

# Breast density implications and supplemental screening

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- Athina Vourtsis (1) Email author (vourtsis@mammography.gr)View author's OrcID profile (View OrcID profile)
- Wendie A. Berg (2)

1. “Diagnostic Mammography”, Medical Diagnostic Imaging Unit, Founding President of the Hellenic Breast Imaging Society, , Athens, Greece
2. Department of Radiology, Magee-Womens Hospital of UPMC, University of Pittsburgh School of Medicine, , Pittsburgh, USA

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## Abstract

Digital breast tomosynthesis (DBT) has been widely implemented in place of 2D mammography, although it is less effective in women with extremely dense breasts. Breast ultrasound detects additional early-stage, invasive breast cancers when combined with mammography; however, its relevant limitations, including the shortage of trained operators, operator dependence and small field of view, have limited its widespread implementation. Automated breast sonography (ABS) is a promising technique but the time to interpret and false-positive rates need to be improved. Supplemental screening with contrast-enhanced magnetic resonance imaging (MRI) in high-risk women reduces late-stage disease; abbreviated MRI protocols may reduce cost and increase accessibility to women of average risk with dense breasts. Contrast-enhanced digital mammography (CEDM) and molecular breast imaging improve cancer detection but require further validation for screening and direct biopsy guidance should be implemented for any screening modality. This article reviews the status of screening women with dense breasts.

## Key Points

- *The sensitivity of mammography is reduced in women with dense breasts. Supplemental screening with US detects early-stage, invasive breast cancers.*

• *Tomosynthesis reduces recall rate and increases cancer detection rate but is less effective in women with extremely dense breasts.*

• *Screening MRI improves early diagnosis of breast cancer more than ultrasound and is currently recommended for women at high risk. Risk assessment is needed, to include breast density, to ascertain who should start early annual MRI screening.*

## **Keywords**

Breast density   Screening ultrasound   Breast cancer   Tomosynthesis  
Magnetic resonance imaging

## **Abbreviations**

ABS

Three-Dimensional Automated Breast Sonography

ACRIN

American College of Radiology Imaging Network

ASTOUND

Adjunct Screening with Tomosynthesis or Ultrasound in women with mammography-Negative Dense breasts trial

BCSC

Breast Cancer Surveillance Consortium

BI-RADS

Breast Imaging Reporting and Data System

CESM

Contrast-enhanced spectral mammography

DBT

Digital breast tomosynthesis

DCIS

Ductal carcinoma in situ

EASY

European Asymptomatic Screening Study

ER

Estrogen receptor

EUSOBI

European Society of Breast Imaging

GC-HBOC

German Consortium for Hereditary Breast and Ovarian Cancer

HHUS

Hand-held ultrasound

ICDR

Incremental cancer detection rate

MBI

Molecular breast imaging

MRI

Magnetic resonance imaging

NCCN

National Comprehensive Cancer Network

PHBC

Personal history of breast cancer

PPV

Positive predictive value

STORM

Screening with Tomosynthesis or Standard Mammography trial

US

Ultrasound

## Notes

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## Compliance with ethical standards

## Guarantor

The scientific guarantor of this publication is: Wendie A. Berg, MD, PhD, Department of Radiology, University of Pittsburgh School of Medicine, Magee-Womens Hospital of UPMC, Pittsburgh, PA, USA.

## Conflict of interest

The authors of this manuscript declare no relationships with any companies whose products or services may be related to the subject matter of the article.

## Statistics and biometry

No complex statistical methods were necessary for this paper.

## Informed consent

Written informed consent was not required for this study because this is a review article.

## Ethical approval

Institutional Review Board approval was not required because this is a review article.

## Methodology

- Review article

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