# The dense breast challenge and our innovative AI-driven 3D ultrasound solution

Various studies conducted in the U.S. and Europe show 40% of women have dense breasts,[1] one of the most common risk factors for developing breast cancer.[2] In dense breasts, cancers may be masked on mammography – potentially delaying diagnosis in these women.[3,4] Both dense breast tissue and cancer appear white on a mammogram. This creates a dangerous camouflage effect and a dilemma for radiologists. The goal is early detection of breast cancer to help avoid missing cancer diagnoses and increase clinical confidence.

40% of women[1] and **70%** of Asian of women[5] have dense breast tissue.
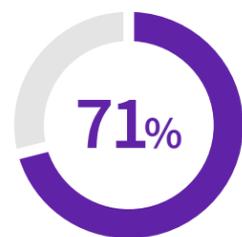
71%
71% of cancers occur in dense breasts.[6]

1/3
Mammography may miss 1/3 of cancers in dense breasts.[3]

Optimal outcomes. Peace of mind.

Invenia ABUS Premium provides the most innovative, patient-friendly, efficient, and AI-driven 3D ultrasound designed to deliver optimal outcomes.

The power of early detection with supplemental screening

Supplemental screening with Invenia ABUS transforms breast care from reactive to proactive.

> Multiple studies have demonstrated the clinical power of ABUS in dense breasts to find mammography occult, invasive cancers at an early stage – small and node-negative[7,8] with the potential to reduce unnecessary biopsies.[9]

Important prognostic implications for your patients

When breast cancers are found at Stage 1 and 2,

70% of patients may avoid chemotherapy.[10]

GE HealthCare offers the first FDA-approved ultrasound supplemental screening that is specifically designed for detecting cancer in dense breast tissue.
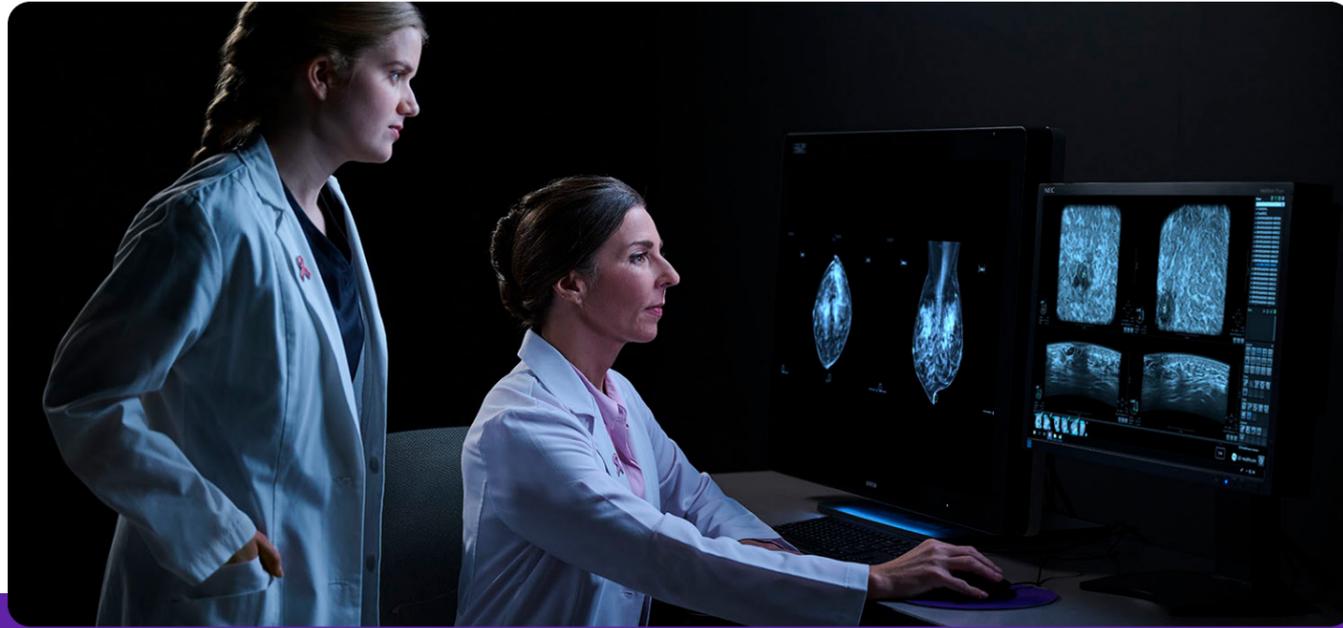
Invenia ABUS is an important pillar in the Breast Care Pathway and makes a difference from screening to diagnostic, planning and monitoring.

