Helping Patients With Breast Cancer

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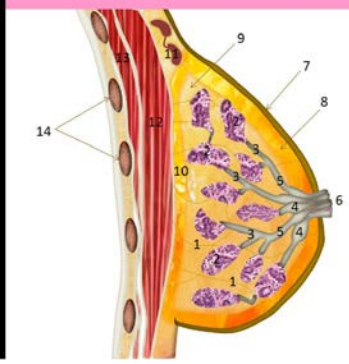
Objectives

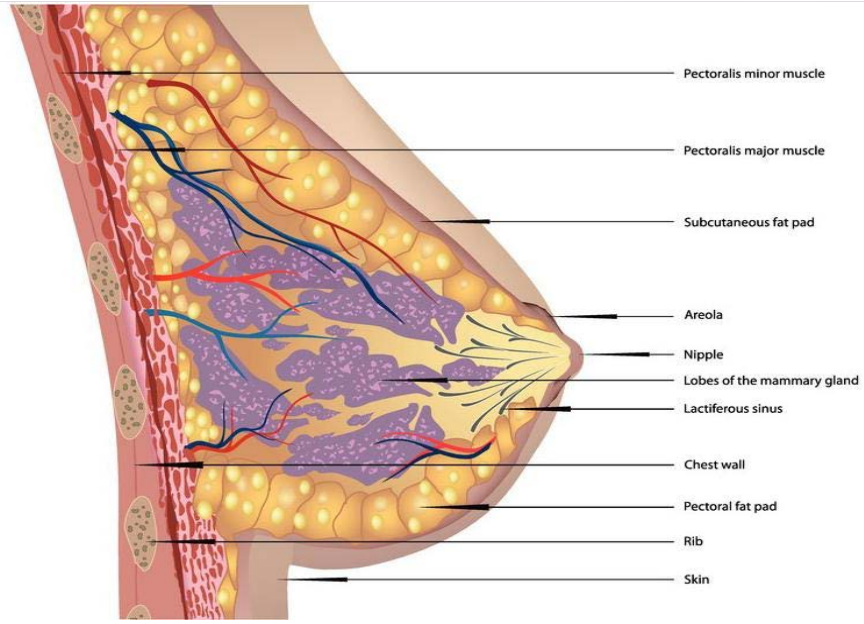
- Identify basic breast anatomy
- Review components of breast exam
- Discuss types of imaging and associated controversies
- Define benign v malignant breast disorders
- Describe the components of the work-up for common breast complaints
- Describe common breast disorders and their management
- Describe the basic treatment and follow-up for patients with or having survived breast cancer

