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Controversy Surrounding Mammography Screening? Not in Our Opinion.

Mammography has been the subject of many passionate and intense debates; nonetheless, mammography remains the gold standard in breast cancer screening and the only breast cancer screening test proven to reduce breast cancer–related mortality in large population-based studies.[1] The most recent results from the Canadian National Breast Screening Study (CNBSS) published by Miller et al[2] in the February 11, 2014, issue of the *British Medical Journal* once again bring the mammography controversy to a head. The authors of that article conclude that mammography screening does not reduce breast cancer mortality. This conclusion is in opposition to a vast body of literature as well as results from the largest and longest running breast cancer screening trials, all of which conclude that mammography screening reduces breast cancer–related mortality by approximately one-third.[3,4] Mammography can help detect small and more treatable tumors, thus reducing breast cancer–related mortality and improving quality of life for women who can then undergo less invasive surgery and cancer treatment.

Health care professionals who care for women with breast cancer have witnessed many cancers caught too late. These providers know that the earlier breast cancer is caught, the greater chance a woman has for survival. Smaller tumors have a better prognosis than larger ones and are also less likely to spread to the lymph nodes or to more distant sites.[5] Population-based breast cancer screening with mammography became widely available in the United States in the mid 1980s; since that time, a reduction of more than 30% was seen in annual rates of breast cancer–related mortality.[6]

Beginning in the early 1970s — the early years of mammography —approximately 40% of cancers were detected by screening alone.[7] However, the CNBSS, which began in the mid 1980s, showed that screening alone detected 32% of cancers.[2] This low number is consistent with reports indicating that the equipment used for mammography screening was of poor quality and was not state-of-the-art at the time,[8] a fact that may account for the low percentage of cancers detected by screening. The mammography technologists and radiologists also received no special training in — what was at the time — such a relatively new technique.[2] Using high-quality digital mammography, more than 60% of breast cancers may be found by screening alone.[9] In addition, the size of the cancers found in the screening arm of the CNBSS were approximately the same size as those in the control arm (1.9 and 2.1 cm, respectively).[2] This supports the idea that the study employed poor-quality mammography. The mean tumor size of a cancer detected on mammography is between 1.0 and 1.5 cm, which is nearly one-half of the size of the tumors found by mammography in the CNBSS.[10]

Furthermore, for a randomized control trial to be valid, the study must ensure that women are randomly assigned to screening and control groups. No details about the participants that could potentially bias the results should be known until they are assigned to one of these groups. The CNBSS researchers did not adhere to these rules.[2,11] Patients enrolled in the CNBSS first underwent a physical examination prior to entering the trial and were then randomized to the screened or nonscreened group. This action most likely resulted in the statistically significant excess of women with advanced breast cancers to the screening arm, as women with palpable masses or lymphadenopathy could be "randomized" to the screening arm.[12] Of the 252 women with breast cancer assigned to the screening arm, 52 patients (28.9%) died during the first year compared with 26 patient deaths (15.2%) in the 170 women with breast cancer assigned to the control arm.[2] The difference in percentage of breast cancer deaths between the 2 groups during the first year of the study provides further evidence for our concern that the CNBSS was an invalid randomized trial.

In conclusion, the CNBSS has 2 fundamental flaws — poor quality mammography and flawed randomization — that have led us to question the validity of its results. We believe these flaws should be strongly considered prior to making any conclusions based on results from the CNBSS. The mammographic equipment utilized was not digital and was not state-of-the-art for the 1980s; thus, the methods used are different from the high-quality digital mammography currently utilized in the United States. Prerandomizing female participants to undergo a physical examination is a flaw in the randomization process that likely resulted in a statistically significant excess of women with advanced breast cancers to be

"randomized" to the screening arm. A multiplicity of facts supports the CNBSS as being flawed, some of which we outlined above, thus limiting any merit given to the conclusions of that study.

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