



Evaluation and Management of Common Breast Problems

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Breast Center of Southern Arizona
November 18th, 2015



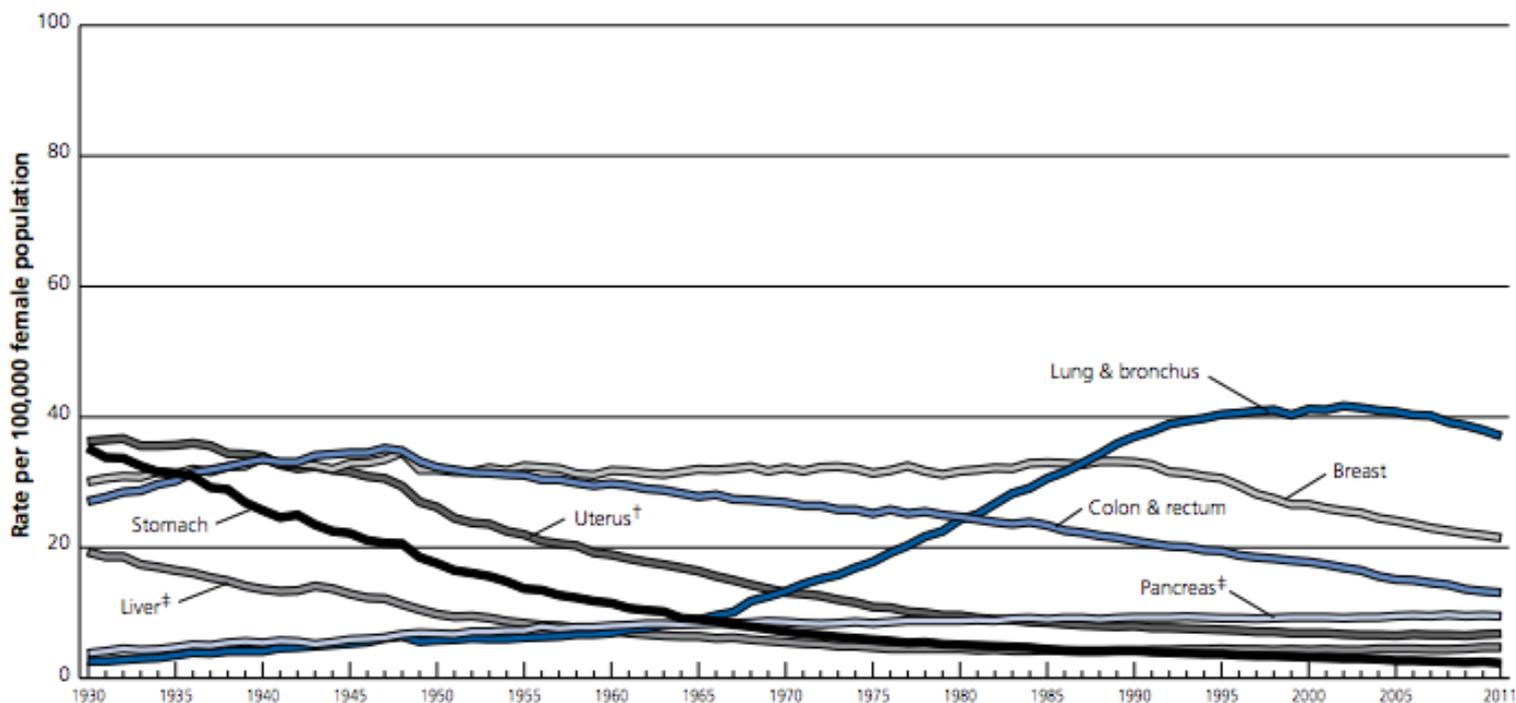
Breast Cancer

- Estimated new cases in 2015:
 - 230,000 invasive cancers
 - 60,000 insitu cancer
- 1 in 8 women will develop breast cancer during their lifetime.
- Incidence has been stable since 2003.
- Mortality is decreasing due to improvements in screening and treatment.



Cancer Death Rates

Trends in Age-adjusted Cancer Death Rates* by Site, Females, US, 1930-2011



*Per 100,000, age adjusted to the 2000 US standard population. †Uterus refers to uterine cervix and uterine corpus combined. ‡Mortality rates for pancreatic and liver cancers are increasing.

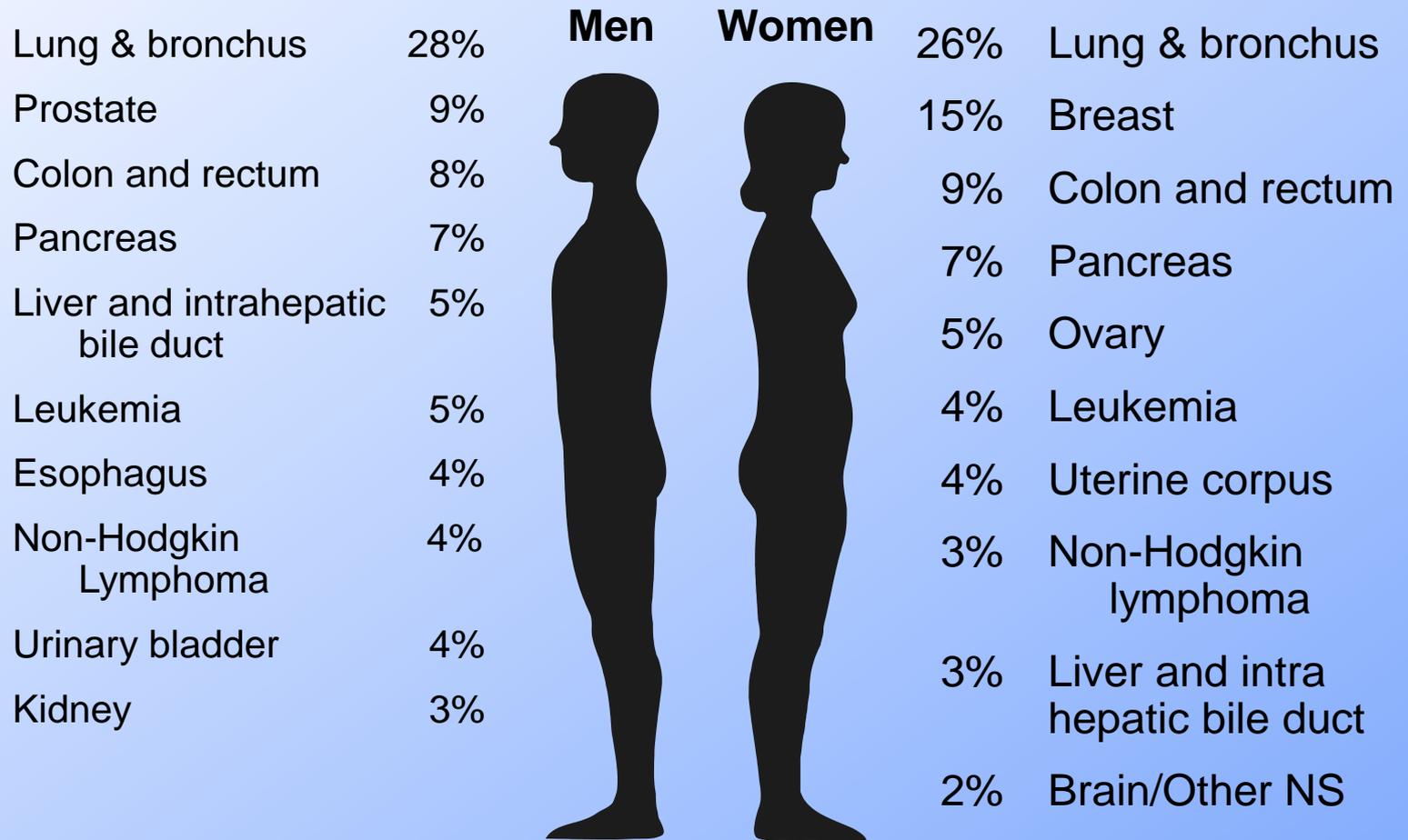
Note: Due to changes in ICD coding, numerator information has changed over time. Rates for cancer of the liver, lung and bronchus, and colon and rectum are affected by these coding changes.

Source: US Mortality Volumes 1930 to 1959 and US Mortality Data 1960 to 2011, National Center for Health Statistics, Centers for Disease Control and Prevention.

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2015 Estimated US Cancer Deaths





Screening for Breast Cancer

- Different recommendations depending on the source:
 - American Cancer Society (ACS)
 - National Comprehensive Cancer Network (NCCN)
 - U.S. Preventive Services Task Force (USPSTF)
- Just revised by the ACS, and currently under re-review by the USPSTF.
- Not an “exact science” and is based on old data (really old data).



American Cancer Society 2015

- Yearly mammograms are recommended age 45 to 54, then:
 - Every other year age 55 and older.
- Clinical breast exam is no longer recommended for women at average risk.
- No comment on breast “self awareness”.

Recommendations for a specific patient should be individualized based on risk and patient concerns.

National Comprehensive Cancer Network



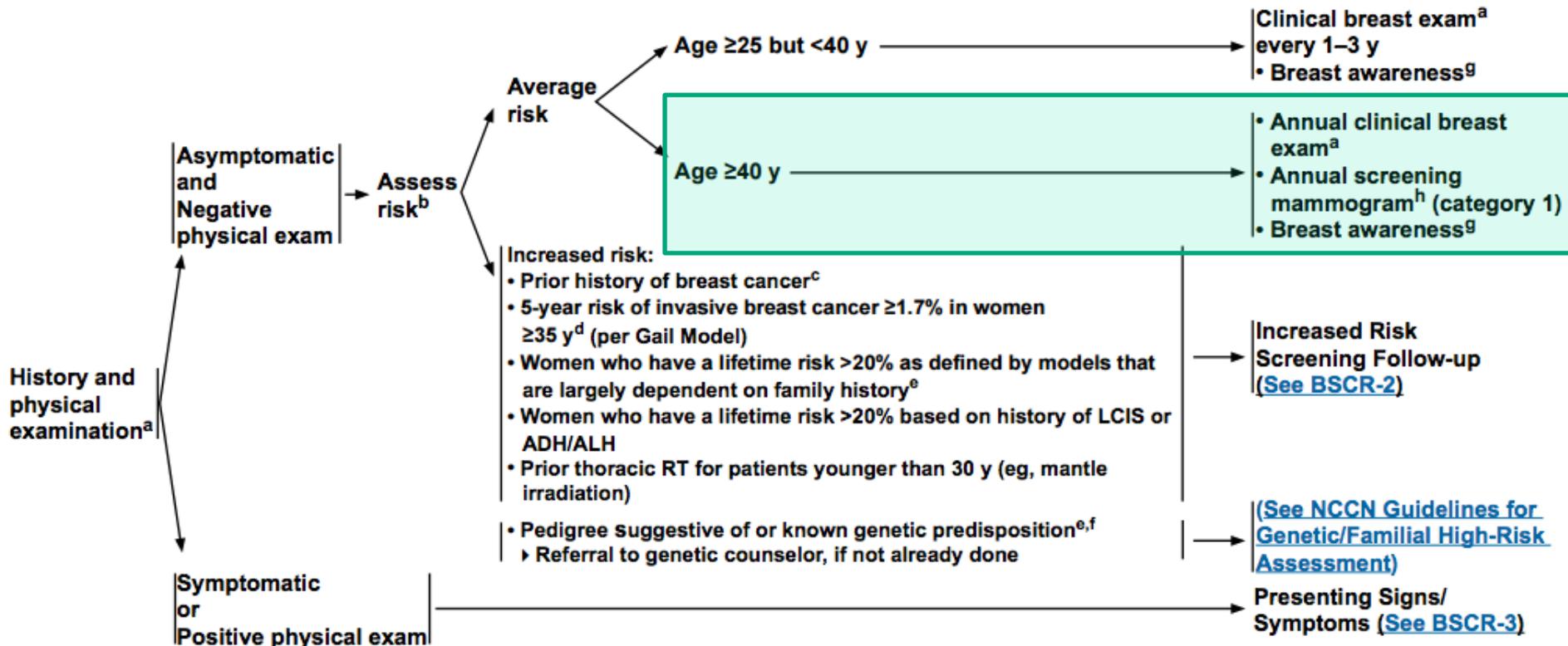
National
Comprehensive
Cancer
Network®

NCCN Guidelines Version 1.2015 Breast Cancer Screening and Diagnosis

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SCREENING OR SYMPTOM CATEGORY

SCREENING/FOLLOW-UP^a





U.S. Preventive Services Task Force

- Women age 50-74: Biennial screening mammography. Individualize for < 50 yo; of uncertain value >74 yo.
- Women age 40 older: “Current evidence is insufficient to assess the additional benefits and harms of clinical breast examination (CBE) beyond screening mammography in women 40 years or older.”
- All women: The USPSTF recommends *against* teaching breast self-examination (BSE).



Other Screening Modalities

- Screening MRI
 - Recommended by ACS and NCCN for patients with lifetime risk >20%
 - No data to support survival benefit except in BRCA positive patients; depends on complex risk calculations
- Screening whole breast ultrasound
 - FDA approved for additional screening for patients with mammographically dense breast tissue.
- “3D Mammography”
 - Reduces “call-backs”
 - May be more sensitive in detection of malignancy based on preliminary data.
- Thermography
 - NO, NO, NO!

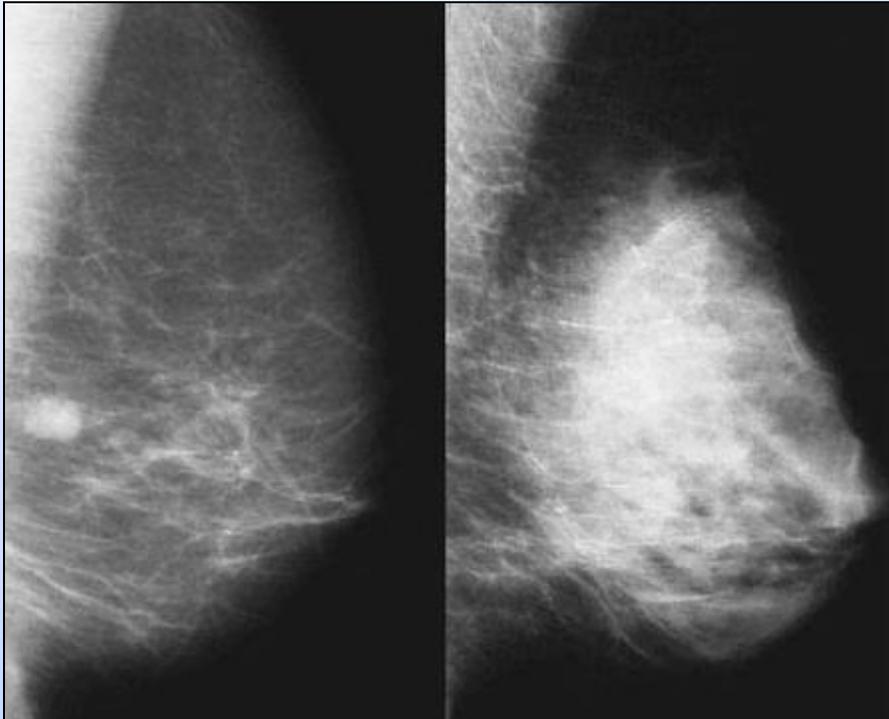


Breast MRI

- When is it useful?
 - Screening for patients at very high risk:
 - BRCA positive
 - H/O mantle radiation for lymphoma
 - >20% lifetime risk based on statistical calculations
 - Equivocal breast imaging
 - Some patients with diagnosed breast cancer.
- In general, this is best determined by the person who will be making decisions about care.



Breast Density



- Affects the sensitivity of the interpretation.
- Is an independent risk factor for breast cancer.
- Starting October 1st 2014, by law, patients will receive a special letter informing them that their tissue is dense.



Keywords for breast density

- Fatty replaced
- Scattered fibroglandular elements
- Heterogeneously dense
- Extremely dense

One of these should be in every screening mammogram report!



