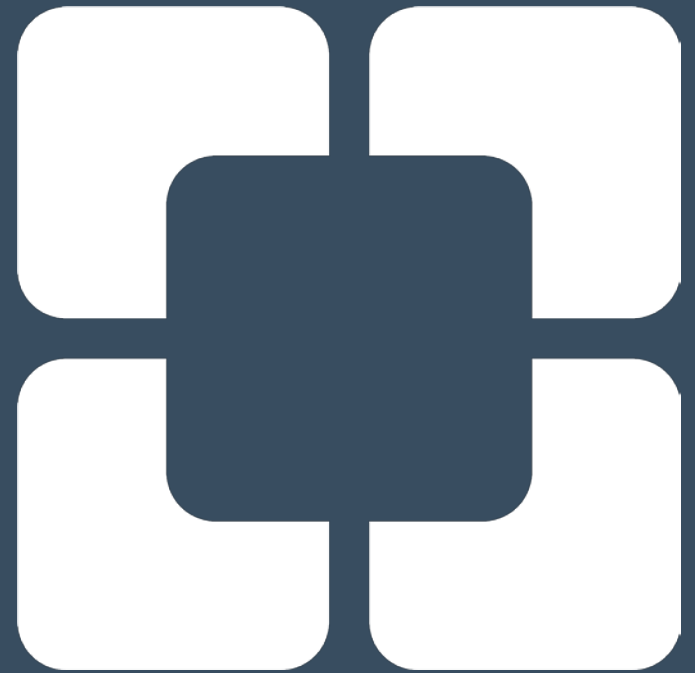


# Breast Cancer Screening and Surgery

April 26, 2018

Ashley B. Simpson, DO



# Objectives

- Breast cancer screening
- Common breast complaints
- Surgical management of breast cancer



# Breast Screening



# Question 1

- At what age and frequency should women begin screening mammography?
  - A. Every 2 years at age 40
  - B. Every 2 years at age 50
  - C. Annually at age 40
  - D. Annually at age 50
  - E. none of the above



# Introduction

- Breast cancer is the leading form of cancer in women.
- In 2017 nearly 30% of cancers diagnosed in women were breast cancers.
- Since 1989 deaths from breast cancer have steadily declined
  - screening mammography leading to earlier detection

# Who Should Be Screened?



AMERICAN COLLEGE OF  
OBSTETRICIANS AND  
GYNECOLOGISTS



American College of Physicians  
Leading Internal Medicine, Improving Lives



International Agency  
Research on Cancer



U.S. Preventive Services  
TASK FORCE



World Health  
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Comprehensive  
Cancer  
Network®

NCCN Clinical Practice Guideline in Oncology (NCCN Guidelines®)

# Breast Cancer Screening and Diagnosis

Version 1.2016 — July 27, 2016

[NCCN.org](http://NCCN.org)

**Risk Assessment!**

# Risk Stratification- How?

## Tyrer Cuzick Model

- Most useful model
- Takes into account 1-3<sup>rd</sup> degree family members with breast / ovarian cancer
- Age of menarche and menopause, AFLB, breastfeeding, BMI, previous biopsies of atypia, known BRCA mutations within the family
- Calculates lifetime risk, risk of a BRCA mutation



Woman's age:  Menarche:

Nulliparous: ☐  
Parous: ☒ Age First Child:   
Unknown: ☐

Hyperplasia (without atypia): ☒ Atypical hyperplasia: ☐ LCIS: ☐ Ovarian cancer: ☐

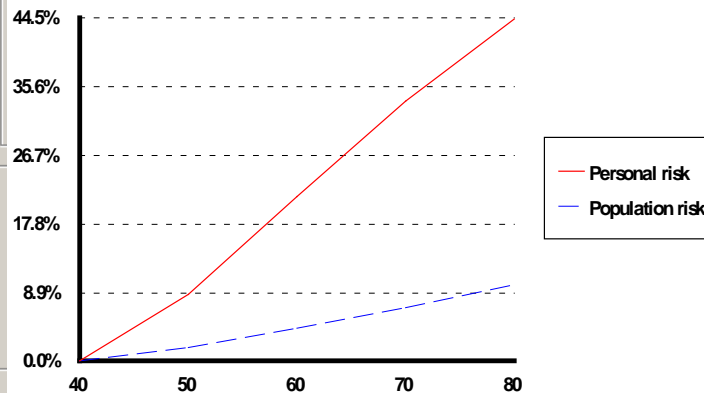
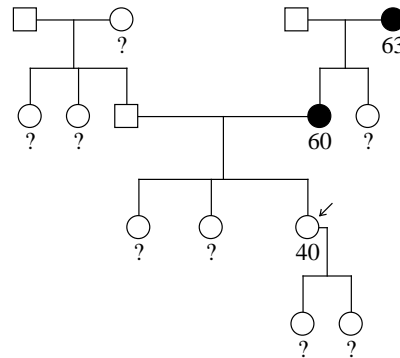
Ovarian: ☐  
Bilateral: ☐  
Mother: Breast cancer: ☒ Age:

Paternal Gran: Ovarian: ☐ Breast cancer: ☐ Age:

Paternal aunts: Number:  Ovarian: ☐ Breast cancer: ☐ Age:

Woman's age is 40 years.  
Age at menarche was 14 years.  
Age at first birth was 30 years.  
Person is premenopausal.  
Height is 5 ft 5 ins.  
Weight is unknown.  
Woman has never used HRT.  
Woman has had hyperplasia without atypia.

Risk after 10 years is 8.474%  
10 year population risk is 1.606%  
Lifetime risk is 44.33%  
Lifetime population risk is 9.736%  
Probability of a BRCA1 gene is 0.062%  
Probability of a BRCA2 gene is 2.292%

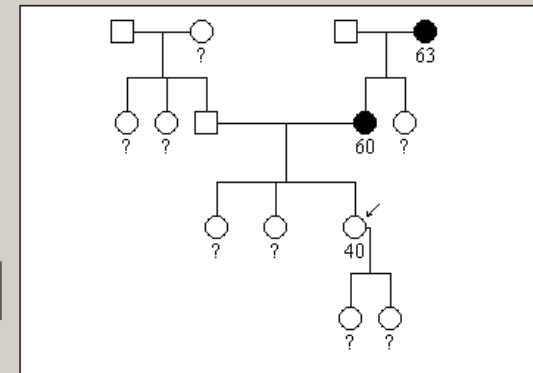


Patient id:  Patient no.:

Calculate Risk

View Family History

HRT use  
Length of use (years):   
Never: ☒  
5 or more years ago: ☐  
Less than 5 years ago: ☐  
Current user: ☐



Daughters:  Ovarian: ☐ Breast cancer: ☐ Age:

# Risk Stratification- How?

## Gail Model

- Calculates 5 year risk
- More limited- low sensitivity and specificity
- Cannot be used to assess role for genetic testing
- Women must be at least 35 to use this model



# Average Risk

- No personal history of biopsy proven atypia or cancer
  - No known genetic predisposition to cancer,
  - Less than 20% lifetime risk of cancer based on risk models.
- 
- Currently, regardless of the model used, there is no method for determining that a patient has a “low” risk patient for breast cancer.

# Average Risk Recommendations

- Breast self-awareness and clinical breast exam along with digital mammography
- Annual mammogram at age 40
- Begin clinical exam every three years before age 40 and annually after 40
- Practice ***self breast awareness***



# Moderate Risk

- Personal history of biopsy-proven atypia or lobular carcinoma in situ (LCIS)
  - ADH 30% risk of developing breast cancer (NEJM)
- First-degree relatives with breast or ovarian cancer
- History of radiation to the chest wall before age 30

# Moderate Risk Recommendations

- Mammography ten years prior to the earliest first-degree relative but not before age 25
- Begin screening 8 years after treatment for patients with chest radiation
- Magnetic Resonance Imaging (MRI) in addition to annual digital mammography screening

# High Risk

- High-risk women have a significantly increased lifetime risk of developing breast cancer
  - > 20% lifetime risk
- Important to discuss all options available for reducing risk
- Lifetime risk is as high as 87% and the risk of ovarian cancer can be as high as 54% with a BRCA 1/2 gene mutation

# High Risk Recommendations

- Initial screening should begin with MRI at the age of 25 and mammogram at age 30.
- Annual MRI until the age of 75
- In women with a known BRCA mutation:
  - Ovarian cancer screening
  - Consider risk reducing mastectomy
  - Consider risk reducing BSO





# Which Test is the Right Test?

- Mammogram
  - Screening
  - Diagnostic
- Ultrasound
- MRI
- Other Modalities



# Patient Education

- Self Breast Awareness
  - Optimal on days 7-15 of menstrual cycle
  - “Know Your Normal”
- Modifiable Risk Factors
  - Obesity
  - More than 1 alcoholic beverage / day
  - HRT
  - Nulliparous / AFLB > 30



# Provider Education

- Annual clinical breast exams
- Obtain detailed family history
  - Type of cancer
  - Age of diagnosis
  - Include several generations
- Identify patients who may benefit from enhanced screening options



# Common Breast Complaints



## Question 2

- What percentage of patients who present with nipple discharge will have breast cancer?
  - A. 0.5%
  - B. 2%
  - C. 7%
  - D. 10%
  - E. 15%



# Answer: B

- Roughly 2% of breast cancers present with nipple discharge.



