

# Pathology

- Cancer histology
  - Invasive ductal
  - Invasive lobular
  - Other invasive
  - DCIS

Distribution of Histologic Types of Breast Cancer

Total Cancers	Percent
<b>In Situ Carcinoma</b>	<b>15-30</b>
Ductal carcinoma in situ	80
Lobular carcinoma in situ (nb. Not considered a breast malignancy, but rather a high-risk lesion)	20
<b>Invasive Carcinoma</b>	<b>70-85</b>
Invasive ductal carcinoma	79
Lobular carcinoma	10
Tubular/cribriform carcinoma	6
Mucinous (colloid carcinoma)	2
Medullary carcinoma	2
Papillary carcinoma	1
Metaplastic carcinoma	<1

# Pathology

- Cancer histology
    - Invasive ductal carcinoma
      - Firm/hard with irregular borders & occasionally calcifications
      - Arises from terminal duct lobular unit
      - 5 year survival (Am Cancer Society)
        - Overall: 75%
        - Localized: 91%
        - Regional: 69%
        - Distant: <19%
- (Based on TNM staging)

# Pathology

- Cancer histology
  - Invasive ductal carcinoma
    - Marked increase in dense, fibrous desmoplastic stroma
    - Accompanied by varying amounts of DCIS

# Pathology

- Wide spectrum of appearances:
  - Well-differentiated tumors (low grade)
    - Tubules lined by minimally atypical cells
    - Typically express hormone receptors
    - Often do not over express *HER2/neu*
  - Poorly differentiated tumors (high grade)
    - Anastomosing sheets of pleomorphic cells
    - Less likely to express hormone receptors
    - Most often over express *HER2/neu*
  - Majority somewhere in between (intermediate grade)

# Pathology

- Cancer histology
  - Invasive lobular carcinoma
    - Firm/hard with irregular margins, or occasionally diffuse thickening without a distinct tumor mass
    - Minimal or absent desmoplastic response
    - Hallmark pathology: single infiltrating tumor cells in single file or in loose clusters or sheets
    - Signet-ring cells common
    - Tumor cells frequently arranged in concentric rings surrounding normal ducts

# Pathology

- Cancer histology
  - Invasive lobular carcinoma
    - Can present as palpable mass or mammographic density; however, 25% have diffuse pattern of invasion presenting as a vaguely thickened area of the breast or subtle architectural changes on mammography
    - Incidence increasing in postmenopausal women
    - Same prognosis as invasive ductal
    - Well-differentiated & moderately differentiated:
      - Usually diploid, express hormone receptors, are assoc. with LCIS; *HER2/neu* overexpression rare
    - Poorly-differentiated:
      - Usually aneuploid, lack hormone receptors, often overexpress *HER2/neu*
- Most show loss of 16q22.1: cluster of cell adhesion genes including e-cadherin &  $\beta$ -catenin
- Unique pattern of metastasis:
  - Mets to peritoneum & retroperitoneum, leptomeninges, GI tract, ovaries & uterus more frequently observed

# Pathology

- Cancer histology
  - Other invasive carcinomas
    - Tubular carcinoma
      - Typically detected as irregular mammographic densities
        - Common presentation in late 40's
      - Well-differentiated by definition
      - Metastasis in <10% of cases
      - Excellent prognosis
      - Morphology: well-formed tubules lined by single layer of cells on background of desmoplastic stroma

# Pathology

- Cancer histology
  - Medullary carcinoma
    - Typically presents as well-circumscribed mass
    - Disproportionate representation in BRCA1 carriers (13%)
    - High nuclear grade, aneuploidy, absence of hormone receptors, high proliferative rates; yet better prognosis than invasive ductal carcinoma (“looks bad, may act good”)
      - Infrequent lymph node metastasis
      - Typically ER-, PR-, Her2-
    - Morphology: solid syncytium-like sheets of large cells with pleomorphic nuclei, prominent nucleoli, & frequent mitoses
      - Lymphoplasmacytic infiltrate surrounding tumor



