Screening for breast cancer

- 1973 HIP (Health Insurance Plan) study prove the reduction of the mortality in women screened with mammography
- Breast Cancer Detection Demonstration Project prove a significant reduction of mortality in different age groups
  - 40-49 years, 50-59 years, 60-69 years


Mammography

- Reliable
- Reproducible
- Rapid
- Reasonable price

Mammography, US, MRI

<table>
<thead>
<tr>
<th></th>
<th>Sensibility</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammo</td>
<td>55 - 89</td>
<td>70 - 77</td>
<td>53 – 94</td>
<td>47 – 81</td>
</tr>
<tr>
<td>US</td>
<td>65 - 71</td>
<td>80 - 98</td>
<td>90</td>
<td>72</td>
</tr>
<tr>
<td>MRI</td>
<td>89 - 99</td>
<td>37 – 96</td>
<td>61 - 95</td>
<td>80 - 100</td>
</tr>
</tbody>
</table>


Breast Ultrasound

- Depends on the operator's level of skill and experience
- Sensitivity depends on breast type
- Trained personal
- Requires time
- Low reproducibility

Schlossbauer T, Hellerhoff K, Roiser M. [Value of breast MRI as supplement to mammography and sonography for high risk breast cancer patients]. Radiologe 2008; 48:351-357.

Indications to Breast Ultrasound

- Initial assessment of a lump in women ≤ 30 years old
- Identification and additional characterization of palpables and non-palpables anomalies
- Guiding of interventions
- Evaluation of problems associated to breast implants
- Not appropriate for screening

ACR Standards for the Performance of Breast Ultrasound Examination. ACR Standards. 2000
Importance of breast density

- Breast density strongly associated with reduced mammographic sensitivity
  - Overall 72%
  - Fatty breast 80%
  - Extremely dense 30%
- Dense breast sixfold greater risk of interval cancer
- 1.2-2.2 increased risk


Hand-held Ultrasound

- At least heterogeneously dense breast
- Women at elevated risk
- Adding screening sonography to mammography yield an additional of 1.1 to 7.2 cancers for 1000 high-risk women
- Substantial increase of false positive rate
- PPV of biopsy falls from 22.6 to 8.9%


Whole-Breast Ultrasound

- Automated sweeping of the probe
- 3D image of the compressed breast
- Reduction of operator dependence
- Supplemental screening
- High false positive rate
- PPV 6-7%


Breast Ultrasound and Screening

- Supplemental screening
  - High risk: MRI
  - Intermediate risk: US as option
  - Average or low risk and dense breast: not recommended
- No replacement of screening mammography
- No additional value of US in women who undergo mammography and MRI


Thank you for your attention