

Screening Is Only Part of the Answer to Breast Cancer

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It is time to reframe our thinking about breast cancer. We need to move away from a primary focus on screening toward the larger issue of reducing the burden of suffering that breast cancer brings to society.

This burden is enormous. Almost 300 000 women will be newly diagnosed with breast cancer and 40 000 women will die of it in 2014 (1). Many more live with the label of having been diagnosed, some still having treatment, others wondering whether the cancer will recur. Even more have had a false-positive mammogram. Collectively, throughout the United States, a heightened sense of risk and awareness about breast cancer has even given new meaning to the color pink (2).

Several studies, including the recent, highly publicized update of the CNBSS (Canadian National Breast Screening Study) (3), spotlight contention and caution in tying our hopes to screening as the panacea for reducing the burden of breast cancer. Begun in 1980, CNBSS was actually 2 randomized, controlled trials. One asked whether intensive screening with mammography and clinical breast examination (CBE) every year for 4 to 5 years reduces breast cancer deaths compared with minimal screening (1-time CBE) for women aged 40 to 49 years. After 25 years of follow-up, the answer was no. The other trial asked whether adding mammography to CBE reduces breast cancer deaths more than CBE alone for women aged 50 to 59 years. After 25 years of follow-up, the answer was no. The authors of the latest update reported the findings of the 2 trials together as a comparison of mammography (with or without CBE) versus no mammography (with or without CBE); again, the answer was that the number of breast cancer deaths after 25 years did not differ.

Critics faulted CNBSS for errors in randomization, inadequate quality of mammography, and inadequate follow-up of positive screening results. Other reviewers concluded that minor flaws in the study did not make much difference in the results. Strengths of the study included individual randomization (rather than randomization by clusters), high rates of screening (adherence) in the screening group and low rates of screening (contamination) in the comparison group, excellent-quality CBE, and long follow-up.

The long follow-up allows a fair comparison between similar groups—one screened more intensively than the other—of the number of cases of breast cancer diagnosed. Because the groups were randomly assigned and thus similar in breast cancer risk, the number of breast cancer cases diagnosed over a long period should be the same—those who had mammography would have just been diagnosed sooner than those who did not. But CNBSS instead found

an excess of 106 cases of invasive breast cancer in the mammography group compared with the no-mammography group.

This excess represents about 22% of cases of screen-detected breast cancer. Thus, these 106 women were “overdiagnosed” in the sense that they were diagnosed with (and presumably treated for) breast cancer that would not have led to their deaths. Other studies show similar estimates of overdiagnosis (4, 5), but this calculation may actually be an underestimate because CNBSS does not consider overdiagnosis due to diagnosing (and treating) ductal carcinoma in situ (6).

The CNBSS update offers 2 messages that we need to be open to hear. First, annual mammography did not reduce breast cancer deaths for women aged 40 to 59 years compared with women who had (aged 50 to 59 years) or did not have (aged 40 to 49 years) CBE. This finding differs from that of a meta-analysis done for the U.S. Preventive Services Task Force (USPSTF), which revealed that trials done primarily in the 1970s and 1980s showed that mammography led to a 15% (aged 40 to 49 years) and 16% (aged 50 to 59 years) relative risk reduction in breast cancer mortality (Table) (7).

Several factors could explain the discrepancy between the findings from CNBSS and the USPSTF meta-analysis. One factor is that treatment of breast cancer has improved. Perhaps better treatment means that women in the no-mammography group would fare better now than in the past and the benefit of mammography over no mammography is less now than it used to be. Another explanation, at least for women aged 50 to 59 years, could be the confounding problem of CBE. Perhaps CBE is better than we thought, and mammography reduces breast cancer deaths when compared with no screening (or poor CBE) but not when compared with excellent CBE.

However, the underlying message of CNBSS and the USPSTF meta-analysis is the same: For women aged 40 to 59 years, screening mammography reduces breast cancer deaths, at best, to only a small degree. Although the USPSTF review found a greater benefit for women aged 60 to 69 years, that estimate, based on only 2 trials, was less certain. A policy of screening for women aged 60 to 69 years every 2 years may provide the best tradeoff between benefits and harms.

