions should be based primarily on patient preference and life expectancy, promoting routine calculation of estimated life expectancy to inform decisions (Table 2).^{28,29}

Not surprisingly, there is variability in the rates of surveillance mammograms in older breast cancer survivors. Studies in Medicare beneficiaries indicate that 77–91% of breast cancer survivors undergo mammography after diagnosis and that the rates of mammography wane over time and with increasing age.^{30,31} Having regular follow-up with providers is also associated with higher rates of surveillance mammography.³¹

Risk of In-Breast Events in Older Breast Cancer Survivors

The goal of mammography in the surveillance setting is to detect new, early-stage or recurrent cancers that would affect a woman's longevity. In order to calculate the benefits of surveillance mammography in older patients, it is useful to first consider the risks for in-breast events (ipsilateral and contralateral) in older breast cancer survivors with residual breast tissue.

Risk for Ipsilateral Recurrence in Breast Cancer Survivors Who Undergo Breast Conservation

Although the Early Breast Cancer Trialists' Collaborative Group (EBCTCG)³² reported an overall risk for distant *or* local recurrence for patients treated with breast conserving surgery (BCS) only at 10 years of 35.0% compared with 19.7% in those receiving BCS with radiation, recurrences decreased with increasing age and with estrogen receptor (ER)-positive disease. In women aged 60–69 and 70, the 10-year risk of locoregional or distant recurrence for those receiving radiation was 14.2% and 8.8%, respectively (vs. 36.1% for women age 40).³² Rates of recurrence in the EBCTCG analysis were further lowered by the use of endocrine therapy and chemotherapy, although interpretations are limited because local and metastatic recurrences were reported together.³²

For women with ER-positive disease taking tamoxifen in the EBCTCG analysis, the 10-year risk of locoregional or distant recurrence was 8.7% in radiation-treated patients and 22.0%

in BCS-only treated patients, whereas rates of recurrence with and without radiation for those with ‘ER-poor’ disease were 28.9% and 43.8%, suggesting the importance of tumor biology when calculating ipsilateral recurrence risk.³² Further, in a single institution study, at 6 years of follow-up after an initial breast cancer, 7% of women with triple negative/basal tumors developed an ipsilateral recurrence compared with 0.8% of those with luminal A cancers (i.e. ER/PR-positive and low grade cancers, which are most frequently seen in older patients).³³ This is consistent with data from Liu et al. which suggest that omission of radiation is an important consideration in those with luminal A cancers because of a 1.3% risk for in-breast recurrence with tamoxifen alone.³⁴ The timing of ipsilateral breast events is also influenced by tumor biology, with a shorter time-to-local-recurrence for those with triple negative disease vs. other tumors.³⁵ However, the risk of a recurrence may be lower for such women who haven’t recurred within a decade of their cancer diagnosis compared to women with ER-positive tumors.

Other studies have reported much lower rates of recurrence than the EBCTCG meta-analysis, with a risk of ipsilateral locoregional recurrence of up to 10%,^{10,36–39} and more recent studies have quoted even lower rates.^{40,41} These recent studies also demonstrate a protective effect of older age on risk of recurrence. For example, in a study of 1,434 women with stage I-II disease treated with BCS and radiation during 1997–2006 (median follow-up 85 months), 2.1% of women experienced a locoregional recurrence by 5 years, and rates were lowest for those with luminal A cancers and for the oldest patients (0.4% of women aged 64–88 had local recurrences vs. 4.7% aged 23–46; hazard ratio [HR] for recurrence=0.97 for each increasing year of age, 95% CI=0.94–0.99).⁴¹ This is consistent with evidence from Cancer and Leukemia Group B Trial 9343, where 0.6% of women age 70 receiving radiation and tamoxifen developed ipsilateral recurrences after a median follow-up of 12.6 years, and only 6% of those receiving tamoxifen alone developed an ipsilateral recurrence.^{42,43} Similarly, data from the PRIME II trial which examined BCS with or without radiation in patients aged 65 years receiving hormonal therapy demonstrated local recurrences of <5% in both groups at a median follow-up of 5 years and no differences in distant recurrences or survival.⁴⁴

Certainly, these studies suggest that the vast majority of older patients with low risk cancers will have a risk of ipsilateral recurrence of much less than 10%, particularly for those receiving radiation and/or hormonal therapy. Further, for those receiving extended hormonal therapy such as those treated on MA.17R where the median age was 65.1 years at the time of randomization (4.5–6 years after starting aromatase inhibitor [AI] therapy; nearly 80% of women received tamoxifen prior to AI), <1% of women developed ipsilateral breast events at 6.3 years.⁴⁵ Interestingly, approximately half of patients treated on study had node-positive breast cancers with an anticipated higher locoregional recurrence risk over time.