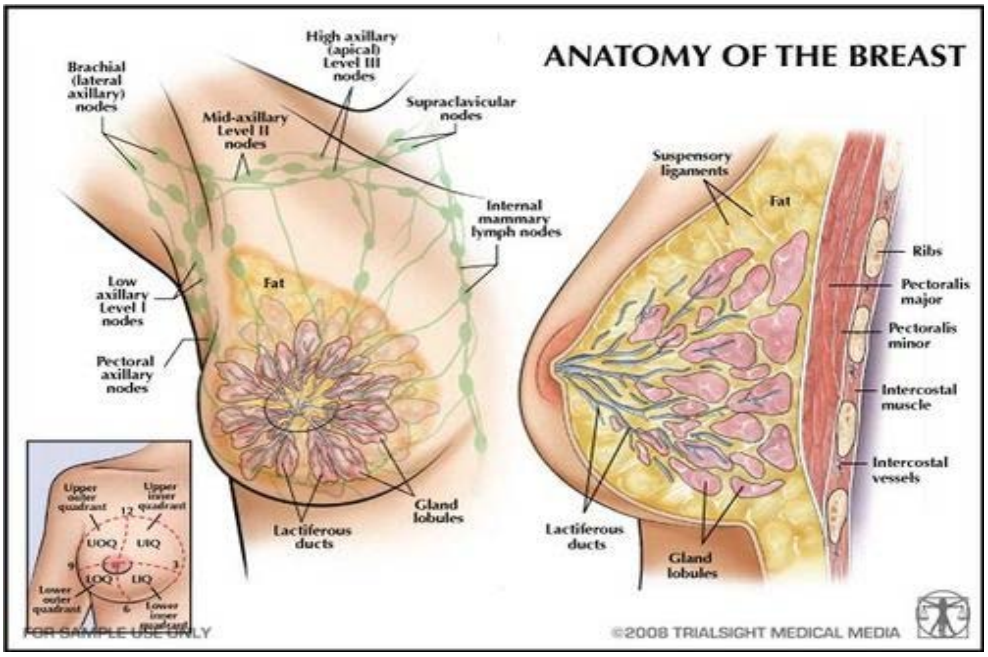
Basic Breast Anatomy

Breast Anatomy



1. Cooper's Ligaments
2. Breast Lobule
3. Extralobular Duct
4. Ductal Ampulla (Reservoir)
5. Main Duct
6. Nipple
7. Skin
8. Subcutaneous Fat
9. Mammary Layer Fatty Tissue
10. Retromammary Fat
11. Lymph nodes
12. Pectoralis Major muscle
13. Pectoralis Minor muscle
14. Rib





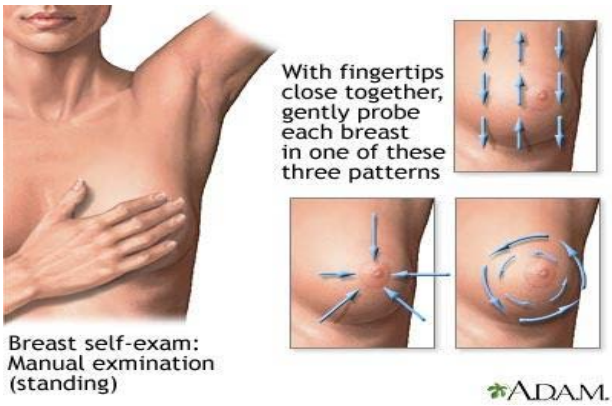
Clinical Breast Exam

- Controversy Exists
  - American College of Obstetricians and Gynecologists
    - Every 1-3 years ages 20-39, annually age >40
  - American Cancer Society
    - Every 1-3 years ages 20-39, annually age >40
  - National Comprehensive Cancer Network
    - Every 1-3 years ages 20-39, annually age >40
  - National Cancer Institute
    - Recommended
  - US Preventative Services Task Force
    - Insufficient Evidence

Self Breast Exam

- Controversy Exists
  - American College of Obstetricians and Gynecologists
    - Consider in high risk patients
  - American Cancer Society
    - Optional for patients > age 20
  - National Comprehensive Cancer Network
    - Recommended
  - National Cancer Institute
    - Not recommended
  - US Preventative Services Task Force
    - Not recommended

The Breast Exam



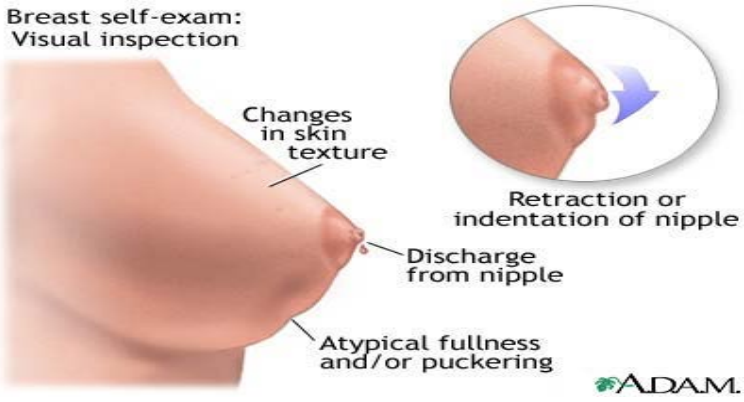
While lying down, use the three middle fingers and apply three levels of pressure in a circular motion. Follow an up and down pattern.

Check for changes with hands on hips and chest muscles flexed.