# Topics

- Nipple Discharge
- Focal Pain
- Skin Changes



# Case 1

- LH is a 48 year old female presents with single duct brown discharge that is spontaneous
- No FH breast cancer.
- Never had a mammogram
- No risk factors for breast cancer





# Nipple discharge

- Most common complaints
- 50-80 % women have had some sort of fluid
- 5-7% referred to surgeons
- Most common etiology is BENIGN



# Nipple Discharge: Evaluation

- Goals: distinguish between benign or pathologic
  - Papilloma, cancer, high risk lesions
- History is most helpful:
  - Benign – bilateral, multiductal, occurs with manipulation
  - Concerning – unilateral, uniductal, spontaneous, bloody



# Types of Discharge

- Lactational
- Physiologic
- Pathologic



# Lactational Discharge

- Postpartum discharge can last at least 6 months after cessation of breastfeeding
- Bloody discharge can be seen in 20% of women during pregnancy and is usually benign (ductal hyperplasia)
- Bloody discharge seen in 15% of lactating women. Self-limiting, if not refer to a surgeon.

# Physiologic Discharge

- Non pathologic, Unrelated to pregnancy or breastfeeding
- Galactorrhea – milky discharge involving multiple ducts bilaterally.
  - Neurogenic stimulation
  - Breast compression
  - Stresses affecting dopamine release



# Physiologic Discharge

- Absence of Galactorrhea
  - Multiple ducts – elicited, bloody or non bloody, bilateral, black or clear, green
  - Fibrocystic changes or ductal ectasia
  - Green nipple discharge is textbook for fibrocystic changes (not molded milk!)
  - Reassurance



# Duct Ectasia

- Major subareolar ducts dilate during aging
- Nipple discharge common
- Scarring due to periductal inflammation
  - most common cause of benign acquired nipple inversion
  - On exam if nipple can be easily everted there is no malignancy

## Medications that cause hyperprolactinemia

Medication class	Frequency of prolactin elevation*	Mechanism
<b>Antipsychotics, first generation</b>		
Chlorpromazine	Moderate	Dopamine D <sub>2</sub> receptor blockade within hypothalamic tuberoinfundibular system
Fluphenazine	High	
Haloperidol	High	
Loxapine	Moderate	
Perphenazine	Moderate	
Pimozide	Moderate	
Thiothixene	Moderate	
Trifluoperazine	Moderate	
<b>Antipsychotics, second generation</b>		
Aripiprazole	None or low	Dopamine D <sub>2</sub> receptor blockade
Asenapine	Moderate	
Clozapine	None or low	
Iloperidone	None or low	
Lurasidone	None or low	
Olanzapine	Low	
Paliperidone	High	
Quetiapine	None or low	
Risperidone	High	
Ziprasidone	Low	
<b>Antidepressants, cyclic</b>		
Amitriptyline	Low	Not well understood. Possibly by GABA stimulation and indirect modulation of prolactin release by serotonin.
Desipramine	Low	
Clomipramine	High	
Nortriptyline	None	
<b>Antidepressants, SSRI</b>		
Citalopram, fluoxetine, fluvoxamine, paroxetine, sertraline	None or low (rare reports)	Same as for cyclic antidepressants
<b>Antidepressants, other</b>		
Bupropion, venlafaxine, mirtazapine, nefazodone, trazodone	None	Not applicable
<b>Antiemetic and gastrointestinal</b>		
Metoclopramide	High	Dopamine D <sub>2</sub> receptor blockade
Domperidone (not available in United States)	High	
Prochlorperazine	Low	
<b>Antihypertensives</b>		
Verapamil	Low	Not well understood. Specific to verapamil. May involve calcium influx inhibition within tuberoinfundibular dopaminergic neurons.
Methyldopa	Moderate	Decreased conversion of L-dopa to dopamine; suppression of dopamine synthesis
Most other antihypertensives (including other calcium channel blockers)	None	Not applicable
<b>Opioid analgesics</b>		
Methadone, morphine, others	Transient increase for several hours following dose	Potentially an indirect effect of mu opiate receptor activation

Medication induced hyperprolactinemia can cause decreased libido and erectile dysfunction in men and galactorrhea and amenorrhea in women.

GABA: gamma-aminobutyric acid; SSRI: selective serotonin reuptake inhibitor.

\* Frequency of increase to abnormal prolactin levels with chronic use: high >50 percent; moderate: 25 to 50 percent; low: <25 percent; none or low: case reports. Effect may be dose-dependent.



# Causes of Nipple Discharge

General Causes and Frequency of Nipple Discharge, Palpable Mass, and Age Distribution in 204 Patients

Histologic Disease	Types of Secretion (n)					Age (yr)			
	Cases	Milky	Greenish	Serous	Bloody	Total	Palpable Tumor (n)	Range	Mean
Fibrocystic disease	65	3	24	16	22	65 (32%)	14	20-58	43
Mammary duct ectasia	23		3	7	13	23 (11%)		20-73	53
Papilloma	68			20	48	68 (33%)	5	28-81	51
Papillomatosis	30			8	22	30 (15%)	3	36-77	53
Carcinoma	18			3	15	18 (9%)	7	40-78	59
<b>Total</b>	<b>204</b>	<b>3</b>	<b>27</b>	<b>54</b>	<b>120</b>	<b>204 (100%)</b>	<b>29</b>		

Modified from Tabár L, Dean PB, Péntek Z: Galactography: The diagnostic procedure of choice for nipple discharge. Radiology 149:31-38, 1983.

# Pathologic Discharge

- Unilateral, single duct, persistent, spontaneous, associated with mass
- Serous, sanguinous, serosanguinous
- Most common reason: papilloma
  - (52-57%)
- Papillomas may harbor atypia or DCIS
- Malignancy in 5-15% pathologic discharge

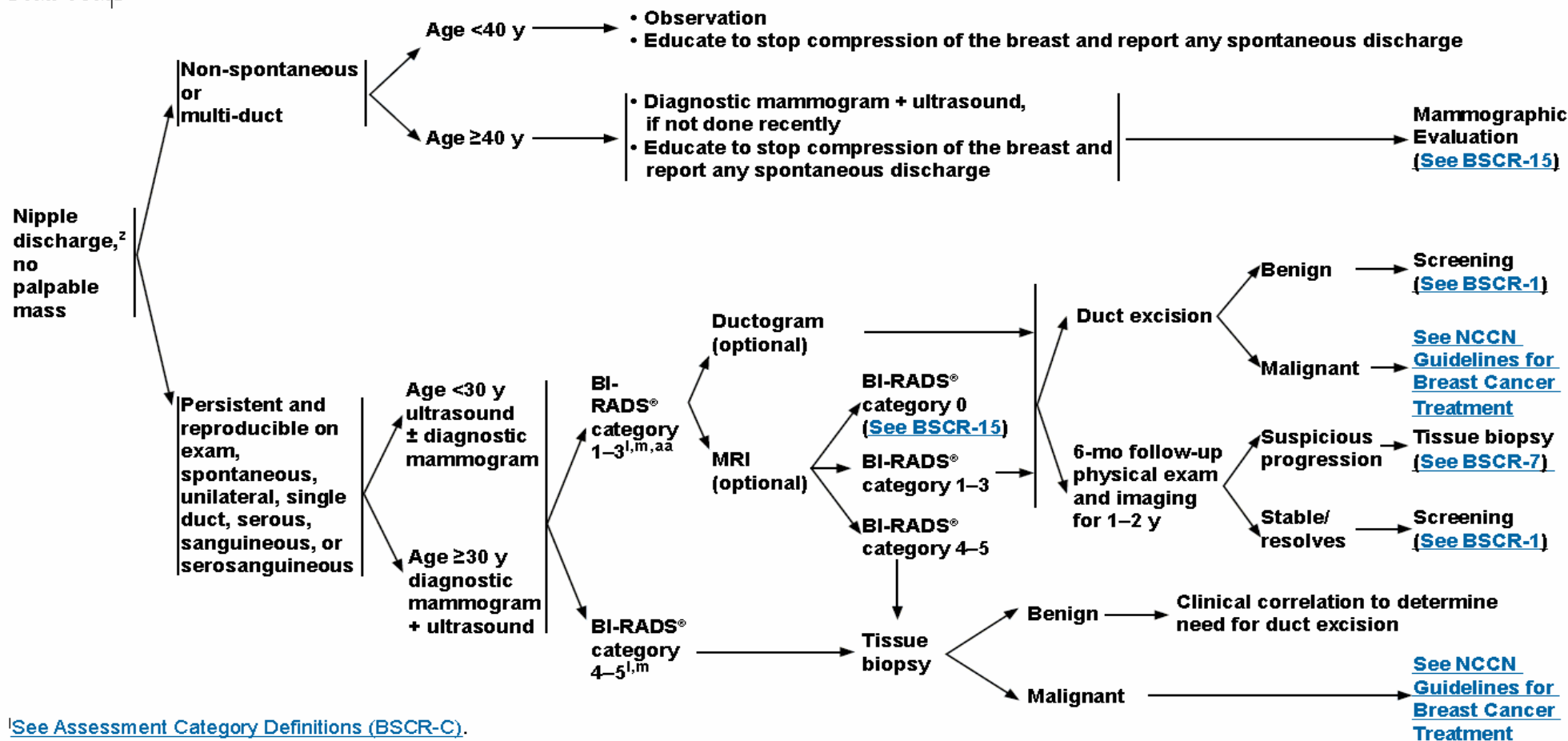
# Pathologic Discharge

- Age is predictive of cancer risk with nipple discharge
- <40 – 3%
- 40-60 – 10%
- >60 – 32%



### PRESENTING SIGNS/ SYMPTOMS

### DIAGNOSTIC FOLLOW-UP



<sup>l</sup>See Assessment Category Definitions (BSCR-C).