Contralateral Risk of Breast Cancer in Breast Cancer Survivors

The risk for contralateral breast cancer (CBC) for older breast cancer survivors over time is even less defined than ipsilateral risk. In general and across age groups, the risk for CBC for those with a history of one cancer ranges from 2–11% over time, approximately 2–6 times the general population risk for developing a first cancer.⁴⁶ In a review of relevant studies, the

incidence rate for CBC was reported to be 4–8 per 1000 person-years, with a lower risk with increasing age.⁴⁶ A more recent, large study in Denmark of 85,863 women diagnosed with breast cancer during 1978–2009 with a median follow-up of 5.6 years (interquartile range 2.3–10.9 years) reported similar findings, with 3.6% of women developing CBC.¹¹ Moreover, the incidence of CBC declined after 1997 in this study and others,⁴⁷ likely as a result of improved systemic and hormonal therapy.¹¹ The occurrence of CBC was significantly lower for older (vs. younger) Danish women, with a sharp decline in incidence after age 65 (incidence rate ratios [IRR] of CBC=0.52 for ages 70–74, 95% CI=0.44–0.62 and IRR=0.68 for ages 75, 95% CI=0.58–0.80; both vs. ages 50–54); incidence rates were highest for women age <35¹¹ and others have also shown a decrease in risk for CBC with increasing age.⁴⁷ Of note, the development of CBC in the Danish registry study was independent of time since a patient's first cancer across all ages, with steady rates over 10 years of follow-up.¹¹

Information can also be gained by examining outcomes of large adjuvant hormonal therapy trials such as the 'Arimidex, Tamoxifen, Alone or in Combination' (ATAC) trial where the median age at randomization was 64.⁴⁸ At a median follow-up of 120 months (and a median age of 72), approximately 3% of patients taking hormonal therapy developed CBC.⁴⁹ Results from the ATAC cohort are likely generalizable to the majority of older patients seen in practice who have ER-positive tumors and who are taking hormonal therapy, with an associated risk reduction for both ipsilateral and contralateral events. These collective data suggest that older patients, and particularly those taking endocrine therapy, have a 3–5% chance of developing CBC over the course of 10 years after their initial diagnosis, which is similar to the general population risk of 1 in 27 (3.7%)⁶ for developing a first cancer during ages 70–80 (though it is important that risks for ipsilateral in-breast events in breast cancer survivors are also accounted for when determining overall risk). Further, for those on the MA.17R trial described above, the risk for CBC in 1,918 study participants was very low at a median follow-up of 6.3 years regardless of treatment assignment, with contralateral events occurring in 1.4% of women on extended letrozole and 3.2% for those on placebo.^{45,50}

Tumor biology also plays a role in the risk of CBC for older breast cancer survivors. For women aged 70–74 at first diagnosis, those with an ER-positive first cancer have an incidence rate of 0.37 per 100/year (95% CI=0.33–0.41), while those with an ER-negative first cancer have an incidence rate of 0.55 (per 100/year) (95% CI=0.47–0.73), likely due to the risk reduction provided by hormonal therapy.⁴⁷

Benefits and Harms of Surveillance Mammography in Older Breast Cancer Survivors

Once treatments are optimized, the risk of developing in-breast events is quite low in older breast cancer survivors. Further, some of these in-breast events will be in-situ cancers only, where treatments have not shown to improve breast cancer mortality.⁵¹ Consequently, the low risk of localized recurrences combined with the increasing comorbidity (and hence competing causes of mortality) in this population call into question the benefit of surveillance mammography. This may be particularly relevant for those with an initial

diagnosis of in-situ disease, where the risk of death from breast cancer approximates that of the general population (3.3%).⁵¹ It is likely that surveillance mammography among women with primary in-situ disease may be of even lower benefit than that for women with invasive cancer.