Recommendations to Patients

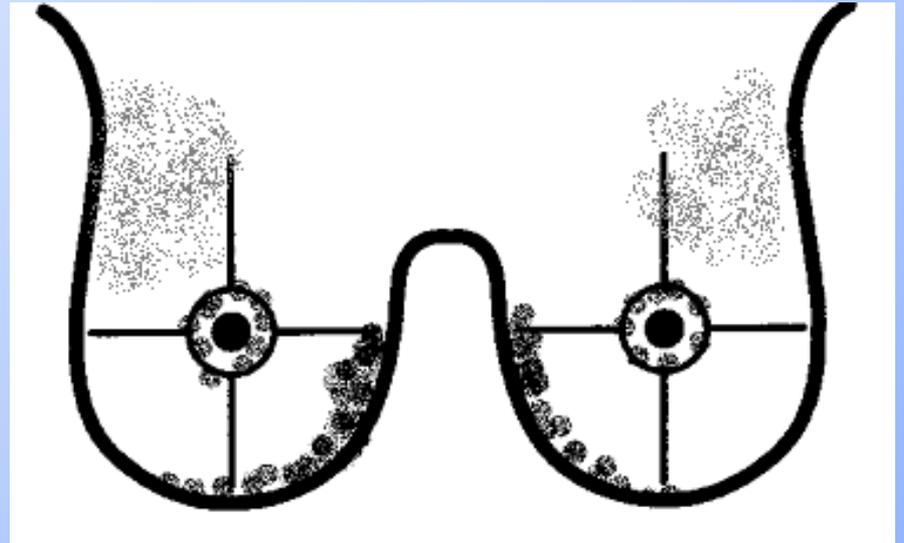
- Recommendations for screening should be individualized based on:
 - Comprehensive risk assessment
 - Difficulty with interpretation of the current imaging and clinical breast exam
 - Patient concerns
 - Options for risk reduction



Lumps vs. “Lumpy”

Increased nodularity is normal in 2 areas:

- Along the infra-mammary ridge
- Just inside areolar margin



Note: The upper outer quadrants contain the largest amount of breast tissue and often seem more prominent and nodular than other areas.



How to explain to patients

- Knuckle analogy:
 - One finger is a lump, three fingers and you feel knuckles.
- A “bump” in the road analogy:
 - Imagine you are driving down a cobble stone street and feel bumps everywhere, but you still know when you hit a “bump.”









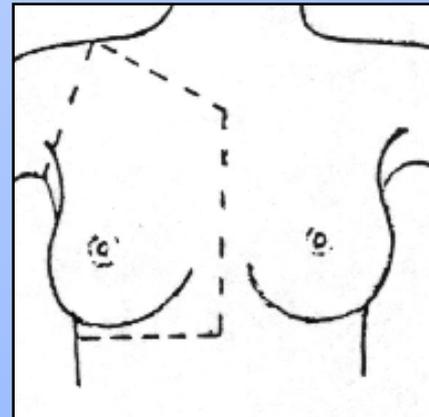
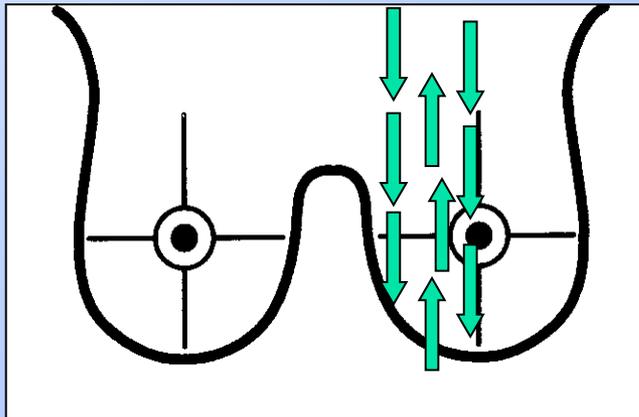
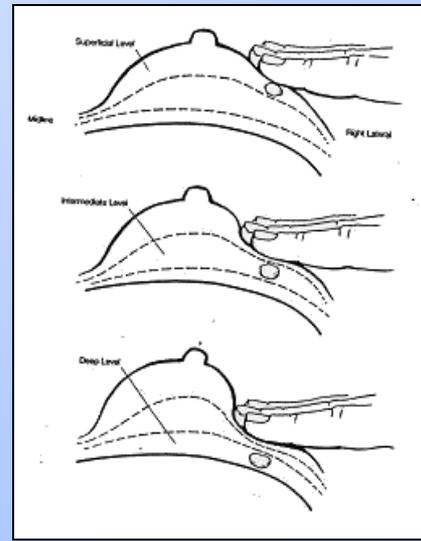
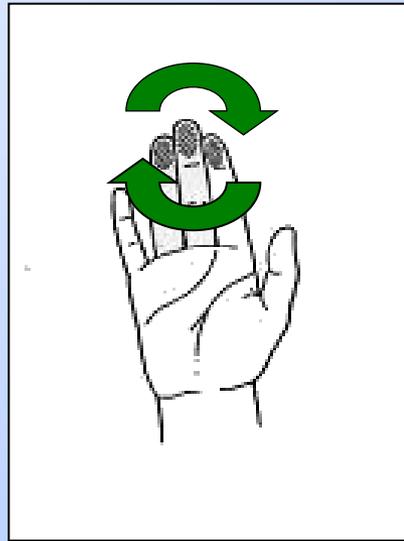
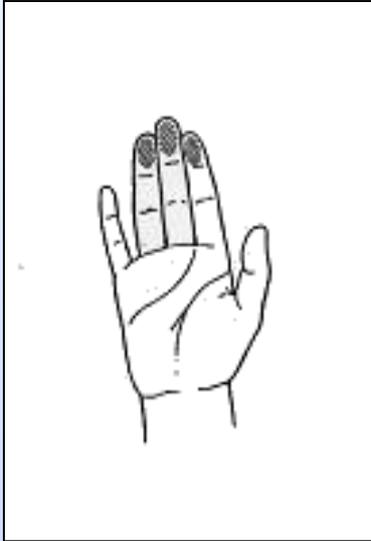








Clinical Breast Exam Technique

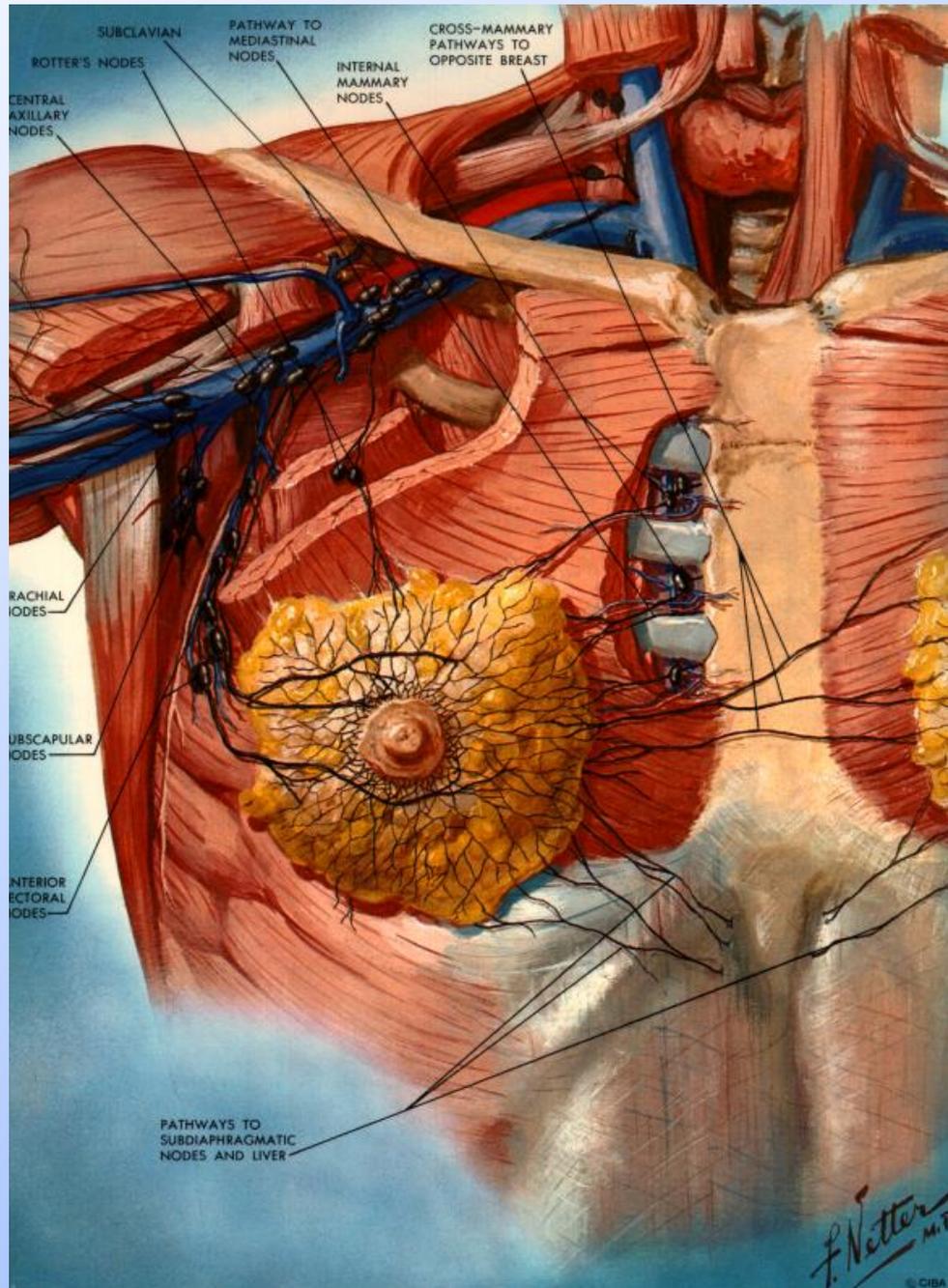


















DATE: 3/10/00 NEW FU

SUMMARY/INT. HX:
Med - Effexor, H lonopin
Mamm - 9/99

PHYSICAL EXAMINATION: WDWUWF NAD

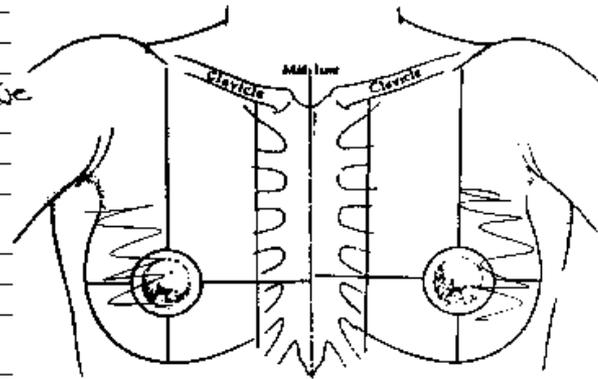
LYMPHADENOPATHY: CERVICAL SUPRACLAVICULAR

AXILLARY

BREAST (S): R=L

RIGHT: masses
Skin or nipple A's
Nipple Dis
very glandular tissue

LEFT: same as R



COMMENTS:

ASSESSMENT: FCA's

PLAN:

TEACHING: DSE - ↓caff, VITE, B

STUDIES: Mamm 9/00

REFERRAL/FU: RTC, Gmos & mamm same day

SEND RECORD TO:



Signature: *Barbara W Ashley*

Barbara W Ashley, RN, MSN, CRNP



Common Clinical Conditions

- Palpable mass
- Nipple discharge and other nipple abnormalities
- Abscess and inflammatory conditions
- Breast pain



Palpable Mass: Principles

- If you detect a palpable mass:
 - Short term, you need confidence that it is not cancer.
 - Imaging may be supportive (BIRADS 2-3)
 - Clinical exam may be supportive (e.g., lipoma)
 - When in doubt, refer!!!
 - Long term, you and the patient will eventually want the lump to be gone.



Palpable Mass since 2006





Important Caveat

Never, ever, ever let a “normal mammogram” report dissuade you from pursuing evaluation of an abnormality on physical examination.

Be cautious of the nature of any palpable mass not recently assessed to your satisfaction.

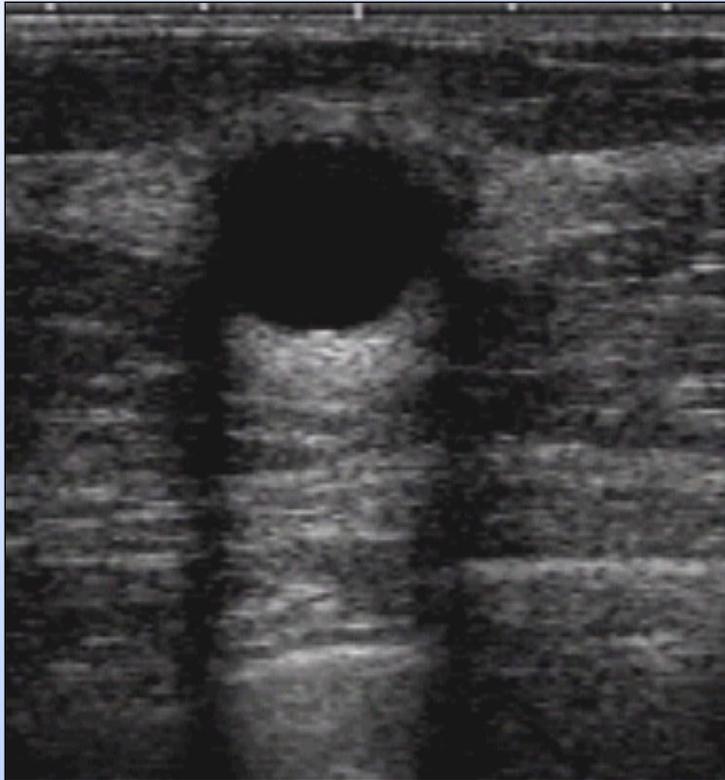


If you feel a palpable mass

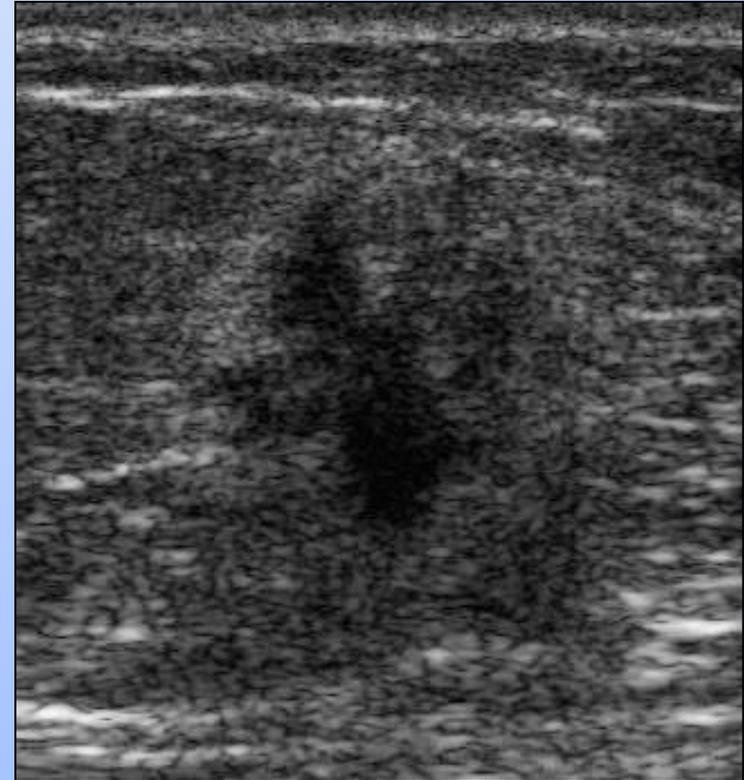
- Workup is age related, but in general ultrasound is a much better diagnostic tool to evaluate palpable changes than mammogram.
- If ≥ 40 , the patient should have had a mammogram in the last 6-12 months.
- Accurate documentation of location is key to any further assessment!



Ultrasound can distinguish...



Simple cyst



Cancer



Documentation of Location

- Indicate the location of the questionable area using:
 - Face of the clock notation and centimeters from the nipple (generally with the patient supine)
 - "1 o'clock position, 4 cms from the nipple"
- Or, utilize the breast specialist tool for accurate localization:





Short-Term Options

- 1-3 month follow up (preferably after menses).
- Fine needle aspiration
 - Must precisely indicate to the pathologist and the patient where you feel the area of concern.
- Refer to specialist for confirmation.
- Advanced imaging such as MRI or BSGI, are NOT routinely indicated.



