Overview

Breast cancer is cancer that starts in the tissues of the breast. There are two main types of breast cancer:

- Ductal carcinoma starts in the tubes (ducts) that move milk from the breast to the nipple. Most breast cancers are of this type.
- Lobular carcinoma starts in the parts of the breast, called lobules, which produce milk.

In rare cases, breast cancer can start in other areas of the breast.

Source: SEER Training Modules


Source: SEER Training Modules

Breast Cancer Ranks Second as a cause of cancer death in women (after lung cancer)

U.S. 2013 New Cases = 296,980
- 234,580 invasive cancers
- 2,240 men
- 64,640 in-situ cancers
- 85% DCIS
- 15% LCIS

U.S. 2013 Deaths = 40,030
- 410 men

Florida New Cases = 19,911
- 15,710 invasive cancers
- 161 men
- 4,201 in-situ cancers

Florida Deaths = 2,660
- 27 men

Source: ACS 2013 Cancer Facts & Figures

Source: ACS 2013 Cancer Facts & Figures

Cancer Facts & Figures 2013

U.S. 2013 New Cases = 296,980
- 64,640 in situ cancers
- 85% DCIS
- 15% LCIS

U.S. 2013 Deaths = 40,030
- 410 men

Florida New Cases = 19,911
- 4,201 in situ cancers

Florida Deaths = 2,660
- 27 men

Source: ACS 2013 Cancer Facts & Figures

Overview

Breast cancer is cancer that starts in the tissues of the breast. There are two main types of breast cancer:

- Ductal carcinoma starts in the tubes (ducts) that move milk from the breast to the nipple. Most breast cancers are of this type.
- Lobular carcinoma starts in the parts of the breast, called lobules, which produce milk.

In rare cases, breast cancer can start in other areas of the breast.

Source: SEER Training Modules


Source: SEER Training Modules

Breast Cancer Ranks Second as a cause of cancer death in women (after lung cancer)

U.S. 2013 New Cases = 296,980
- 234,580 invasive cancers
- 2,240 men
- 64,640 in-situ cancers
- 85% DCIS
- 15% LCIS

U.S. 2013 Deaths = 40,030
- 410 men

Florida New Cases = 19,911
- 15,710 invasive cancers
- 161 men
- 4,201 in-situ cancers

Florida Deaths = 2,660
- 27 men

Source: ACS 2013 Cancer Facts & Figures

Overview

Breast cancer is cancer that starts in the tissues of the breast. There are two main types of breast cancer:

- Ductal carcinoma starts in the tubes (ducts) that move milk from the breast to the nipple. Most breast cancers are of this type.
- Lobular carcinoma starts in the parts of the breast, called lobules, which produce milk.

In rare cases, breast cancer can start in other areas of the breast.

Source: SEER Training Modules


Source: SEER Training Modules

Breast Cancer Ranks Second as a cause of cancer death in women (after lung cancer)

U.S. 2013 New Cases = 296,980
- 234,580 invasive cancers
- 2,240 men
- 64,640 in-situ cancers
- 85% DCIS
- 15% LCIS

U.S. 2013 Deaths = 40,030
- 410 men

Florida New Cases = 19,911
- 15,710 invasive cancers
- 161 men
- 4,201 in-situ cancers

Florida Deaths = 2,660
- 27 men

Source: ACS 2013 Cancer Facts & Figures

Overview

Breast cancer is cancer that starts in the tissues of the breast. There are two main types of breast cancer:

- Ductal carcinoma starts in the tubes (ducts) that move milk from the breast to the nipple. Most breast cancers are of this type.
- Lobular carcinoma starts in the parts of the breast, called lobules, which produce milk.

In rare cases, breast cancer can start in other areas of the breast.

Source: SEER Training Modules


Source: SEER Training Modules

Breast Cancer Ranks Second as a cause of cancer death in women (after lung cancer)

U.S. 2013 New Cases = 296,980
- 234,580 invasive cancers
- 2,240 men
- 64,640 in-situ cancers
- 85% DCIS
- 15% LCIS

U.S. 2013 Deaths = 40,030
- 410 men

Florida New Cases = 19,911
- 15,710 invasive cancers
- 161 men
- 4,201 in-situ cancers

Florida Deaths = 2,660
- 27 men

Source: ACS 2013 Cancer Facts & Figures

Overview

Breast cancer is cancer that starts in the tissues of the breast. There are two main types of breast cancer:

- Ductal carcinoma starts in the tubes (ducts) that move milk from the breast to the nipple. Most breast cancers are of this type.
- Lobular carcinoma starts in the parts of the breast, called lobules, which produce milk.