<sup>m</sup>Mammography results are mandated to be reported using Final Assessment categories (Quality Mammography Standards: Final Rule. Federal Register. 1997;62:55988).

<sup>z</sup>A list of drugs that can cause nipple discharge (not all-inclusive): Psychoactive drugs, antihypertensive medications, opiates, oral contraceptives, and estrogen

<sup>aa</sup>If BI-RADS Category 3 finding is unrelated to nipple discharge, manage mammographic finding by [BSCR-15](#).

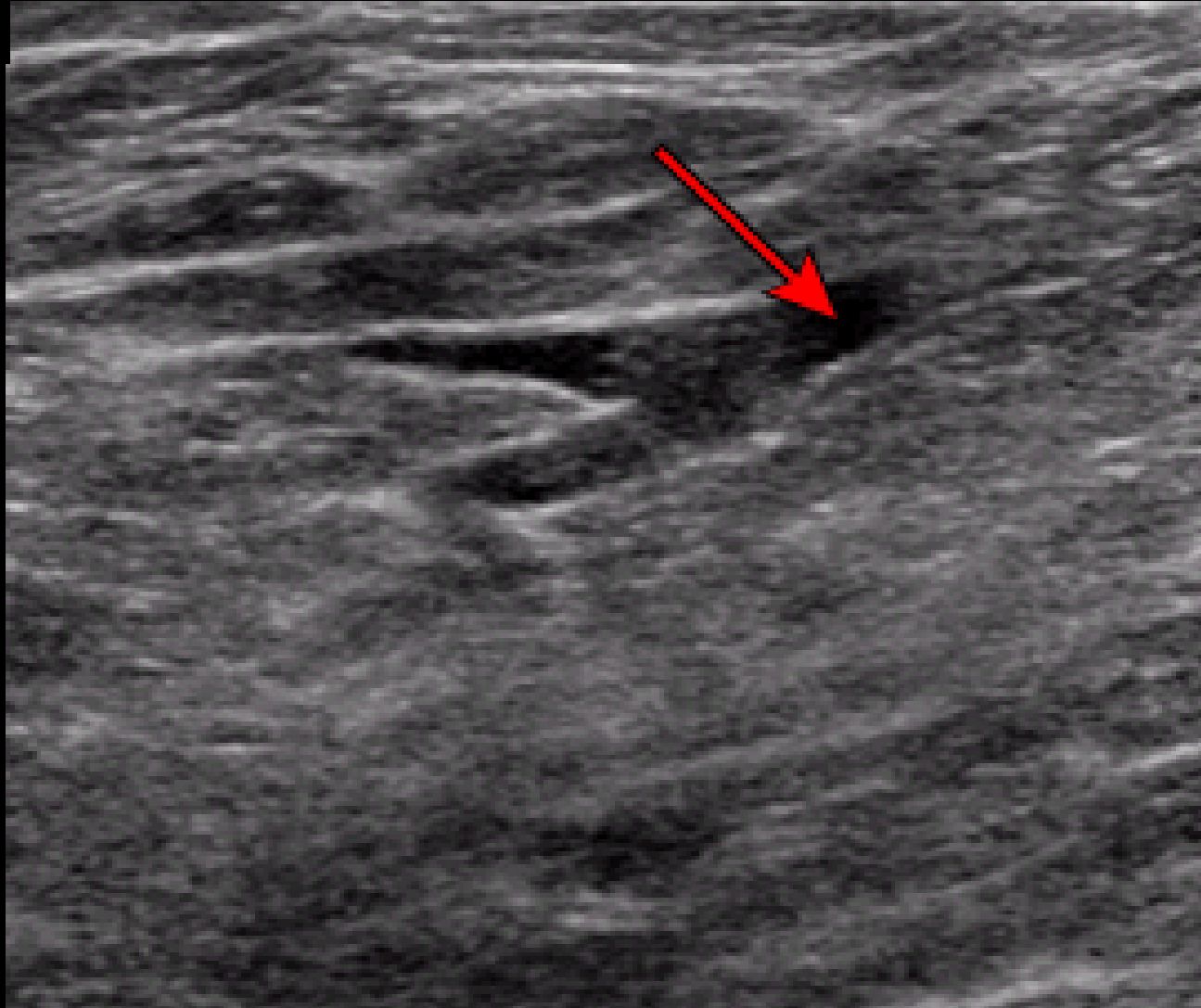
Note: All recommendations are category 2A unless otherwise indicated.

Clinical Trials: NCCN believes that the best management of any cancer patient is in a clinical trial. Participation in clinical trials is especially encouraged.

# Evaluation

- History and Physical
- Diagnostic Evaluation: Bilateral diagnostic mammogram and retroareolar ultrasound
- Referral to a surgeon: spontaneous, unilateral, single duct discharge, bloody, or clear, or reassurance
- Cytologic examination not necessary

# Intraductal papilloma



# Case 1

- Patient underwent diagnostic imaging and retroareolar ultrasound that showed a retroareolar mass
- Minimally invasive biopsy showed an intraductal papilloma with atypia
- On excisional biopsy, the patient was shown to have DCIS



# Case 2

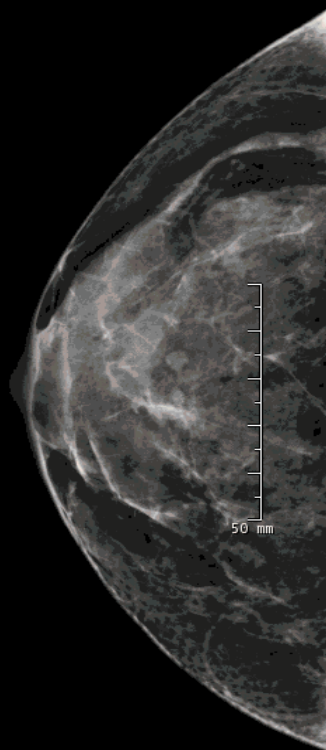
- 52 year old with focal pain in the right upper inner quadrant breast
- Diagnostic mammogram (tomosynthesis) was negative
- CBE 1.5 cm mobile irregular mass in the upper inner quadrant breast