Quantifying the benefits of surveillance testing without prospective data is very challenging. Studies have suggested ongoing benefit but are limited in interpretation because of the biases inherent to retrospective medical records or claims-based data, where survival benefits of screening may be significantly confounded by the fact that healthy, older breast cancer survivors are more likely to undergo surveillance mammography than less healthy ones and are thus more likely to survive longer. In a study of mammography and survival among 1,846 breast cancer survivors age 65 with stage I-II breast cancer, each additional surveillance mammogram was associated with a 0.69 fold decrease in the odds of breast cancer mortality (95% CI=0.52–0.92).⁵² However, this study was likely substantially confounded by the excellent health of women undergoing surveillance imaging.⁵² A similar study also demonstrated mortality benefits of surveillance mammography with increasing age and found that the benefits of mammography were consistent even beyond the first five years after a diagnosis.⁵³ Neither of these studies addressed the potential harms of screening. Recently, Massimino et al.⁵⁴ published a single institution study assessing surveillance mammography in women aged 80 with a history of invasive/in-situ breast cancer. At a mean follow-up of 50 months, 429 women had undergone 1,466 mammograms that detected 13 *non-palpable* cancers (0.9%), while 9 additional cancers were detected by physical exam. Although the study did not assess long-term outcomes, these findings raise questions about the value of surveillance mammography in older women.

The harms of surveillance mammography are poorly quantified for older patients. The main risks include over-diagnosis, false positive results, unnecessary biopsies, and the associated pain and anxiety,^{19–23,26,55} which may be heightened among women with a breast cancer history. Although studies have suggested that the false positive rate is lower in older vs. young women,^{54,56,57} the cumulative probability of having a false-positive mammogram over 10 years is 14–27% for those having biennial mammography and twice that for those undergoing annual mammography.²⁶ Further, given the comorbidity present in many older patients and the fact that many will die of non-breast cancer causes,^{3–5} over-diagnosis and the ensuing overtreatment are even more significant than in younger patients.^{19–23}

Can We Ever Stop Surveillance Mammography in Older Breast Cancer Survivors?

Given the lack of prospective and randomized data available, it is challenging to know which older patients might derive benefit from surveillance mammography. With increasing recognition of the role of functional rather than chronological age, it is difficult to place age cut-offs for recommendations that are meaningful for both healthy and frail patients. However, the available data for surveillance mammography in older women allow some conclusions to be drawn. First, increasing age is consistently associated with a lower risk of in-breast events, and this risk is further reduced by hormonal therapy and/or radiation.

Second, there is a consistent suggestion that rates of ipsilateral recurrences and contralateral breast events are low but persistent over time. Given this, the timing of mammography cessation should not be specifically dictated by the time from diagnosis. However, as patients age and the probability of dying from breast cancer decreases,^{3–5} increasing time from diagnosis will impact/lower the breast cancer mortality benefits of screening.

It is impossible to derive a one-size-fits-all surveillance approach across all older patients with varying comorbidity and functional status. Although it is ideal to prospectively study the impact of surveillance mammography for this population, it is unlikely that we will ever have large scale, prospective clinical trials that will optimally answer these questions for older breast cancer survivors. Despite these challenges, it may still be possible to develop some consensus on how to tailor recommendations.

A Starting Point?

The NCCN Older Adult Oncology Guidelines were recently updated to include recommendations about surveillance mammography in older breast cancer survivors, stating that risks and benefits should be discussed, decisions should be individualized, and that patients with a life expectancy of <5 years are unlikely to benefit from ongoing mammography²⁸ (Table 1). Here, we aim to build upon these recommendations and suggest a more comprehensive framework to facilitate dialogue with patients. Although not specifically validated for breast cancer survivors, we suggest estimating life expectancy using standard life tables^{26,28} (Table 2) or newer tools that incorporate health status, such as ePrognosis,²⁹ and we recommend the following surveillance approach and talking points (Tables 2 and 3). In recently diagnosed older patients, obtain a mammogram 6–12 months after local treatment to establish a baseline for future comparisons. From there, recognizing the slightly increased risk for new primary cancers and a potential clinical benefit of surveillance mammography in survivors beyond that seen in screening populations, we suggest that healthy 70–80 year-old breast cancer survivors have annual *or* biennial mammography, similar to the ACS and USPTSF general screening recommendations. Biennial mammography would aim to maintain the benefits of surveillance, while minimizing the potential harms of mammography and would allow patients to ease into a less rigorous surveillance program over time. Once patients reach age >80 (where average life expectancy is <10 years)⁵⁸ *or* if patients have advanced comorbidity at any age with a life expectancy of <5 years,^{30,53} the benefit of surveillance imaging is likely minimal, and we recommend discussion regarding the risks and benefits of cessation of routine surveillance mammography. We fully recognize the limitations in applying this framework to all patients but suspect these recommendations could apply to most women. However, if a woman enjoys extraordinary health at age 80 and has a life expectancy >10 years and strongly wishes to continue mammography, we support an informed decision with a focus on functional rather than chronological age. Further, if a woman is perceived to be at higher risk for local or contralateral breast events because of a known genetic mutation or because of her own disease characteristics and/or treatment plan (e.g., positive margins), annual surveillance is reasonable to continue for longer than the average older patient until life expectancy is <5 years. Conversely, women who are too frail to receive adjuvant therapy should not continue mammographic surveillance. Finally, we value and recommend regular