Comprehensive Breast Care Pathway

Screening	Diagnostic	Planning	Monitoring
Finding clinically relevant cancers as early as possible	**Managing complex cancer diseases**	**Making the invisible visible**	**Providing extraordinary patient care**
The special coronal plane with an exact lesion localization and double reading capabilities makes ABUS an excellent screening tool to detect small cancers.[7,8]	Supporting early diagnosis with virtual rescans and multiplanar reading within the entire breast volume helps in complex multifocal and multicentric cancer disease management.[11]	The coronal plane provides the entire tumor extension for a precise and effective therapy planning by offering a surgical 3D view to the entire breast.[11]	The reproducible and standardized ABUS volumes can be easily compared to priors helping to monitor systematic therapy response and benign lesions in young women.[12]

Built for outstanding patient care

The non-invasive Invenia ABUS is designed for extraordinary patient care

Deliver optimal outcomes for your patients based on ABUS's advanced technology without any iodinated contrast agent or ionizing radiation. The gently shaped new transducer fits perfectly to a woman's breast anatomy and the selectable compression levels provide personalized comfort during the exam.

Enjoy a new breast ultrasound experience to advance quality time with your patients by separating reading from the acquisition.

A patient experience study[13] showed that **100**% of women would recommend an ABUS exam to their best friend.

Diana's story

"I'm convinced that **ABUS gives my doctor more concrete evidence** than other technologies[13] and provides a one-of-a-kind image. It's completely **painless, comfortable, fast,** and **convenient.** Unlike handheld ultrasound, which is very time intensive, ABUS is **faster** – the appointment only takes 15 minutes."

Jill's story

"I knew I had dense breast tissue, and I knew that reading dense tissue is a challenge. Requesting ABUS makes the whole journey easier by **finding cancer earlier,** when **less treatment** is likely to be needed, and the imaging is **totally pain-free and comfortable** — a **great golden ticket**!"[14]

Guelsen's story

"I felt **peace of mind during the ABUS exam** because I was told ABUS doesn't use any radiation. Thanks to the recommended ABUS screening and the attention of my physician, **my cancer was detected early** on both breasts, and I was able to receive treatment as early as possible."[15]

AI-driven, faster and reproducible scanning

The Invenia ABUS Premium is designed for high patient throughput and extraordinary image quality to provide a great level of confidence. With its innovative design, it's easy to use, reproducible, user-independent, standardized and allows reading anywhere.

Enabled by Verisound™ AI

- The **Scan Quality Assessment** provides an immediate qualitative evaluation during the exam for proper breast coverage and positioning
- **Auto Nipple Detection** automatically offers the positioning of the nipple marker to enable consistency within the breast volumes to speed up the overall exam time

The latest Reverse Curve™ transducer

The gentle shape of the 15.3 cm **Reverse Curve transducer** follows the breast's natural contour for outstanding patient comfort and full contact, ensuring comprehensive coverage and extraordinary image quality, which leads to a high degree of diagnostic confidence for reading ABUS exams.

An image quality evolution: cSound™ Imageformer and Fast Scan

With the touch of a button, the predefined scanning protocols will be enabled with an automated selection of all appropriate ultrasound parameters.

- The **cSound Imageformer** advancement transforms processing from hardware-to software-based, producing exquisite image quality by automatically creating focus at every pixel and resulting in consistent, high-resolution image quality and reproducibility from user to user
- **Fast Scan** increases scan speed by 40%* to enable high operational efficiency and better patient throughput

Fast Scan increases scan speed by **40%***

Simple and streamlined reading

The Invenia ABUS Viewer is designed for fast, efficient workflow for reading and reporting, allowing physicians to quickly review, interpret and archive patient exams. Based on Windows® and powerful processing, the Invenia ABUS Viewer incorporates intuitive user interface icons and multiple viewing and hanging protocols, which can be customized by the user.

AI Assistant to improve clinical confidence

The Invenia ABUS Viewer with AI Assistant** integrates FDA-approved AI tools to enhance ABUS 3D dataset reviews, seamlessly incorporating intelligent algorithms to assist in detecting and characterizing breast lesions, reducing reading time and providing a second opinion for added confidence.

Key productivity features to enhance workflow

- **Programmable hot keys** enable users to define commonly used functions to help reduce keystrokes.
- **Three-view layout option** displays a synchronized view of multiple acquisitions on a single screen, allowing physicians to efficiently evaluate and cross reference areas of interest from multiple angles and increase diagnostic confidence.
- **Auto Prior Compare** allows physicians to easily compare a region of interest to prior exams.