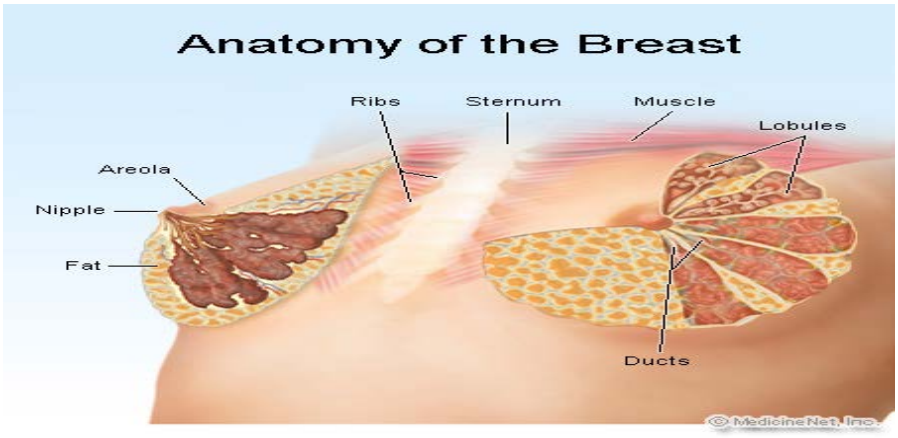
Examine underarm while upright, with arm slightly raised.

ADAM.

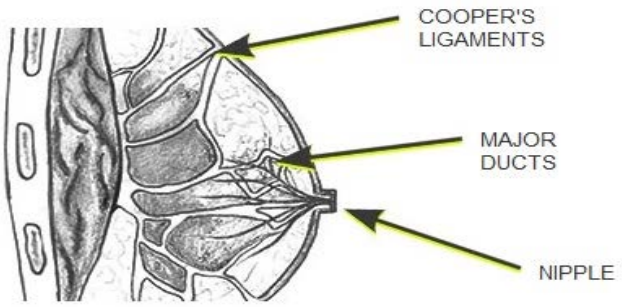
What am I Looking For?



Thinking About the Underlying Structure



Cooper's Ligaments



Benign Breast Disorders

A heterogeneous group of lesions that may represent a palpable mass, nonpalpable abnormality on imaging, or an incidental microscopic finding

Goals in the pathologic evaluation of benign breast biopsies

- Distinguish benign from in situ or invasive carcinomas
- Assess the risk of subsequent breast cancer associated with the lesion identified.

Components in the workup of a breast complaint

- History of Chief Complaint
- Reproductive Factors
- Associated Factors
- Imaging Studies
- Family History
- Clinical Breast Exam

History of Chief Complaint

- Onset
- Duration
- Changes over time
- Associated symptoms: pain, skin changes, nipple inversion, nipple discharge, fevers, prior trauma

Reproductive Factors

- Age at menarche
- LMP
- Pregnancies/Age of first live birth
- OCP/implants/HRT use

Associated Factors

- Family history
- Radiation exposure (Hodgkin's Disease)
- Prior breast biopsy
- Weight change
- Diet
- Breast Density