In rare cases, breast cancer can start in other areas of the breast.

Source: SEER Training Modules


Source: SEER Training Modules

Breast Cancer Ranks Second as a cause of cancer death in women (after lung cancer)

U.S. 2013 New Cases = 296,980
- 234,580 invasive cancers
- 2,240 men
- 64,640 in-situ cancers
- 85% DCIS
- 15% LCIS

U.S. 2013 Deaths = 40,030
- 410 men

Florida New Cases = 19,911
- 15,710 invasive cancers
- 161 men
- 4,201 in-situ cancers

Florida Deaths = 2,660
- 27 men

Source: ACS 2013 Cancer Facts & Figures

Overview

Breast cancer is cancer that starts in the tissues of the breast. There are two main types of breast cancer:

- Ductal carcinoma starts in the tubes (ducts) that move milk from the breast to the nipple. Most breast cancers are of this type.
- Lobular carcinoma starts in the parts of the breast, called lobules, which produce milk.

In rare cases, breast cancer can start in other areas of the breast.

Source: SEER Training Modules


Source: SEER Training Modules

Breast Cancer Ranks Second as a cause of cancer death in women (after lung cancer)

U.S. 2013 New Cases = 296,980
- 234,580 invasive cancers
- 2,240 men
- 64,640 in-situ cancers
- 85% DCIS
- 15% LCIS

U.S. 2013 Deaths = 40,030
- 410 men

Florida New Cases = 19,911
- 15,710 invasive cancers
- 161 men
- 4,201 in-situ cancers

Florida Deaths = 2,660
- 27 men

Source: ACS 2013 Cancer Facts & Figures

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate Per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>50</td>
</tr>
<tr>
<td>1980</td>
<td>60</td>
</tr>
<tr>
<td>2000</td>
<td>100</td>
</tr>
</tbody>
</table>

Risk Factors

- Gender
- Family Hx
- Personal Hx
- Birth Control
- Increasing Age
- Race/Ethnicity
- Age of Menarche
- Age of Menopause
- Physical Inactivity
- Overweight/Obesity
- Alcohol Consumption
- Certain Breast Conditions
- Hormone Replacement Therapy

[Source: http://beyondbrac.med.nyu.edu]

Cancer Death Rates* Among Women, US, 1930-2009

<table>
<thead>
<tr>
<th>Year</th>
<th>Rate Per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1930</td>
<td>20</td>
</tr>
<tr>
<td>1940</td>
<td>30</td>
</tr>
<tr>
<td>2000</td>
<td>100</td>
</tr>
</tbody>
</table>

Genetic Difference in Breast Tissue Among Races

- BRCA1
- BRCA2
- ATM
- P53 or TP53
- CHEK2
- PTEN
- CDH1
- STK11

Signs and Symptoms

- There are no usual symptoms for small tumors which are often treatable at an early stage.
- Larger tumors may become evident as palpable breast masses.
- Less common symptoms include persistent changes to the breast such as: thickening, swelling, distortion, tenderness, skin irritation, redness, scaliness, and nipple abnormalities.

Signs and Symptoms

- Hardening
- Indentation
- Skin erosion
- Redness or heat
- New fluid
- Dimpling
- Bump
- Growing vein
- Nipple retraction
- Asymmetry
- 'Orange peel' skin
- Inside lump (a lump you can feel, but cannot see)

Screening for Breast Cancer

- Breast Self Exam
- Clinical Breast Exam
- Mammography (digital or standard radiography)
- Magnetic Resonance Imaging
- Breast Ultrasound
- Thermography
- Tissue Sampling
- Cancer Screening Trials
ACS Screening Recommendations

- Breast self-exam is an option for women starting in their 20s. Women should report any breast changes to their health professional right away.
- Women in their 20s and 30s should have a clinical breast exam by a qualified health professional every year.
- Women age 40 and older should have a screening mammogram every year and should continue to do so for as long as they are in good health.
- Women at high risk for breast cancer based on certain factors should get an MRI and a mammogram every year.
- The American Cancer Society recommends against MRI screening for women whose lifetime risk of breast cancer is less than 15%.
- The American Cancer Society states there is not enough evidence to make a recommendation for or against yearly MRI screening for women who have a moderately increased risk of breast cancer (lifetime risk 15% - 20%).

