Breast Imaging For Cancer Prevention

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Staying Abreast For Life
A Breast Health and Cancer Prevention Seminar
Breast Cancer Screening in an Era of Personalised Regimens

- Significant in public health policy and women's health policy.

- Several factors are driving how population-based screening is approached.
  - **Advanced** imaging technologies
  - Health system **performance measures**,
  - Health care reform
  - Concern for "over-diagnosis"
  - Improved understanding of risk

- Moving away from a fixed guideline paradigm and shifting towards **personalised strategies**.
Incidence and Risk
Breast cancer has been the commonest malignancy and the leading cause of cancer death among Singaporean women for the past 30 years.

Breast cancer accounts for **23%** of female cancer

1 in **17** in Singaporeans are likely to be afflicted

More than **1300** new cases per year
Common Screening Tests

- Self breast examination
- Mammography
- Clinical breast examination
Breast self-examination:  
*Once a month*

Mammogram:  
*Repeat once every 2 years or more often as advised by the doctor.*

X-ray results:  
*You will receive your results in the form of a letter. A report will not be given.*

Further test results:

**NORMAL**  
**ABNORMAL** *(go for further tests)*

**NORMAL**  
**ABNORMAL** *(go for further tests)*
Mammography

- Reduces the rate of death from breast cancer to **23%**

- **Safety**
  - Approximately 0.4 mSv and extremely unlikely to cause cancer (CXR is 0.1mSv).
  - Annual mammograms in women aged 40 to 80 years
    - May cause up to one breast cancer per 1,000 women.
A mammogram is an X-ray of the breast that takes pictures of the fat, fibrous tissues, ducts, lobes, and blood vessels.
Mammogram

When should a mammogram be performed?

- Presence of a lump during self-examination or by a physician
- Younger women who have a strong history of breast cancer in their family
- All women over 40
- Women who have had previous diagnosis of breast cancer
Breast Ultrasound

- **Areas of interest detected by mammogram or clinical examination**
  - A mass seen on a mammogram
  - A palpable lump

- **Helpful in these circumstances**
  - Characterising the area of concern
  - Guiding a biopsy (tissue sample) of the area.

- **Ultrasound screening**
  - Women with dense breast tissue who may be at higher risk of developing breast cancer
Ultrasound

Studies of women with hereditary risk:
- 2 of 83 cancers were detected solely by annual ultrasonography.
- 2 additional non-palpable cancers were detected by ultrasounds performed at 6-month intervals

Accessible mammography
- Remains the **best screening option** for all women.
Breast Ultrasound

- **2008: ACRIN 666 trial**
  - Looked at combined screening with US and MG, compared to mammography alone, in women at ‘high risk’ of breast cancer who also had dense breast.

- **Additional cancers detected** from US, in addition to MG
  - Additional 4.2 cancers per 1000 women screened.

- Had an increased number of **false positive examinations**.
  - < 10% of the biopsies prompted by the ultrasound examination showing cancer.
**MRI vs Ultrasound**

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<th>MRI</th>
<th>Ultrasound</th>
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<td><strong>Women at high risks for breast cancer</strong> (genetic mutations)</td>
<td>Little evidence to support the use of US for screening asymptomatic women.</td>
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<td>Currently, US role in breast cancer detection is primarily to evaluate breast abnormalities identified through clinical breast exam or MG, and to guide biopsies.</td>
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Screening US is *more sensitive but less specific* than MG as a screening.

US identifies *more* lesions which can result in a higher rate of biopsies.

Recall for a biopsy
- Repeat visits for additional tests.
- Needle biopsy – safe procedure, but can be stressful and painful

BSS aims to maximise benefits and minimise harms in the screening environment.
- A test with a high number of false positive outcomes is not well suited to the screening environment.

Additionally, some cancers may be missed with US
- Ultrasound does not usually show the micro-calcifications which are commonly associated with DCIS
Breast Self Examination

- Performed once a month
- After 7 – 10 days of menses
Breast Self Examination

5 simple steps

1. Begin by standing in front of a mirror with arms on hips (look for size, shape, color, nipple)

2. Raise arms, and look for same changes.

3. Look for nipple discharge.

4. Lie down.

5. Use right hand on left breast and left hand on right breast.
Breast Self Examination

- Large population studies in Russia and Shanghai have shown that as a stand alone – does not show to have affected on:
  - breast cancer mortality rate
  - the number of diagnosed benign breast lesions.
May identify 4.5% to 10.7% of cancers that are mammography occult
Clinical proficiency affects' effectiveness
Variable recommendation widely. American Cancer Society recommends the exam every 3 years for average-risk women in their 20s and 30s and every year for women aged 40 and older.

U.S. Preventive Services Task Force (USPSTF) says the evidence for or against routine clinical breast exams is too insufficient to make any recommendation.
Diagnosis

- Percutaneous biopsy
  - Has largely replaced surgical biopsy as the initial procedure of choice for diagnosing breast cancer.
  - Less invasive than surgical biopsy
  - Shown to often reduce the need for further surgical procedures.

- Even when screening has revealed an obvious cancer, a biopsy may still be done to improve planning for the patient’s treatment.
25 year follow-up of 89,835 women, aged 40-59, randomly assigned to mammography or control

CONCLUSION: Annual mammography in women aged 40-59 does not reduce mortality from breast cancer beyond that of physical examination or usual care when adjuvant therapy for breast cancer is freely available.
“(in) a meta-analysis of 11 randomised trials, the relative risk of breast cancer mortality for women invited to screening compared with controls was 0·80 (95% CI 0·73-0·89), which is a relative risk reduction of 20%
The effectiveness of mammographic screening
  ◦ A subject of *ongoing* research and debate

The prevalence of breast cancer in Singapore and Asia is increasing rapidly, although still lagging western countries.
Screening is offered at
- Raffles Hospital
- Health Screening Centres – Marina Bay Financial Centre and Shaw Centre

Additional assessments
- Additional views
- Ultrasound plus biopsy
Thank you.