Risk Assessment: Dense Breasts

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Medical Director, Christiana Care Breast Program
Delaware’s Dense Breast Notification

“Your mammogram shows that your breast tissue is dense. Dense breast tissue is common and is not abnormal. However, dense breast tissue can make it harder to evaluate the results of your mammogram and may also be associated with an increased risk of breast cancer. This information about the results of your mammogram is given to you to raise your awareness and to inform your conversations with your doctor. Together, you can decide which screening options are right for you. A report of your results was sent to your physician.”
Connective Tissue: holding it all together
Almost Entirely Fatty
Scattered Areas of Fibroglandular Density
Heterogeneously Dense
Extremely Dense
Percentage of women age 40 – 75yr with each level of mammographic density

- Extremely Dense, 10%
- Fatty, 10%
- Scattered Fibroglandular Density, 40%
- Heterogeneously Dense, 40%
Percentage of women age 40 – 75yr with each level of mammographic density

- Extremely Dense, 10%
- Fatty, 10%
- Scattered Fibro glandular Density, 40%
- Heterogeneously Dense, 40%

50%
PERCENTAGE OF WOMEN AGE 40 – 75 YR BY MAMMOGRAPHIC DENSITY

- Predominantly fatty
- Extremely dense
Masking Effect of Dense Breast
Asymmetry
Tomosynthesis Mammography

- X-ray Tube
- Movement
- Compression paddle
- Centre of Rotation
- Breast
- No Grid
- Flat Panel Detector
Tomosynthesis Mammography
Tomosynthesis

Mammography

Lesion superimposed in 2D

2D

3D

Lesion isolated in 3D
<table>
<thead>
<tr>
<th>Relative Risk of Breast Cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heterogeneously dense</strong></td>
</tr>
<tr>
<td>One second degree relative with breast cancer</td>
</tr>
<tr>
<td>Prior benign biopsy</td>
</tr>
<tr>
<td><strong>Extremely dense</strong></td>
</tr>
<tr>
<td>One first degree relative with breast cancer</td>
</tr>
<tr>
<td>Two first degree relatives with breast cancer</td>
</tr>
</tbody>
</table>

Refuting the Dense Breast Risk “attribution” claim from UCSF

<table>
<thead>
<tr>
<th></th>
<th>Premenopausal: Controls 52,860</th>
<th>Premenopausal: Invasive or in situ 5,286</th>
<th>Post menopausal: Controls 131,449</th>
<th>Post menopausal: Invasive or in situ 13,151</th>
<th>Δ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heterogeneously dense</td>
<td>46.3%</td>
<td>53.0%</td>
<td>Δ 6.7</td>
<td>34.0%</td>
<td>41.4%</td>
</tr>
<tr>
<td>Extremely dense</td>
<td>15.8%</td>
<td>21.6%</td>
<td>Δ 5.8</td>
<td>5.5%</td>
<td>7.1%</td>
</tr>
</tbody>
</table>

There is significant inter observer variation in BI-RADS density “c” vs “d”

**Totally unsupported claim:**
26.2% of postmenopausal breast cancers could be averted if all women with heterogeneously dense or extremely dense breasts shifted to lower level of breast density.

JAMA Oncol, Feb 2, 2017 online.
Fatty, 10%
Scattered Fibroglandular Density, 40%
Heterogeneously Dense, 40%
Extremely Dense, 10%

Data also from the Breast Cancer Screening Consortium, for years overlapping the study period.
Dense Breast Notification Laws

• 50% of states have state mandated density notification for patients with heterogeneously or extremely dense breasts

• This is an opportunity for a woman to discuss risk assessment and risk reduction with her PCP
Primary care tools to identify individuals for referral to genetic counselors:

Referral Screening Tool (RST)

Tyrer-Cuzick Risk Calculator

IBIS (International Breast Cancer Intervention Study)
Tyrer-Cuzick Model Breast Cancer Risk Evaluation Tool

About IBIS
This risk assessment tool was developed by scientists at the Wolfson Institute of Preventive Medicine, Queen Mary University of London and is provided for non-commercial research purposes only. No responsibility is accepted for clinical decisions arising from its use. Commercial use requires a license. For further information contact: mihan@cancercentre.com or lmiddletori@cancercentre.com

IBIS Risk Assessment Tool
This tool estimates the likelihood of a woman developing breast cancer specifically within 10 years of her current age and over the course of her lifetime. The tool is utilized to inform women and help support the decision-making process for genetic counseling and testing.

Note: This tool is not intended to assess the risk for women who have already been diagnosed with breast cancer.

System of Measurement:
- Metric Units
- Imperial Units

Personal History: Please enter the woman’s age, weight and height below...

Current Age: [Current age...]
Weight: [Weight in kg... kg]
Mass. Breast Risk Education and Assessment Task Force; Evidence-based supplemental screening algorithm

The strengths and weaknesses of currently available adjunctive imaging:

1. MRI increases cancer detection approximately 14.7/1000, but increases recalls and biopsies.

2. Ultrasound increases cancer detection approximately 3–4/1000, but increases recalls and biopsies by as much as 30%.

3. Tomosynthesis increases cancer detection approximately 1–4/1000, and decreases recalls and biopsies by 15%.
69 yr old woman with 1 cm invasive carcinoma, obscure on mammogram, seen on Molecular Breast Imaging.
Molecular Breast Imaging

**problems**

- Requires T99 sestimibi injection
- Lack of direct biopsy capability
- Slightly higher radiation to breast than digital mammography (2.4 mSv for MBI, 1.0 mSv for mammography)

**opportunities**

- Nuclear imaging techniques exploit functional differences between tumor and normal cells that result in different levels of radiotracer uptake and are independent of the surrounding parenchymal density
- MBI may increase by 8/1000 screens the number of cancers found among women with extremely dense breasts.
- No Gadolinium required.

*AJR 2015; 204:241–251*
**Prevention**

- **NSABP P-1 and STAR trials:** 50% risk reduction, Tamoxifen and Evista
- **1999, Lynn Hartmann, bilateral mastectomy:** 90% risk reduction


Prevention

- California Teachers Study, 150 minutes/week of moderate physical activity: 20-50% risk reduction

Prevention

- The rate of new breast cancer cases is 24% higher among smokers than among nonsmokers.

- The risk of invasive breast cancer was highest in women who began smoking at an earlier age. When compared to women who never smoked, those who started smoking before their first menstrual cycle had a 61% higher risk.

American Cancer Society’s Cancer Prevention Study II (CPS-II), Journal of the Natl Cancer Institute; Feb 28, 2013
Being overweight or obese after age 18 increases the risk of breast cancer as much as 30%.

Prevention

- Alcohol: Dose related risk, with increased risk directly proportional to intake.

Thank you very much for your attention!

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