Breast Specialist Secret Weapon #2



- To the radiologist, if there is a question on imaging;
- To the pathologist, if there is a question about the pathology;
- To the surgeon, if there is a question on clinical exam



Nipple Discharge

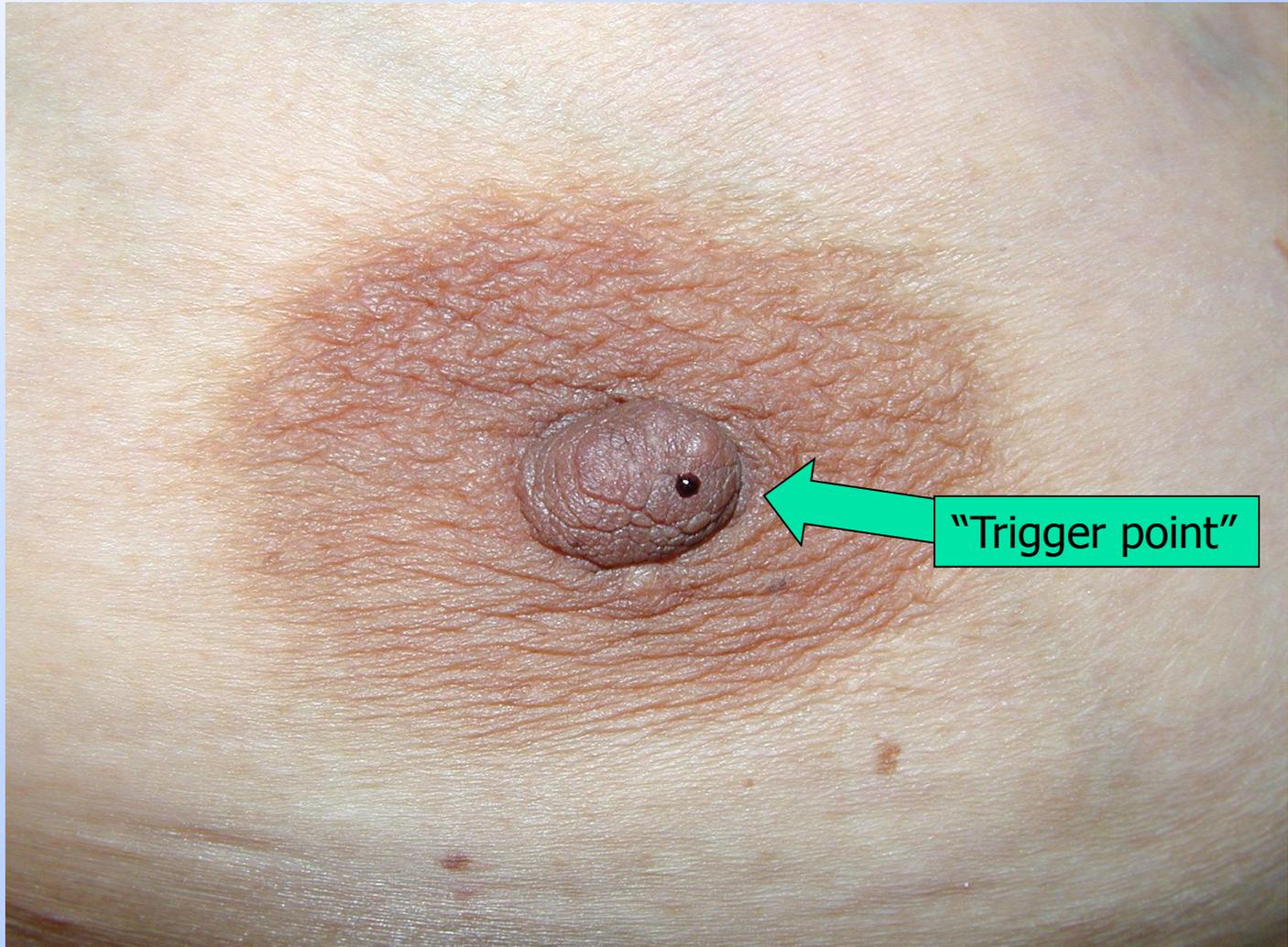
- Non-spontaneous, non-bloody discharge is present in 2/3^{rds} of women.
 - If routine evaluation is normal, no further evaluation is required.
- Spontaneous, single duct, recurrent discharge requires evaluation.
 - Routine assessment, ultrasound, diagnostic mammogram.
 - Ductogram and MRI may be valuable.
 - Cytology and cultures are of NOT required.



Multiduct Discharge



Pathologic Discharge





Multiduct Discharge





Pathologic Discharge





Paget's Disease





Unilateral Nipple Inversion





Bilateral Congenital Nipple Inversion





Skin Edema



Right - Normal



Left – Thickening and Edema



Inflammatory Carcinoma





Abscess in Pregnancy/Nursing



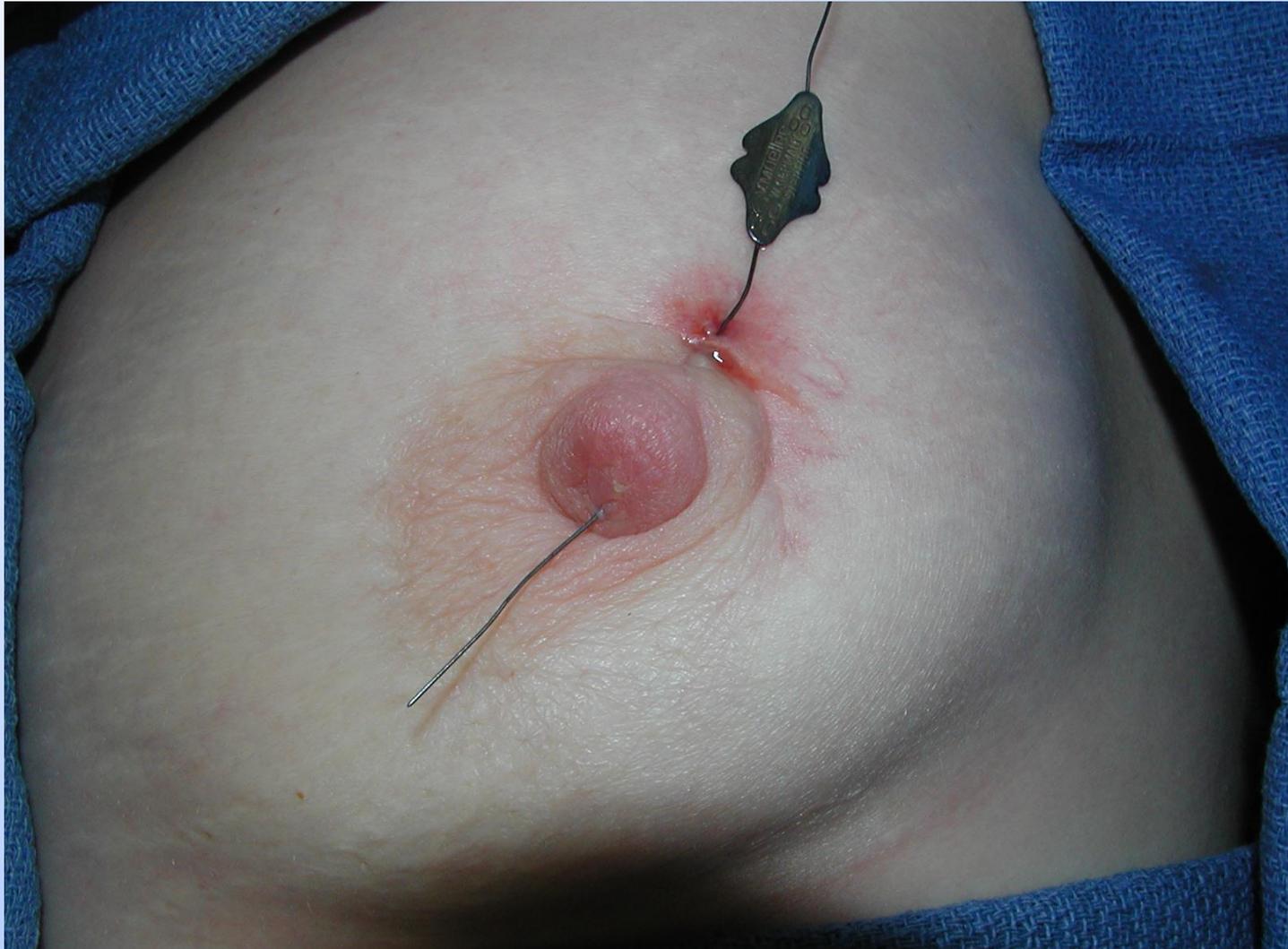


Chronic Subareolar Abscess





Chronic Subareolar Abscess





Breast Pain

- Is it from the breast?
- Cyclical or non-cyclical?
- Treatment for cyclical pain:
 - NSAID's, support bra.
 - Evening primrose oil, Danazol, Bromocriptine, Tamoxifen, low fat diet, etc.
- The key point is that if everything else is normal, breast pain is not predictive of malignancy!



TAKE HOME: Screening

- Start screening mammography between ages of 40-50 for average risk women.
- Every other year screening is reasonable after age 50-55.
- Screening should be individualized based on risk and patient concerns.



TAKE HOME: Clinical exam

- Distinguish a discrete lump from “lumpiness”
- A true lump needs evaluation:
 - Age appropriate mammography
 - Ultrasound!!!
 - Biopsy may be required to exclude carcinoma



TAKE HOME: Clinical Conditions

- Nipple discharge is easy:
 - Single duct/spontaneous/recurrent vs. multiduct.
- Abscess in pregnancy/nursing is easy:
 - Antibiotics and percutaneous aspiration.
- Other common conditions can be difficult to manage:
 - Pain
 - Subareolar abscess



TAKE HOME: Avoid This!

Never, ever, ever let a “normal mammogram” report dissuade you from pursuing evaluation of an abnormality on physical examination.

Be cautious of the nature of any palpable mass not recently assessed to your satisfaction.

Breast Surgeon: Typical Case

- 35 year old Caucasian female
- Mother had breast cancer at age 36 (who comes with her to the visit)
- G1P1
- First pregnancy at age 29
- Baseline mammogram last year showed “dense tissue”
- Patient is concerned about a “thickening” in the UOQ of the right breast

Factors Patient Cannot Control

- Female gender
- Increasing age
- Family history
- Past personal history of breast cancer
- Onset and cessation of menses
- Race
- DES exposure
- Dense tissue on mammogram
- Previous abnormal biopsy:
 - Atypical hyperplasia, lobular neoplasia
- Chest wall irradiation

Factors Patient Can Control

- Nulliparity 
- Age first pregnancy (>35) 
- Use of HRT 
- Smoking 
- Alcohol 
- Physical activity 
- Breast feeding 
- Specific medications 

Gail Model: Relative Risk

- Statistical derivation from the BCDP, a mammography study of >250,000 women.
- Elements:
 - Patient age and race
 - Age at menarche
 - Age at first live birth (and number of first degree relatives)
 - Number of biopsies
 - Atypical hyperplasia



Gail Model Risk Assessment Tool

What is the age of your patient?	35
What was patient's age at time of first menstrual period?	13
What was patient's age at first live birth of child?	29
How many of patient's first-degree relatives – mother and/or sister(s), daughter(s) – have had breast cancer?	1
Has the patient ever had a breast biopsy?	n
What is the patient's race?	w

If known, please indicate the race of your patient. If you leave this question blank, the program will use data for white females to estimate the predicted risk.

Click on next to continue.

exit

next

Statistical Risk Calculators

- Gail Model (NCI)
- Claus
- Myriad (proprietary based on genetic testing data)
- Tyrer-Cuzick (European)
- BRCAPro

HUGHES RISKAPPS

About

Express Entry

Example:

Uncle Maternal Brain Cancer 33 Melanoma 44 Leukemia 55

Add New Relative

Next Screen...

Relationship Age	Bloodline	First Cancer	Age	Second Cancer	Age	Third Cancer	
Self	Both						
Mother	Maternal	Breast Cancer	36				
Father	Paternal						
Grandmother	Maternal						
Grandfather	Maternal						
Grandmother	Paternal						
Grandfather	Paternal						
Aunt	Maternal	Ovarian Cancer	42				

[Next Screen...](#)

Physical Data:

Gender:

Age:

Weight: lbs

Height: feet inches

Childbirth History:

of Pregnancies:

Age at first live birth:

Biopsies:

of biopsies:

Did any biopsy show atypia:

Ethnicity:

Grandparents of Jewish descent:

Racial background:

Hispanic:

Menstrual History:

Age at first period:

Menopause Status:

Both ovaries removed:

Age at ovary removal:

Hormone Replacement Therapy:

Used hormones:

Combined:

years taken:

Intended Duration:

Years since taken:

Comprehensive Risk Calculations

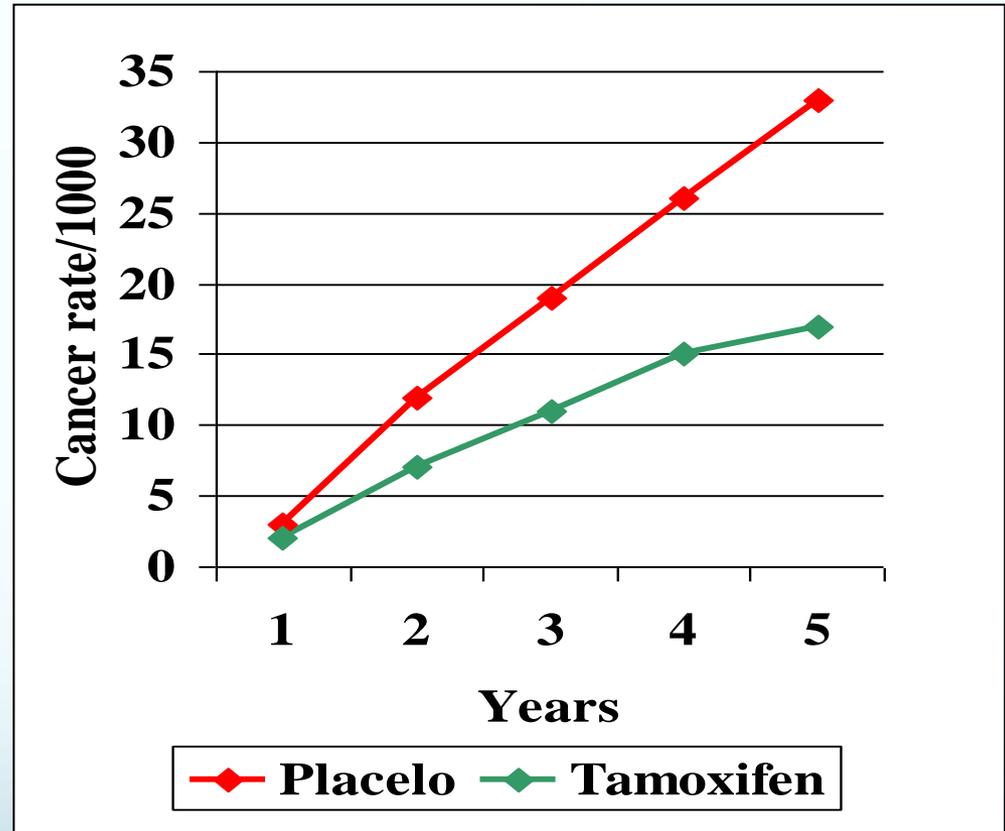
Risk of a BRCA1 or BRCA2 Mutation		<i>Last Updated: Apr 2nd 2014</i>	
BRCAPRO	0.1%		
Tyrer Cuzick v6	0.0%		
Tyrer Cuzick v7	0.3%		
Myriad	1.5%		
Risk Breast Cancer		5 Year Risk	Lifetime Risk
BRCAPRO	2.1%	2.1%	5.8%
Tyrer Cuzick v6	17.8%	17.8%	32.0%
Tyrer Cuzick v7	7.9%	7.9%	26.3%
Gail	7.2%	7.2%	21.3%
Claus	1.4%	1.4%	3.1%
Risk Ovarian Cancer		5 Year Risk	Lifetime Risk
BRCAPRO	0.2%	0.2%	0.7%
Other Risk Results			
Tamoxifen Benefit Risk Index	14		
		<i>Last Updated: Nov 13th 2014</i>	

NSABP P-1: Design

- Double-blind, randomized trial of Tamoxifen vs. placebo in high-risk women.
- 13,388 women total.
- Median follow up 4.2 years.
- Measure cancer incidence and side-effects.
- Defined “high-risk” as:
 - Age \geq 60 years old.
 - Personal history of LCIS.
 - Predicted 5 year risk of $>$ 1.66% (Gail Model)

NSABP P-1: Results

- Significantly decreased risk of invasive and non-invasive cancers. ($p < 0.00001$)
- Advantage seen across all age groups.



STAR Trial (NSABP P-2)

- “Study of Tamoxifen and Raloxifene”
- Double-blind, randomized trial comparing efficacy and side-effects of Tamoxifen and Raloxifene.
- Post-menopausal women > 35 years old
- Calculated 5 year Gail risk > 1.66.
- 19,000 women from 400 sites.
- Raloxifene proved to be effective as Tamoxifen in reducing risk of breast cancer.