Breast Self Exam and Clinical Breast Exam

Screening versus Diagnostic Procedure

- Screening – looking for cancer before a person has any symptoms to find cancer at early/treatable stage
- Risks of Screening – False Negative, False Positive, Radiation Exposure, Anxiety, Pain, Discomfort
- Early Treatment may not impact survival/mortality
- Diagnostic – patient has already had one or more screening procedure(s) and is now being seen to establish a diagnosis using FNA, tissue biopsy, excision

Mammography

- Calcifications
  - Microcalcifications
  - Macrocalcifications
- Mass – can be with or without calcifications
  - Cyst(s) – follow with ultrasound
  - Simple Cyst – fluid filled – no biopsy
  - Complex Cyst – partially solid cyst – biopsy
  - Non-Cancerous Solid Tumors (fibroadenoma) - biopsy
  - Cancerous Solid Tumor – biopsy/resection
- Assessment of Mass/Tumor
  - Size
  - Shape
  - Margins (edges)
  - Watchful Waiting
- Computer Aided or Computer Assisted Diagnosis (CAD)

Breast MRI

- Normal mammogram
- Benign cyst (not cancer)
- Cancer

Source: www.pl999.net/images
Source: www.cancer.gov
Source: www.boobisaweekendword.com
Source: www.jekotbreastimaging.com
Understanding the Results of Breast Imaging

- Breast Imaging Reporting and Database System
  - BI-RADS® is a quality assurance guide designed to standardize breast imaging reporting and facilitate outcome monitoring.
  - BI-RADS® serves as a comprehensive guide providing standardized breast imaging terminology, report organization and assessment structure by category
  - BI-RADS® serves as a classification system for mammography, ultrasound, and magnetic resonance imaging (MRI) of the breast.

Source: American College of Radiology (ACR)

Other Imaging

- Scintimammography
  
Source: efl.lbl.gov/instrumentation

- Thermography
  
Source: www.swfhealthandwellness.com

Anatomy of the Breast

Source: SEER Training Modules

Scintimammography

Thermography

Anatomy of the Breast

- Clock® Positions, Quadrants and ICD-O Codes of the Breast

Source: SEER Training Modules
ICD-O-3 Term

C50.0 Nipple Paget disease without underlying tumor
C50.1 Central portion of breast (subareolar) area extending 1 cm around areolar complex
Retroareolar
Infraareolar
Next to areola, NOS
Paget disease with underlying tumor
Lower central

C50.2 Upper-inner quadrant of breast (UIQ)
Upper-inner quadrant (UIQ) of breast
Superior medial
Lower medial

C50.3 Lower-inner quadrant (LIQ) of breast
Inferior medial
Lower medial

C50.4 Upper-outer quadrant (UOQ) of breast
Superior lateral
Upper lateral

C50.5 Lower-outer quadrant (LOQ) of breast
Inferior lateral
Inferior outer
Lower lateral

C50.6 Axillary tail of breast
Tail of breast
Tail of Spence

C50.7 Overlapping lesion of breast
Inferior breast, NOS
Inner breast, NOS
Lateral breast, NOS
Lower breast, NOS
Medial breast, NOS
Medial breast, NOS
Upper breast, NOS
Inferior medial
3:00, 6:00, 9:00, 12:00 o'clock

C50.8 Breast, NOS
Entire breast
Multiple tumors in different subsites within breast
Inflammatory without palpable mass
¾ or more of breast involved with tumor
Diffuse (tumor size 998)

Lymphatics of the Breast

A blue dye in lumpectomy site
B axillary lymph nodes: levels I
C axillary lymph nodes: levels II
D axillary lymph nodes: levels III
E large lymphatic channels
F small lymphatic channels
G sentinel lymph nodes taking up dye

Source: oncolink.org/resources

Metastatic Sites

- Chest wall
  - Ribs
  - Intercostal muscles
  - Serratus anterior muscle
  - Pectoral muscle does not constitute chest wall invasion
- Lymph nodes
  - Cervical lymph nodes or contralateral internal mammary or contralateral axillary lymph nodes
- Distant Metasis
  - Bone
  - Lung
  - Brain
  - Liver
- Disseminated tumor cells (DTCs) – Bone Marrow
- Circulating tumor cells (CTCs) – Blood Stream

MPH Rules
Terms and Definitions

2014-2015 Updates
New MPH Database
Text Only Rules
Stay Tuned

Invasive Duct
DCIS

Combination Codes
### MPH Rules

#### Multiple Primary Rules

- 2014-2015 Updates
- New MPH Database
- Text Only Rules
- Stay Tuned

#### MPH Rules

##### Combination Codes

<table>
<thead>
<tr>
<th>Combination Codes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>A single code is used for a single tumor.</td>
</tr>
<tr>
<td>Multiple</td>
<td>Multiple codes are used for multiple tumors.</td>
</tr>
</tbody>
</table>

