Learning Objectives

- Describe the symptoms and physical examination findings of benign or malignant conditions of the breast
- Discuss initial management options for benign and malignant conditions of the breast
- Assess risk for breast malignancy, gynecologic malignancies
- Explain prevention guidelines including screening procedures for breast disease

Prerequisites:
- FLAME LECTURE 7 – The basic OB/GYN Exam - Breast

See also – for closely related topics
- FLAME LECTURE 184 – Evaluation of Breast Mass
- FLAME LECTURE 185 – Evaluation of Nipple Discharge
- FLAME LECTURE 186 – Evaluation of Mastalgia
Epidemiology

- Lifetime risk of breast cancer is 12% (1 in 8) women
  - Highest incidence (27%) of any cancers in women
  - Second highest mortality cancer in women
- Screening has decreased mortality by 19-30%\(^2\) since 1990
- Tumors detected at early stage (small unilateral) are more likely to be successfully treated
  - 98% 5 year survival rate in localized disease
  - 89% of those <1cm cured with primary surgery alone\(^2\)

<table>
<thead>
<tr>
<th>Incidence</th>
<th>1. Breast</th>
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<td>2. Lung</td>
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<td>3. Colon/rectum</td>
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<tr>
<th>Mortality</th>
<th>1. Lung</th>
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TYPES OF CANCER

Infiltrating Ductal Carcinoma
- Malignancy of the breast ducts
- Ductal hyperplasia → Atypical ductal hyperplasia & DCIS (Ductal Carcinoma In Situ) may predispose
- Most often diagnosed by a cluster of microcalcifications on mammogram
- Most common invasive breast cancer

Lobular Carcinoma
- Malignancy of the breast acini
- Lobular hyperplasia → Atypical lobular hyperplasia → lobular carcinoma
- LCIS (Lobular Carcinoma In Situ) is NOT considered a predisposing lesion, but present in two thirds of the cases
- Often bilateral and multifocal
- Not associated with any specific mammogram/palpable features- incidental diagnosis
TYPES OF CANCER

- Paget Disease of the Nipple
  - Malignancy of nipple epidermis
  - Presents with ulceration, crusting, itching, and irritation of nipple

- Inflammatory Breast Carcinoma
  - Infiltrates dermal lymphatics and causes edema
  - Peau d’orange, erythema, warmth that resembles mastitis but does not respond to antibiotics
  - Often aggressive with a poor prognosis
Common Risk Factors

**High risk:**
- Age (>65 yrs)
- BRCA1/BRCA2
- ≥ 2 1st degree relatives w/ Breast CA at an early age
- High breast tissue density
- Biopsy-confirmed atypical hyperplasia
- Combined HRT use

**Medium risk:**
- One 1st degree relative with breast cancer at an early age
- High dose radiation to the chest

**Low risk:**
- Nulliparity
- 1st pregnancy >30 yo
- Menarche <12 yo
- Menopause >55 yo
- No breastfeeding
- Obesity

**Risk Calculators:**
- Modified Gail/NSBP
Screening Tools

- Self Breast Awareness & Self Breast Exams
- Clinical Breast Exam
  - CBE alone if >40 yo has cancer detection rate of 59\%^3
- Mammogram
  - Screening vs. diagnostic
  - Cancer detection rate: Digital 59\% vs. Films 38\%^4

- Breast Ultrasound
  - Good for:
    - Younger patients <30 yo / Dense breast tissue / Pregnant patients
    - Cysts vs. solid masses
    - Inconclusive mammogram findings
  - NOT recommend for screening average risk patients
- MRI for high risk patients
## Screening Guidelines

<table>
<thead>
<tr>
<th></th>
<th>Mammography</th>
<th>Clinical Breast Exam</th>
<th>Breast Self-Exam Instruction</th>
<th>Breast Self-Awareness</th>
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</thead>
<tbody>
<tr>
<td><strong>ACOG</strong></td>
<td>Age 40 yrs &amp; older annually</td>
<td>Age 20-39 every 1-3yrs</td>
<td>Consider for high-risk patients</td>
<td>Recommended</td>
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<td>Age 40 yrs &amp; older annually</td>
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<tr>
<td><strong>American Cancer Society</strong></td>
<td>Age 40 yrs &amp; older annually</td>
<td>Age 20-39 yrs every 1-3yrs</td>
<td>Optional for 20 yrs &amp; older</td>
<td>Recommended</td>
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<td>Age 40 yrs &amp; older annually</td>
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<td><strong>National Comprehensive Cancer Network</strong></td>
<td>Age 40 yrs &amp; older annually</td>
<td>Age 20-39 yrs every 1-3yrs</td>
<td>Recommended</td>
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<tr>
<td><strong>National Cancer Institute</strong></td>
<td>Age 40 yrs &amp; older every 1-2 yrs</td>
<td>Recommended</td>
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<td>Not recommended</td>
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<tr>
<td><strong>U.S. Preventive Services Taskforce</strong></td>
<td>Age 50-74 yrs biennially</td>
<td>Insufficient evidence</td>
<td>Not recommended</td>
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BIRADS Assessment System