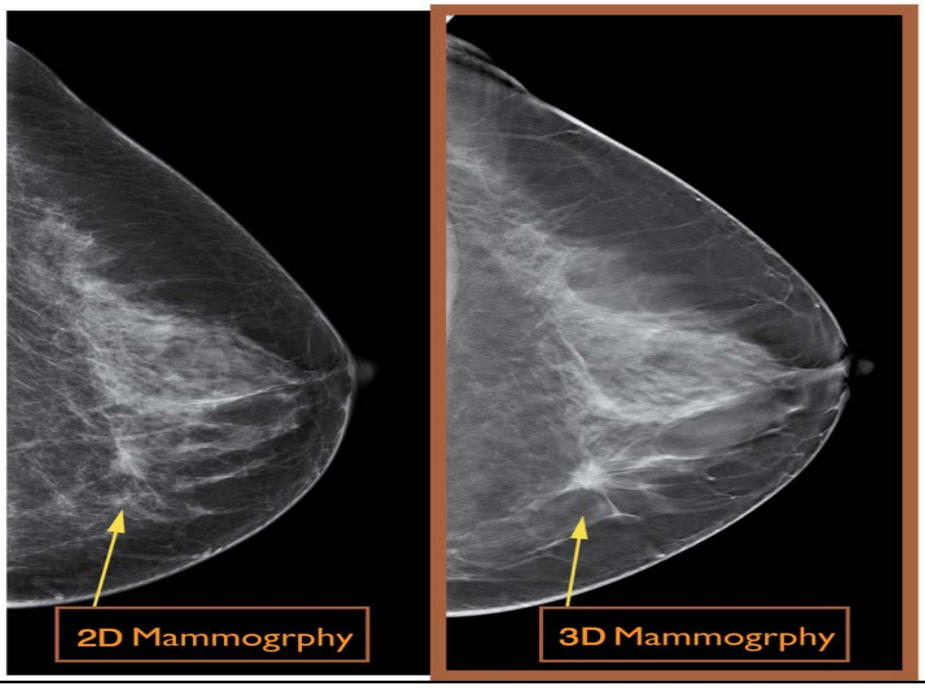
Imaging Studies

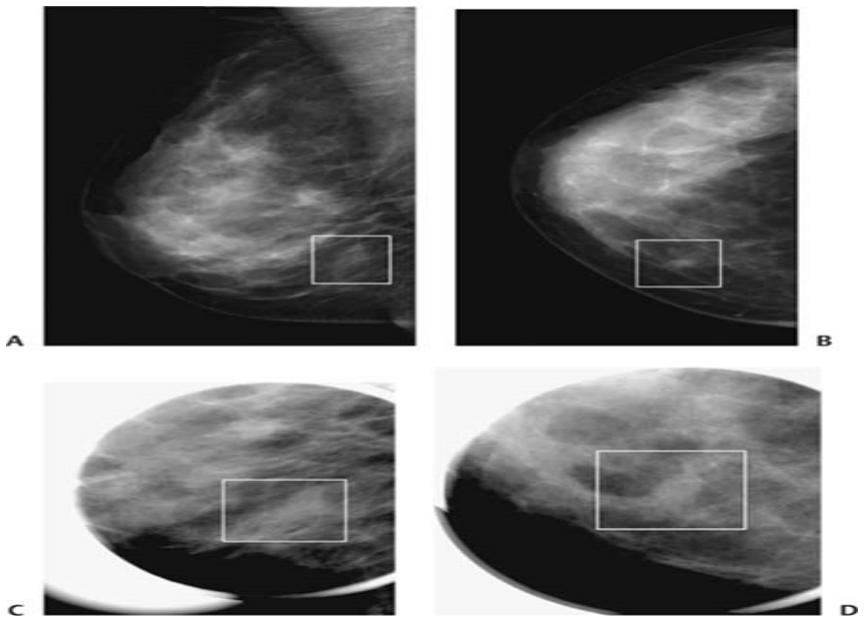
- Mammogram: screening v diagnostic
- Ultrasound
- MRI
- Thermograms

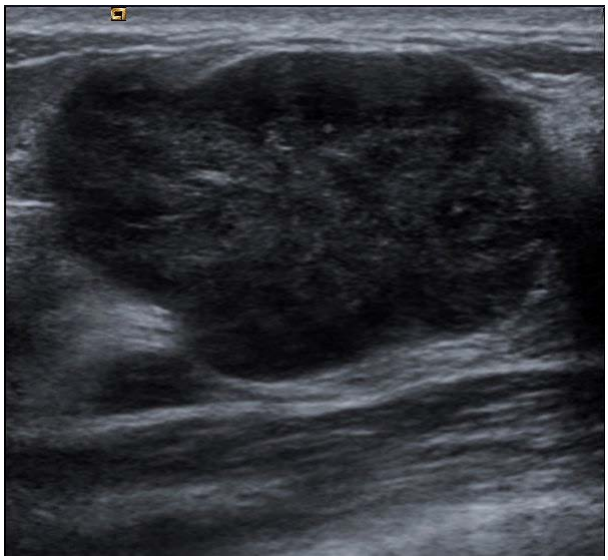
Mammogram

Types of Mammograms

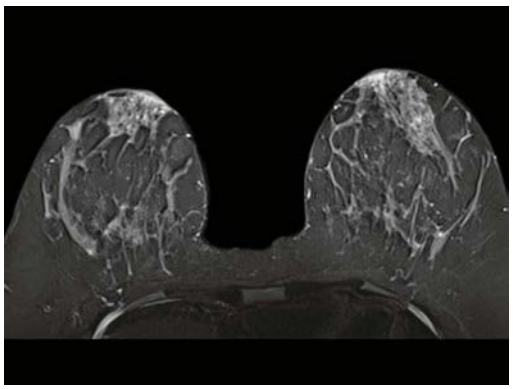
- Screening
- Diagnostic
- 3-D or tomosythesis