#### MP Rules - Abbreviated

<table>
<thead>
<tr>
<th>Unknown number</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1. Unknown if single or multiple tumors = single</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>One tumor</th>
</tr>
</thead>
<tbody>
<tr>
<td>M2. Inflammatory carcinoma = single</td>
</tr>
<tr>
<td>M3. A single tumor = single</td>
</tr>
</tbody>
</table>

#### MP Rules - Abbreviated

<table>
<thead>
<tr>
<th>Multiple Tumors</th>
</tr>
</thead>
<tbody>
<tr>
<td>M4. Different topography = multiple</td>
</tr>
<tr>
<td>M5. Diagnosis dates &gt; 5 years apart = multiple</td>
</tr>
<tr>
<td>M6. Inflammatory carcinoma = single</td>
</tr>
<tr>
<td>M7. Tumors on both sides = multiple</td>
</tr>
<tr>
<td>M8. Invasive after in situ &gt; 60 days = multiple</td>
</tr>
<tr>
<td>M9. (Intra)ductual and Paget disease = single</td>
</tr>
<tr>
<td>M10. Lobular and (intra)ductual = single</td>
</tr>
<tr>
<td>M11. Multiple intraductal and/or ductal = single</td>
</tr>
<tr>
<td>M12. Histology different = multiple</td>
</tr>
<tr>
<td>M13. All other = single</td>
</tr>
</tbody>
</table>

#### MPH Rules

##### Histology Coding Rules

<table>
<thead>
<tr>
<th>Breast Cancer Histology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenocarcinoma, NOS (8140/3)</td>
</tr>
<tr>
<td>Sometimes this is all the pathologist can characterize</td>
</tr>
<tr>
<td>Ductal or Duct Carcinoma (850_/2 or 850_/3)</td>
</tr>
<tr>
<td>80% of all invasive breast cancers</td>
</tr>
<tr>
<td>80% of all non-invasive breast cancers</td>
</tr>
<tr>
<td>Numerous Subtypes (see Table 1 and Table 2 of MPH Terms and Definitions)</td>
</tr>
<tr>
<td>Papillary Subtype (8503/2 or 8503/3 – DO NOT CODE 8050/2 or 8050/3)</td>
</tr>
<tr>
<td>Lobular Carcinoma (852_/2 or 852_/3)</td>
</tr>
<tr>
<td>10% of all invasive breast cancers</td>
</tr>
<tr>
<td>15% of all non-invasive breast cancers</td>
</tr>
<tr>
<td>Mixed Breast Cancers – 10%</td>
</tr>
<tr>
<td>Microcystic or solid (840_/2) – 5-5%</td>
</tr>
<tr>
<td>Inflammatory (8520/3) – 1-3%</td>
</tr>
<tr>
<td>Paget Disease (8540/3) – 1%</td>
</tr>
<tr>
<td>Phyllodes Tumor (89680) – 1%</td>
</tr>
<tr>
<td>Medullary (851_/3) – 1%</td>
</tr>
<tr>
<td>Tubular (8521/3) – 1%</td>
</tr>
<tr>
<td>Ductular Carcinoma (8521/3) is NOT ductal carcinoma</td>
</tr>
<tr>
<td>Many Mixed Histologies Have Special Rules – Use Them</td>
</tr>
<tr>
<td>Many Mixed Histologies Have Special Codes – Use Them</td>
</tr>
</tbody>
</table>
**Breast Cancer Behavior & DCIS Subtypes**

- **Column 1:** Code
- **Column 2:** Type
  - 8522: Pagetoid carcinoma
  - 8523: Carcinoma with colloid-like giant cells
  - 8530: Duct, NSG
  - 8531: Colloid carcinoma
  - 8532: Secretory carcinoma of breast
  - 8533: Intraduct papillary adenocarcinoma with invasion
  - 8534: Invasive adenocarcinoma

**Breast Cancer Behavior & Ductal Subtypes**

- **Column 1:** Code
- **Column 2:** Type
  - 8032: Pancreatic carcinoma
  - 8033: Carcinoma with cholangioid-like giant cells
  - 8501: Duct, NSG
  - 8591: Carcinoid carcinoma
  - 8592: Serous carcinoma of breast
  - 8593: Intraduct papillary adenocarcinoma with invasion
  - 8598: Cystic lymphoepithelial carcinoma

**LCIS and Invasive Lobular Carcinoma**

- **LCIS** – Cancer Confined to Lobules
  - Is it a true cancer or pre-cancer?
  - Controversial Classification
  - Controversial Treatment
  - Often Bilateral (mirror)
  - What is “cancerization of lobules”?

