

Comparative Effectiveness of Digital Versus Film-Screen Mammography in Community Practice in the United States

A Cohort Study

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Abstract

Background: Few studies have examined the comparative effectiveness of digital versus film-screen mammography in U.S. community practice.

Objective: To determine whether the interpretive performance of digital and film-screen mammography differs.

Design: Prospective cohort study.

Setting: Mammography facilities in the Breast Cancer Surveillance Consortium.

Participants: 329 261 women aged 40 to 79 years underwent 869 286 mammograms (231 034 digital; 638 252 film-screen).

Measurements: Invasive cancer or ductal carcinoma in situ diagnosed within 12 months of a digital or film-screen examination and calculation of mammography sensitivity, specificity, cancer detection rates, and tumor outcomes.

Results: Overall, cancer detection rates and tumor characteristics were similar for digital and film-screen mammography, but the sensitivity and specificity of each modality varied by age, tumor characteristics, breast density, and menopausal status. Compared with film-screen mammography, the sensitivity of digital mammography was significantly higher for women aged 60 to 69 years (89.9% vs. 83.0%; $P = 0.014$) and those with estrogen receptor–negative cancer (78.5% vs. 65.8%; $P = 0.016$); borderline significantly higher for women aged 40 to 49 years (82.4% vs. 75.6%; $P = 0.071$), those with extremely dense breasts (83.6% vs. 68.1%; $P = 0.051$), and pre- or perimenopausal women (87.1% vs. 81.7%; $P = 0.057$); and borderline significantly lower for women aged 50 to 59 years (80.5% vs. 85.1%; $P = 0.097$). The specificity of digital and film-screen mammography was similar by decade of age, except for women aged 40 to 49 years (88.0% vs. 89.7%; $P < 0.001$).

Limitation: Statistical power for subgroup analyses was limited.

Conclusion: Overall, cancer detection with digital or film-screen mammography is similar in U.S. women aged 50 to 79 years undergoing screening mammography. Women aged 40 to 49 years are more likely to have extremely dense breasts and estrogen receptor–negative tumors; if they are offered mammography screening, they may choose to undergo digital mammography to optimize cancer detection.

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