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Breast Density and Breast Cancer Risk: New Understandings

2018

High Mammographic Breast Density (HMBD)

1. Masking effect
2. Increased risk of breast cancer
3. Management guidelines

2

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High Mammographic Breast Density (HMBD)


Masking Effect

3

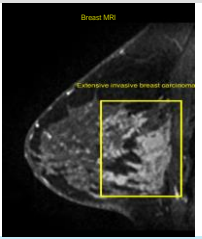
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Decreased Sensitivity of Mammography

Normal Mammogram



Breast MRI



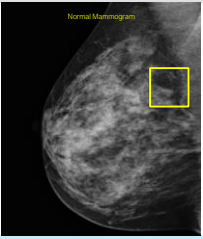
Extensive invasive breast carcinoma

4

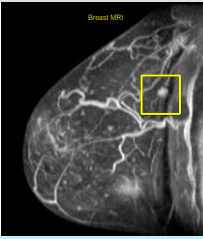
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Decreased Sensitivity of Mammography

Normal Mammogram



Breast MRI

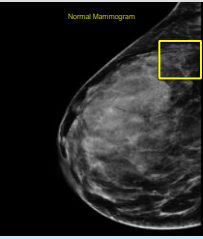


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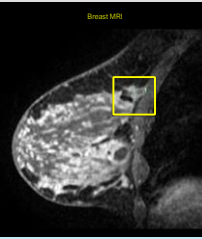
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Decreased Sensitivity of Mammography

Normal Mammogram



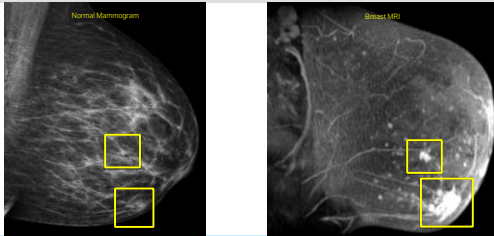
Breast MRI



6

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Decreased Sensitivity of Mammography

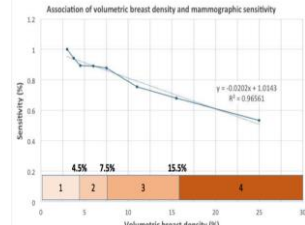


7

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Norwegian Screening Results ~250,000 women

Destounis et al AJR Jan 2017



8

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High Mammographic Breast Density (HMBD)

Increased Risk

9

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Bi-Rads

Normal Mammograms

The breast is almost all fatty tissue with very little dense tissue.

The breast contains scattered areas of dense glandular and fibrous tissue.

More of the breast is made of dense glandular and fibrous tissue. This can make it hard to see small tumors near or around the dense tissue.

The breast is extremely dense, which makes it hard to see tumors in the breast.

Image is a simulation from mammography.

Volpara® report

LOWEST DENSITY

HIGHEST DENSITY

	Right	Left
Volume of Fibroglandular Tissue (cm ³)	131.6	133.7
Volume of Breast (cm ³)	465.0	508.4
Volumetric Breast Density (%)	28.5	26.3

1.9 mGy 10.4 kPa 27.3%

10

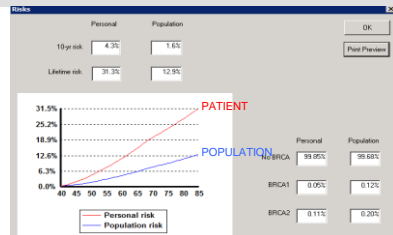
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Breast Cancer Risk Calculator Tyrer-Cuzick Model

11

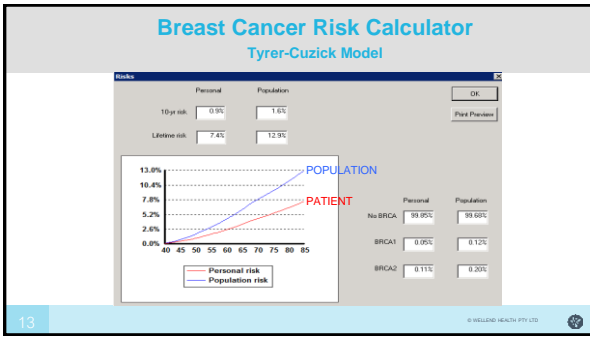
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Breast Cancer Risk Calculator Tyrer-Cuzick Model



12

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Risk Factors for HMBD

Most (60%) of the risk for developing HMBD is inherited.