follow-up and physical exams, including clinical breast exams, regardless of decisions on mammography so that clinically meaningful disease can be detected and treated as appropriate.

In the end, even with the absence of optimal evidence to support decisions, a unified approach is needed regarding surveillance mammography in older women. The approach we propose incorporates extrapolation of existing data and the individualized needs and wishes for older breast cancer survivors. Discussions with breast cancer survivors about mammography should take into consideration not only the risks of developing new or locally recurrent breast cancer, but the competing medical conditions that are more likely to impact survival, similar to other treatment and screening decisions. Further, priorities in follow-up care should be addressed regularly with all patients, regardless of age (Table 3), with a focus on treating underlying comorbidities and promoting a healthy lifestyle. The limited benefits of mammography should be addressed openly with patients and the ‘knee jerk reflex’ for indefinite annual mammography should be reconsidered, especially as it often is linked with a false security that mammography will forever improve one’s longevity. In addition and perhaps most importantly, clinicians should reassure patients that stopping mammography does not reflect “giving up on them” as they age, but simply approaching their follow-up care in a thoughtful way that prioritizes benefits, risks, and concerns. If women understand the reasons for the recommendations, even those who are initially reluctant may agree with these recommendations over time. Finally, with the aging population and growing number of older breast cancer survivors in coming years,^{9,59} it remains an urgent research priority to prospectively examine ways to optimize surveillance strategies and decision-making in this population.¹²

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Table 1

Selected Mammographic Screening and Surveillance Guidelines for Older Women

<i>Screening Guidelines for Older Women</i>		
Guideline Society	Year of most recent guideline update	Current Screening Guidelines for the Older Patient (Average Risk)
United States Preventative Services Task Force (USPSTF) ^{8,17}	2016	Age 50–74: recommend biennial screening Age 75: current evidence is insufficient to assess the balance of benefits and harms of screening
American Cancer Society (ACS) ^{7,16,17}	2015	Women 55 years and older should transition to biennial screening or have the opportunity to continue screening annually. Women should continue screening mammography as long as their overall health is good and they have a life expectancy of 10 years or longer.
National Comprehensive Cancer Network (NCCN) ²⁵	2015	Age 40: Annual screening mammogram “With the high incidence of breast cancer in the elderly population, the same screening guidelines used for women who are age 40 or older are recommended. Clinicians should always use judgment when applying screening guidelines.
Canadian Task Force ⁶⁰	2011	Age 50–74: Mammogram every 2–3 years No guidelines for mammography at 75 and older
United Kingdom-National Health Service ⁶¹	2015	Age 50–70: Mammogram every 3 years Routine screening not offered for age >70
Swiss Medical Board ^{62,63}	2014	No new screening programs; phase out all existing programs
<i>Surveillance Mammography Guidelines for Older Women with a Personal History of Breast Cancer</i>		
NCCN ⁶⁴	2015	Annual surveillance without age specific guidance
NCCN Senior Oncology Guidelines ²⁸	2016	“Decisions about mammograms for older breast cancer survivors should incorporate discussions with patients about their risk of developing recurrent or new breast cancer, the potential benefits of mammography in improving outcomes, the potential harms of mammography, and patients’ values and preferences...There likely is no benefit to regular mammograms for older women with a life expectancy of less than 5 years. In this group..harms likely outweigh any potential benefits.”
American Society of Clinical Oncology (ASCO) and ACS Breast Cancer Survivorship Care Guidelines ²⁷	2015	Annual mammography