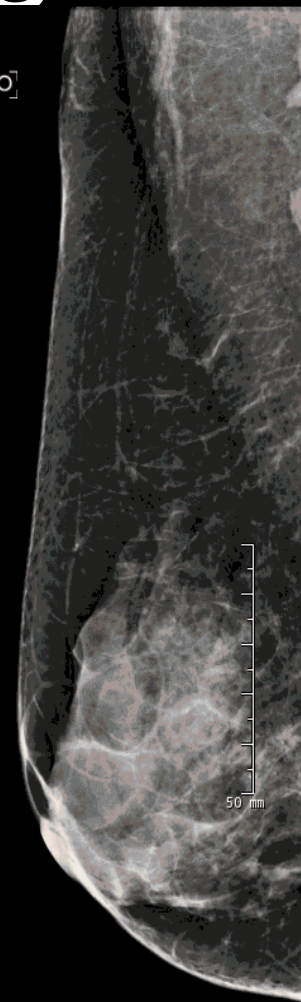


# Diagnostic Mammogram

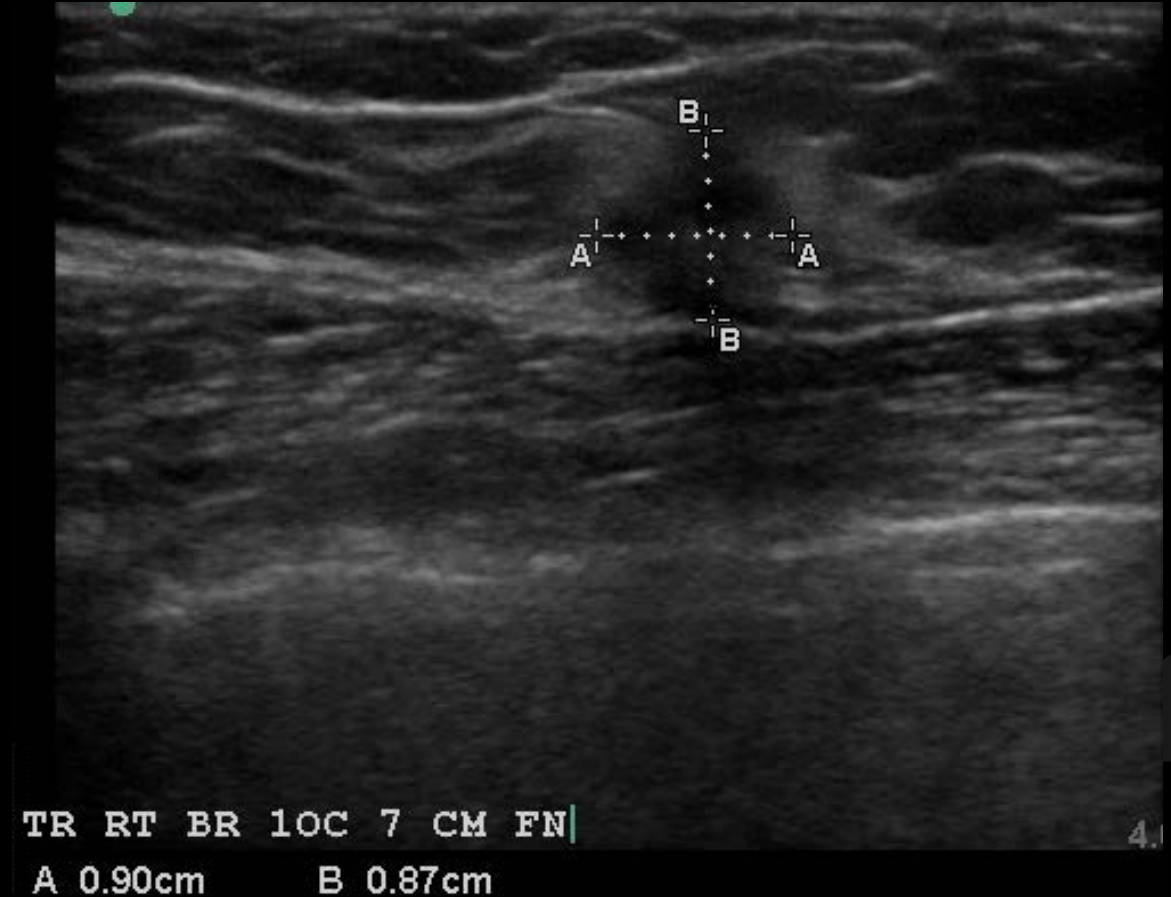
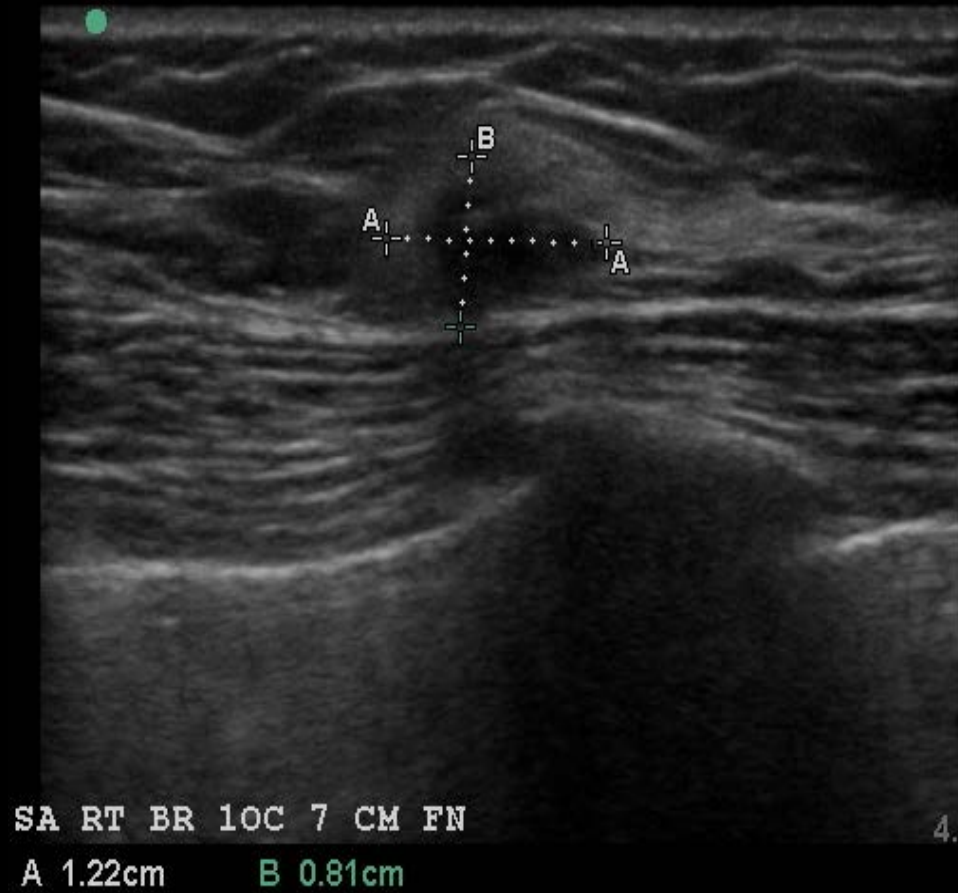
[P RCC]



[P RMLO]



# Ultrasound



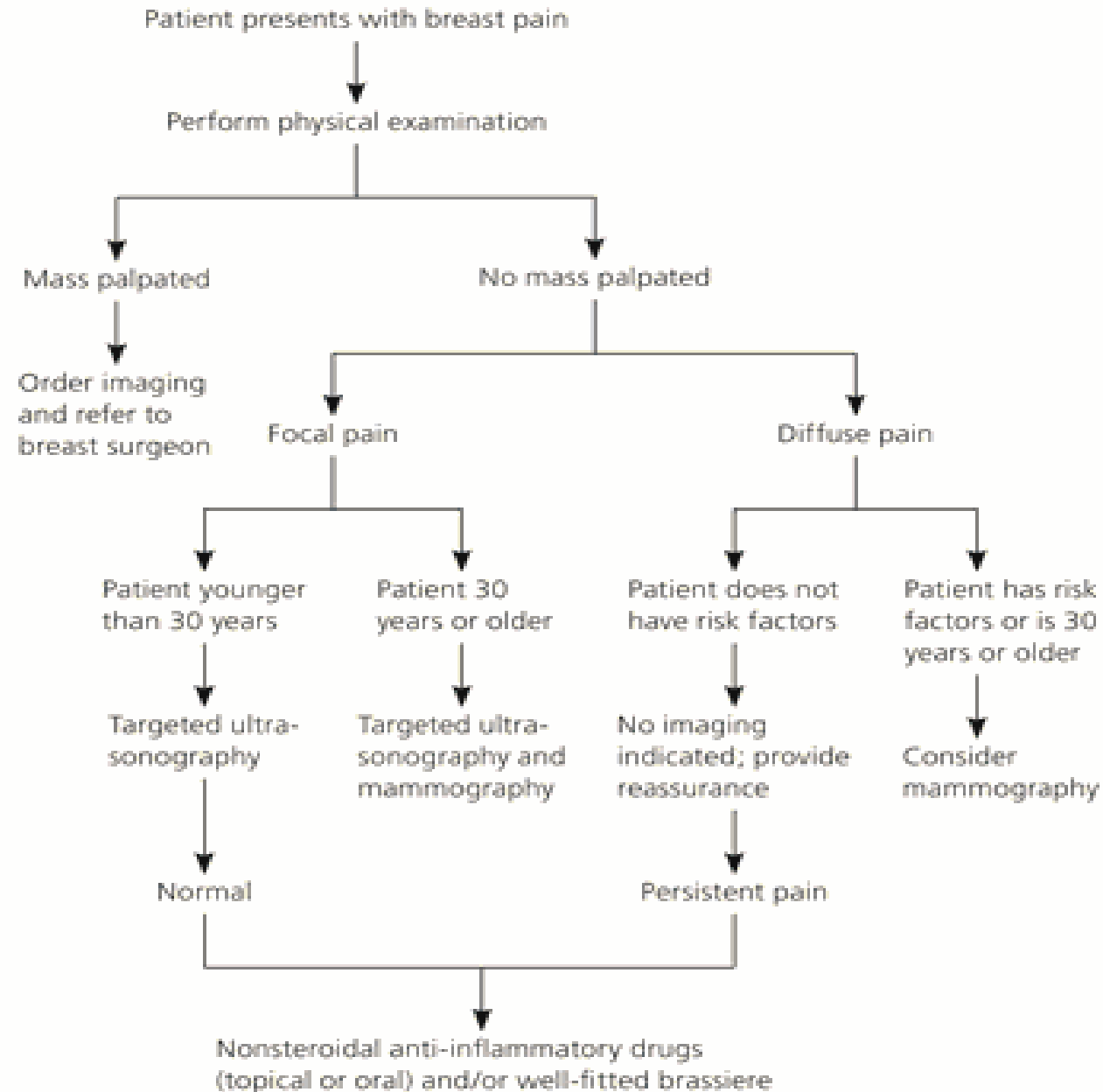
# Breast Pain

- Cyclical
  - hormonal changes with menstrual cycle
  - bilateral and more common in UOQ
- Noncyclical – unilateral
  - Pendulous breasts, diet/lifestyle
  - HRT, ductal ectasia, mastitis, breast cancer
  - hidradenitis suppurativa
  - pregnancy, trauma, cysts, medications

# Evaluation

- History and Physical
- Focal pain with or without a mass
  - diagnostic imaging
- Most breast pain is benign
  - 0.5-3.3% breast pain associated with cancer.
- Refer for any concern despite negative imaging

## Approach to the Patient with Breast Pain



# Case 2

- Patient underwent a minimally invasive biopsy that showed a malignancy



# Skin Changes

- Nipple Areolar Eczema vs. Paget's
- Infection vs. Inflammatory
- Sebaceous cyst vs. Malignancy



# Eczema

- Characterized by thickened skin, increased skin markings (lichenification), and excoriated, fibrotic papules.
- Involvement of nipple may mimic Paget's
- Generally bilateral, possible systemic