Other risk factors include:

1. Family history of breast cancer
2. Early (age 12-17) and/or prolonged use of OCP
3. IVF treatments, particularly if over the age of 35
4. HRT (MHT), particularly combination HRT
5. First child after the age of 30
6. Nulliparous

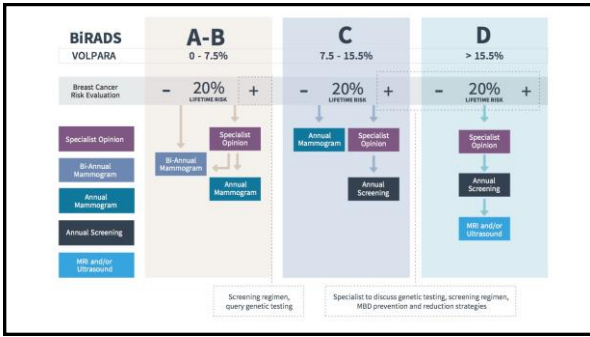
Women's Health Initiative Re-examined Byrne, et al JNCI March 2017

ARTICLE
Mammographic Density Change With Estrogen and Progestin Therapy and Breast Cancer Risk
 Celia Byrne, Gisèle Ursin, Christopher F. Martin, Jennifer D. Peck, Etiodia B. Cole, Donglin Zeng, Eunhee Kim, Martin D. Yaffe, Norman F. Boyd, Gerardo Heiss, Anne McTiernan, Rowan T. Chlebowski, Dorothy S. Lane, JoAnn E. Manson, Jean Wactawski-Wende, Etta D. Pisano

- Every 1% increase in MBD = 3.4% increase in BCa risk
- Increase in MBD warrants cessation of HRT
- Significantly reduced detection of BCa
- Top 20th percentile 3.6 fold increase in risk

High Mammographic Breast Density (HMBD)

Management Guidelines



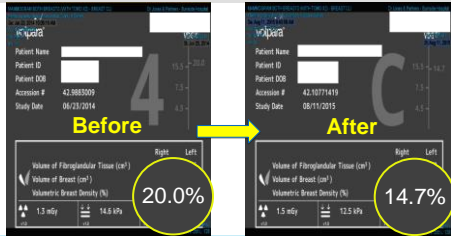
Prevention Strategies

Tamoxifen-Induced Reduction in Mammographic Density and Breast Cancer Risk Reduction: A Nested Case-Control Study

Jack Cuzick, Jane Warwick, Elizabeth Pinney, Stephen W. Duffy, Simon Cawthorn, Anthony Howell, John F. Forbes, Ruth M. L. Warren. *JNCI August 2011*

- In the tamoxifen arm 46% patients > 10% reduction in breast density at 18 months
- 10% reduction = 63% reduction in BCa risk. This persisted after 5 years of treatment
- PBS listed Jan 2016
- Tolerability of tamoxifen problematic

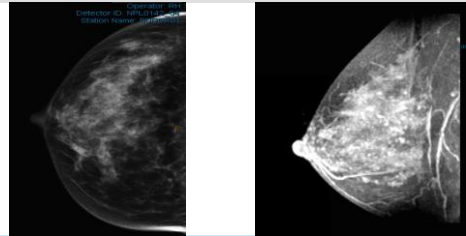
Open labelled trial of androgen/aromatase inhibitor in premenopausal women 8th IDM San Francisco June 2017



19

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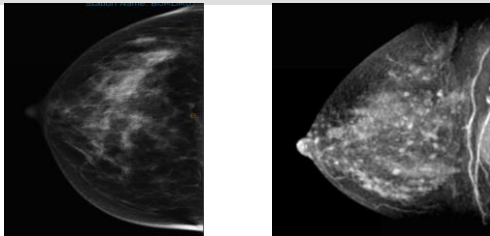
Therapeutic Intervention to reduce MBD



20

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Therapeutic Intervention to reduce MBD



21

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Take home messages

- Reducing MBD is a surrogate endpoint for breast cancer prevention
- Order mammography to include density score in the report to enable accurate risk calculation
- Do a risk assessment, if >20% lifetime risk - needs specialist opinion
- Preventative strategies are best commenced in specialist setting
- Offer MMG baseline screening to 35 yo women on long-term use of OCP, family history of MBD, IVF use, and/or nulliparous
- Offer baseline MMG at 40 for 'non-at-risk' patients
- DO NOT increase MBD if it can be avoided

22

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Take home messages

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23

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