- **Invasive (infiltrating) Lobular Carcinoma**
  - Treated like invasive ductal carcinoma
  - Often mixed with ductal carcinoma
  - Often Bilateral (mirror)

**Mixed In-Situ CA and Invasive CA**

**ONLY CODE THE CHARACTERISTICS OF THE INVASIVE CARCINOMA**

---

**IGNORE ALL IN-SITU TERMS IN REPORT**

**Mixed Duct and Lobular**

- 8522/2 – DCIS and LCIS only
- 8522/3 – Invasive Duct and Invasive Lobular
- 8523/2 – Mixed DCIS Subtypes (Table 1)
- 8523/3 – Invasive Duct with Invasive Non-Duct CA
  - Cribriform
  - Mucinous
  - Tubular
  - Colloid
- 8524/2 – LCIS with non-DCIS (Table 1) other in-situ carcinoma
- 8524/3 – Invasive Lobular with Invasive Non-Duct CA (Table 2)

**Inflammatory Carcinoma of Breast**

- **Combined Clinical and Pathological Diagnosis**
  - Clinical
    - Symptoms resembling breast inflammation
    - Resembles acute mastitis of breast
    - Diffuse involvement of breast
    - Nipple retraction common
    - No palpable mass
    - Warm and reddened
    - Firm and swollen
    - Peau d’orange
    - Itching
- Pathological
  - Dermal lymphatic invasion proven on biopsy
  - Assign histology code 8530/3 only when final dx on path states ICB
  - Record dermal lymphatic invasion in stage [CS TST, CS Ext, “T” (TNM)]
### Mixed/Combination/Multiple Histology

**GO DIRECTLY TO**

**TABLE 3 – BREAST MPH TERMS AND DEFINITIONS**

**USE HISTOLOGY CODING RULES**

**DO NOT GUESS**

**DO NOT USE DROP DOWN MENU**

**DO NOT AUTOMATICALLY CODE 8523**

---

### Histology Coding Rules - Abbreviated

#### Single tumor, all in situ

- H1. If no tissue, code physician’s statement
- H2. Single histology
- H3. Most specific term
- H4. Comedocarcinoma, non-infiltrating with any other intraductal carcinoma
- H5. Intraductal and in situ lobular
- H6. Intraductal mixed with other in situ ca
- H7. In situ lobular mixed with other in situ ca
- H8. 8255 for mixed subtypes when no mention of intraductal or in situ lobular

**Source:** AFritz and Associates, LLC

#### Single tumor – mixed in situ and invasive

- H9. Code invasive histology

#### Single tumor – all invasive

- H10. If no tissue, code physician’s statement
- H11. Metastatic site histology
- H12. Most specific term
- H13. 8530 Inflammatory carcinoma
- H14. Single histology
- H15. Highest duct carcinoma code
- H16. 8522 duct and lobular
- H17. 8523 duct mixed with other duct ca
- H18. 8524 lobular mixed with other ca
- H19. 8255 adenoca with mixed subtypes

**Source:** AFritz and Associates, LLC

#### Multiple tumors as single primary

- H20. If no tissue, code physician’s statement
- H21. If no primary tissue, code metastasis
- H22. 8530 Inflammatory carcinoma
- H23. Single histology
- H24. Paget disease in situ and intraductal ca
- H25. Paget disease and intraductal ca
- H26. Paget and infiltrating duct carcinoma
- H27. Invasive histology
- H28. 8522 Duct and lobular
- H29. Higher code

**Source:** AFritz and Associates, LLC

---

### Coding Grade for Invasive Tumors

<table>
<thead>
<tr>
<th>NOTTINGHAM or BLOOM/RICHARDSON (BR) Score/Grade</th>
<th>C6 Code</th>
<th>Grade Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score of 3</td>
<td>030</td>
<td>1</td>
</tr>
<tr>
<td>Score of 4</td>
<td>040</td>
<td>1</td>
</tr>
<tr>
<td>Score of 5</td>
<td>050</td>
<td>1</td>
</tr>
<tr>
<td>Score of 6</td>
<td>060</td>
<td>2</td>
</tr>
<tr>
<td>Score of 7</td>
<td>070</td>
<td>2</td>
</tr>
<tr>
<td>Score of 8</td>
<td>080</td>
<td>3</td>
</tr>
<tr>
<td>Score of 9</td>
<td>090</td>
<td>3</td>
</tr>
<tr>
<td>Low Grade, Bloom/Richardson (BR) Grade 1, Score Not Given</td>
<td>110</td>
<td>1</td>
</tr>
<tr>
<td>Medium Grade, Bloom/Richardson (BR) Grade 2, Score Not Given</td>
<td>120</td>
<td>2</td>
</tr>
<tr>
<td>High Grade, Bloom/Richardson (BR) Grade 3, Score Not Given</td>
<td>130</td>
<td>3</td>
</tr>
</tbody>
</table>