# Skin Changes

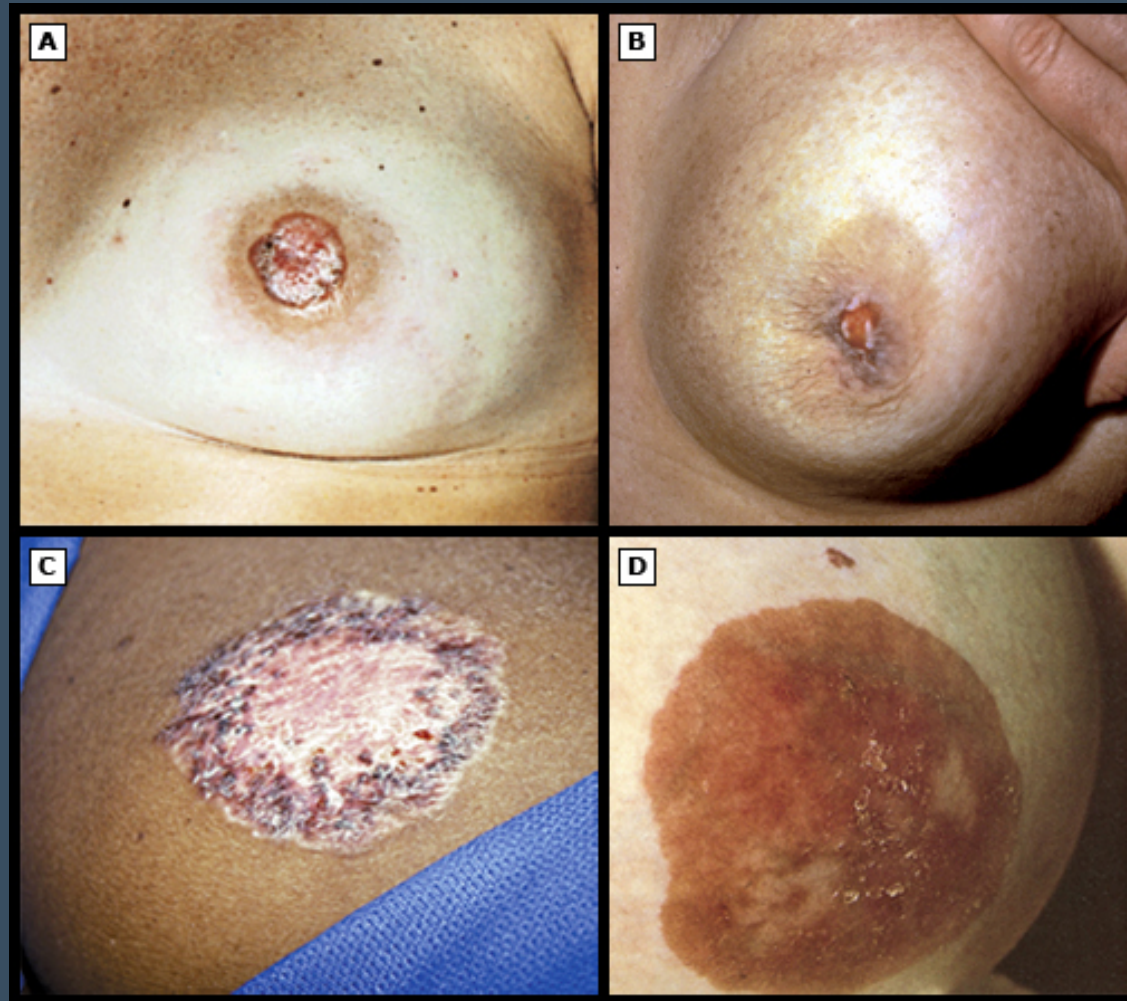
Nipple eczema



Paget's



# Paget's Disease



# Paget's Disease of the Breast

- Scaly, raw, vesicular, or ulcerated lesion that *begins on the nipple* and then spreads to the areola
- Occasionally bloody discharge is present
- Usually unilateral
- Nipple retraction
- Symptoms lasting months
  - May have delay in diagnosis

# Infection

- Lactational: commonly seen in first pregnancy and first 12 weeks of postpartum, weaning
  - Cracked nipple / skin abrasion – leading to edema of ducts and poor milk drainage leading to increased number of organisms
  - Sx: Pain, erythema, swelling, possible fluctuant mass



# Lactational Infection

- Management: antibiotics and breast feeding
- Improvement usually seen in 48-72 hours
- If a fluctuant mass – drain the abscess
  - Needle aspiration
- Reevaluate in 72 hours



# Non-lactational Abscess

- Central or periareolar infection
- Common in Cigarette smokers (Zuska's)
  - damages the wall of the subareolar ducts
- Causes periductal inflammation leading to periductal mastitis
- *Short* onset of central breast pain, mass, possible nipple retraction, purulent nipple discharge

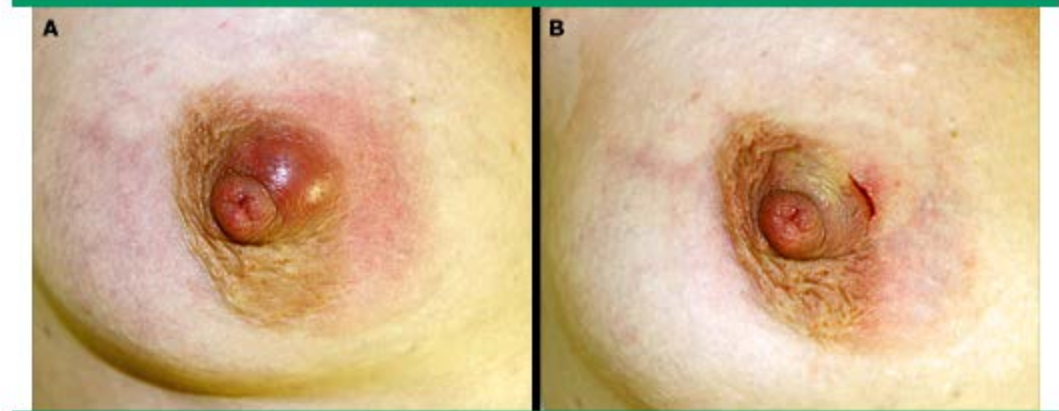
# Management

- Antibiotics and drainage
- Encourage smoking cessation
- Rule out inflammatory breast cancer if persistent redness
- Peripheral abscesses seen less common and may assoc with DM, rheumatoid arthritis, steroids, trauma





### Periareolar abscess



Periareolar abscess. Large incisions are not necessary for the drainage of a breast abscess.

*Courtesy of Michael J Dixon, MD.*



# Granulomatous Lobular Mastitis

- Non caseating granulomata and microabscesses.
- Causes: Autoimmune, sarcoidosis, Wegener's, arthritis, foreign body, TB, mycotic, parasitic, idiopathic,
- Firm mass – similar to malignancy





# Inflammatory Breast Cancer

- Red, warm, slightly indurated, tender breast with peau d'orange appearance
- Dermal lymphatics containing tumor emboli
- Vascular congestion and tissue edema
- *Onset over weeks*





