

Breast Cancer Screening

An Evidence-Based Update



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KEYWORDS

- Breast cancer screening • Overdiagnosis • Mammography
- Clinical breast examination • Breast self-examination • MRI
- Informed decision making

KEY POINTS

- Mammography is the best-studied breast cancer screening modality and the only recommended imaging tool for screening the general population of women.
- Overall, there is a modest mortality benefit from routine breast cancer screening with mammography at the population level.
- Potential harms of routine screening include false-negative results, false-positive results with undue anxiety and benign biopsies, and overdiagnosis.
- Efforts should be made to help women make more informed decisions about participating in breast cancer screening.

INTRODUCTION

Breast cancer screening is used to identify women with asymptomatic cancer with the goal of enabling women to undergo less invasive treatments that lead to better outcomes, ideally at earlier stages and before the cancer progresses. There are important considerations for who should be screened, how often women should be screened, and with which imaging modality (or modalities). Ultimately, clinicians need to help women understand the benefits and risks of breast cancer screening to make informed decisions.

WHO SHOULD BE SCREENED?

Guidelines for who should undergo breast cancer screening vary within and among countries.¹ In the United States, the US Preventive Services Task Force recommends

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that breast cancer screening with mammography be offered to women 50 to 74 years of age and that starting screening before age 50 years should be based on the individual woman's context, including her values regarding the benefits and risks.² The American Cancer Society recommends screening starting at age 40.³ Screening women 40 to 49 years of age is more controversial than older ages, with less evidence available to determine the risk–benefit balance. Analyses using 6 different breast cancer simulation models of the National Cancer Institute–funded Cancer Intervention and Surveillance Modeling Network (CISNET) found that starting biennial (every 2 years) screening at age 40 years with mammography, in comparison to age 50 years, was associated with reduced breast cancer mortality by an additional 3%, but at the expense of more false-positive results and greater use of health care resources.⁴

There is little evidence to support screening women of average risk less than 40 years of age. These women have a lower incidence of breast cancer and were largely excluded from randomized controlled trials (RCTs) involving screening mammography. Similarly, there is little evidence regarding screening women more than 75 years of age because older women were also largely excluded from RCTs. Moreover, elderly women are more likely to have comorbid medical conditions and may experience less marginal benefit from screening. It is not recommended that people with limited life expectancy (<5 years) undergo routine screening, as early breast cancer detection and treatment could impair quality of life while not improving survival. However, women with limited life expectancy continue to be screened for breast cancer in the United States.⁵

HOW OFTEN SHOULD WOMEN BE SCREENED?

Countries vary in how often they recommend women undergo breast cancer screening. In a prospective cohort study of US women, it was found that after 10 years of screening with mammography, the cumulative probability of a woman receiving a false-positive recall (being called back for additional examination after abnormal screening but subsequently found to not have cancer) was lower with biennial screening than with annual screening.⁶ In addition, analyses using 6 CISNET simulation models found that biennial screening mammography maintained most of the benefit of annual screening while reducing false-positive results by almost one-half.⁴ The US Preventive Services Task Force, therefore, recommends currently that women without additional risk factors be offered screening mammography biennially starting at age 50.

METHODS OF BREAST CANCER SCREENING

Breast cancer screening modalities include both physical breast examinations as well as mammographic imaging. Additional supplemental screening with breast MRI may be considered for special high-risk populations.

Physical Examination

Breast self-examination

Many awareness campaigns encourage women to conduct monthly breast self-examinations. However, the evidence for mortality reduction from breast self-examination is limited. This topic has been investigated in RCTs, case-control studies, nonrandomized trials, and cohort studies.⁷ Although breast self-examination may lead to detection of lesions at a smaller size, increased false-positive results and more testing have been noted with no reduction in mortality. Breast self-examination is no longer recommended by most guidelines.

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