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The Ongoing Breast Screening Debate

Time to Clear the Air

In an age of social media and digital algorithms, being able to empower patients with the correct information and facilitate the ability to make safe, informed decisions about healthcare is a role that healthcare providers cannot afford to underestimate. The merits of screening for Breast Cancer have been challenged by cynics for decades, but the evidence supports that more lives are saved when regular screening is employed.

HOW DOES SCREENING WORK?

Breast cancer screening aims to reduce breast cancer mortality by early detection and early treatment of asymptomatic cancer. In simple terms, picking things up early (by undergoing a screening examination) and, at a smaller size, gives the best possible outcome as there is an increased likelihood of the disease being contained, i.e. less chance of spread. Better systemic treatments have also contributed to the overall improved outcomes since the introduction of breast screening.

WHO TO SCREEN?

A risk factor is defined as anything that affects an individual's chance of developing a condition. Certain major risk factors for breast cancer are beyond an individual's control (Table 1). Simply being a woman is the main risk factor for breast cancer, with breast cancer being about 100 times more likely to occur in women than in men. Ageing also inevitably increases the risk of developing breast cancer. Almost 8 out of 10 women diagnosed are over the age of 50. Breast cancer is rare in people under 30 years (Table 2). Overall, 8% of women in the so-called developed world will get a breast cancer diagnosis by age 75 years.[1,2]

HOW TO SCREEN?

Studies show that even when women have access to the latest therapies, deaths from breast cancer decline at a much higher rate in women who get mammographic screening either in an organized programme or in the form of patient-initiated opportunistic screening.

In most European countries, mammographic screening programmes include all women, with age being the only determinant. Screening is offered starting at the age of 40–50 years until the age of 64–74 years at intervals of 1–2 years (3 years in the UK). A comparison of the different screening regimens shows that starting early at a regular shorter interval results in a higher reduction in mortality and more quality-of-life years gained (Table 3).[3]

Screening mammography is a standardised procedure composed of four projections,[2] two for each breast: the cranio-caudal projection and the medio-lateral oblique projection (Figure 1).

Despite the overall survival advantages achieved with the use of mammographic screening, this "one-size-fits-all" approach is associated with several drawbacks, not least that mammography alone is not sufficient to achieve early diagnosis in the high-risk population (Table 4).[4] Mammographic screening sensitivities of up to 89% in women with mainly fatty breasts drop to 62% in the case of women with dense breasts

due to the masking effect of glandular elements (Figure 2). Considering that about 40–50% of women have dense breasts (heterogeneously and extremely dense breasts), this represents a valid issue. Supplemental assessment, in practice, at least with ultrasonography, is recommended as an adjunct for further assessment of denser breasts.

LIMITATIONS OF BREAST SCREENING

Screening mammography involves exposure of the breast tissue to ionising radiation (which is potentially carcinogenic) in a presumed, and more likely than not, healthy population.

The effective dose for a standard 2-view mammogram of each breast is 0.4mSV for digital mammography. This may be comparable to 2 months of background radiation i.e. just being on the planet, quoted at 3mSV per annum or the equivalent of under a third of the effective dose from a lumbosacral spine X-ray. The small risk of radiation-induced cancer in an organised and controlled breast screening programme is outweighed by the benefits of expected mortality reduction.[5]

Cancer may still develop between one screening round and the next, known as an interval cancer. Any symptoms which develop in the interim should not be dismissed without a workup.

A number of screening clients may undergo additional tests, such as additional mammographic views or needle sampling, and associated worry, which result in a normal or benign diagnosis. The average risk of false positive recall of clients undergoing biennial screening aged 50-69 years has been calculated at 20%.[5]

Also, some screen-detected breast cancers would have never otherwise been found and would not have become life-threatening. This phenomenon is commonly known as overdiagnosis.

Overtreatment is, however, the real issue here. In truth, there is as yet no way to identify which breast cancers are not life-threatening, and treatment is offered for all diagnosed breast cancers.

SO, WHERE DOES THIS LEAVE US?

There should be no doubt that for the majority of our patients, breast screening - starting early and at a regular short interval - is better than the alternative. Early detection, essentially by imaging (4-view direct digital mammography +/- ultrasound) in conjunction with the improved systemic therapies available, saves lives.

Table 1. Risk factors of Breast Cancer.

Non-modifiable

- Age
- Gender
- Genetics (BRCA1/2)

Modifiable

- Hormonal factors
- Lifestyle
- Alcohol
- Obesity

Table 2. Age & Risk of Breast Cancer.

Risk up to and including age 29 years	1 in 2000
Risk up to and including age 39 years	1 in 315
Risk up to and including age 49 years	1 in 50
Risk up to and including age 59 years	1 in 22
Risk up to and including age 69 years	1 in 13
LIFETIME RISK	**1 in 8**

Table 3. Comparison of Screening Protocols.

SCREENING PROGRAMME	MORTALITY REDUCTION %	LIFE YEARS GAINED PER 1000 WOMEN SCREENED	MAXIMUM LIFETIME SCREENS PER WOMAN	NUMBER NEEDED TO SCREEN PER LIFE YEAR GAINED
No Screening	0.0	0.0	0	
Triennial ages 50-69	24.6	45.9	7	11.1
Triennial ages 50-74	27.9	50.8	9	9.4
Biennial ages 50-69	32.0	60.6	10	8.4
Biennial ages 50-74	36.2	66.8	13	7.2
Annual ages 40-49	18.6	37.1	10	17.2
Annual ages 50-69	45.6	85.6	20	5.9
Annual ages 50-74	49.5	92.5	25	5.2
Annual ages 40-49, Biennial ages 50-69	38.6	94.6	20	5.9
Annual ages 40-49, Biennial ages 50-74	40.9	101.3	22	5.5
Annual ages 40-69	49.8	118.8	30	4.5
Annual ages 40-74	53.0	124.9	35	4.1

Figure 1. The Mammogram. 4 VIEWS: Right & Left Mediolateral oblique views (a,b) and Bilateral Craniocaudal views (c,d).

