Volpara Scorecard

Volpara® Scorecard™ software augments your radiology reports with automated, objective breast density, dose, and pressure assessment for every exam.

Scorecard generates a DICOM® Secondary Capture Image (SCI) used by radiologists during 2D and/or 3D mammography. Each scorecard SCI displays patient information, breast density category (a, b, c, or d), VDG® scale, individual breast metrics, and average dose and pressure. Scorecard can also send content to DICOM destinations in the form of a DICOM Structured Report (SR) object.

1 Higher volumetric density of left or right breast

2 VDG threshold scale and location of volumetric breast density (VBD%) along this scale

3 VDG breast category visible in "thumbnail"

4 Average radiation dose per image, using patient's density results

5 Average pressure applied using compression force/contact area

6 Individual breast measurements

7 Average VBD% validated for use in the Tyrer-Cuzick v8 risk model

Scorecard combines three key clinical functions

The **Volpara® TruDensity™** clinical function is a decision support tool intended to help you provide a consistent density assessment to your patients so you can guide their personalised imaging pathways based on an objective measure. Ultimately, you have the expertise to determine the patients' density score and supplemental imaging options.

The **Volpara® TruRadDose™** clinical function analyses the dose delivered to your patients based on their individual breast density instead of the dose estimated by the equipment manufacturer.

The **Volpara® TruPressure™** clinical function measures the compression pressure applied to the breast, calculated using the force from the gantry and the breast's contact area with the paddle. Volpara's target compression range is 7–15 kPa. Lower and higher pressures have been shown to reduce mammographic performance.[1] This helps inform clinicians about the patient experience and the clinical performance of the exam.

Special cases

Radiologists' visual assessment may sometimes differ from the volumetric-based VDG score. Also, occasionally TruDensity may not accurately assess density (see examples, right). In such cases, radiologists will want to visually assess density. However, to maintain integrity and consistency across your organisation, we recommend setting internal guidelines outlining when the automatic density assessment should be manually overridden.

Density variations over time

Breast density variations over time happen for a variety of reasons that should be reviewed when a change in density is detected:

- Lobular involution due to age
- Drug therapy such as hormone replacement or endocrine therapies
- Significant weight loss or gain
- Positioning changes
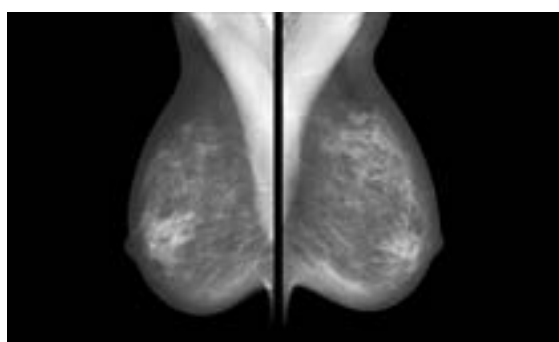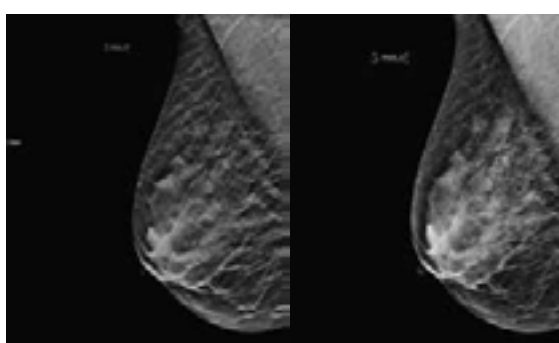- Density at a category threshold easily affected by factors outlined above
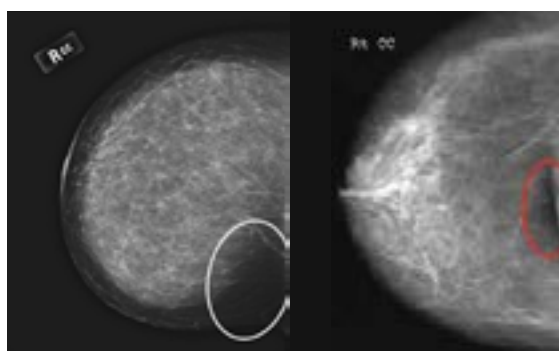
Air gap
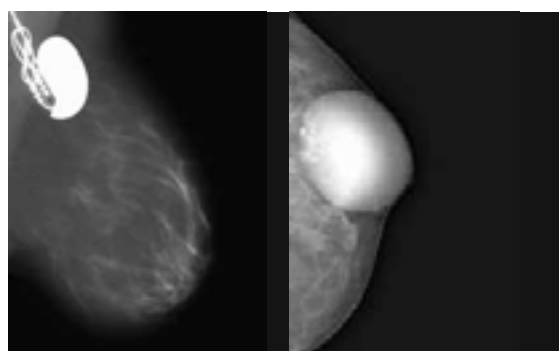
Foreign object   Cyst

VBD 4.9%   VBD 9.3%

Synthetic   2D

Positioning Artifacts

Air gaps or lucent areas caused by poor position or uneven compression may cause the algorithm to overestimate density.

Artifacts

TruDensity should detect and remove highly attenuated objects from the calculation, but on rare occasions it interprets the object as dense tissue, increasing the density result.

Asymmetry

If one breast has higher density than the other, the higher density is reported when configured to BI-RADS 5th Edition. This could move the study up to a higher VDG category.

Synthetic vs. 2D Images

Compared with 2D digital mammography, reading a 3D study with synthetic images results in lower visual density assessments.[2]

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References

1. Holland K, Sechopoulos I, Mann RM, den Heeten GJ, van Gils CH, Karssemeijer N. Influence of breast compression pressure on the performance of population-based mammography screening. Breast Cancer Res. 2017 Nov 28;19①:126. doi: 10.1186/s13058-017-0917-3. PMID: 29183348; PMCID: PMC5706300.
2. Gastounioti et al., *Radiology* 2019; 291(2):320–327