MORE Trial

- “Multiple Outcomes of Raloxifene Evaluation”
- 7700 women high risk for osteoporosis (but not breast cancer)
- 8 year follow up.
- 72% reduction in breast cancer in the Raloxifene arm compared to placebo.

Comprehensive Risk Calculations

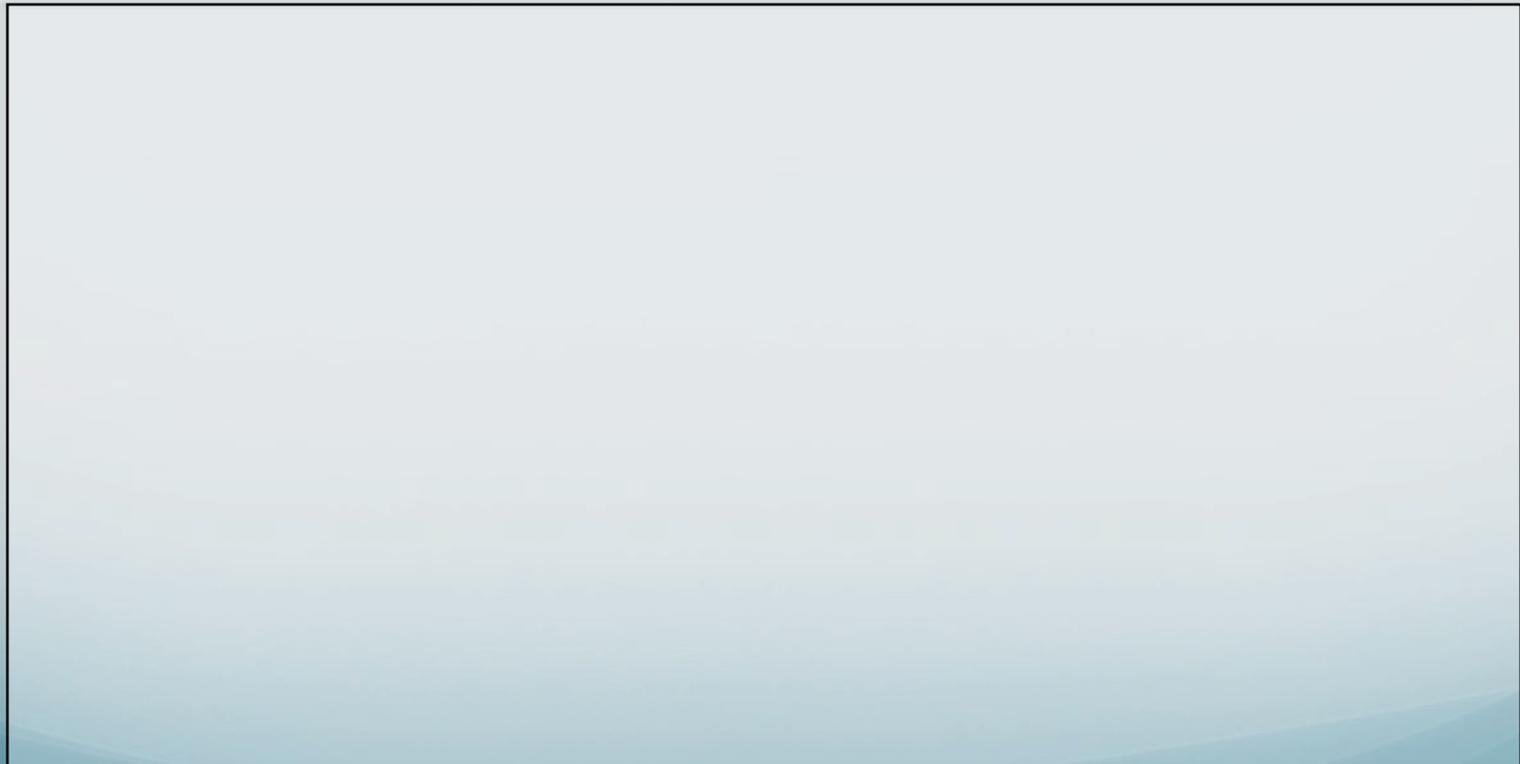
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Other Risk Results			
Tamoxifen Benefit Risk Index	14		
			<i>Last Updated: Nov 13th 2014</i>

Enhanced Screening (MRI)

- Consensus recommendations for annual screening MRI for patients with a calculated lifetime risk $> 20\%$:
 - American Cancer Society:
 - Annual MRI for patients with calculated lifetime risk $> 20\%$ (but not by Gail/NCI model)
 - National Comprehensive Cancer Network:
 - Annual MRI for patients for patients with calculated lifetime risk $> 20\%$ based on statistical models based on family history.

MRI Enhanced Screening

- Data supporting accuracy of lifetime risk calculations of Tyrer-Cuzick models, versions 6 and 7:

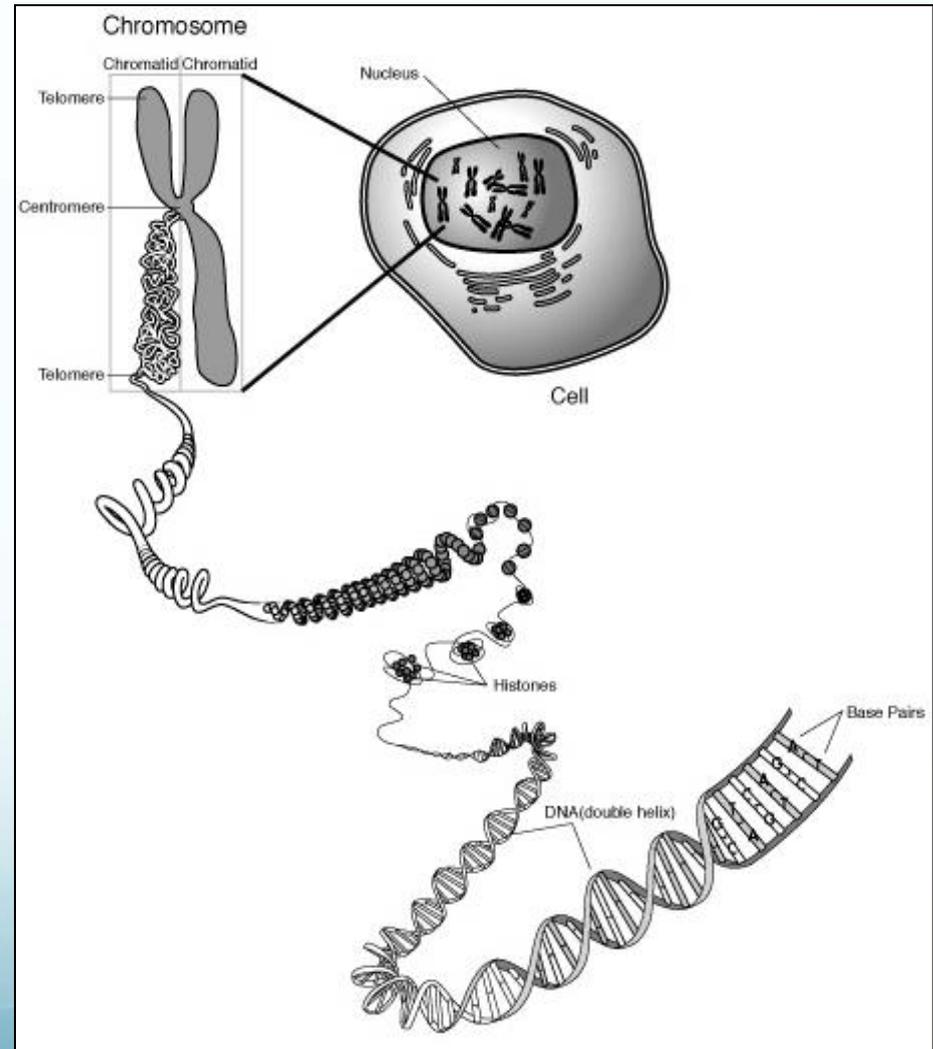


Genetic Risk

- 1994 Genetic linkage analysis resulted in discovery of two breast cancer genes: BRCA1 and BRCA2.
- Lifetime risks:
 - Breast cancer: 35-85%
 - Ovarian cancer: 9-65%
- Responsible for between 5 to 15% of cases of breast cancer in patients with a family history.

Genetic Testing

- Eukaryotic cell is 10 microns
- 46 chromosomes
- 3 billion base pairs (2 meters long)
- BRCA1 on 17q and BRCA2 on 13q
- Individual base pair substitutions result in deleterious mutations



Value of Genetic Testing

- Allows very precise estimate of cancer risk:
 - BRCA for breast and ovarian cancer
 - Multiple other genes for a host of cancers
- Permits changes in screening for cancer:
 - MRI if BRCA positive
- Provides opportunities for risk reduction:
 - Lifestyle changes, medication, prophylactic surgery

Breast Surgeon: Typical Case

- 35 year old Caucasian female
- Mother had breast cancer at age 36 (who comes with her to the visit)
- G1P1
- First pregnancy at age 29
- Baseline mammogram last year showed “dense tissue”
- Patient is concerned about a “thickening” in the UOQ of the right breast

Who should be tested? The patient or her mother?

Current Genetic Testing

- While BRCA1 and 2 account for most cases of genetically induced breast cancer, current testing includes analysis of up to 25 genes:
 - PALB2
 - CHEK2
 - pTEN
 - p53...

The current problem is not gene sequencing, but understanding the results and how to advise patients!

Risk Reduction Options

- Lifestyle:
 - “Everything your mother said is true...”
 - Don’t smoke and don’t drink
 - Eat well and exercise
- Medications:
 - Tamoxifen, Raloxifene, Exemestane:
 - 44% to 88% reduction in future risk of breast cancer
- Surgery:
 - >90% effective
 - Multiple reconstructive options

Breast Surgeon: Typical Case

- 35 year old Caucasian female
- Mother had breast cancer at age 36 (who comes with her to the visit)
- G1P1
- First pregnancy at age 29
- Baseline mammogram last year showed “dense tissue”
- Patient is concerned about a “thickening” in the UOQ of the right breast
- **Additional:**
 - Ashkenazi Jewish ancestry
 - Maternal aunt had ovarian cancer
 - The patient’s mother tested positive for a BRCA1 mutation
 - Patient subsequently tested positive for the same BRCA1 mutation
 - Patient elected to have bilateral prophylactic mastectomy and is considering bilateral oophorectomy.

TAKE HOME: High Risk

- Perform a comprehensive risk assessment:
 - Consider statistical, genetic, histologic factors
- Encourage lifestyle changes:
 - Early first pregnancy, breast feeding, avoiding alcohol, regular exercise, avoiding exogenous hormone use
- Consider recommendations for enhanced screening with periodic breast MRI.
- Assess benefit/risk of medication
 - Tamoxifen, Raloxafine, etc.
- In extreme cases, consider prophylactic surgery.

TAKE HOME: Genetic Testing

- Always best to test the “proband” first = the family member with cancer.
- Testing a patient without cancer is useful if positive for a deleterious mutation, but of limited value if negative.

Testing for 25 genes is amazing!!!

Note: We have 20,000 to 25,000 protein coding genes.



Open Surgical Biopsy





Open Surgical Breast Biopsy

Pros

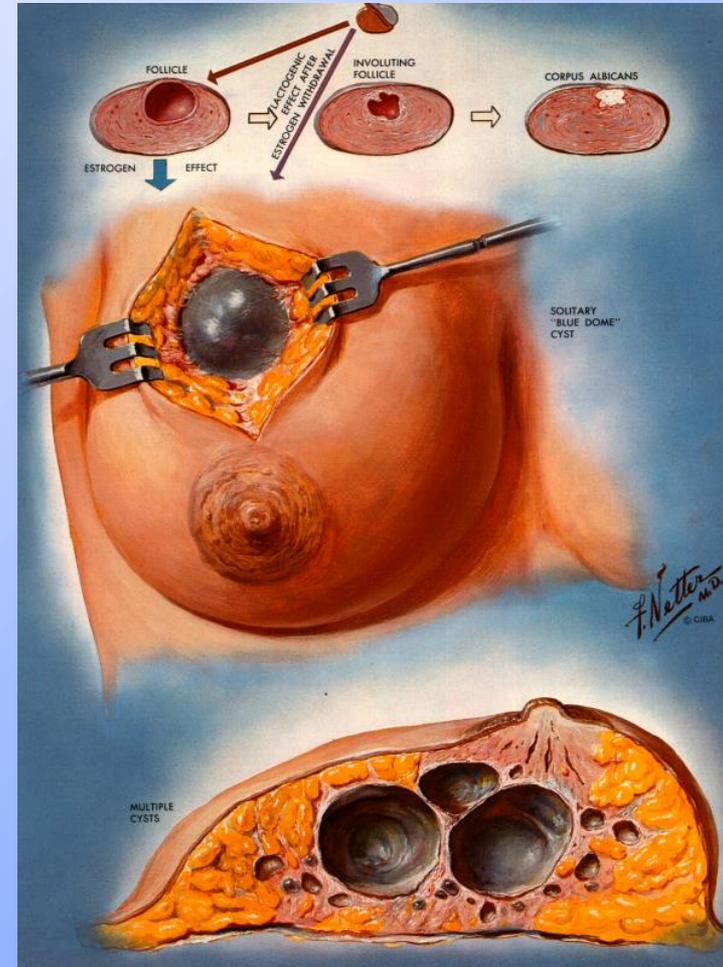
- Outpatient
- Few complications
- Current gold-standard for diagnosis

Cons

- Requires
 - Incision
 - Standby anesthesia
- Disrupts breast architecture
- Rarely necessary to diagnose cancer, and often not necessary for benign diagnosis
- Most importantly, can interfere with SLN identification!!!



Cyst Aspiration





What To Do With The Fluid?

- Options:
 - Discard
 - Discard
 - Discard
 - Discard

If the fluid is not grossly bloody and the cyst is fully decompressed with no residual lesion, there is no indication for cytological analysis!