A
B
C
D



Breast MRI



Controversies in Mammography

- 2D v 3D
- When to Screen and How Often

BiRads

Breast Imaging Reporting and Database System (BI-RADS)		
Category	**Assessment**	**Follow-up**
0	Need additional imaging evaluation	Additional imaging needed before a category can be assigned
1	Negative	Continue annual screening mammography (for women over age 40)
2	Benign (noncancerous) finding	Continue annual screening mammography (for women over age 40)
3	Probably benign	Receive a 6-month follow-up mammogram
4	Suspicious abnormality	May require biopsy
5	Highly suggestive of malignancy (cancer)	Requires biopsy
6	Known biopsy—proven malignancy (cancer)	Biopsy confirms presence of cancer before treatment begins

ACR BI-RADS® Atlas Fifth Edition
QUICK REFERENCE

MAMMOGRAPHY

Breast composition	a. The breasts are almost entirely fatty b. There are scattered areas of fibroglandular density c. The breasts are heterogeneously dense, which may obscure small masses d. The breasts are extremely dense, which lowers the sensitivity of mammography	
Masses	Shape	Oval Round Irregular
	Margin	Circumscribed Obscured Microlobulated Indistinct Spiculated
	Density	High density Equal density Low density Fat-containing
Calcifications	Typically benign	Skin Vascular Coarse or "popcorn-like" Large rod-like Round Rim Dystrophic Milk of calcium Suture
	Suspicious morphology	Amorphous Coarse heterogeneous Fine pleomorphic Fine linear or fine-linear branching
	Distribution	Diffuse Regional Grouped Linear Segmental
Architectural distortion		
Asymmetries	Asymmetry	

ULTRASOUND

Tissue composition *(screening only)*	a. Homogeneous background echotexture – fat b. Homogeneous background echotexture – fib c. Heterogeneous background echotexture	
Masses	Shape	Oval Round Irregular
	Orientation	Parallel Not parallel
	Margin	Circumscribed Not circumscribed - Indistinct - Angular - Microlobulated - Spiculated
	Echo pattern	Anechoic Hyperechoic Complex cystic and solid Hypoechoic Isoechoic Heterogeneous
	Posterior features	No posterior features Enhancement Shadowing Combined pattern
Calcifications	Calcifications in a mass Calcifications outside of a mass Intraductal calcifications	
Associated features	Architectural distortion Duct changes	
	Skin changes	Skin thickening Skin retraction
	Edema	
	Vascularity	Absent Internal vascularity Vessels in rim

Society Guidelines

Controversies Exist

- American College of Obstetricians and Gynecologists
  - Annually starting at age 40
- American Cancer Society
  - Annually 45-55 then every other year starting at age 55
- National Comprehensive Cancer Network
  - Annually starting at age 40
- US Preventative Services Task Force
  - Every other year ages 50-74

Calculating Risk for Breast Cancer

- Gail Model
- Age
- Age at first period
- Age at the time of the birth of a first child (or has not given birth)
- Family history of breast cancer (mother, sister or daughter)
- Number of past breast biopsies
- Number of breast biopsies showing atypical hyperplasia
- Race/ethnicity
- Women with a 5-year risk of 1.67 percent or higher are classified as "high-risk."
- A 5-year risk of 1.67 percent or higher is the FDA guideline for taking a risk-lowering drug (tamoxifen or raloxifene) to reduce breast cancer risk.

Calculating Risk for Breast Cancer

- Claus Model
  - use family history to estimate breast cancer risk. Such tools can be used for women who have 1 or more relatives with breast cancer or 1 or more relatives with ovarian cancer.
  - requires the age at breast cancer diagnosis of first- or second-degree relatives as an input
- Tyrer-Cuzik model
  - The program assumes that there is a gene predisposing to breast cancer in addition to the *BRCA1/2* genes. The woman's family history is used to calculate the likelihood of her carrying an adverse gene, which in turn affects her likelihood of developing breast cancer
  - The risk from other classical factors including age at first child and benign disease are combined with familial risk.

Managing High Risk Patient

- High risk mutations
- High risk based on Gail or other models

Classification of Benign Disease Stratifying for Risk

- Nonproliferative lesions
- Proliferative lesions without atypia
- Atypical hyperplasia

Nonproliferative Lesions

- Cysts
- Papillary apocrine change
- Epithelial calcifications
- Mild hyperplasia, usual type

Proliferative Lesions Without Atypia

- Moderate/florid hyperplasia
- Intraductal papillomas
- Sclerosing adenosis
- Radial Scar
- Fibroadenoma

Atypical Hyperplasias

- Defined as proliferative lesions that possess some, but no all features of carcinoma in situ
- ADH (features similar to DCIS)
- ALH (features similar to LCIS)

