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EDITORIAL – BREAST ONCOLOGY

Screening Mammography: Getting to Version 2.0

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In the last decade, screening mammography, long accepted as a significant advance in breast cancer care, has become a source of considerable controversy. Many factors have contributed to this shift, including reconsideration of the impact that routine screening has on mortality, concerns about overdiagnosis and overtreatment, and concerns about false-positive screens necessitating an invasive workup. The report by Elder and colleagues in this issue of *Annals of Surgical Oncology* adds to this debate by reminding us that more nuanced considerations to screening mammography beyond overdiagnosis and mortality exist, such as disease burden and treatment intensity, need to be considered.

To be sure, the findings from this report are not novel, as the authors themselves point out, and thus not a surprise. Aware of the ongoing controversies, the authors have tried to balance the work by accommodating the concept of overdiagnosis in their analyses. Even with this more critical look, screening mammography comes out ahead, with women who participate in active screening programs much more likely to have lower disease burden and less intensity of required treatment than women with a new diagnosis who did not engage in active screening. The evidence that screening works as it was intended—to detect cancer at an earlier stage—is not debated.

However, the confirmation that active screening is associated with early detection is tangential to the issue at the heart of the debate surrounding routine mammographic screening for sporadic breast cancer. The critical question for public health policy is how to tailor screening to breast cancer risk and mortality. Screening based on risk affords the opportunity to maximize the benefits of early detection demonstrated by Elder and colleagues while reducing the harms to populations not at risk. In its report in 2009, the U.S. Preventative Services Task Force attempted to tailor screening to risk and recommended reduced screening before the age of 50 years, given that as a group, women 40–49 years of age carry less risk for cancer than their peers older than 50 years.[1]

The significant controversy generated against such recommendations in part reflects the unease of using a tool as crude as age to stratify for breast cancer risk. Better strategies are needed to personalize risk. The Women Informed to Screen Depending on Measures of risk (WISDOM) trial, currently underway, attempts to assess individual risk through more comprehensive consideration of risk factors including genetic information and family history, and to tailor screening intervals on the basis of this more personalized assessment of breast cancer risk.[2] The primary goal of the study is to compare the proportion of early and later stage cancers between women whose screening is tailored to risk and women undergoing routine annual screening. The WISDOM study investigators hypothesize that such personalized breast cancer screening recommendations based on individual risk assessments will be at least as safe as annual screening for all.

By testing the concept that use of mammographic screening can be tailored to risk without having an impact on breast cancer outcomes, the WISDOM trial is an important step forward in the debate around population screening for breast cancer and, if successful, will create a new framework for screening. The explosion of genomic technologies and application of machine learning to mine mammographic images for texture and density features that may be able to inform on risk likely will provide even greater opportunities for personalization of risk in the future.[3,4] Incorporating such new tools for risk assessment and building on the conceptual foundation established by the WISDOM trial are critical steps to moving the field

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beyond the ongoing controversy and getting to screening mammography version 2.0, one focused on personalized screening rather than universal one-size-fits-all screening.

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