---

### Are there grades of in situ? Do we code them?

- **What does it mean if my ductal carcinoma in-situ is described as being “low grade”, “intermediate grade”, or “high grade”; or “nuclear grade 1”, “nuclear grade 2”, or “nuclear grade 3”; or “low mitotic rate”, “intermediate mitotic rate”, or “high mitotic rate”?

- These are all different ways of describing the microscopic appearance of ductal carcinoma in-situ (DCIS). DCIS which is high grade, nuclear grade 3, or high mitotic rate (as compared to low grade, nuclear grade 1, or low mitotic rate) is associated with an increased risk of coming back (recurrence) following local excision and this may affect subsequent therapy.

- **COMING SOON - 2014 REVISED Coding Instructions for Grade**
What do Biomarkers do?

- Prognostic – clinical outcome
- Predictive – response to therapy
- Can a marker be both prognostic and predictive?
- Are biomarkers the same as genetic testing?
- What do I need to know as a cancer registrar?

Breast Cancer Tumor Markers

ESTROGEN RECEPTOR (ER)
PROGESTERONE RECEPTOR (PR)
HER2 RECEPTOR (HER2)
OTHER BIO-MARKER TESTING

Biomarkers do:

- Prognostic – clinical outcome
- Predictive – response to therapy
- Can a marker be both prognostic and predictive?
- Are biomarkers the same as genetic testing?
- What do I need to know as a cancer registrar?

FCDS DAM – Appendix C

APPENDIX C

When and Why an ER/PR/HER2 Test is Considered in Breast Cancer Profiling

- Estrogen Receptor (ER)
  - Abnormal: ≤10% of tumor cells express ER
  - Normal: >10% of tumor cells express ER
- Progesterone Receptor (PR)
  - Abnormal: ≤1% of tumor cells express PR
  - Normal: >1% of tumor cells express PR
- HER2 Receptor (HER2)
  - Abnormal: HER2 amplified or HER2 overexpression
  - Normal: No HER2 amplification or overexpression

Other Biomarker Testing

- Human Epidermal Growth Factor Receptor 2 (HER2) testing
- Tumor suppressor gene testing (e.g., BRCA1, BRCA2)
- MicroRNA analysis

Biomarkers in Clinical Practice

- Prognosis
- Response to therapy
- Personalized treatment

Genetic Testing vs Biomarker Testing

- Genetic testing identifies specific genetic mutations
- Biomarker testing evaluates protein expression

FCDS DAM – Appendix C

Table of Breast Cancer Tumor Markers

<table>
<thead>
<tr>
<th>Marker</th>
<th>Test Methodology</th>
<th>Prognostic Value</th>
<th>Predictive Value</th>
<th>Treatment Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER</td>
<td>IHC</td>
<td>Positive</td>
<td>Negative</td>
<td>Adjuvant Hormone Therapy</td>
</tr>
<tr>
<td>PR</td>
<td>IHC</td>
<td>Positive</td>
<td>Negative</td>
<td>Adjuvant Hormone Therapy</td>
</tr>
<tr>
<td>HER2</td>
<td>IHC/ISH</td>
<td>Amplified</td>
<td>Overexpressed</td>
<td>Targeted Therapy</td>
</tr>
<tr>
<td>Ki-67</td>
<td>IHC</td>
<td>High</td>
<td>Low</td>
<td>Chemotherapy</td>
</tr>
<tr>
<td>NIBC</td>
<td>IHC</td>
<td>Positive</td>
<td>Negative</td>
<td>Adjuvant Chemotherapy</td>
</tr>
<tr>
<td>PDGFR-B</td>
<td>IHC</td>
<td>Activated</td>
<td>Non-activated</td>
<td>Anti-angiogenic Therapy</td>
</tr>
<tr>
<td>EGFR</td>
<td>IHC</td>
<td>Overexpressed</td>
<td>Low</td>
<td>Anti-EGFR Therapy</td>
</tr>
<tr>
<td>NOTCH3</td>
<td>IHC</td>
<td>Activated</td>
<td>Non-activated</td>
<td>Targeted Therapy</td>
</tr>
</tbody>
</table>