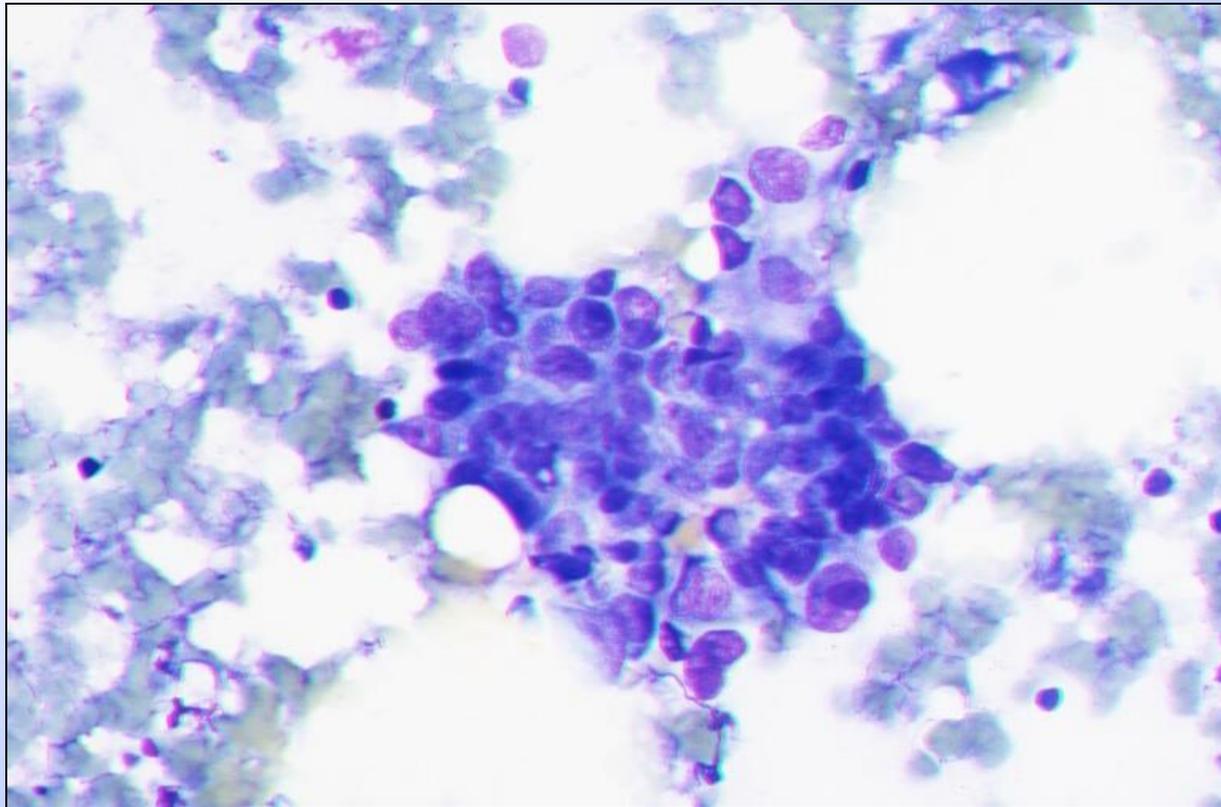


Fine Needle Aspiration





FNA Cytology



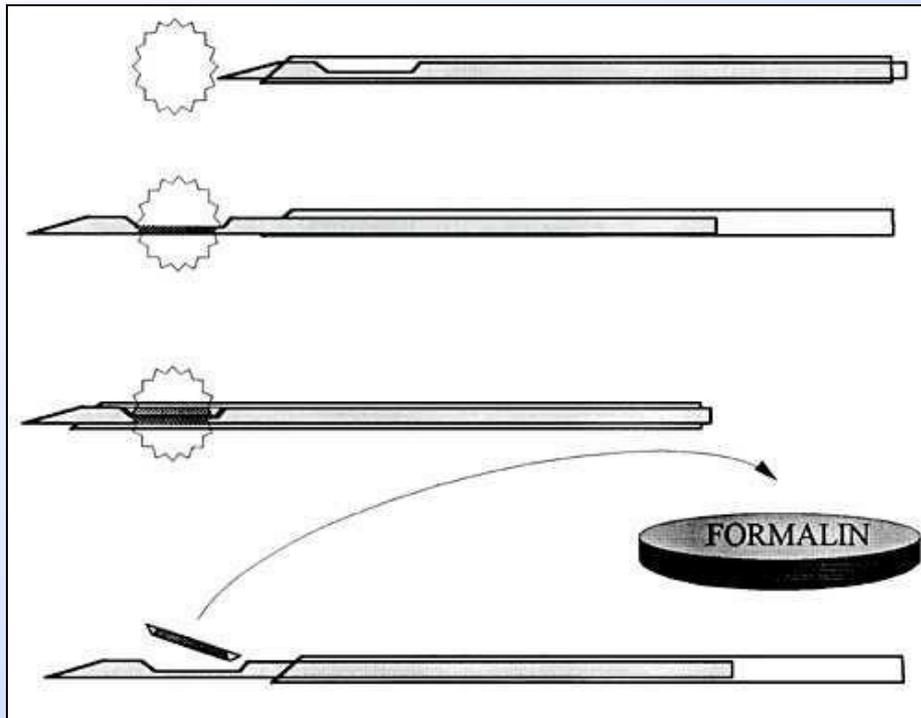


Fine Needle Aspiration

- Cytology vs. Histology
- Requires a cyto-pathologist
- Significant insufficient sampling
 - 2% - 36%
- Unable to differentiate in-situ from invasive



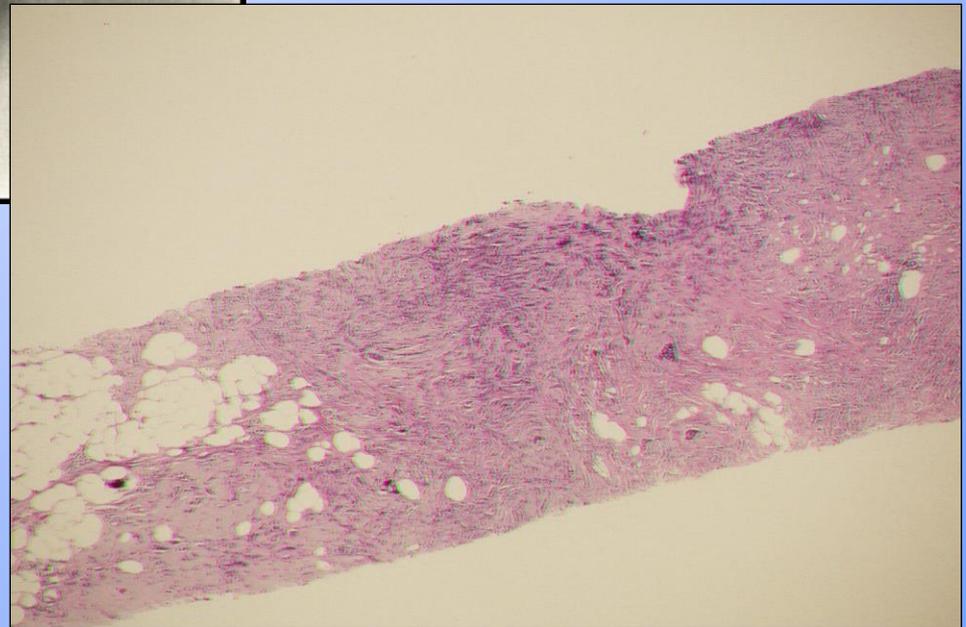
Core Needle Biopsy

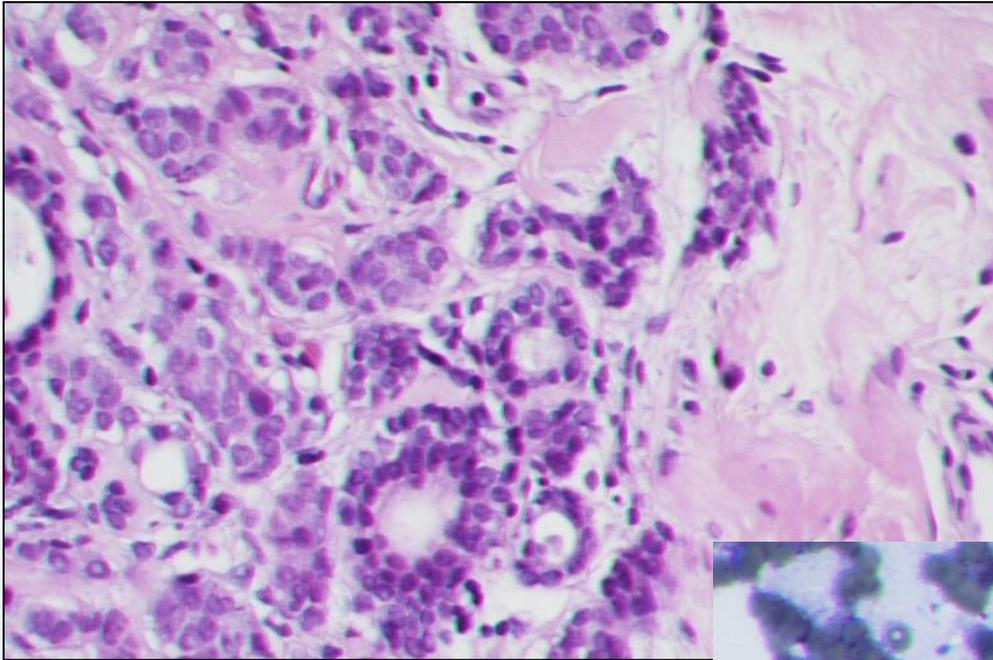


- Limited by small sample size
- Requires multiple insertions
- Precise targeting



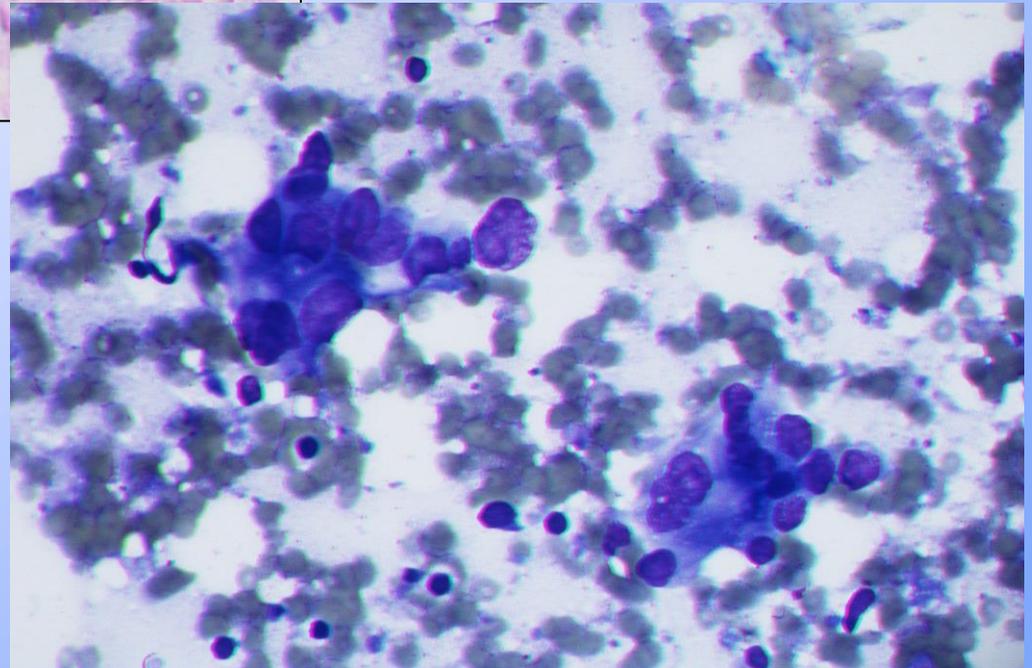
Core Needle Biopsy





**Histology from
core biopsy**

**Cytology from
FNAB**





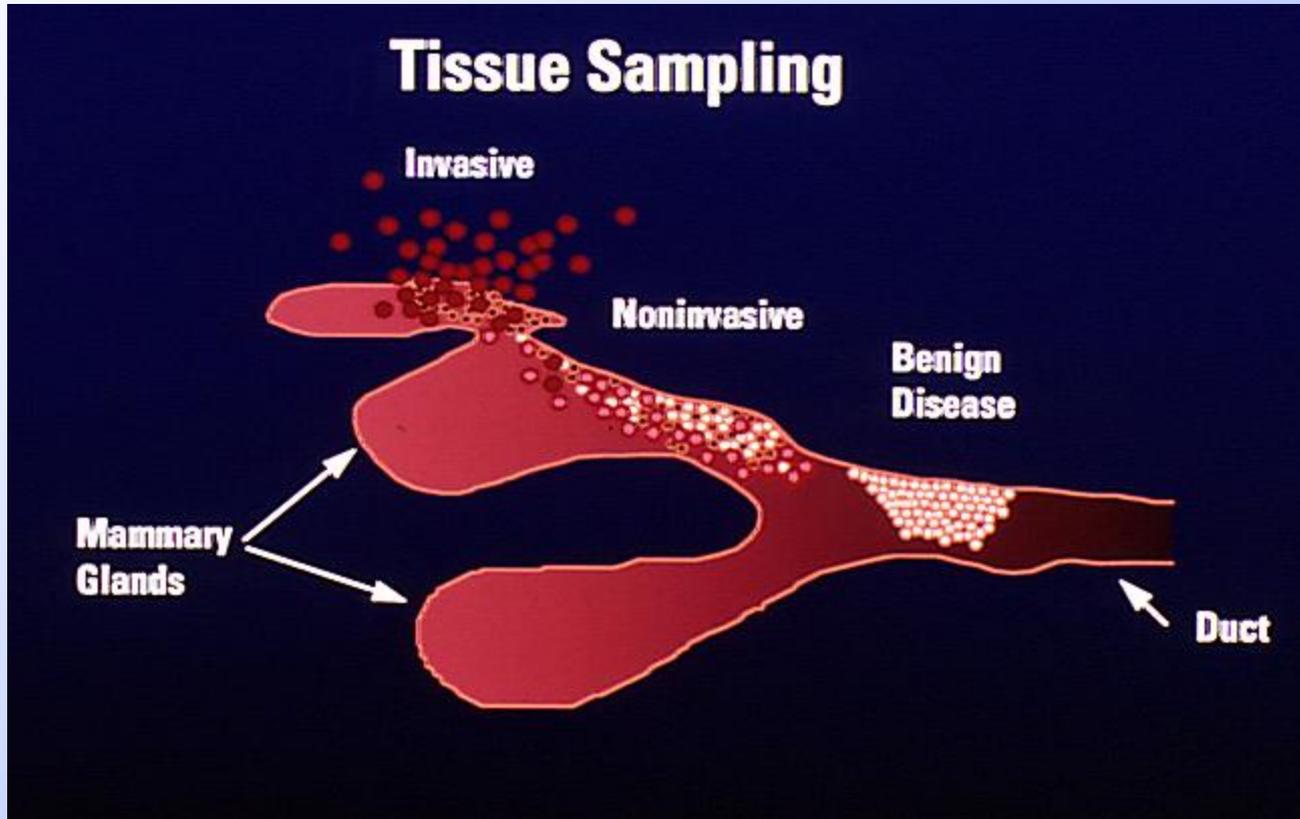
Number of Cores = "Adequacy"

- Nodular density - 5 or 6 cores
- Microcalcifications - 9 to 12 cores
 - DCIS multifocality
 - Skip areas



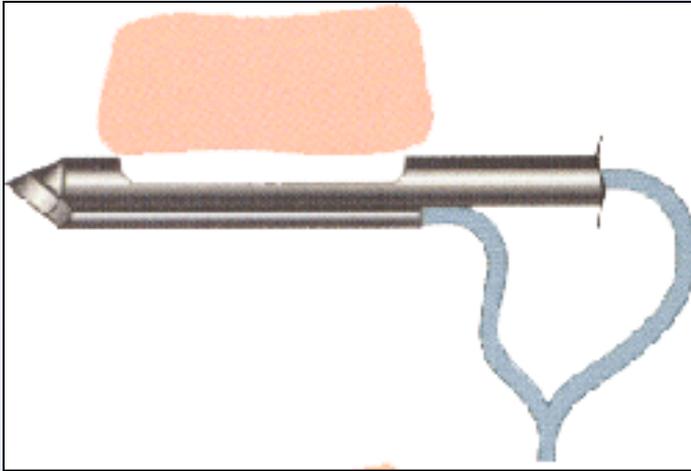


Sampling and Analysis

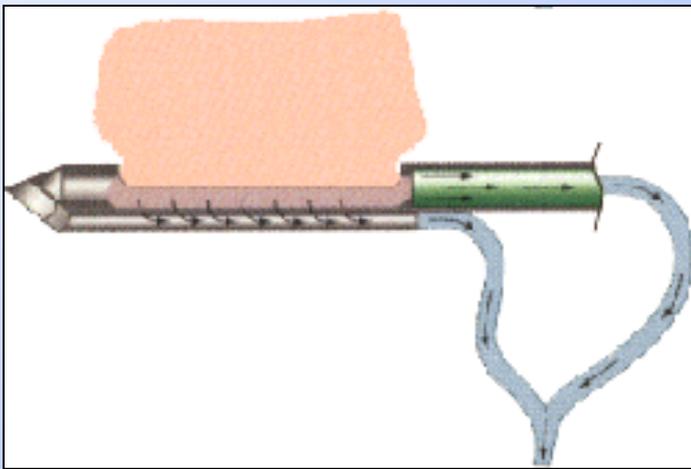




Vacuum Assisted Large Core Biopsy



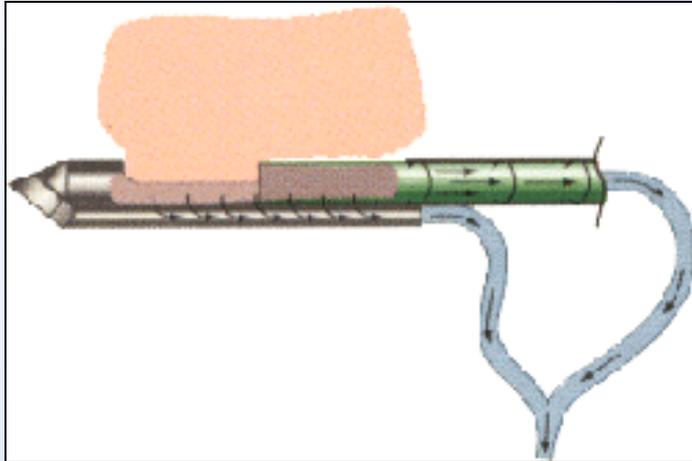
Using stereotactic or ultrasound guidance, the probe is positioned in the breast to align the center of aperture with the center of the lesion.



