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Congress Abstract

Supplemental Screening for Women with Dense Breast Tissue: A Review of Published Evidence from the Dense, Braid, Praim and Assure Studies

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Background: Dense breast tissue reduces mammographic sensitivity and raises breast cancer risk. Supplemental imaging and artificial intelligence supported mammography reading have been tested prospectively. The European Society of Breast Imaging recommends supplemental magnetic resonance imaging for extremely dense breasts, whereas the American College of Physicians in 2026 advised against it for average risk women with dense breasts. This review summarises what the principal studies measured and found.

Objective: To review the published evidence on both strategies in dense breasts, reporting each study's endpoints and results.

Materials and Methods: Narrative review of primary publications, published online 2019 to 2025, quoted verbatim. Four large prospective multicentre studies reporting on dense breasts were selected, two per strategy: the randomised trials DENSE (Netherlands, magnetic resonance imaging) and BRAID (United Kingdom, abbreviated magnetic resonance imaging, automated ultrasound and contrast-enhanced mammography), and the observational studies PRAIM (Germany, artificial intelligence supported double reading) and ASSURE (United States, artificial intelligence supported single reading with safeguard review).

Results: DENSE randomised 40,373 women with extremely dense breasts and normal mammography to invitation for supplemental magnetic resonance imaging or to mammography alone: interval cancers 2.5 versus 5.0 per 1000; among the 59% accepting, detection was 16.5 and false positives 79.8 per 1000. BRAID randomised 9361 women with dense breasts and a negative mammogram: detection was 17.4 per 1000 examinations with abbreviated magnetic resonance imaging, 19.2 with contrast-enhanced mammography and 4.2 with automated ultrasound, the contrast-based modalities not differing significantly; recall 9.7%, 9.7% and 4.0%, median invasive size 10, 11 and 22 millimetres. In PRAIM (463,094 women), artificial intelligence supported double reading was associated with detection of 6.7 versus 5.7 per 1000 (17.6% higher) and non-inferior recall; in dense breasts the 18.7% increase was not statistically significant. In ASSURE (579,583 tomosynthesis examinations, single reading), detection with the artificial intelligence workflow was 5.6 versus 4.6 per 1000 (21.6% higher), recall 11.1% versus 10.6%, and detection in dense breasts 22.7% higher.

Conclusions: In BRAID, abbreviated magnetic resonance imaging and contrast-enhanced mammography detected three times as many invasive cancers as automated ultrasound, at half the size with more than twice the recall, and did not differ significantly from each other. In DENSE, invitation to supplemental magnetic resonance imaging halved the interval cancer rate. Artificial intelligence support was associated with higher detection in PRAIM without higher recall and in ASSURE with slightly higher recall; neither was randomised. No included study measured breast cancer mortality; survival benefit remains undemonstrated and overdiagnosis unquantified.

Keywords: Breast Neoplasms; Breast Density; Mammography; Magnetic Resonance Imaging; Ultrasonography; Mammary; Radiographic Image Interpretation; Computer-Assisted