FCDS DAM – Appendix C

Table of Breast Cancer Tumor Markers

<table>
<thead>
<tr>
<th>Marker</th>
<th>Test Methodology</th>
<th>Prognostic Value</th>
<th>Predictive Value</th>
<th>Treatment Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER</td>
<td>IHC</td>
<td>Positive</td>
<td>Negative</td>
<td>Adjuvant Hormone Therapy</td>
</tr>
<tr>
<td>PR</td>
<td>IHC</td>
<td>Positive</td>
<td>Negative</td>
<td>Adjuvant Hormone Therapy</td>
</tr>
<tr>
<td>HER2</td>
<td>IHC/ISH</td>
<td>Amplified</td>
<td>Overexpressed</td>
<td>Targeted Therapy</td>
</tr>
<tr>
<td>Ki-67</td>
<td>IHC</td>
<td>High</td>
<td>Low</td>
<td>Chemotherapy</td>
</tr>
<tr>
<td>NIBC</td>
<td>IHC</td>
<td>Positive</td>
<td>Negative</td>
<td>Adjuvant Chemotherapy</td>
</tr>
<tr>
<td>PDGFR-B</td>
<td>IHC</td>
<td>Activated</td>
<td>Non-activated</td>
<td>Anti-angiogenic Therapy</td>
</tr>
<tr>
<td>EGFR</td>
<td>IHC</td>
<td>Overexpressed</td>
<td>Low</td>
<td>Anti-EGFR Therapy</td>
</tr>
<tr>
<td>NOTCH3</td>
<td>IHC</td>
<td>Activated</td>
<td>Non-activated</td>
<td>Targeted Therapy</td>
</tr>
</tbody>
</table>

Table of Breast Cancer Tumor Markers

<table>
<thead>
<tr>
<th>Marker</th>
<th>Test Methodology</th>
<th>Prognostic Value</th>
<th>Predictive Value</th>
<th>Treatment Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>ER</td>
<td>IHC</td>
<td>Positive</td>
<td>Negative</td>
<td>Adjuvant Hormone Therapy</td>
</tr>
<tr>
<td>PR</td>
<td>IHC</td>
<td>Positive</td>
<td>Negative</td>
<td>Adjuvant Hormone Therapy</td>
</tr>
<tr>
<td>HER2</td>
<td>IHC/ISH</td>
<td>Amplified</td>
<td>Overexpressed</td>
<td>Targeted Therapy</td>
</tr>
<tr>
<td>Ki-67</td>
<td>IHC</td>
<td>High</td>
<td>Low</td>
<td>Chemotherapy</td>
</tr>
<tr>
<td>NIBC</td>
<td>IHC</td>
<td>Positive</td>
<td>Negative</td>
<td>Adjuvant Chemotherapy</td>
</tr>
<tr>
<td>PDGFR-B</td>
<td>IHC</td>
<td>Activated</td>
<td>Non-activated</td>
<td>Anti-angiogenic Therapy</td>
</tr>
<tr>
<td>EGFR</td>
<td>IHC</td>
<td>Overexpressed</td>
<td>Low</td>
<td>Anti-EGFR Therapy</td>
</tr>
<tr>
<td>NOTCH3</td>
<td>IHC</td>
<td>Activated</td>
<td>Non-activated</td>
<td>Targeted Therapy</td>
</tr>
</tbody>
</table>
Other Marker Testing

- Multi-Signature Gene Testing
- Oncotype DX Breast Cancer Assay
- HERmark Breast Cancer Assay
- MammaPrint
- Axela Breast Cancer Xpres Chip

Breast Cancer Staging

SEER Summary Stage

AJCC Cancer Staging - TNM

AJCC Cancer Staging - TNM

Breast Cancer Stage Distribution

Source: SEER Summary Staging Manual 2000

http://ww5.komen.org/images
Collaborative Stage Data Collection

CS Tumor Size and “T” in TNM

CS Extension and “T” in TNM
CS Extension and “T” in TNM

Breast Regional Lymph Nodes (N)

- Level I (low-axilla): lymph nodes lateral to the lateral border of pectoralis minor muscle
- Level II (mid-axilla): lymph nodes between the medial and lateral borders of the pectoralis minor muscle and the interpectoral (Rotter’s) lymph nodes
- Level III (apical axilla): lymph nodes medial to the medial margin of the pectoralis minor muscle and inferior clavicle (apical or infraclavicular nodes) worse prognosis