QVCAD™ The Power of AI

koios™

93%
Experience up to 93% sensitivity for lesion detection[16]

33%
Reduce reading time by 33%[17]

55%
Decrease benign biopsies by up to 55%[18]

> **"If you can read breast ultrasound, you can read ABUS. Now, with the AI Assistant, powered by QVCAD, the read time is down about 30% to about a minute and a half."**[19]

Positive health economics

Impactful economic benefits by implementing ABUS

GE HealthCare

-1.05%	€54 million	44%	18%	61%
total economic impact[20]	savings to Italian NHS[20]	saving of radiologist reading time[21]	reduction in operational costs[21]	increased breast ultrasound revenue by implementing ABUS[22]

Clinical trailblazer   **Operational efficiency**   **Financial outcomes**

Beyond technology

Program integration, marketing, and education

Grow your ABUS program

GE HealthCare takes a holistic approach to helping integrate Invenia ABUS into your facility. Our dedicated team is here to support you in implementing your ABUS program, finding your most effective and individual workflow to make it a success. Our marketing and digital tool kits focus on education and awareness for referring physicians, your community, and most importantly, your patients!

Comprehensive education program

Gain quick, clinical confidence to read ABUS exams through the extensive and progressive Mastery Program for physicians. The FDA-approved curriculum is led by experienced and certified peer educators. The advanced technologists' training occurs on-site with our experienced team of clinical application specialists.

ABUS Club & ABUS Club app

Users have access to an online community that offers clinicians educational resources, marketing tools and best practices from ABUS users, to help implement, launch and grow their program. The ABUS Club app has a user-friendly interface and can be speedily accessed anywhere.

References:

1. Pisano et al. NEJM 2005; 353: 1773.
2. Engmann NJ, et al, JAMA Oncol. 2017;3(9):1228-1236.
3. Mandelson et al. J Natl Cancer Inst 2000; 92:1081-1087.
4. Tagliafico, Massimo Calabrese et al, Journal of Clinical Oncology 2016 34:16, 1882-1888.
5. Ellison-Loschman, et al, PLOS ONE July 2013.
6. Arora N, King TA, Jacks LM., Ann Surg Onc, 2010; 17:S211-18.
7. FDA PMA P110006 summary of safety and effectiveness.
8. Wilczek B, European Journal of Radiology (DOI: 10.1016/j.ejrad.2016.06.004).
9. Wenhui Ren et. al, Elsevier Acad Radiol 2023; 30:S114–S126.
10. Sparano, JA, et al. N Engl J Med 2018; 379:111-121.
11. GE HealthCare Case Study: 3D ABUS and its potential role for preoperative staging, Prof. Mundinger, Marienhospital Osnabrueck, JB50302XX.
12. M.E. Hatzipanagiotou, et.al. Feasibility of ABUS as an Alternative to HHULS for Response Control in Neoadjuvant Breast Cancer Treatment Elsevier Clinical Breast Cancer, Volume 22, Issue 2, 2022, Pages e142-e146.
13. Shah et.al. Journal of Diagnostic Medical Sonography DOI: 10.1177/8756479313476920 2013.
14. GE HealthCare Insights article, JB20802XX.
15. GE HealthCare Insights article, JB26277XX.
16. Performance and Reading Time of Automated Breast US with or without Computer-aided Detection. Read More: https://pubs.rsna.org/doi/10.1148/radiol.2019181816.
17. Interpretation Time Using a Concurrent-Read Computer-Aided Detection System for Automated Breast Ultrasound in Breast Cancer Screening of Women With Dense Breast Tissue (Yulei Jiang) Read More: https://www.ajronline.org/doi/10.2214/AJR.18.19516.
18. Barinov, et al. Impact of Data Presentation on Physician Performance Utilizing Artificial Intelligence-Based Computer-Aided Diagnosis and Decision Support Systems. J Digit Imaging (2018). https://doi.org/10.1007/s10278-018-0132-5.
19. GE HealthCare Case Study; Dr. Kohne: Make a difference, not a diagnosis. JB26704XX.
20. Foglia, Scaperrotta et.al. Budget impact analysis of breast cancer screening in Italy: The role of new technologies, Health Services Management Research DOI: 10.1177/0951484819870963.
21. GE HealthCare Case Study: Implementation of Invenia ABUS improves operational and economic benefits. Prof. Aribal, Acibadem Hospital. JB21392XX.
22. GE HealthCare Case Study: Real World Experience and Outcomes with ABUS, Imaging for Women, JB49815XX.