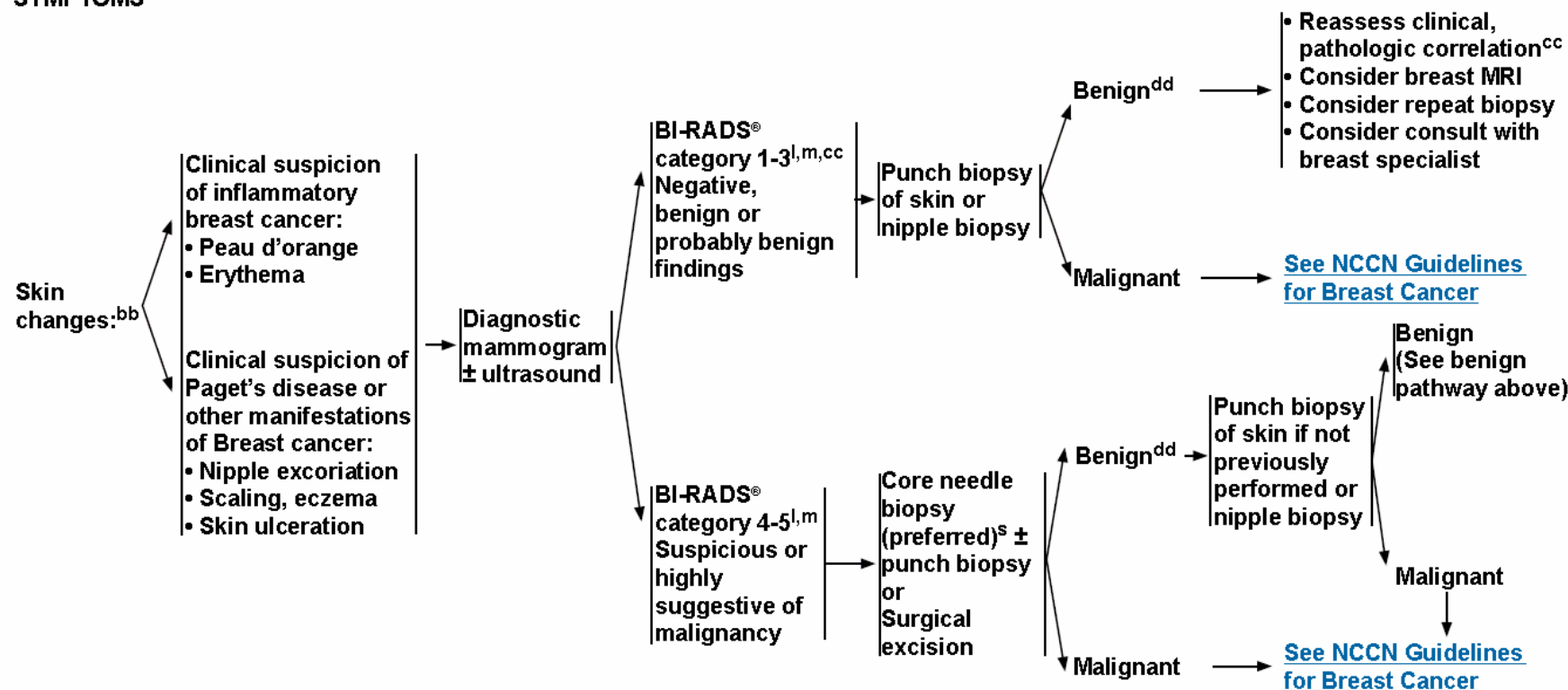
### Inflammatory breast cancer



It is important to rule out inflammatory breast cancer if a suspected breast infection does not respond to antibiotics.

PRESENTING SIGNS/  
SYMPTOMS

DIAGNOSTIC FOLLOW-UP



<sup>l</sup>See Assessment Category Definitions (BSCR-C).

<sup>m</sup>Mammography results are mandated to be reported using Final Assessment categories (Quality Mammography Standards: Final Rule. Federal Register. 1997;62:55988).

<sup>s</sup>FNA and core (needle or vacuum-assisted) biopsy are both valuable. FNA requires cytologic expertise. Surgical excision is appropriate if unable to perform core needle biopsy or if strongly desired by patient.

<sup>bb</sup>This may represent serious disease of the breast and needs evaluation.

<sup>cc</sup>If clinically of low suspicion for breast cancer or high suspicion for infection, a short trial (7–10 days) of antibiotics for mastitis may be indicated.

<sup>dd</sup>A benign skin punch biopsy in a patient with a clinical suspicion of inflammatory breast cancer does not rule out malignancy. Further evaluation is recommended.

Note: All recommendations are category 2A unless otherwise indicated.

Clinical Trials: NCCN believes that the best management of any cancer patient is in a clinical trial. Participation in clinical trials is especially encouraged.

# Breast Infections

- Quick onset, painful
- Start abx, REEXAMINE in 72 hours
- Ultrasound to evaluate for abscess
- Alternative diagnoses such as inflammatory breast cancer should also be considered



# Surgical Management of Breast Cancer



# Question 3

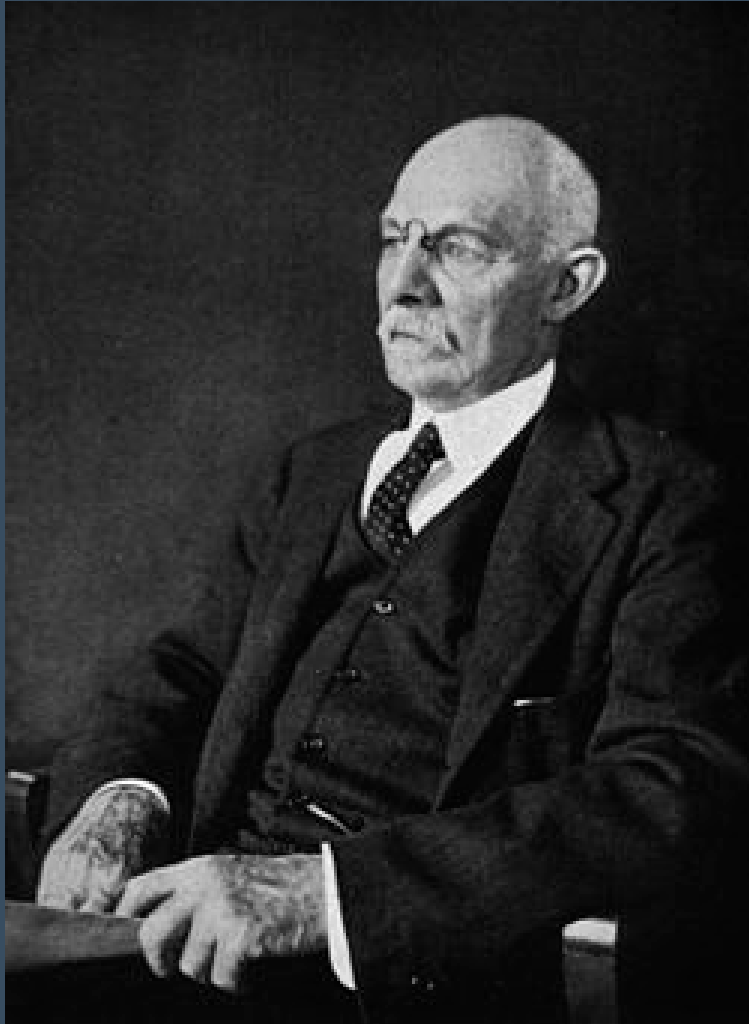
- Which statement is most accurate regarding mastectomy compared to breast conservation therapy(BCT)?
  - A. Rate of recurrence for mastectomy is lower than lumpectomy alone
  - B. There is no difference in overall survival with mastectomy compared to BCT
  - C. Tumors with aggressive biology are best treated with mastectomy
  - D. All of the above
  - E. A&B
  - F. A&C



# Answer: E

- Long term data has proven partial mastectomy (lumpectomy) combined with whole breast radiation is equivalent to mastectomy to overall survival.
- Lumpectomy alone carries a ~40% risk of recurrence compared to mastectomy (10%)
- Tumor biology alone should not direct surgical management

# Historical Perspective



- NSABP
  - B-04
  - B-06

## ORIGINAL ARTICLE

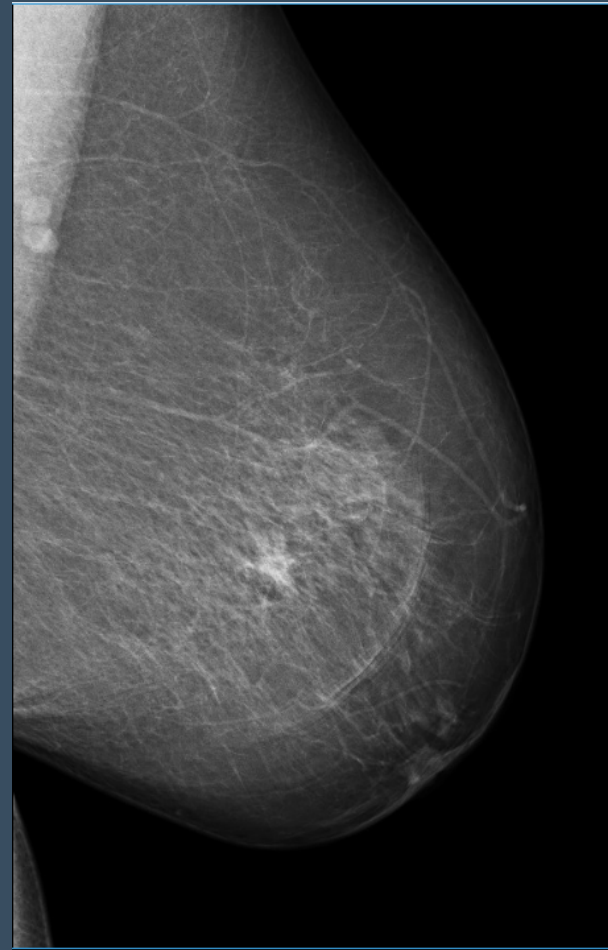
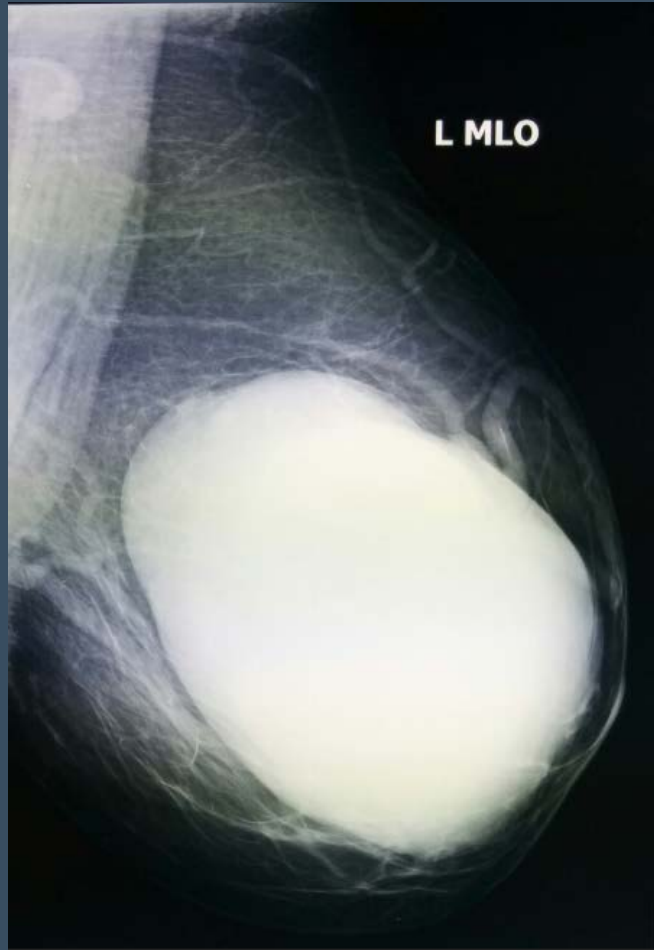
### Twenty-Five-Year Follow-up of a Randomized Trial Comparing Radical Mastectomy, Total Mastectomy, and Total Mastectomy Followed by Irradiation

Bernard Fisher, M.D., Jong-Hyeon Jeong, Ph.D., Stewart Anderson, Ph.D., John Bryant, Ph.D., Edwin R. Fisher, M.D., and Norman Wolmark, M.D.

