Extending screening mammography to include younger women minimally increased life expectancy with large increases in cost

Salzmann P, Kerlikowske K, Phillips K. **Cost-effectiveness of extending screening mammography guidelines to include women 40 to 49 years of age.** Ann Intern Med. 1997 Dec 1;127:955-65.

Objective
To compare the cost-effectiveness of screening mammography for 2 age groups of women ≥ 40 years of age.

Design
Cost-effectiveness analysis using a Markov model and Monte Carlo simulations comparing breast cancer screening strategies by using data from previously published randomized controlled trials.

Setting
Economic perspective of the U.S. health care system.

Patients
A theoretical cohort of healthy women 40 to 69 years of age.

Intervention
2 breast screening strategies were compared: No screening was compared with biennial screening from 50 to 69 years of age, and screening every 18 months from 40 to 49 years of age followed by biennial screening from 50 to 69 years of age was compared with biennial screening from 50 to 69 years of age.

Main cost and outcome measures
Life expectancy, cost of screening mammography per woman, and cost of screening mammography per quality-adjusted life-year (QALY). The cost of screening mammography was based on the average cost reported by the National Cancer Institute's National Survey of Mammography Facilities and was expressed in 1995 U.S. dollars using a 3% discount rate.

Main results
Compared with no screening, biennial screening of 10 000 women from 50 to 69 years of age prolonged life by 329 years (an increased life expectancy of 12 d per woman). Screening every 18 months from 40 to 49 years of age compared with screening biennially from 50 to 69 years of age prolonged life by an additional 64 years (an increased life expectancy of 2.5 d per woman). Compared with the cost of no screening, the cost of biennial screening of women 50 to 69 years of age was $704 per woman, which resulted in a cost-effectiveness ratio of $21 400 per year of life saved and $21 700 per QALY saved. Screening women 40 to 49 years of age resulted in an incremental cost of $676 per woman, and an incremental cost-effectiveness ratio of $105 000 per year of life saved and $111 800 per QALY saved. A multiway sensitivity analysis showed a > 75% chance that screening mammography from 50 to 69 years of age would cost < $50 000 per year of life saved and a < 7% chance that extending screening to women 40 to 49 years of age would have the same cost-effectiveness ratio.

Conclusions
Breast cancer screening for women 40 to 49 years of age minimally increased life expectancy compared with screening women 50 to 69 years of age. The incremental cost-effectiveness ratio of screening women 40 to 49 years of age was approximately 5 times that of screening women 50 to 69 years of age.

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Commentary

Who to screen for breast cancer and when to do so remains one of the most controversial questions in current clinical practice. These issues have commanded much attention and provided the basis for many studies. The recommendations are particularly problematic for younger women (< 50 y). The cards are stacked against having as much benefit from screening mammography in this age group because of the lower incidence of cancer, less-accurate mammograms, and a longer time after screening until any benefit becomes apparent. These difficulties also suggest that screening is likely to be less economically attractive (higher cost-effectiveness ratios) in this age group. The picture is clouded, however, by 2 recently published cost-effectiveness analyses (1, 2) that erroneously calculated a favorable cost-effectiveness ratio for screening in younger women.

The study by Salzmann and colleagues addresses this misconception by doing a proper cost-effectiveness analysis and, most important, by interpreting the results appropriately. They have recognized that incremental rather than average cost-effectiveness ratios must be used. The reasoning is that, because we know that screening older women (> 50 y) is effective and can be accomplished at reasonable expense for the health benefits achieved, it should be considered an acceptable clinical policy and encouraged. The cost-effectiveness of extending screening to younger women depends on its benefits and costs incremental to this policy.

Because Salzmann and colleagues have done a valid cost-effectiveness analysis and correctly interpreted their data, they have corrected the results and conclusions of the 2 previous studies. On the basis of available data and the current cost of mammography, the study clearly indicates that screening younger women is not a cost-effective use of scarce medical resources.

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References

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Notes