CS Lymph Nodes and “N” in TNM

A blue dye in lumpectomy site
B axillary lymph nodes: levels I
C axillary lymph nodes: levels II
D axillary lymph nodes: levels III
E large lymphatic channels
F small lymphatic channels
G sentinel lymph nodes taking up dye

Source: http://www.breastcancer.org
Special Codes for CS Lymph Nodes


CS Site Specific Factors

Review Definition – 1st Course Treatment

The first course of treatment includes all methods of treatment recorded in the treatment plan and administered to the patient before disease progression or recurrence.

First course of treatment includes all types of therapy whether the intent is to cure the patient, for symptom control (palliation), or to slow disease progression.

Treatment Planning

<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Performance Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Cardiac Clearance</td>
</tr>
<tr>
<td>Age</td>
<td>Weight</td>
</tr>
<tr>
<td>Family History</td>
<td>Breast Function</td>
</tr>
<tr>
<td>Paraneoplastic History</td>
<td>Symptoms</td>
</tr>
<tr>
<td>Other General Factors</td>
<td>Other Considerations</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Clinical Factors</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Clinical</th>
<th>Pathological</th>
<th>Molecular</th>
<th>Genetic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When is a “biopsy” coded “surgery”?

**Types of Breast Biopsy and Primary Breast Surgery**
- FNA (fine needle aspiration biopsy)
- Core Needle Biopsy
- Incisional Biopsy
- Excisional Biopsy
- Local Excision
- Lumpectomy
- Radical Mastectomy
- Modified Radical Mastectomy
- Mastectomy, NOS
**When is a “biopsy” coded “surgery”?**

- What is a sentinel lymph node biopsy
- What if the surgeon later removes more lymph nodes as a sampling or excision
- Why not take all the lymph nodes
- Distant lymph nodes in breast cancer
- Where to go for answers...see below reference

**Coding Scope of Lymph Node Surgery**

- What is a sentinel lymph node biopsy
- What if there is more than 1 sentinel node removed
- What if the surgeon later removes more lymph nodes as a sampling or excision
- Why not take all the lymph nodes
- Distant lymph nodes in breast cancer
- What if the diagnosis is in situ but there is a + lymph node?
- Where to go for answers...see below reference

**Coding Radiation Summary and Modality**

- TOO Many Agents are being coded incorrectly
- Ancillary Agents Coded as Chemo, Hormone or BRM
- Two Names for Same Drug Coded as Multi-Agent
- Hormones Coded as Chemo
- Chemo Coded as Hormones
- BRM Coded as Chemo
- Chemo Coded as BRM
- Look them up...please
- We cannot find these errors using EDITS
When a patient has chemo for one type of cancer (i.e. colon cancer), you do not code the chemo as treatment for other cancers (i.e. breast cancer).

However, if a patient has multiple breast primaries (both breasts) and chemotherapy is first course treatment for one primary – it should also be coded as first course treatment for the patient’s other breast cancer if it was dx’d at same time.

It is up to the registrar to sort out which chemo goes with which primary (e.g. colon versus breast versus lung).

Use SEER*Rx to check which regimens and agents are standard therapy for which cancer(s).
Stem Cell and Bone Marrow Transplant

NCCN Treatment Guidelines

NCCN Treatment Guidelines

NCCN Sample - DCIS

NCCN Sample – Invasive Duct (stage)

NCCN Sample – Invasive Duct (ER/PR/Her2)
References

- American Cancer Society – http://www.cancer.org
- American College of Radiology – http://acr.org
- American Joint Committee on Cancer – http://cancerstaging.org
- AJCC Cancer Staging Manual, 8th edition
- AJCC Cancer Staging Atlas, 5th edition
- WHO Classification of Tumours of Breast, 4th edition
- International Classification of Diseases for Oncology, 3rd edition
- ACS/UsC – http://www.acs.org
- 2013 FDER Data Acquisition Manual
- 2013 Cancer Facts and Figures – American Cancer Society
- 2013 Multiple Primary and Histology Coding Rules – Breast
- NCCN Guidelines for Patients – Breast Cancer
- NCCN Guidelines for Health Professionals – Breast Cancer
- The Breast Cancer Checklist by Fern Reiss
- SEER Training Modules – Breast
- SEER Summary Staging Manual 2000
- Collaborative Stage Data Collection System v01.01
- North Carolina Cancer Registry – CEE Educational Materials