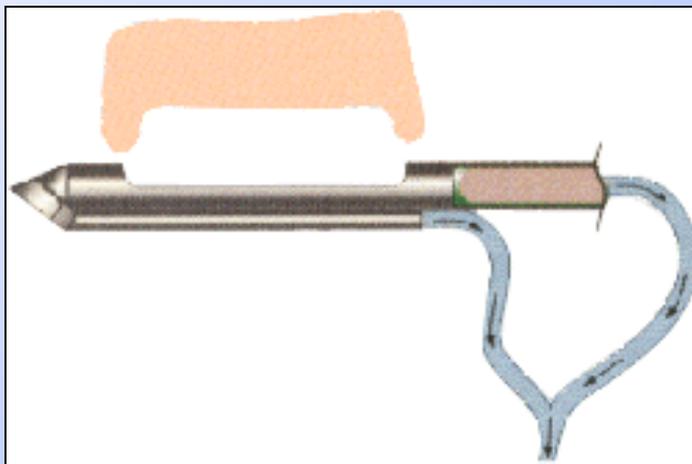
The tissue is vacuum-aspirated into the aperture.



Vacuum Assisted Large Core Biopsy



The rotating cutter is advanced forward, capturing a specimen.

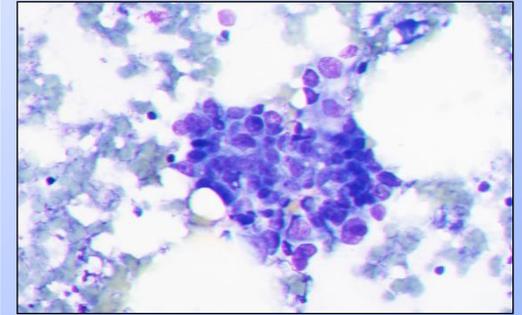
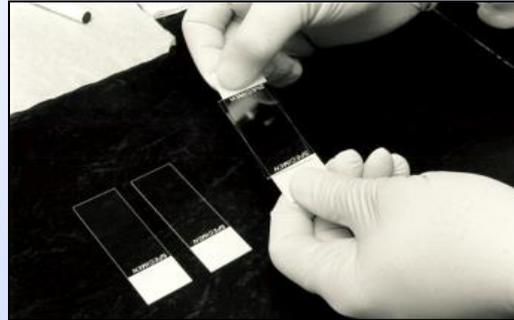


The cutter is withdrawn, and the vacuum system helps transport the specimen to the tissue collection chamber to be retrieved.

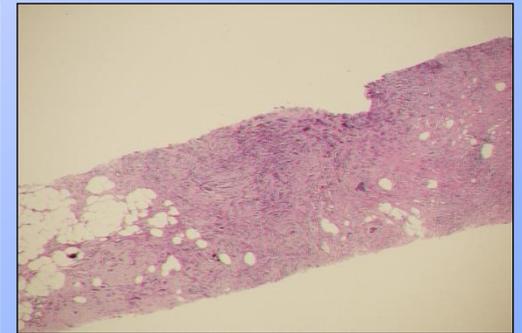
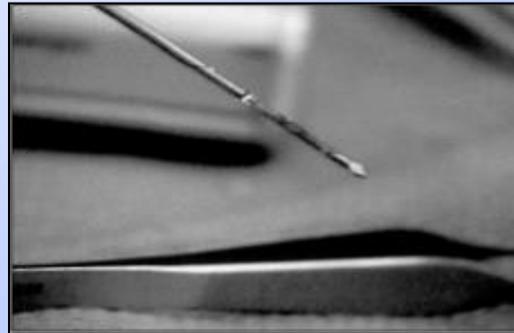


Needle Biopsy Techniques

- Fine needle aspiration biopsy



- Needle core biopsy



- Vacuum assisted needle biopsy



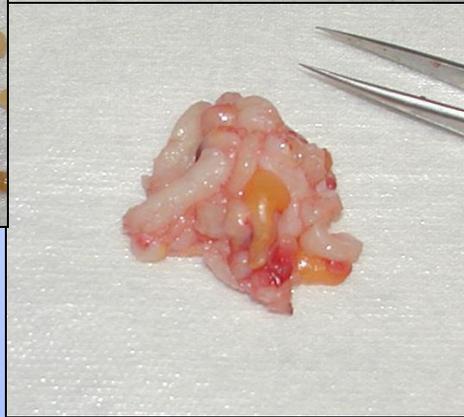
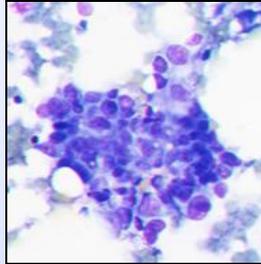


The Lady and the Unicorn





Some, Adequate, Better, Best





Needle Biopsy Not Definitive for:

- Atypical ductal and lobular hyperplasia, lobular neoplasia (LCIS)
 - 20% risk of underlying breast cancer
- Radial scars (> 6 mm)
- Papillomas incompletely removed at needle biopsy



TAKE HOME: Aspiration

- Cyst aspiration fluid rarely requires or benefits from cytology.
- Fine needle aspiration is a useful technique to confirm the clinical impression of benign change.



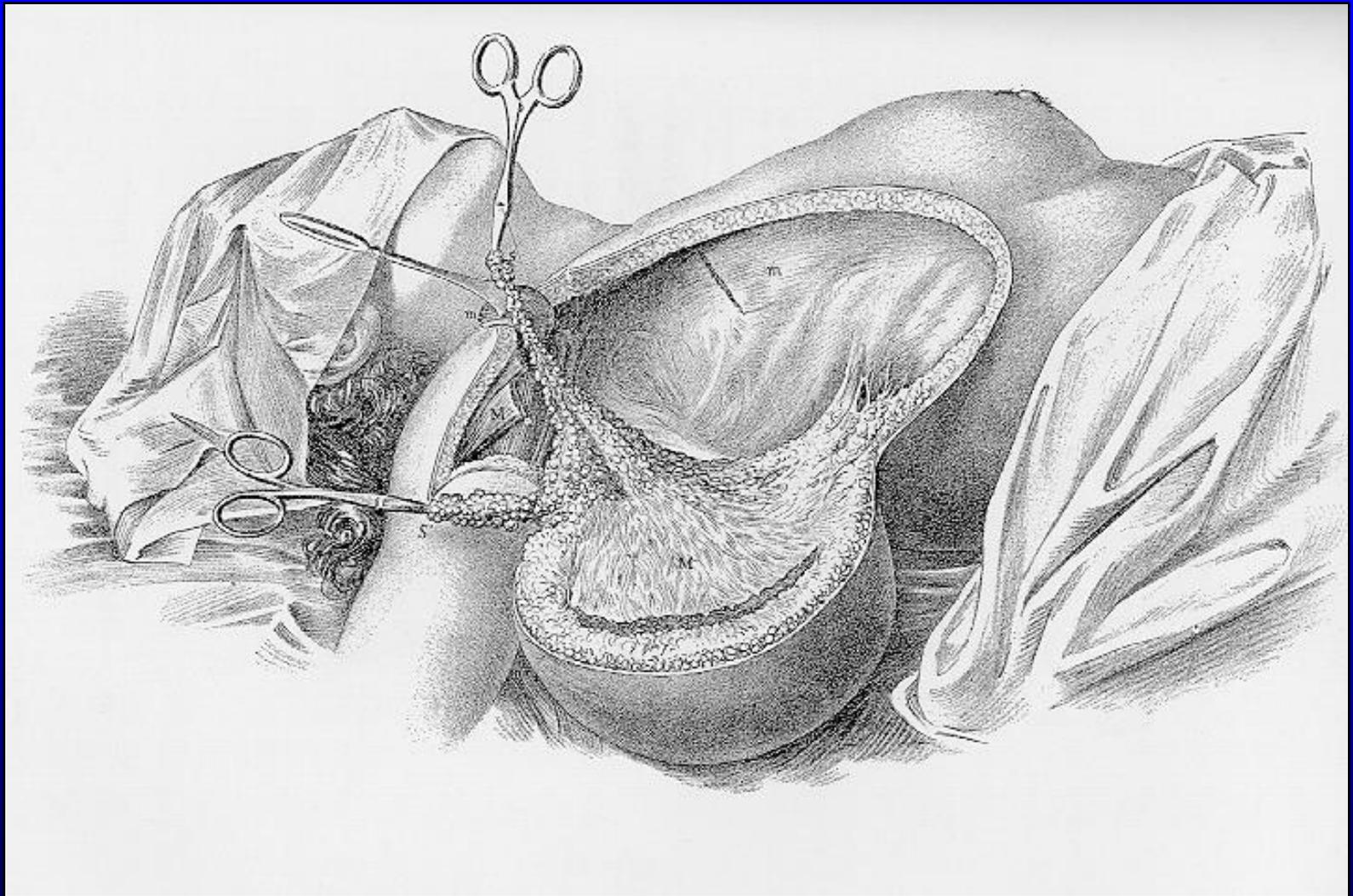
TAKE HOME: Biopsies

- The biopsy technique influences interpretation of the pathology results.
- Needle biopsy is not adequate for analysis of:
 - Atypical hyperplasia, radial scar, some papillomas, lobular neoplasia (LCIS)
- Needle biopsy is preferred to surgical biopsy to diagnose cancer.

Newly Diagnosed Cancer

What to tell the patient with a newly diagnosed breast cancer?

“The biopsy did show breast cancer, but this is very treatable. I need to obtain further information and refer you to a specialist to know what the best treatment will be.”



The Results of Operations for the Cure of Cancer of the Breast Performed at the Johns Hopkins Hospital from June 1889 to January 1894, Surgical Papers by William Stewart Halsted, 1924.

Paradigm Change (1960's)

- G. Crile, B. Fisher hypothesis:
 - Hematogenous spread of cancer cells.
 - Lymph nodes are *markers* of biologic potential.
 - Limited surgery could be as successful as radical surgery.
- Classic trials from the 1970's (NSABP B-04/06) demonstrated:
 - No difference in survival in patients having mastectomy with or without removal of LN's.
 - No difference in survival in patient having mastectomy vs lumpectomy and radiation.

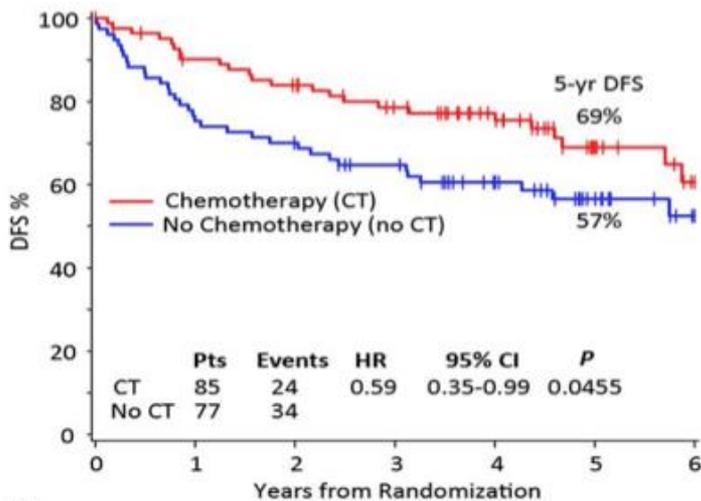
Mastectomy vs. Lumpectomy



At the Same Time (1980's)...

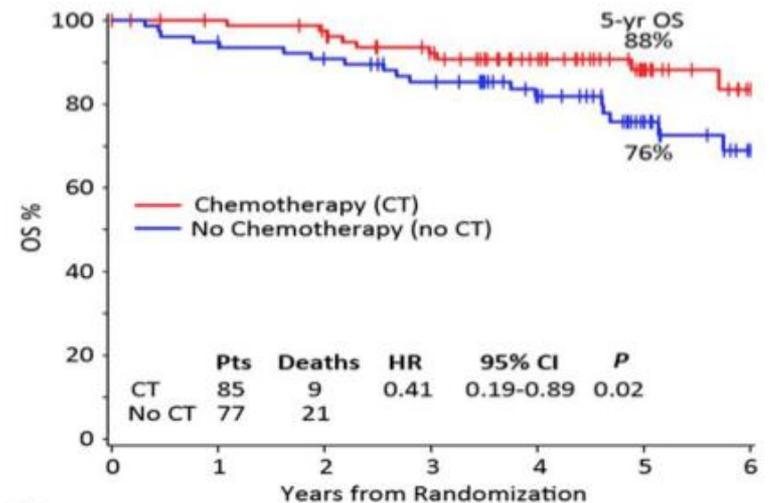
- Multiple clinical trials demonstrated the advantages of systemic chemotherapy on disease-free and overall survival:

Disease-Free Survival



Number at Risk						
Chemotherapy	85	72	66	57	45	23
No Chemotherapy	77	58	53	46	34	21

Overall Survival



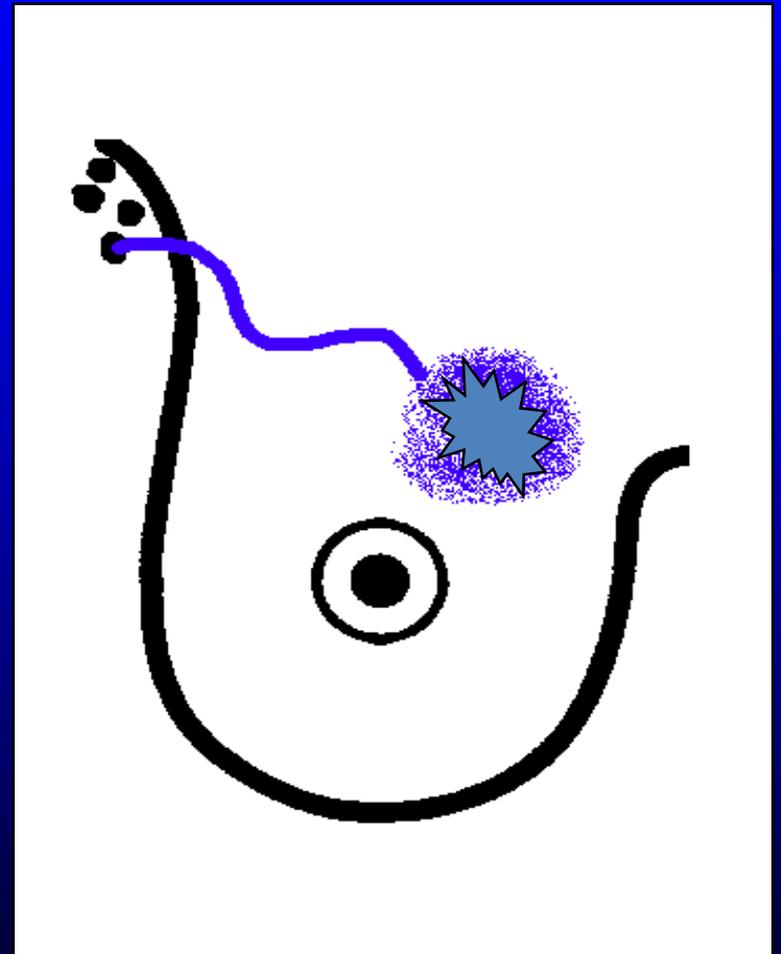
Number at Risk						
Chemotherapy	85	80	76	65	51	29
No Chemotherapy	77	72	68	61	47	30

By 1990's, We Knew...

- Radical surgery was not superior to limited surgery.
- Radiation therapy helps reduce the local recurrence rate (39% with lumpectomy alone to 14% with radiation).
- Systemic therapy - chemotherapy and hormonal therapy - improves disease-free and overall survival.
- ...however, we continued to removal axillary lymph nodes to help the medical oncologists determine the need for chemotherapy.

Sentinel Lymph Node (1990's)

“The *sentinel lymph* node is the FIRST lymph node to which a tumor drains.”