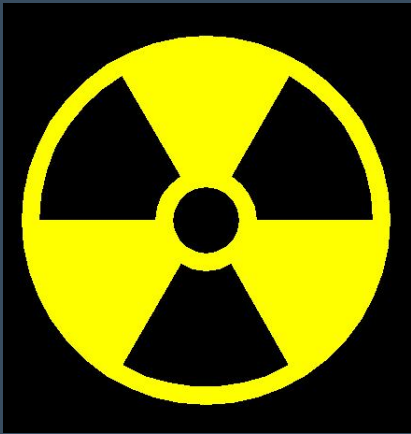
### TWENTY-YEAR FOLLOW-UP OF A RANDOMIZED TRIAL COMPARING TOTAL MASTECTOMY, LUMPECTOMY, AND LUMPECTOMY PLUS IRRADIATION FOR THE TREATMENT OF INVASIVE BREAST CANCER

BERNARD FISHER, M.D., STEWART ANDERSON, Ph.D., JOHN BRYANT, Ph.D., RICHARD G. MARGOLESE, M.D., MELVIN DEUTSCH, M.D., EDWIN R. FISHER, M.D., JONG-HYEON JEONG, Ph.D., AND NORMAN WOLMARK, M.D.

# BCT vs Mastectomy?



# BCT vs Mastectomy



+



=



# Potential Contraindications

- **Collagen vascular disease**
  - Lupus, scleroderma
- **Pregnancy (1<sup>st</sup> & 2<sup>nd</sup> trimester)**
- **Pacemakers**
- **History of previous breast/chest radiation**
- **Significantly compromised pulmonary / cardiac function**



# Tumor To Breast Ratio

- Neoadjuvant chemo can be used to shrink large tumors for patients who desire BCT
  - TNBC
  - HER2

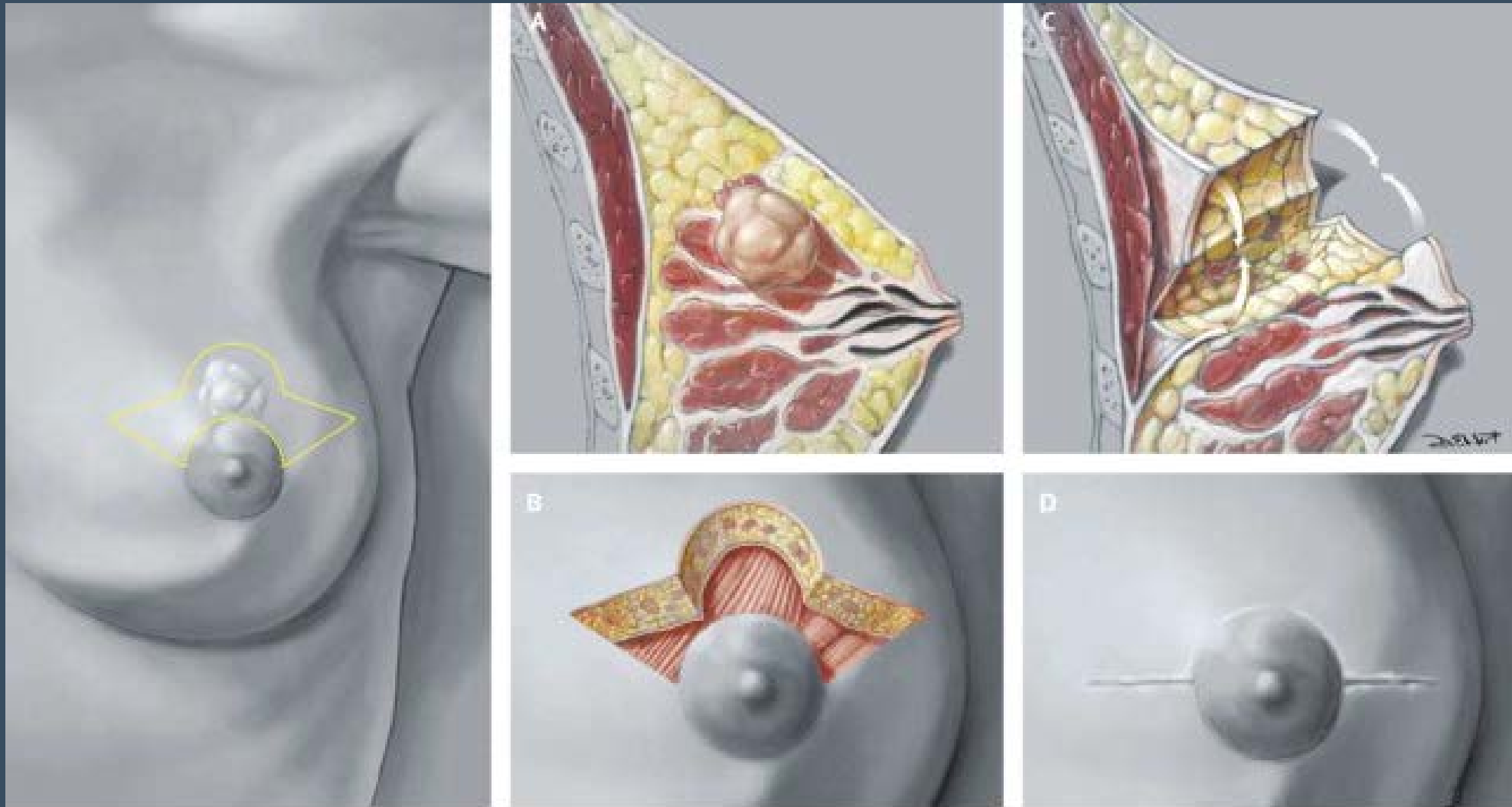


# Tumor to Breast Ratio

- 20% breast tissue removal results in deformity of the breast
- Oncoplastic surgery involves resection of the tumor with rearrangement of the breast tissue to correct deformity.

