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Towards More Equitable Breast Cancer Outcomes

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In their revised recommendation statement, the U.S. Preventive Services Task Force (Task Force) now recommends that all women undergo routine breast cancer screening every other year beginning at age 40. This is an adjustment from the previous recommended start age of 50 and part of an overarching aim to increase earlier detection of breast cancer and address inequalities in breast cancer mortality, especially among Black women.[1] Additionally, the Task Force, in acknowledgement of evolving technology, updated the recommended primary screening modalities to include digital breast tomosynthesis (3D mammography). They noted that digital breast tomosynthesis improves the benefit-to-risk ratio compared to digital mammography, primarily by decreasing false-positive results, a well-known screening-related harm.[2]

The revised recommendations from the Task Force shed light on two major issues that demand greater attention: addressing health inequities related to breast cancer outcomes and ensuring benefits for all women amidst rapid screening technological advancements. The major impetus for lowering the recommended start age to 40 stems from the observed increase in breast cancer incidence noted among women in their 40s and the need to tackle disparities affecting specific subpopulations. Notably, Black women continue to face disproportionately high mortality rates, 40% higher compared to White women in the U.S.[3] Black women also experience more aggressive cancer subtypes, such as triple negative cancers, and tend to have cancers diagnosed at later stages, compared to White women.

Some may question the recommendation changes given the absence of new randomized controlled trials (RCTs). Such trials are expensive, require many years to complete, and randomization of women to no mammography screening would be unethical given its known mortality benefit. Moreover, both screening technologies and treatments are rapidly evolving, potentially making screening RCTs less informative by the time data are collected and results published. Instead, the Task Force relied on statistical simulation modeling from the Cancer Intervention and Simulation Modeling Network (CISNET) using the older trial data complemented with newer observational evidence. The modeling incorporates parameters and variables with uncertain, and even unknowable, values. However, by considering multiple different simulation modelling approaches, CISNET provides overall estimates of the expected magnitude of benefits and harms of different screening strategies at the U.S. population level.

By lowering the starting age to 40, the hope is that more women will have their cancers detected earlier with the potential for earlier intervention with curative intent. Across all women, CISNET modeling found that starting biennial digital breast tomosynthesis screening at age 40 instead of age 50 until age 74 could avert 8.2 breast cancer deaths per 1000 women versus no screening (a 30% mortality reduction). However, among the more than 16000 mammography exams that these 1000 women will have during their screening years, this benefit comes at the expense of 1376 false-positive recalls and 14 overdiagnosed cases per 1000 women.[4] For Black women, expanding biennial digital breast tomosynthesis screening to women 40-49 (i.e., starting a decade earlier), averted a median of 1.8-2.8 additional breast cancer deaths per 1000 women.[4]

While the CISNET simulation models are robust, they hinge on additional assumptions. Encouraging earlier screening at age 40 represents just one facet of the breast care continuum. These assumptions include women accessing screening facilities with up-to-date technology, receiving prompt diagnostic evaluations, and accessing high quality definitive treatment – a reality that doesn't always hold, particularly for individuals belonging to groups and communities that are traditionally underserved and under-resourced. Studies in the U.S. highlight disparities in access to breast cancer care. A cohort study involving 2 million U.S. screening mammograms revealed that Black and Hispanic women, women with lower income, and women with less education, were less likely to utilize facilities offering digital breast tomosynthesis and were less likely to obtain this technology if it was an option on-site compared to their White, higher income, and more educated counterparts.[5] In another study of >45,000 U.S. women with abnormal mammography screening results, Black women faced a 20% higher likelihood of experiencing delays exceeding 90 days in obtaining a breast biopsy compared to their White counterparts.[6] Inequities in screening technology access and timely diagnosis and treatment diminish the benefits of early cancer detection.

There is an urgent need for better evidence on the topic of supplemental screening with ultrasound or magnetic resonance imaging (MRI) for women with dense breasts. The topic is of critical concern since starting September 2024, the FDA will mandate that all U.S. screening facilities inform women about their breast density with their mammography results. Some states additionally require a statement recommending women discuss the option of supplemental screening ultrasound or MRI due to dense breasts with their primary care providers. It is important to recognize that nearly half of all women in the U.S. have dense breasts, a normal variation associated with a small increase in breast cancer risk similar to having an aunt with breast cancer.[7] As the Task Force states, there is currently inadequate evidence to recommend for or against additional screening with breast ultrasound or MRI due to dense breasts.

Although the Task Force emphasizes the need for further research in many areas, it overlooks the pressing issue of emerging use of artificial intelligence (AI) support tools. Mammography-based AI tools are already FDA-cleared and are being used in community settings. Historically, millions of U.S. women underwent screening mammograms with older, pre-AI computer-aided detection tools for nearly two decades before population-level studies revealed decreased accuracy when these tools were used.[8,9] This historical error provides a clear warning that larger studies are required before wide adoption of newer AI tools for mammography. We are concerned that a similarly swift adoption of new AI support tools may occur before we have adequate scientific data to justify use at a population screening level. While AI algorithms show promise for enhancing cancer detection, their impact on patient outcomes and the balance between benefit and harms remain uncertain. How radiologists will incorporate AI tools into their decision-making may differ from the findings of small retrospective reader studies used to obtain FDA clearance.[10] Moreover, these AI tools have been primarily trained and tested on older White women, potentially exacerbating existing disparities unless they are validated on diverse populations to ensure that benefits are equitably experienced across all races and ethnicities.[10]

Overall, the updated Task Force recommendations highlight a rapidly evolving intersection of technology and equity within an already complex healthcare ecosystem where disparities remain a persistent problem. It remains imperative that physicians continue to practice medicine's art to ensure that women make informed decisions aligned with their preferences. Moving ahead, population-level data collection throughout the entire breast care continuum is imperative to pinpoint interventions at individual, neighborhood, and healthcare facility levels that can help address existing disparities gaps across the entire screening and diagnostic episode of care. With the advent of emerging technologies like AI, it is crucial to gather real-time, real-world data to assess clinical effectiveness and performance across diverse populations. Until that is fully realized, we must continue to do our best with the current resources, knowledge, and recommendations to ensure that enhancements in cancer outcomes benefit all individuals equitably.

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