Screening Mammography

• Module 4: Agreement over screening
  – Screening Mammography reduces breast cancer mortality

• Module 5: Controversies in screening
  – When to start?
  – When to end?
  – How often?

• Module 6: Negative consequences of screening
Module 6

Negative consequences of screening

• Intended Learning Outcomes
  – Identify concerns of women regarding mammogram recommendations
  – Use your understanding of the data and consensus opinions to support screening recommendations
  – Reassure patients regarding mammogram radiation and other concerns
Negative consequences of screening

- Recalls/extra views
- False Positive: Biopsy
- ‘Over diagnosis’
- Radiation
- Anxiety/Discomfort
Negative consequences of screening

- Recall from screening
  - Additional mammogram views or ultrasound
  - Benchmark: <10%
  - Slightly higher for baseline studies
  - Decreases with more frequent screening

Negative consequences of screening

- False positive mammogram results:
  - Biopsy performed/ benign diagnosis
  - PPV Benchmark: 25–40%

- Analysis of USPSTF 2009 data
  - FP biopsy
    - 4.3–6.7/1000 screens/year
    - Once in 149 –233 years for screening in 40s–70s

Hendrick RE et al USPSTF Screening mammography recommendations: science ignored AJR 2011;196(2)112–116
Overdiagnosis

• Detection of a breast cancer at screening that would not have been identified clinically in a woman’s lifetime

• Controversial issue, 0–31%
  – Overdiagnosis vs overtreatment

• Assumes prospective ability to discriminate ‘good’ from ‘bad’ cancers on imaging

UK Review Overdiagnosis RCT: 10.7%
Cancers (inv + DCIS) diagnosed over whole follow up period among women invited to screening

Overdiagnosis observational studies

- European population-based screening programs
- 13 primary studies of overdiagnosis in seven European countries
  Netherlands, Italy, Norway, Sweden, Denmark, Spain, and UK

Overdiagnosis - observational studies 0-10%

- Overdiagnosis Estimates Based on Adjustment for Breast Cancer Risk and Lead-time

Radiation

- Radiation
  - Screening exam – ~ 0.4 mSv
  - Background in US 3–4 mSv/year
  - Equivalent to 1–2 months of ambient exposure
  - No direct evidence of increased incidence related to low dose radiation in women over 40
American Association of Physicians in Medicine Policy Statement: 2011

• “Risks of medical imaging at effective doses below 50 mSv for single procedures or 100 mSv for multiple procedures over short time periods are too low to be detectable and may be nonexistent.

• Predictions of hypothetical cancer incidence and deaths in patient populations exposed to such low doses are highly speculative and should be discouraged. These predictions are harmful because they lead to sensationalistic articles in the public media that cause some patients and parents to refuse medical imaging procedures, placing them at substantial risk by not receiving the clinical benefits of the prescribed procedures.”
Anxiety and False Positive Screening Mammograms

– JAMA– DMIST sub-study  
  • (Phone survey Time 0 and 1 year)

– Screening recalls  
  • Increased short term anxiety  
  • No increase in long term anxiety  
  • Increased a woman’s future intention to be screened

Harms of not screening

Harms of omission

• Under diagnosis/Death
• Increased morbidity
• FP – physical exam/palpation guided biopsy
• Costs: financial and human
• Lack of identification and treatment of pre invasive breast cancer
Michigan Cancer Consortium
Screening Guidelines for Early Detection of Breast Cancer
May 2014

The Michigan Cancer Consortium supports the breast cancer screening guidelines for women at average and increased risk as recommended by the American Cancer Society (2014)\(^1\) and the National Comprehensive Cancer Network (NCCN) Clinical Practice Guidelines in Oncology for Breast Cancer Screening and Diagnosis (V2.2013)\(^2\).

I. Recommendations for Breast Cancer Screening

<table>
<thead>
<tr>
<th>Screening Exam</th>
<th>Interval</th>
<th>Age to Begin</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast Awareness/</td>
<td>Optional</td>
<td>Mid-20’s</td>
<td>See NOTE*</td>
</tr>
<tr>
<td>Breast Self Exam(^1,2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical Breast Exam</td>
<td>Every three (3)</td>
<td>Age 25-39</td>
<td>CBE should be part of</td>
</tr>
<tr>
<td>(CBE)(^1,2)</td>
<td>years</td>
<td></td>
<td>a periodic health</td>
</tr>
<tr>
<td></td>
<td>Annually</td>
<td>Age 40</td>
<td>exam</td>
</tr>
<tr>
<td>Mammography(^1,4,5)</td>
<td>Annually</td>
<td>Age 40</td>
<td>Yearly exams</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>should continue for</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>as long as a woman</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>is in good health.</td>
</tr>
</tbody>
</table>