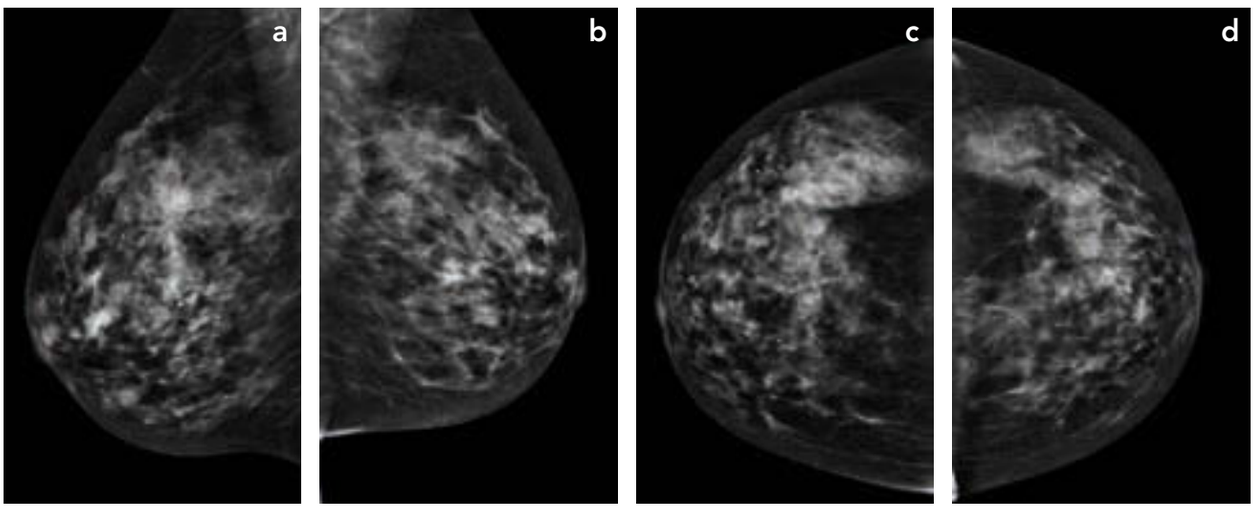
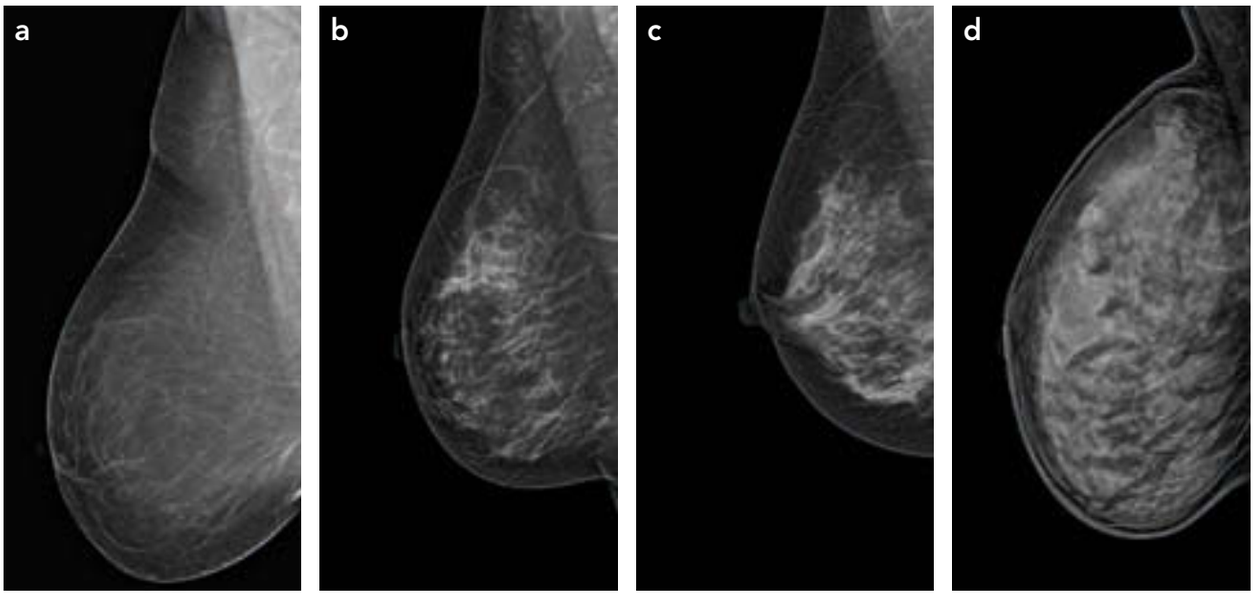


Table 4. High-Risk Breast Cancer – Breast MRI screening in these patients is recommended commencing at circa 30 years of age.

Pathogenic Variant	Lifetime risk of Breast Cancer
BRCA1	>60%
BRCA2	>60%
PALB2	40-60%
PTEN	40%
TP53	40%
CDH1	40% (Lobular breast cancer)
STK11	40%
ATM	25-30%
CHEK2	25-30%
BARD 1	20%
RAD51C	20%
RAD51D	10%

Figure 2. Breast density (proportion of fat to glandular elements in the breast) described as: a - Almost entirely fatty. b - Scattered fibroglandular tissue. c - Heterogenously dense. d - Extremely dense.



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