Cystic Masses

- Pre and Perimenopausal
- Result from lobular involution, acini degeneration into microcysts that then expand into larger masses
- Wax, wane and are usually tender
- Associated with hormonal changes

Cystic Masses Work-up

- Imaging depends on age
- Aspiration or core biopsy
- Surgical biopsy
- Medications
- Supplements

Solid Masses

- False negative rate for mammography is 10-20%
- Dominant noncystic masses under age 40 are common
- Incidence of breast cancer under 30

Solid Masses

- Imaging studies: mammogram, ultrasound, MRI
- Core biopsy
- Follow-up management based on pathology

Fibroadenomas

- Pseudo-encapsulated, demarked, ovoid
- Mobile, multilobulated
- Complex
- Juvenile
- Giant/Phyllodes
- Infarction

Fibroadenomas

- Imaging based on age
- Core biopsy
- Surgical excision

Adenomas

- Well circumscribed tumors of benign epithelium elements with sparse stroma
- Tubular
- Lactational
- Nipple

More Solid Mases

- Radial scar
- Granular cell tumor
- Fibromastosis
- Lipoma
- PASH (Pseudoangiomatous Stromal Hyperplasia)
- Leiomyoma
- Hamartoma
- Lipoma
- Hematoma
- Vascular lesions/hemangiomas

Mammary Duct Ectasia and Periductal Mastitis

- Perimenopausal
- Characterized by dilated ducts/nipple disorder
- Pathology: dilated, thick walls, fibrotic stroma rupture, and leakage of pasty secretions into the surrounding tissue
- Symptoms: pain, nipple inversion, greenish nipple discharge
- Management: symptomatic +/- antibiotics +/- surgical duct excision

Granulomatous Mastitis

- Thought to be an immune response, chronic and difficult to treat
- Symptoms: Presents as firm, tender nodules, capsule formation with varying fibrosis and inflammatory changes
- Management: Steroids +/- antibiotics +/- surgical excision

Reactive Inflammatory Lesions

- Fat Necrosis- simulates breast cancer clinicall
- Mondor's Disease- phlebitis of the breast
- Diabetic Mastopathy- autoimmune, painful mass with development of fibrotic nodularity

Gyencomastia

- ACE inhibitors
- Alcohol
- Amiodarone
- Anabolic Steroids
- Ca channel blockers
- Amphetamines
- Bicalutamide
- Diazepam
- Methyldopa
- Phenytoin
- Tricyclic antidepressants
- Cimetidine
- Digitalis
- Estrogens
- Finesteride
- Furosemide
- Heroin
- Marijuana
- Ketoconazole
- Omperazole
- Sprinolactone

Types of Biopsies

- Stereotactic Core Biopsy
- Ultrasound Core Biopsy
- MRI Guided Biopsy
- Excisional Biopsy

Types of Core Biopsies

- Stereotactic
- Ultrasound Guided
- MRI Guided

Excisional Biopsy

- Surgical Procedure in the OR
- Requires localization
  - Ultrasound Guided
  - Needle-localized

Nipple Disorders

- Nipple inversion/retraction: Congenital v acquired
- Paget's Disease vs spongiotic dermatitis
- Management: Start with prescription strength topical steroids. If no improvement after one week, consider punch biopsy

Nipple Discharge

- 95% benign etiology: Hormonal, papilloma, duct ectasia
- Worrisome: unilateral, single duct, spontaneous, bloody
- Age of patient is an important distinguishing variable
- Predictor of Malignancy: age <40: 3%

  40-60: 10%

  >60: 32%
- Management: guaiac, not cytology; surgical duct excision; medications/supplements

Infections

- Cellulitis with or without abscess formation
- Risk Factors: overweight, large breasted, previous surgery, prior radiation, sebaceous cysts, smoking
- Staph aureus is the most common
- Treatment: antibiotics, symptom management

Infections

- Hydradenitis: involves distribution of sweat glands in the axillae, inframammary folds, and groin
- Risk Factors: more common in smokers and African American women
- Symptoms: extensive, painful "boils"
- Management: chronic antibiotics, surgical excision, and aggressive local hygiene

Nonlactional Infections

- Periareolar: younger women, smokers, 50% recurrence rate
- Mammary Duct Fistula: most common after I&D. Can be spontaneous
- Peripheral nonlactional abscess: less common, associated with diabetes, RA, steroid treatment and trauma
- Tuberculosis: rare in Western cultures, presents as an acute abscess with sinus tract from the axilla
- Management: antibiotics, smoking cessation