* NOTE: Breast Awareness/Breast Self Exam

- Breast self exam (BSE) is an option for women starting in their 20s. Women should be informed about the benefits and limitations of BSE.\(^1\)
- Women should be familiar with their breasts and promptly report changes to their healthcare provider. Periodic, consistent BSE may facilitate breast self awareness. Pre-menopausal women may find BSE most informative when performed at the end of menses.\(^2\)
### Screening for Patients at High Risk

#### II. Recommendations for Breast Cancer Screening

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Screening Exam</th>
<th>Interval</th>
<th>Age to Begin</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Known Genetic predisposition (e.g., BRCA) or pedigree suggestive of predisposition including Hereditary Breast and Ovarian Cancer Syndrome and untested 1&lt;sup&gt;st&lt;/sup&gt; degree relative of BRCA case.</strong></td>
<td>CBE</td>
<td>6-12 months</td>
<td>Age 25</td>
<td>* See Note Breast Self-Awareness Consider Risk Reduction Strategies (See NCCN Breast Cancer Risk Reduction Guidelines)</td>
</tr>
<tr>
<td></td>
<td>Mammogram</td>
<td>Annual</td>
<td>≥ age 30 (Controversial between age 25 and 30)</td>
<td>Referral to genetic counselor</td>
</tr>
<tr>
<td></td>
<td>MRI</td>
<td>Annual</td>
<td>Age 25</td>
<td></td>
</tr>
<tr>
<td>**High Breast Cancer Risk (&gt;20% lifetime risk)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Per models largely based on family history</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBE</td>
<td>6-12 months</td>
<td>Age Risk is Identified</td>
<td>* See Note Breast Self-Awareness Consider referral to genetic counselor Consider Risk Reduction Strategies (See NCCN Breast Cancer Risk Reduction Guidelines)</td>
</tr>
<tr>
<td></td>
<td>Mammogram</td>
<td>Annual</td>
<td>Age ≥ 30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MRI</td>
<td>Annual</td>
<td>Age ≥ 30</td>
<td></td>
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<tr>
<td><strong>Prior thoracic radiation therapy between ages of 10-30</strong></td>
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<tr>
<td></td>
<td>CBE</td>
<td>6-12 months</td>
<td>Begin 8-10 years after Radiation Therapy or age 40, whichever occurs first</td>
<td>* See Note Breast Self-Awareness</td>
</tr>
<tr>
<td></td>
<td>Mammogram</td>
<td>Annual</td>
<td>As above, no earlier than age 25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MRI</td>
<td>Annual</td>
<td>As above, no earlier than age 25</td>
<td></td>
</tr>
<tr>
<td><strong>Personal History of Breast Cancer</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBE</td>
<td>6-12 months</td>
<td>Post Diagnosis</td>
<td>* See Note Breast Self-Awareness See NCCN Breast Cancer Guidelines-Surveillance Section</td>
</tr>
<tr>
<td></td>
<td>Mammogram</td>
<td>Annual</td>
<td></td>
<td></td>
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<tr>
<td><strong>Moderate Breast Cancer Risk (15% - 20% lifetime risk)</strong></td>
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</tr>
<tr>
<td></td>
<td>CBE</td>
<td>6-12 months</td>
<td>Age risk is identified</td>
<td>* See Note Breast Self-Awareness</td>
</tr>
<tr>
<td></td>
<td>Mammogram</td>
<td>Annual</td>
<td></td>
<td></td>
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<tr>
<td><strong>Personal history of atypical hyperplasia or Lobular Carcinoma In Situ (LCIS)</strong></td>
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<tr>
<td></td>
<td>CBE</td>
<td>6-12 months</td>
<td>Post diagnosis</td>
<td>* See Note Breast Self-Awareness Consider Risk Reduction Strategies (See NCCN Breast Cancer Risk Reduction Guidelines)</td>
</tr>
<tr>
<td></td>
<td>Mammogram</td>
<td>Annual</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Women &gt;= 35 with 5-year risk of invasive breast cancer &gt;= 1.7%</strong></td>
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</tr>
<tr>
<td></td>
<td>CBE</td>
<td>6-12 months</td>
<td>≥35</td>
<td>* See Note Breast Self-Awareness Consider Risk Reduction Strategies (See NCCN Breast Cancer Risk Reduction Guidelines)</td>
</tr>
<tr>
<td></td>
<td>Mammogram</td>
<td>Annual</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
RCT, observational studies and computer models show mortality reduction with screening beginning at 40.

Largest benefit comes from annual screening beginning at 40.

Controversies regarding age to start, age to end and frequency remain subjective judgments on the relative value of benefits and harms.
References

1. ACS 2014, SEER 2015
17. NCCN Breast Cancer Screening and Diagnosis Version 1.2014
20. Hendrick RE et al USPSTF Screening mammography recommendations: science ignored AJR 2011;196(2)112–116