See also:

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Table. Comparison of Breast Cancer Screening Studies

Study	Studies/ Participants	Years	Age Group, y	Study Group	Follow-up, y	Relative Risk for Breast Cancer Mortality (95% CI)
CNBSS-1	50 430 participants	1980–2005	40–49	Annual mammography plus CBE for 5 y vs. 1-time CBE	Approximately up to 25*	1.09 (0.80–1.49)
CNBSS-2	39 405 participants	1980–2005	50–59	Annual mammography plus CBE for 5 y vs. annual CBE for 5 y	Approximately up to 25*	1.02 (0.77–1.36)
CNBSS total	89 835 participants	1980–2005	40–59	Mammography (with or without CBE) vs. no mammography (with or without CBE)	Up to 25†	1.05 (0.85–1.30)
USPSTF meta-analysis	9 studies	Primarily 1970s and 1980s	39–49	Mammography vs. no screening	11–20	0.85 (0.75–0.96)‡
USPSTF meta-analysis	8 studies	1970s and 1980s	50–59	Mammography vs. no screening	11–20	0.86 (0.75–0.99)§
USPSTF meta-analysis	2 studies	1970s and 1980s	60–69	Mammography vs. no screening	12	0.68 (0.54–0.87)

CBE = clinical breast examination; CNBSS = Canadian National Breast Screening Study; USPSTF = U.S. Preventive Services Task Force.

* Mean length of follow-up, ≈21.9 y.

† Mean length of follow-up, 21.9 y.

‡ Number of women needed to invite to be screened to avoid 1 breast cancer death is 1904.

§ Number of women needed to invite to be screened to avoid 1 breast cancer death is 1339.

|| Number of women needed to invite to be screened to avoid 1 breast cancer death is 377.

This brings us to the second message of CNBSS: Overdiagnosis is real and constitutes at least 22% of cases of screen-detected invasive cancer. Although this calculation is still controversial, the literature may be converging toward this estimate. The bottom-line messages of CNBSS are that mammography probably does little to reduce breast cancer deaths for women aged 40 to 59 years but may do more for women aged 60 to 69 years. Also, the harms of overdiagnosis are substantial, giving us further pause about the wisdom of screening mammography. If we hear the messages, we may begin to witness the slow scaling back of what has been our greatest hope for reducing the burden of suffering due to breast cancer: screening mammography.

Where does this leave worried women? If mammography is really no more than a partial answer to the problem of breast cancer, what further action can women take to deal with a disease that seems unpredictable and uncontrollable? The answer lies in reframing the issue.

We should think beyond trials to consistent epidemiologic associations that we have known for years. Obese women, particularly postmenopausal women who gain weight, are more likely to be diagnosed with breast cancer than nonobese women (8). Physically active women are less likely to be diagnosed with breast cancer than sedentary women (9). We do not have trial evidence about these lifestyle practices, but we do have consensus that there are multiple reasons to avoid obesity and to be physically active. Let us begin thinking of these activities as reducing risk not only for cardiovascular disease and other conditions but also for breast cancer.

If we can be open to the messages of CNBSS and to all of the evidence about the burden of breast cancer, there is

a way forward. If we can come to think of screening in a more limited way, moving some of our hope to lifestyle change, we could reduce the harms of screening and gain the multiple benefits of a healthy lifestyle. Maybe it would even lessen the contentious mammography debates and give a new meaning to the “race for the cure.” We just need to think and hope in a different way.

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Family History

On Sundays before dinner,
 Aunt Mary, whose breast hadn't
 turned cancerous yet, insisted
 I climb to my grandmother's room.
 In the stairwell carnivorous vines
 that grew in the wallpaper
 between rows of bloodstained daggers
 terrified me. The old woman's
 camphorous sick room smothered
 the glow from her bedside lamp
 as I walked in. In a lumpy
 yellow voice, she demanded
 I step closer and put my lips
 to her forehead. After dinner,
 the aunts propped up her body
 with pillows. We circled the bed
 and recited the Five Sorrowful
 Mysteries of the rosary.
 Beneath her repulsiveness, I felt
 a dark current—whispers
 and glances, my father's night trip
 to Chicago for Laetrile,
 tense arguments in the kitchen.
 I couldn't help wondering
 which of the mansions God had made
 for the righteous in heaven,
 my grandmother would live in.

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