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Table 2

Life expectancy for women by current age, adapted from Walter et al and Actuarial Life Tables (Social Security Administration)^{26,28,58}

Current age	50 th percentile for the number of years of life expected prior to death* (lowest 25 th percentile-highest 25 th percentile)
70	16.6 (10.3–22.0)
75	12.6 (7.4–17.6)
80	9.1 (5.0–13.4)
85	6.2 (3.1–9.8)
90	4.0 (1.9–6.8)
95	2.6 (1.1–4.6)

* Additional estimates based on comorbidity can be made using calculators such as ePrognosis.²⁹

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Table 3

Suggested approach for surveillance mammography and physical exams for older breast cancer survivors ^a

Age/Timing	Recommendations/comment
Annually, any age	Calculate/estimate life expectancy ²⁹ and discuss individualized pros and cons of mammographic surveillance
Every 6–12 months, all ages	Continue physical exams, including clinical breast exams, to find clinically significant cancers
One-time, 6–12 months after completion of local therapy	All patients; establish new baseline
Age 70–80	Offer annual or biennial mammographic surveillance ^b
Age >80	Consider stopping routine mammographic surveillance unless in extraordinary health or unless patient felt to have higher-than-average risk for ipsilateral or contralateral breast events ^c
Any age + advanced comorbidity	Stop routine mammographic surveillance
Life expectancy < 5 years	Stop routine mammographic surveillance
Annually, as needed, any age	Re-assess surveillance plan as appropriate

^a to be used as a framework for discussion with patients; this is not intended as a one-size-fits-all approach

^b Consider biennial exams in those felt to be at lower risk (i.e. small, lower-risk tumors, those on endocrine therapy)

^c e.g., known or suspected genetic mutation, history of positive margins, high risk for bilateral breast events per provider discretion

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Table 4

Talking points for the Oncologist to Consider when Speaking with Older Patients about Surveillance Mammography

Current recommendations for surveillance and limitations of evidence	<ul style="list-style-type: none"> • Relatively little evidence is available to guide decisions about surveillance mammography in older women • Most guidelines leave decisions about mammography up to patients and providers but start recommending against mammography if life expectancy is limited due to other medical conditions • Physical exam, including clinical breast exam, remains important and should continue
Quantifying individualized risks for locally recurrent or new breast events	<ul style="list-style-type: none"> • Overall, the risk for locally recurrent or new breast cancers following breast conserving surgery for older patients is low (approximately <10% at 10 years after surgery) and is even lower for women who have received hormonal therapy or radiation • The risk for breast cancer in the other breast in older patients is low (approximately 10% at 10 years after diagnosis) and is even lower for women who have received hormonal therapy • Risks are influenced by the cancer subtype, margin status, inherited pre-dispositions to cancer and should be included in decision-making
Potential benefits of screening and surveillance	<ul style="list-style-type: none"> • Mammograms are used to detect early-stage cancers and localized recurrences with a goal of lowering the risk of dying of breast cancer, but this benefit is less clear for older women • Because cancer survivors may have a higher risk of breast cancer than women in the general population, they may benefit more; however, any mortality benefits of mammography decrease with increasing age
Potential harms of screening and surveillance	<ul style="list-style-type: none"> • <i>Potential harms include false positive tests, unnecessary biopsies, over-diagnosis (finding cancers that would never become clinically significant in a patient's lifetime), and lack of mortality benefit</i>^{19-23,26,55} • Harms not well studied in the surveillance setting but extrapolated from screening literature
Life expectancy and patient/provider preferences	<ul style="list-style-type: none"> • One's comorbidity, functional status, frailty, and life expectancy will impact how much a patient benefits from mammography • Women with a shorter life expectancy will benefit less from mammography • <i>Life expectancy should be approximated when making decisions about mammography (Table 3)</i>
Reassurance	<ul style="list-style-type: none"> • Patients should be reassured that stopping mammography does not reflect "giving up on them" as they age, but simply approaching their follow-up care in a thoughtful way that prioritizes benefits, risks, and concerns • Regular physical exams, including clinical breast exams, should continue
Decision-making	<ul style="list-style-type: none"> • Patient and family preferences should be included in decisions • Plan for surveillance mammography can be reassessed every 1-2 years as needed