

Participation in mammography screening

Women should be encouraged to decide what is right for them, rather than being told what to do

Lisa M Schwartz associate professor of medicine, **Steven Woloshin** associate professor of medicine, VA Outcomes Group (111B), Department of Veterans Affairs Medical Center, White River Junction, VT 05009, USA Lisa.Schwartz@Dartmouth.edu

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In April 2007, the American College of Physicians—the largest medical specialty society in the United States—issued new guidelines on screening mammography for women aged 40-49. Rather than calling for universal screening, the guidelines recommend that women make an informed decision after learning about the benefits and harms of mammography.¹

The last time a major US policy organisation made such a recommendation all hell broke loose. In 1997, a consensus panel of the National Institutes of Health concluded “that the data currently available do not warrant a universal recommendation for mammography for all women in their forties. Each woman should decide for herself whether to undergo mammography.” This recommendation generated intense reactions in the press, public, and government.² Most stories in the press suggested that women should be screened and others directed anger at the panel for “failing” to recommend screening. The panel’s chair was summoned before congress, and a US senate resolution in favour of screening was unanimously passed—a rare act of bipartisanship. After a few months of intense political pressure, the National Cancer Institute contravened the panel’s conclusions and recommended that women in their 40s should be screened.

In contrast, the reaction to the recent guidelines was muted. The press carried a few stories—a few of which were critical—but there were no senate resolutions and no hearings to cross examine the leadership of the American College of Physicians.

The possible reasons for these dramatically different reactions are that the American College of Physicians may not have the same visibility as the National Institutes of Health panel; journalists and readers may be tired of the mammography debate; and politicians may be preoccupied with other matters. But a more positive explanation is that the public and profession

increasingly accept that cancer screening has both benefits and harms. Perhaps we are finally moving beyond the debate about what women should do and are ready to focus on how to help women make the best decision for themselves.

So how can clinicians help? The first step—exemplified by the recent guideline—is to acknowledge that women face a real choice. Screening entails trade-offs that are hidden by slogans such as “If you haven’t had a recent mammogram, you may need more than your breasts examined.” These messages are meant to persuade women to do what is right, as decided by the people who write them. But no right choice exists, because screening has mixed effects—some women will benefit (by avoiding death from breast cancer) but others will be harmed. So the next step is to ensure that women understand what is likely to happen if they do or do not undergo screening.

The table shows estimates of the benefits and harms of screening mammography for women in their 40s and (for context) older women. Despite the wealth of published literature, the numbers are still controversial, and any of the figures could be criticised. The table is not meant to be the final word on mammography but to convey the order of magnitude of its effects. Furthermore, the data are based on averages, so the risks will be different for women at high risk (such as those with a strong family history of early breast cancer). And of course, the numbers are only a start. If we seriously want to promote informed decisions, we must ensure that women understand the data and have some context for judging how big (or small) these numbers are.^{10 11}

The main benefit of screening is to avoid death from breast cancer. The relative risk of death from breast cancer for women who are screened is 0.85 for those in their 40s and 0.78 for those 50 and older.⁴ These figures may underestimate the efficacy of screening because

Summary of data on benefits and harms of screening mammography every 1-2 years for 10 years

Benefits and harms	Age group of women (years)	
	40-49	50-69
Benefits		
10 year risk of death from breast cancer*:		
No screening	3.3/1000 (0.33%)	8.9/1000 (0.89%)
Screening	2.5/1000 (0.25%)	6.0/1000 (0.6%)
Avoidance of death from breast cancer	0.8/1000 (0.08%)	3/1000 (0.30%)
Harms		
Patient has at least one false positive screening examination that results in additional testing [‡]	100-500/1000 (10-50%)	100-500/1000 (10-50%)
Unnecessary diagnosis and treatment for breast cancer [†]	2-5/1000 (0.25-0.5%)	3-9/1000 (0.30-0.90%)

*The 10 year chance of dying from breast cancer for American women aged 40-49 and 50-69 (2002-4) came from the National Cancer Institute. We calculated the risk for the two sets of women using the risk reduction of mammography for each age group⁴ after adjusting for non-compliance in trials^{5 6} and national estimates of mammography uptake in each age group about 10 years earlier according to the National Center for Health Statistics. This approach assumes that the total risk of death from breast cancer is the weighted average of the risks faced by women who are and are not screened.

†We applied estimates of the proportion of screen detected cancers that are overdiagnoses (low 10%,⁷ high 30%⁸) to the rate of screen detected breast cancers in trials of women ≥ 55 and those 40-49.⁹

of non-compliance in the trials; when we adjusted the relative risks for compliance the figures were 0.76 for younger women⁵ and 0.67 for older women.⁶ In the US, this means that for every 1000 women screened, over the next 10 years less than one life will be “saved” for younger women and about three lives will be saved for older women. Expressed differently, screening of women who are 50 or older improves the chance of not dying from breast cancer in the next 10 years from about 991/1000 to 994/1000.

Screening has several harms, including false positives and overdiagnosis. False positives are the most familiar to women and to doctors—abnormalities detected at mammography often cause women to undergo repeat testing (or perhaps biopsy) to rule out cancer. The table shows a range for false positives because thresholds for deciding that a mammogram is abnormal differ greatly among mammographers and across settings (recall rates are much lower in the United Kingdom than in the US¹²).

False positives cause short term anxiety, inconvenience, and sometimes unnecessary biopsies, but we think that overdiagnosis is the most important harm of screening. Overdiagnosis is the detection of lesions that meet the pathological criteria for cancer but would not progress to cause symptoms or death. Such lesions lead to overtreatment. Because we do not know which cancers are overdiagnoses, we treat everybody. But women who are overdiagnosed can only be harmed by treatment—they cannot benefit because no treatment was needed. Harms include disfiguring surgery, side effects of chemotherapy or hormonal therapy (such as nausea,

fatigue, and hair loss), and injury from radiation.

Overdiagnosis is a counterintuitive phenomenon, and few women know about it.¹³ Because we cannot identify overdiagnosis during life, we do not hear stories from women harmed in this way by screening (in contrast, we routinely hear stories from women whose lives were “saved” by screening). But once informed about the possibility of overdiagnosis, most women say they would factor it into their decision about screening.¹³

Estimating the chance of overdiagnosis is challenging as it cannot be measured directly. Screening trials consistently show an excess of breast cancer diagnoses in the intervention group, which does not go away with time, making it possible to estimate the proportion of screen detected breast cancers that are overdiagnoses. We used a range of published data to calculate the numbers shown in the table.^{7 8}

The new guideline is an improvement because it integrates informed decision making into policy recommendations—a refreshing change in a field dominated by soundbites and slogans. But why should this advance be limited to women in their 40s? And why just American women (only women over 50 are routinely invited for mammography in the UK)? Whether a woman is in her 40s or older—on either side of the Atlantic—screening for breast cancer involves benefits and harms. Rather than telling women what they should do, policy makers should encourage women to make a decision that is right for them.

All references are on bmj.com