# Pathology

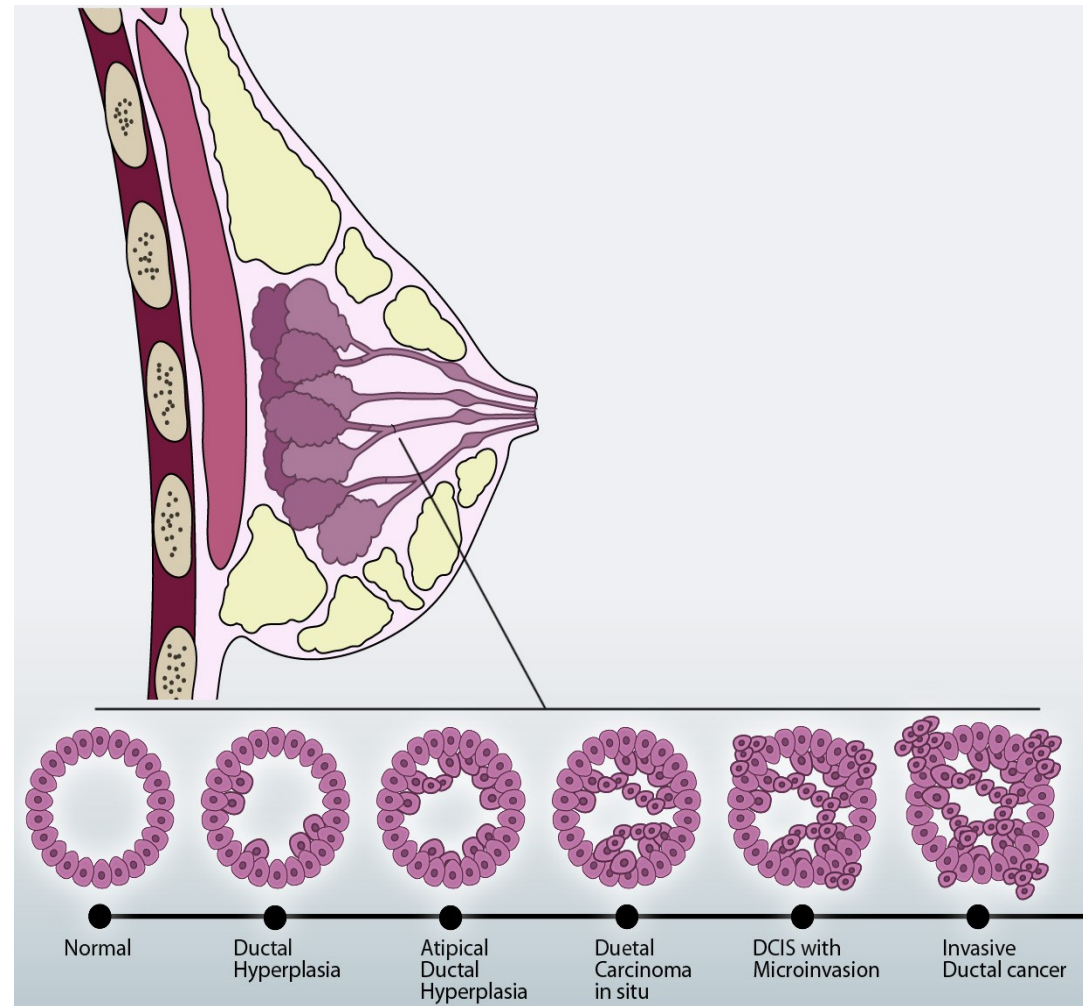
- Cancer histology
  - Other invasive carcinomas
    - Mucinous (colloid) carcinoma
      - Older women (>60 yrs)
        - May grow slowly over many years
      - Uncommon (1-6% of breast carcinomas)
      - Typically presents as circumscribed mass
      - May have better prognosis than invasive ductal
      - Distinctive pattern of small islands of tumor cells in sea of mucinous material

# Pathology

- Cancer histology
  - Invasive papillary carcinoma
    - Typically presents like invasive ductal carcinoma, but may have better prognosis
    - Papillary architecture
    - Rare (<1% of invasive breast cancers)
  - Metaplastic carcinoma
    - Includes wide variety of rare types

# Pathology

- Cancer histology
  - Ductal carcinoma in situ (DCIS)
    - Most frequently presents as mammographic calcifications; often undetectable by palpation/visual inspection
      - Represent 50% of mammographically detected cancers
    - May be multicentric
    - Malignant population of cells limited to ducts & lobules by basement membrane



# Pathology

- Cancer histology
  - Ductal carcinoma in situ (DCIS)
    - Progresses to invasive carcinoma!
      - 25% of patients may develop same breast invasive carcinoma
      - Comedo pattern imparts greater risk
    - Treatment:
      - Mastectomy curative in 95% of cases
      - Breast conservation appropriate for most women with slightly higher risk of recurrence
        - » Risk factors for recurrence: grade, size, margins