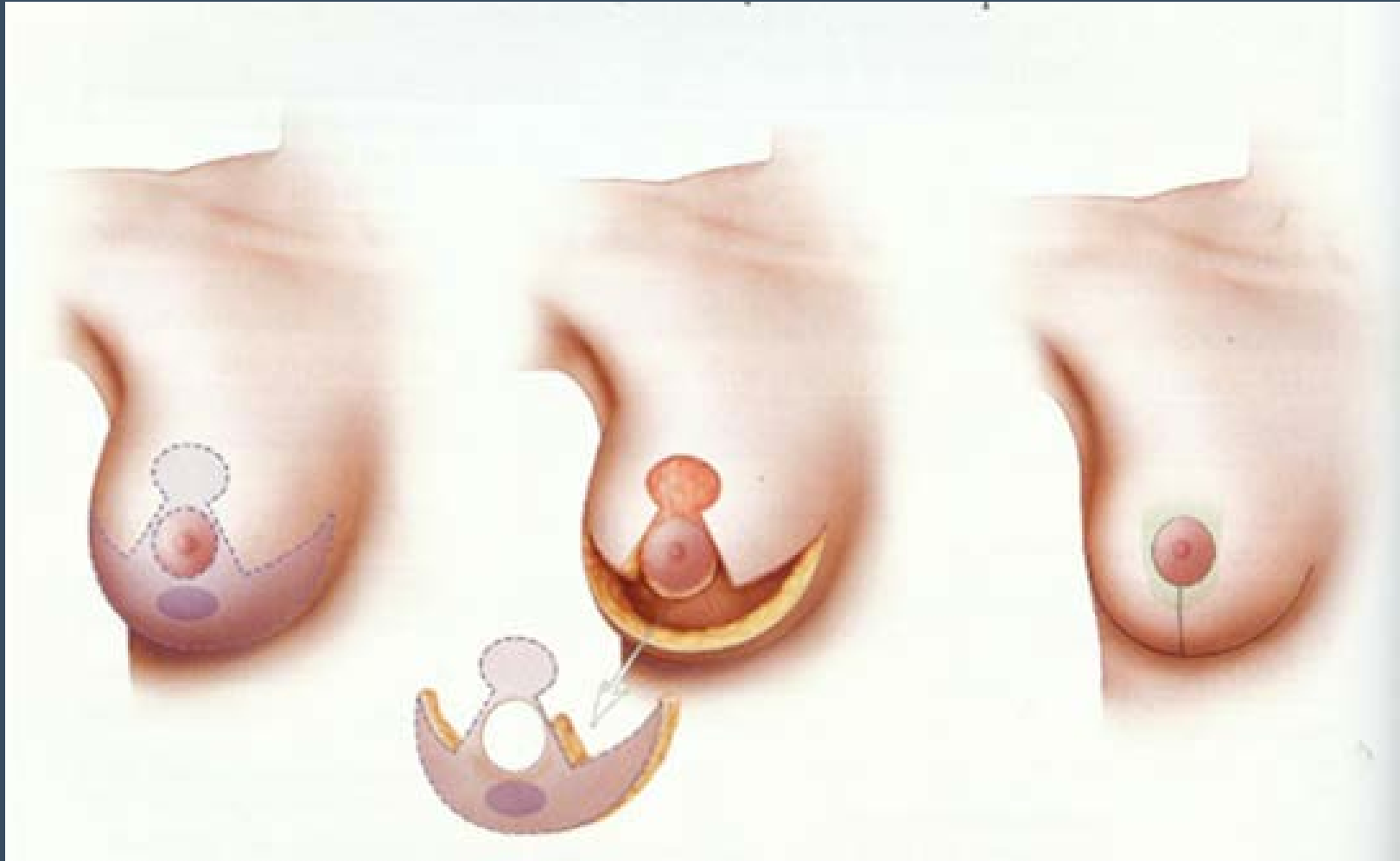


# Oncoplastic Surgery





# Oncoplastic Surgery- Wise Pattern



# Multi Centric Breast Cancer

- Synchronous tumors within different quadrants
- Significant deformity with BCT
- Best served with mastectomy



# Inflammatory Breast Cancer

- Rare < 5% breast cancers
- Aggressive
- Neoadjuvant chemo
- Modified radical mastectomy
- PMRT



# Surgical Options

## BCT

- Oncoplasty
- APBI
- IORT

## Mastectomy

- Nipple Sparing
- Direct to implant
- Autologous recon



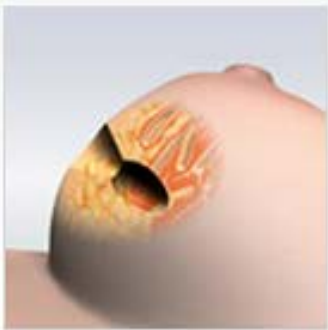
# Nipple Sparing Mastectomy



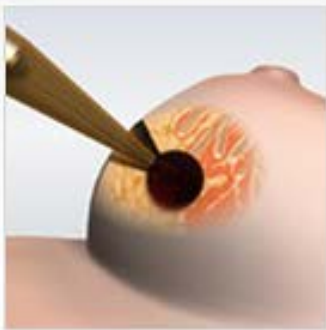
Bilateral Hidden Scar Mastectomy

*Photograph courtesy of Beth DuPree, MD,  
Holy Redeemer Health System,  
Meadowbrook, PA*

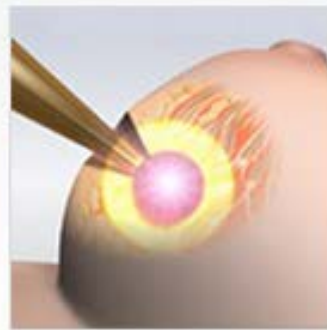
# IORT



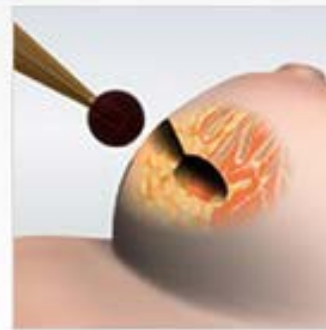
**Step 1:** INTRABEAM IORT is delivered during the lumpectomy procedure, immediately following tumor removal.



**Step 2:** After the surgeon has removed the tumor, the radiation oncologist positions the INTRABEAM applicator in the area of the breast where the tumor was located.



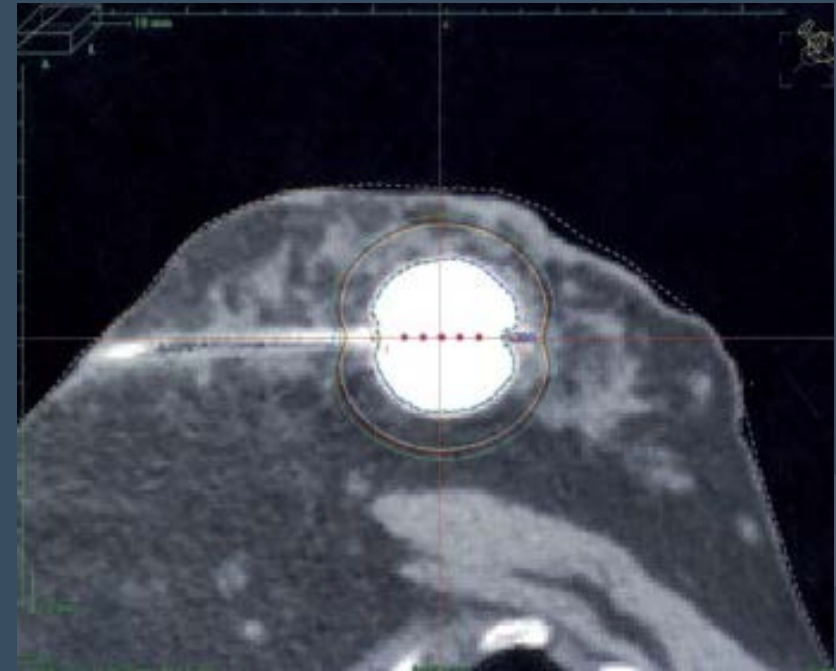
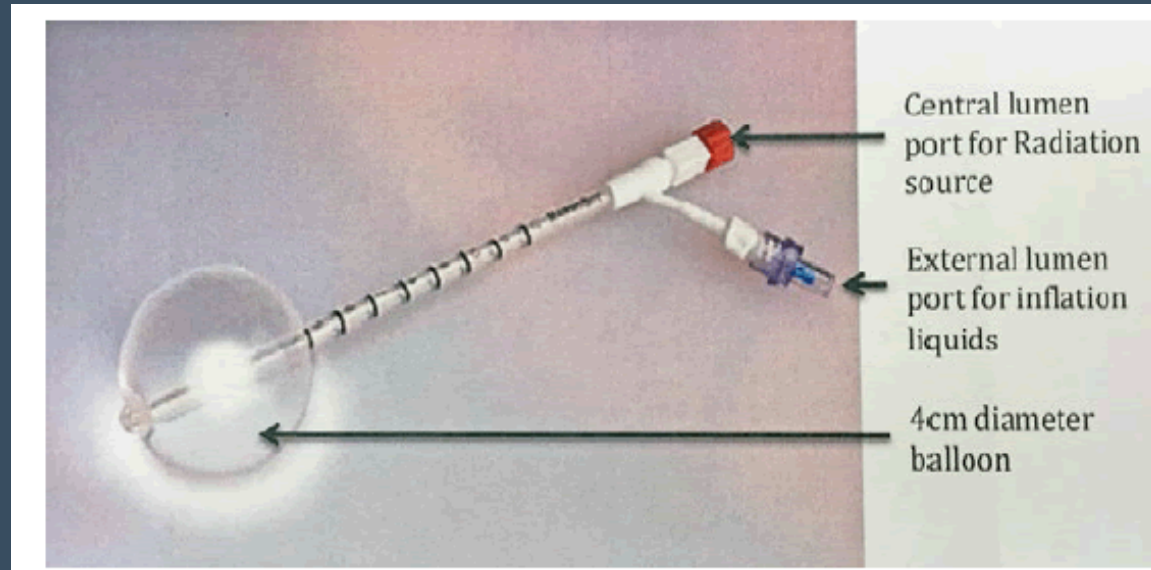
**Step 3:** Low energy radiation is delivered locally to the targeted tissue in the tumor bed, minimizing healthy tissue exposure to radiation.



**Step 4:** After 20-30 minutes of radiotherapy, the applicator is removed and the surgeon then closes the incision.



# APBI Mammosite





# Contralateral Prophylactic Mastectomy





# www.choosingwisely.org



Choosing Wisely<sup>®</sup>

*An initiative of the ABIM Foundation*

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## American Society of Breast Surgeons

Five Things Physicians and Patients Should Question

Released June 27, 2016

 [DOWNLOAD PDF](#)

1

**Don't routinely order breast MRI in new breast cancer patients.**

After a new diagnosis of breast cancer, breast MRI can be useful in selected patients to aid treatment decisions. However, there is a lack of evidence that routine use of MRI lessens cancer recurrence, death from cancer or the need for re-operation after lumpectomy surgery. The routine use of MRI is associated with an increased need for subsequent breast biopsy procedures, delays in time to treatment and higher cost of care. Increased mastectomy rates can occur if the MRI finds additional cancers or indeterminate findings cause patient anxiety, leading to patient requests for mastectomy.

2

**Don't routinely excise all the lymph nodes beneath the arm in patients having lumpectomy for breast cancer.**

After a new diagnosis of invasive breast cancer, most patients undergoing partial breast removal (lumpectomy) benefit from a sentinel node (SN) biopsy, a procedure that removes a small number of lymph nodes beneath

**Patient Materials**

- Search [patient-friendly resources](#) by Consumer Reports.

**We Can Do It!**





**Every life deserves world class care.**