Numerical interpretation of imaging results (mammo, US, MRI)

- **BIRADS 0** – Incomplete exam
  - Not enough information from views available; Repeat imaging is required

- **BIRADS 1** – Negative

- **BIRADS 2** – Benign Findings
  - Routine follow up

- **BIRADS 3** – Probably Benign
  - Likelihood of malignancy <2%
  - Followed at shorter intervals for stability
    - usually q6m x 1-2 years unless category is changed to more definitive finding

- **BIRADS 4** – Suspicious
  - Likelihood of malignancy 2-94%
    - 4A (2-9%)
    - 4B (10-49%)
    - 4C (50-94%)

- **BIRADS 5** – Highly Suggestive
  - Classic malignancy with 95-100% likelihood

- **BIRADS 6** – Biopsy Proven Malignancy
Screening High Risk Populations

- Personal history of predisposing lesions
  - Atypical hyperplasia, carcinoma in situ, high density breast tissue
- Personal history of ovarian or endometrial cancer
- Personal history of breast cancer in remission >5yrs
- Personal history of chest radiation at 10-30 years of age
- BRCA 1 or 2 carriers
- Untested family members of BRCA carriers
- Other genetic syndromes:
  - Li Fraumeni, Cowden syndrome
- First degree relatives with early breast cancer
- Male relatives with breast cancer

WHO??
- Begins at 25 yo or 10 yrs earlier than family members age at diagnosis

HOW??
1. Self Exam Teaching
2. CBE q6months
3. Annual Mammograms (+/- Ultrasound)
4. Consider annual MRIs
5. Discuss Risk Reducing Strategies
Breast Cancer Management

Surgery
Neoadjuvant chemotherapy
Radiation therapy
Adjuvant chemotherapy

Evaluation for metastasis:
Liver, Lung, Bone, Brain
Surgical Options

- **Lumpectomy** (breast conserving therapy [BCT])
  - If early stage, may be curative
  - Though, may require adjunctive radiation therapy
- **Contraindicated in:**
  - Multi-centric disease with tumors in multiple quadrants
  - History of previous BCT with radiation therapy
  - Multiple positive margins after attempted at re-excision

- **Mastectomy**
  - **Radical mastectomy**
    - Removal of breast, skin, and pectoralis muscles + axillary LND
  - **Modified radical mastectomy**
    - Removal of breast and fascia of pectoralis without removing muscles + ALND
  - **Simple mastectomy**
    - Removal of breast without removing pectoralis muscles or axillary nodes (SLNB only)
Lymph node sampling

- **Sentinel Lymph Node Biopsy (SLNB)**
  - Radioisotope injected subdermally and taken up by breast lymphatics
    - Gamma probe used to detect lymph node(s) that take up isotope as sentinel lymph node; the first node(s) to pick it up are the sentinel nodes and are removed
  - Dye can also be injected at the site of concern as well

- **Axillary Lymph Node Dissection**
  - Removes all axillary lymph nodes
  - Indications:
    - positive SLNB
    - Clinically positive lymph nodes
    - Inflammatory carcinoma
Non-surgical Options

- Radiation therapy
  - Combined with breast conserving therapy or simple mastectomy for lesions with high risk of recurrence

- Chemotherapy
  - Neoadjuvant (before surgery): if tumor very large, it can reduce the size of the tumor and improve surgical outcomes
  - Adjuvant (after surgery): as with radiation, can be considered after surgery to reduce recurrence & mortality
Non-surgical Options – Hormonal Therapy

- **Tamoxifen** (*Soltamox*): estrogen receptor antagonist in breast
  - Useful in women with estrogen-sensitive cancer
  - Adverse effects: ER agonist in endometrium, ↑ risk for endometrial CA
    - Also an ER agonist in bone which can lead to beneficial side effects of preventing osteoporosis

- **Anastrozole** (*Arimidex*): aromatase inhibitor (which prevents androgen conversion to estrogen)
  - Used in postmenopausal women when most estrogen comes from conversion from androgens in peripheral tissues
  - Adverse effects: bone weakness

- **Trastuzumab**: monoclonal antibody against HER-2/neu receptor
IMPORTANT LINKS / REFERENCES

- ACOG Practice Bulletin 122 – Breast Cancer Screening
- UpToDate.com
- National Breast and Cervical Cancer Early Detection Program
- Oslo II Study