Lactational Infections

- Most common during first six week of breastfeeding
- Symptoms: pain, swelling, tenderness, cracked nipple/abrasion, fevers, chills
- Management: antibiotics +/- I&D

Breast Pain/Mastalgia

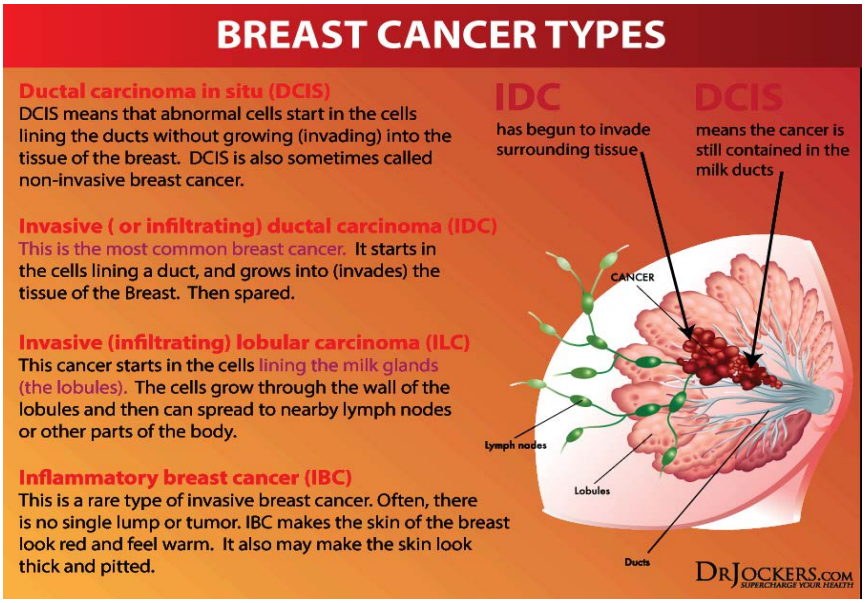
- Most common symptom associated with fibrocystic breast disease
- Cyclic vs noncyclic assessment
- Etiology: hormonal dysfunction, xanthines, saturated fats, stress
- Management: lifestyle modifications, dietary and vitamin supplements, NSAIDs, hormonal therapies, prescription medications

Breast Cancer Risk

- Risk Factors
  - Modifiable
    - Female
    - Age > 45
    - Genetics/Family History/Personal History
    - Race and Ethnicity
    - Breast Density
    - Some Benign Breast Conditions
    - LCIS
    - Age of menarche/menopause
    - Chest wall irradiation
    - DES exposure

Breast Cancer Risk

- Modifiable Risk Factors
  - Not having children/delayed childbearing (slight increase risk)
  - OCP/implant use (slight increase risk)
  - Hormone therapy after menopause (risk inc after 2 years of use)
  - Breastfeeding (slight risk reduction)
  - Alcohol consumption
  - Obesity
  - Physical activity (slight risk reduction)



Less Common Types of Breast Cancer

- Medullary carcinoma (5%)
- Mucinous (colloid) carcinoma (<5%)
- Tubular carcinoma (1-2%)
- Papillary carcinoma (1-2%)
- Metaplastic (<1%)
- Paget Disease (1-4%)

Surgical Approaches

- Lumpectomy
  - Oncoplastic Tissue Rearrangement
- Mastectomy
  - Total
  - Modified Radical
  - Radical

Surgical Approaches

- Sentinel Lymph node biopsy
- Axillary lymph node dissection
  - Axillary reverse mapping
  - Targeted axillary node dissection

Medical Management

- Chemotherapy
  - Oncotype Dx
  - Mammaprint
  - Prosigna
- Endocrine Therapy
  - SERMs
  - Aromatase Inhibitors
  - Ovarian Suppressoin

Radiation Therapy

- For patients undergoing lumpectomy
- For patients s/p mastectomy with invasive tumor > 5cm or positive lymph nodes
- Daily M-F, generally for 4-6 weeks

Implications of Treatment of Breast Disease

- Monitoring for recurrence
- Short and long term surgery side effects
- Short and long term chemotherapy/endocrine therapy side effects
- Short and long term radiation side effects

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