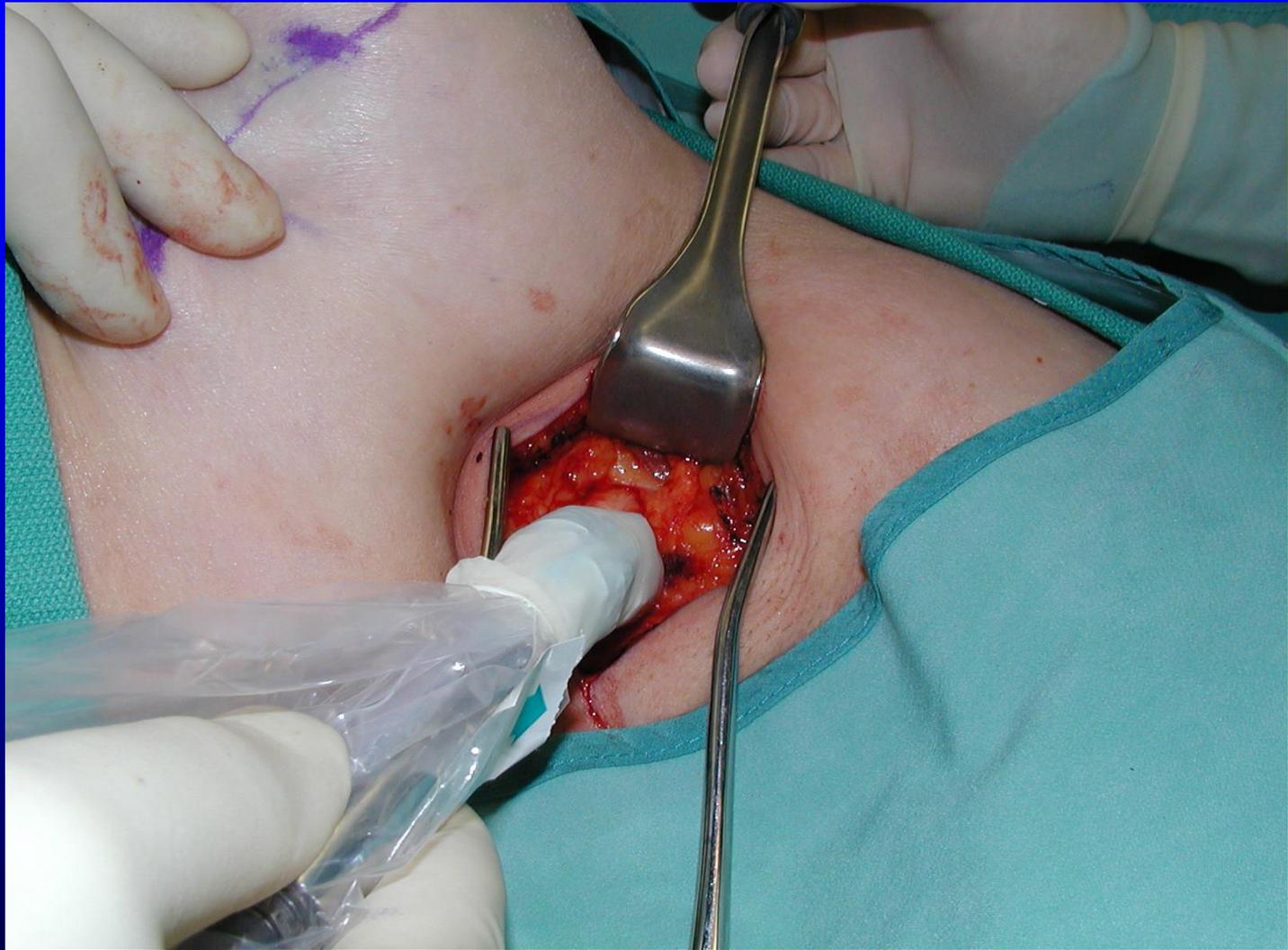


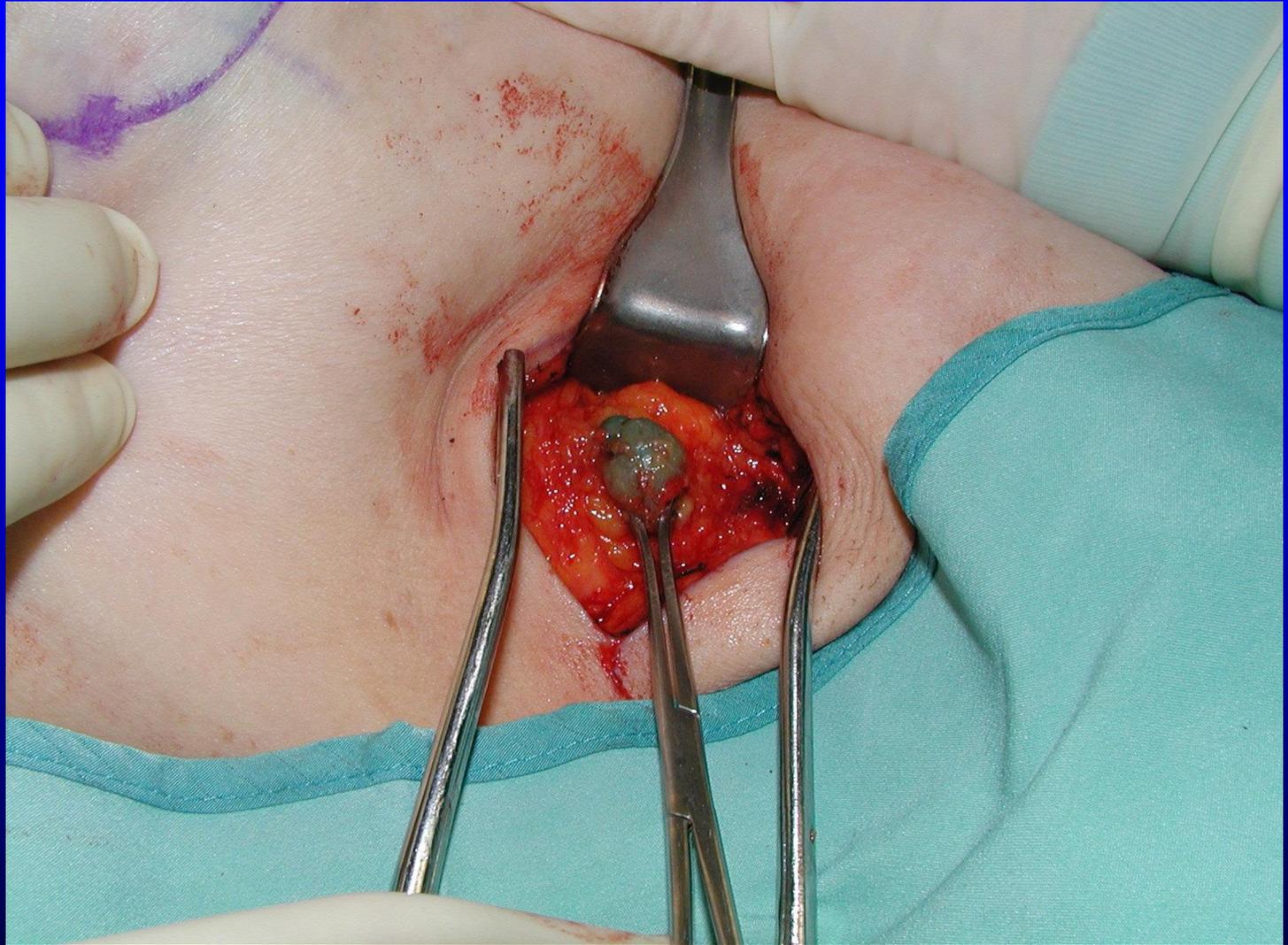


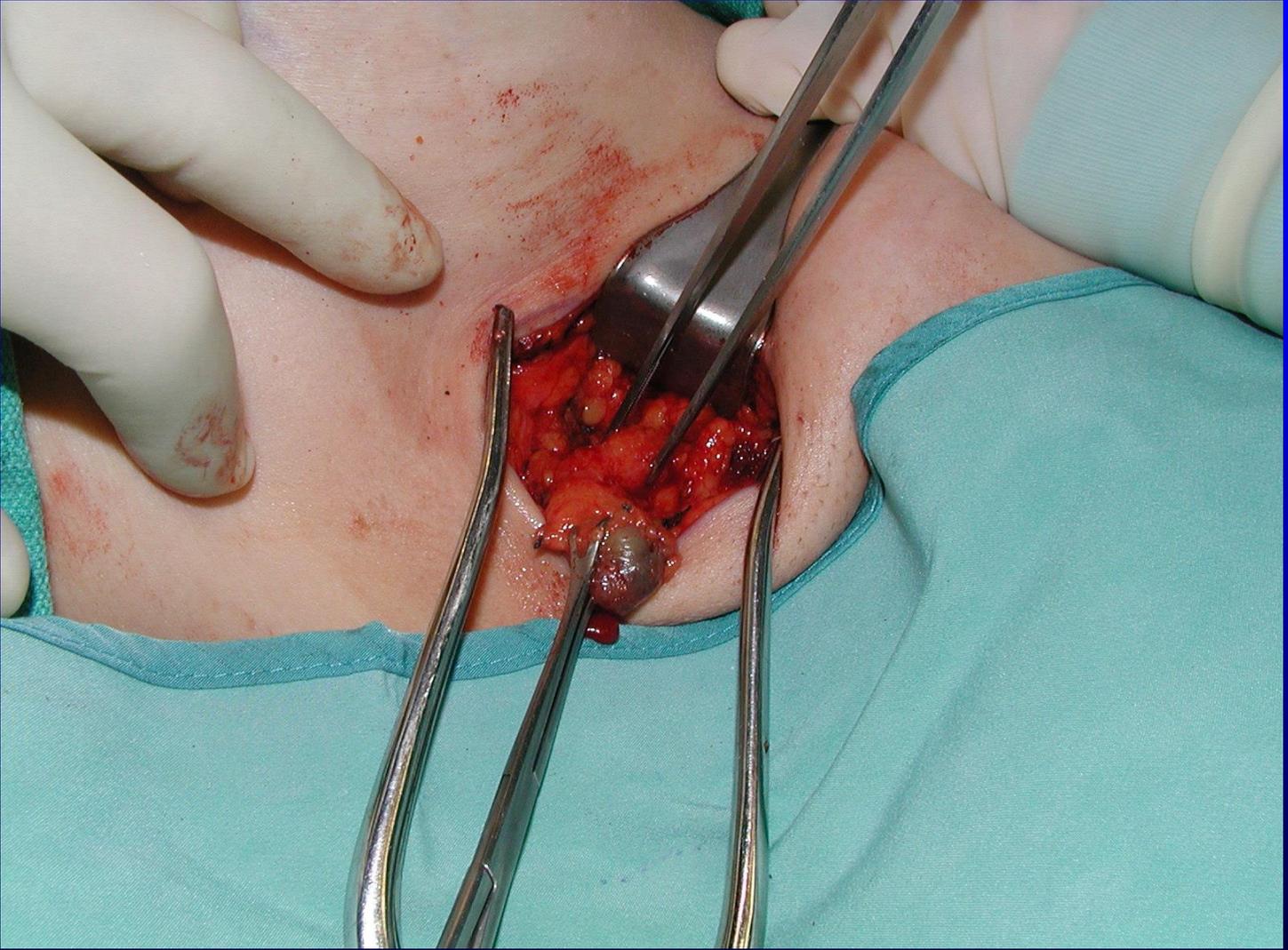


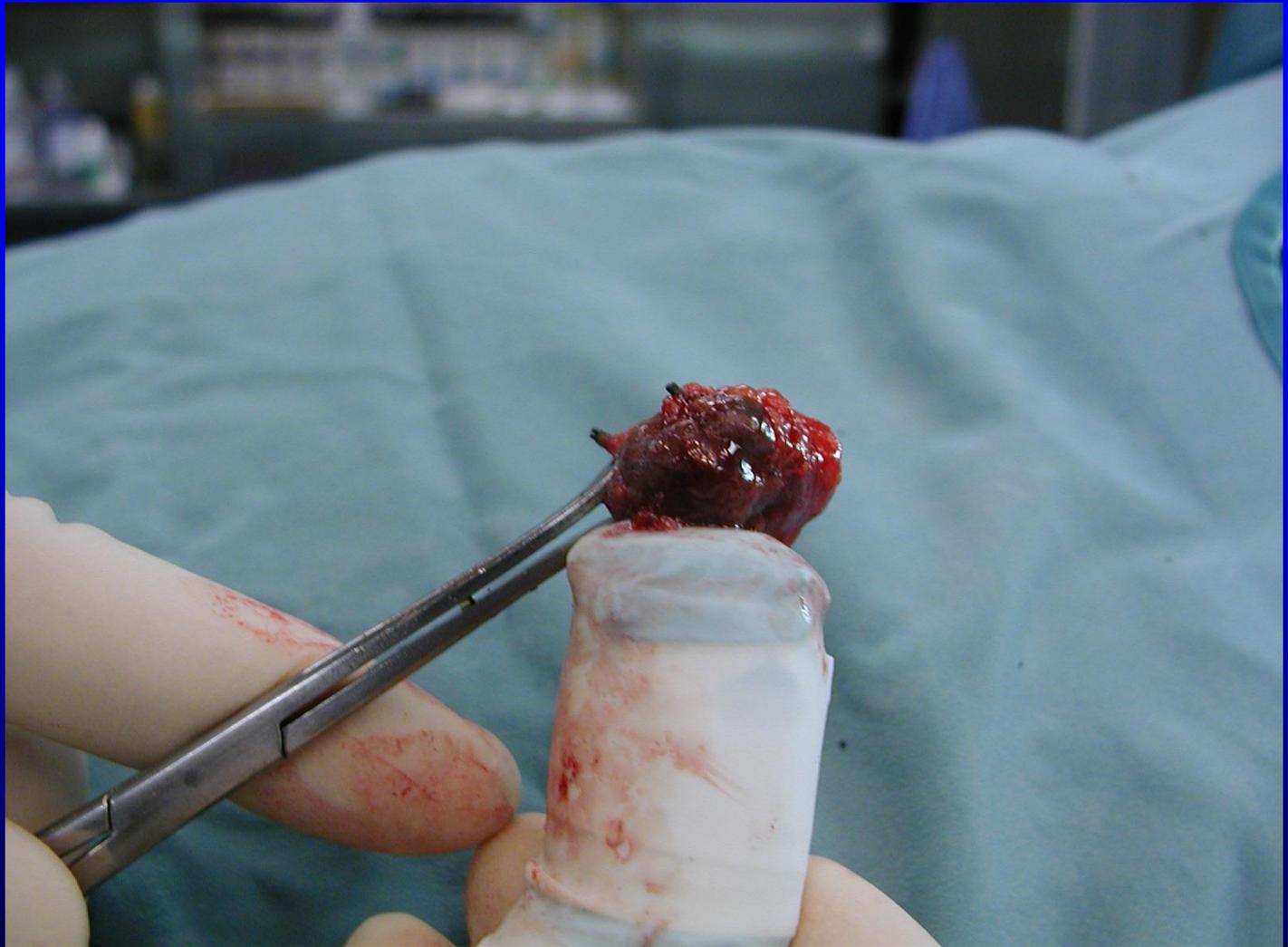
Gamma Counter



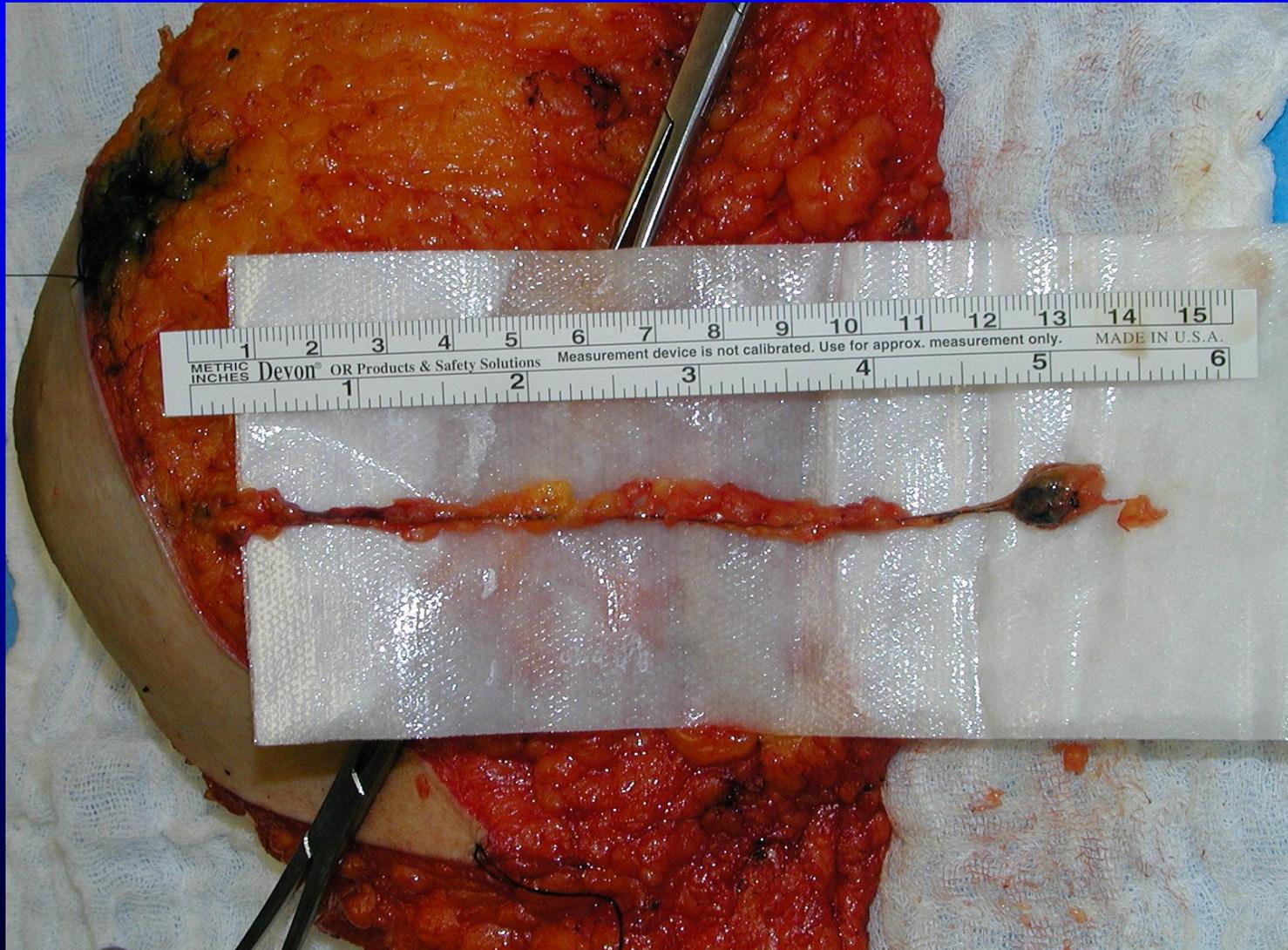








Technical Improvements

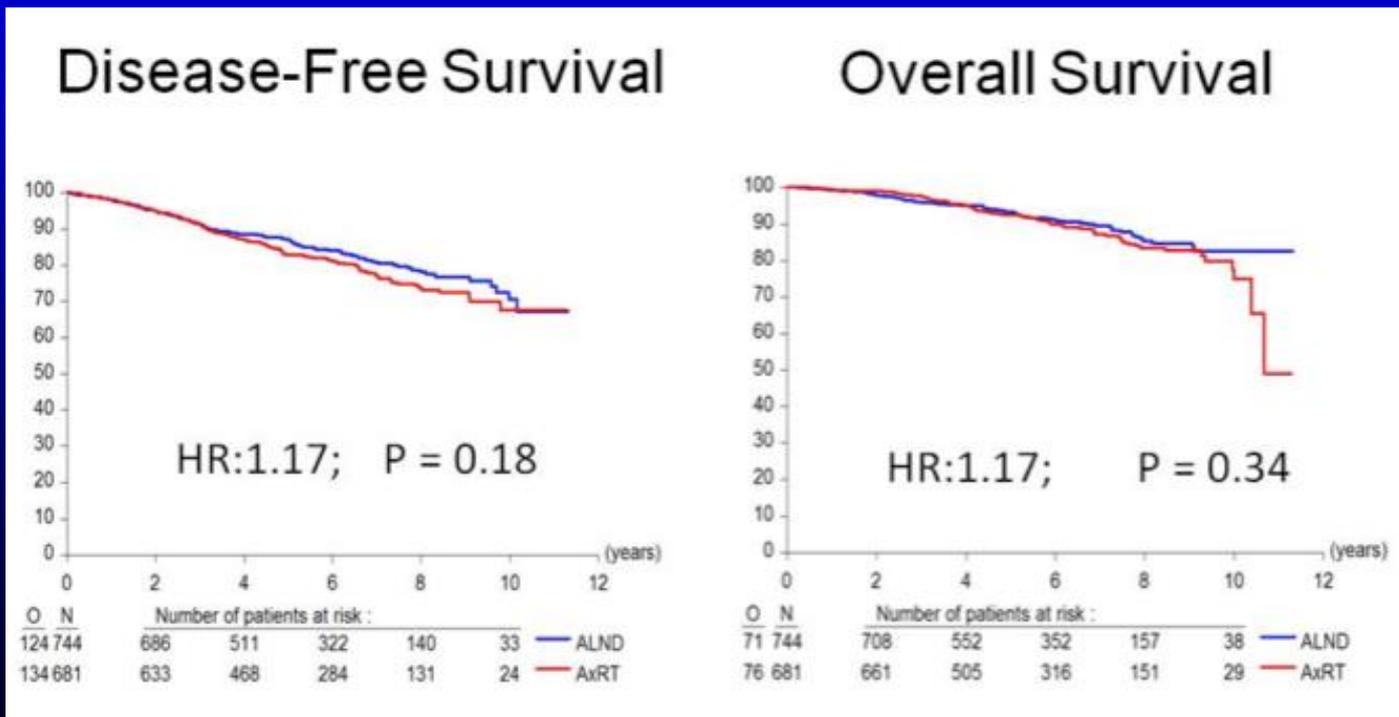


SLN Clinical Trials (2000 – 2010)

- NSABP B-32: 5601 patients randomized to SLN vs. axillary surgery:
 - 97% identification rate for SLN
 - No difference in disease free or overall survival at 10 years
- ACOSOG Z-011: 891 patients randomized to SLN vs. axillary surgery for patients with up to 2 positive SLN's!!!
 - No difference in disease free or overall survival at 5 years.

Radiation for Positive LN's (2010)

- AMAROS Trial in Europe showed in 1400 patients with breast cancer that axillary radiation was as effective as surgery in controlling axillary disease



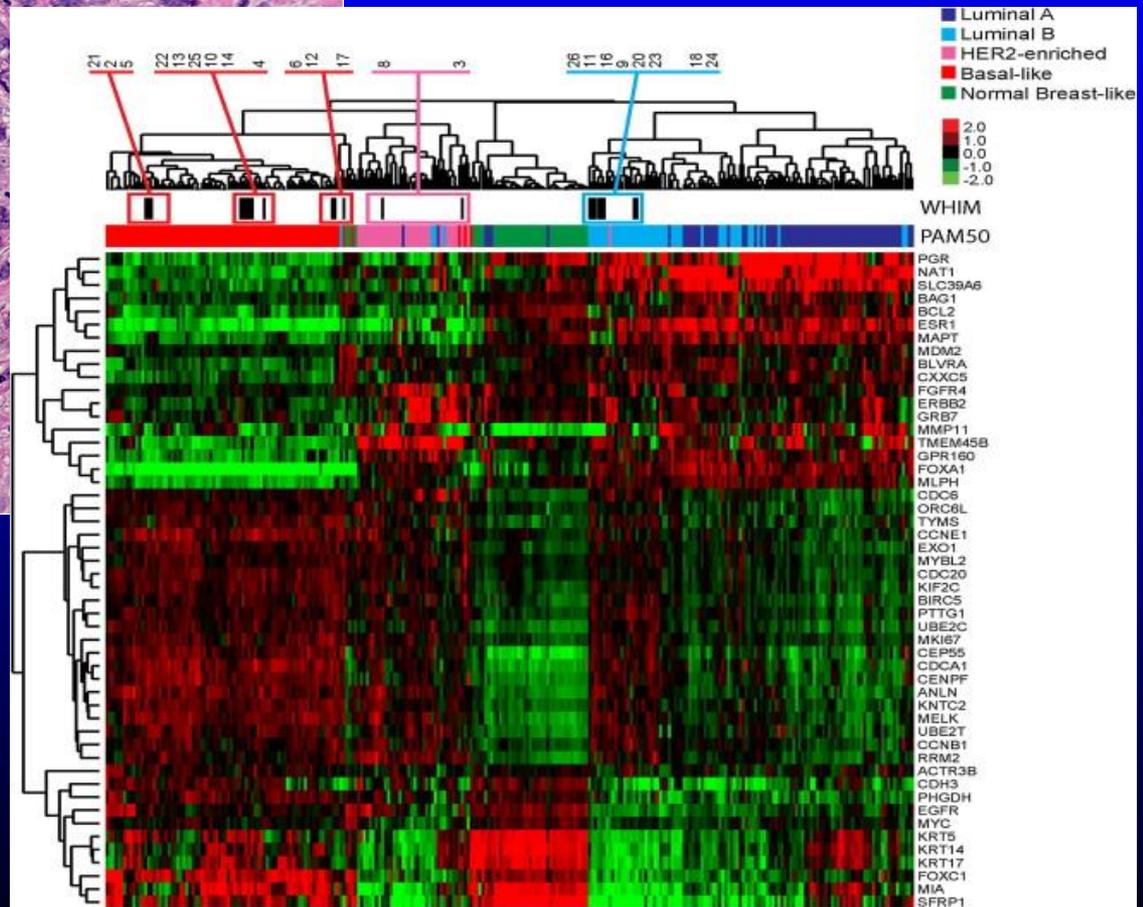
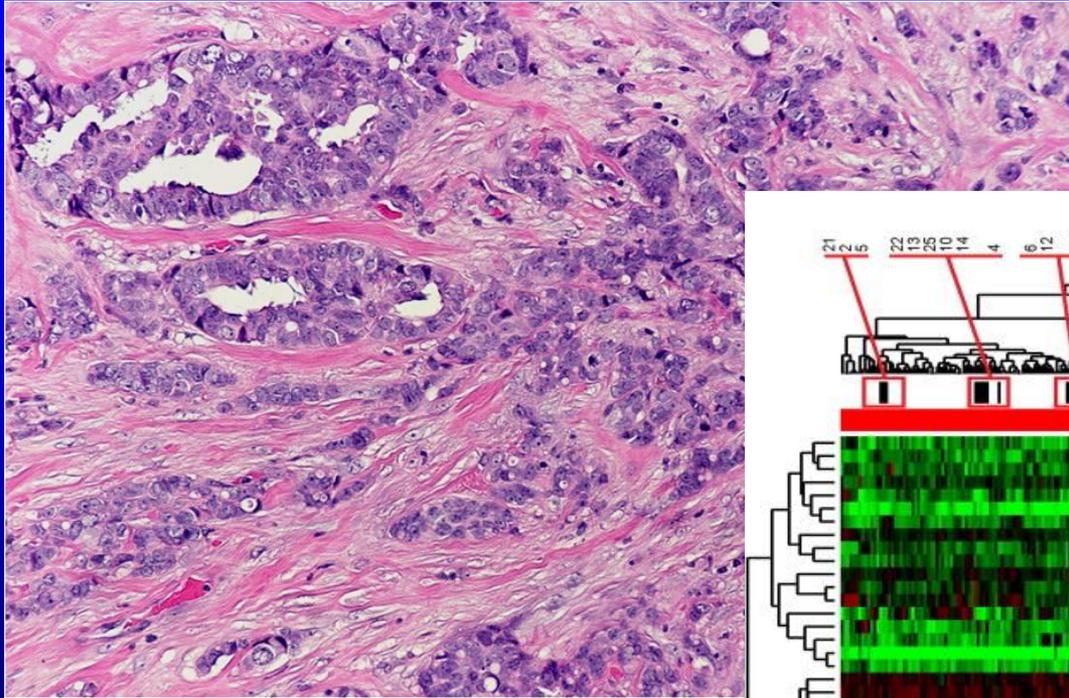
Pause: Interim Summary

- Essentially no role for radical surgery
- Total mastectomy = lumpectomy with radiation
- SLN alone is adequate for most patients including some with positive lymph nodes.
- Radiation works as well as surgery for many patients with positive lymph nodes.

Molecular Profiling of the Cancer

- Genetic profiling of the primary tumor was found to be predictive of the value of chemotherapy, even for some patients with positive axillary lymph nodes!
 - OncotypeDX
 - Mammaprint

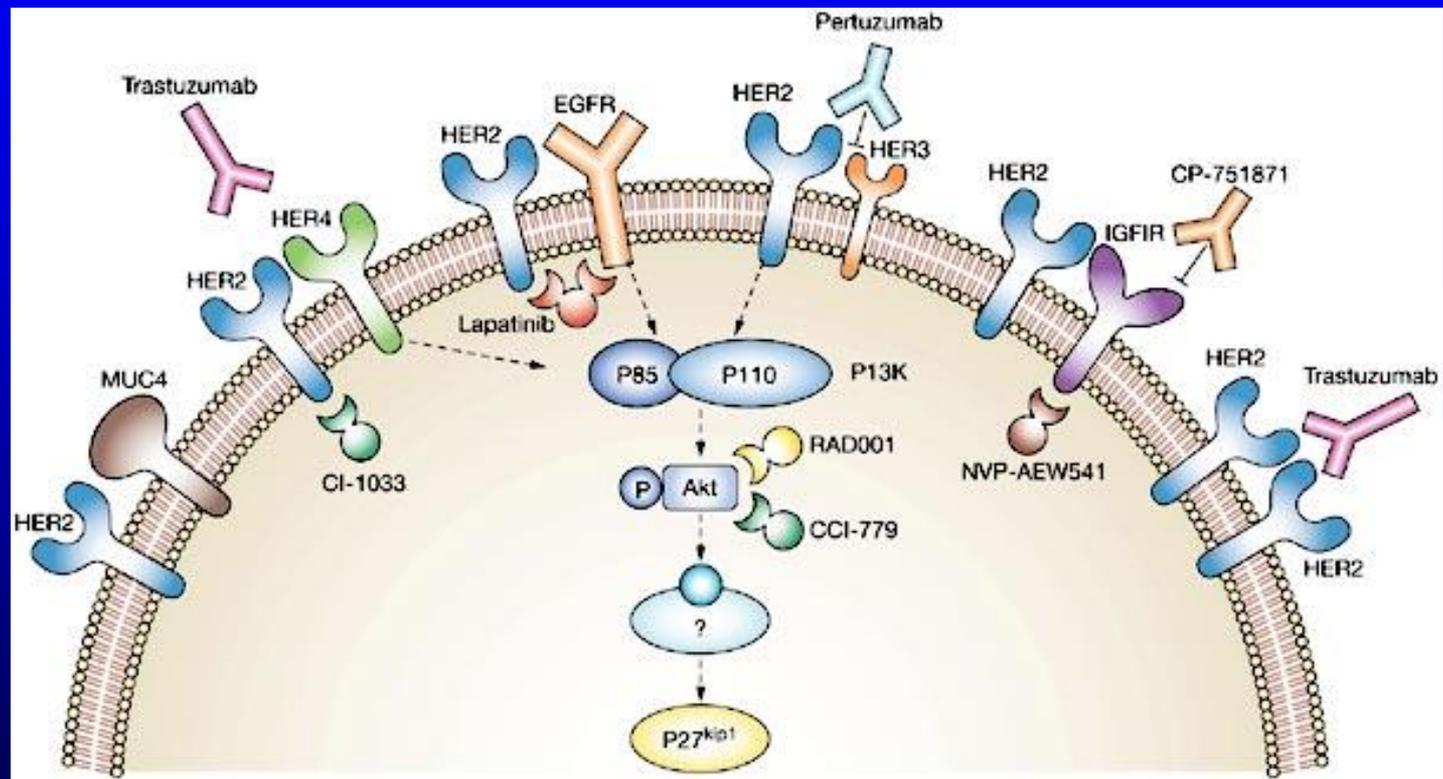
Histology vs. mRNA Profile



Development of Targeted Therapy

- The ability of specifically target breast cancer cells began in the 1970's:
 - Tamoxifen is a selective estrogen receptor agonist-antagonist
 - Aromatase inhibitors block peripheral production of estrogen
- Newly developed monoclonal antibodies specifically target cells with over-expression of the Her2 protein.

Targeted Therapy: Her2 Antibody



Preoperative Systemic Therapy

- Improvements in chemotherapy were used to “down-stage” patients with large tumors to permit lumpectomy instead of mastectomy.
- Targeted therapy results in up to a 70% complete clinical response prior to surgery!
- Preoperative therapy can also down-stage the axilla!

Current Summary

- Principle: “Biology trumps Anatomy”
 - Surgery impacts local control and obtains some information about biology (SLN and molecular profiling).
 - Targeted therapy is associated with excellent outcomes
 - Pre-surgical therapy allows for less extensive surgery (in the breast and axillary lymph nodes.)
 - Radiation is as effective as surgery for control of most axillary metastatic disease.

Breast cancer is a systemic biologic condition much more like diabetes and hypertension than a broken bone or a hernia.

Clinical Implications: Examples

Biopsy Result	➔	Final Treatment
<ul style="list-style-type: none">• DCIS		<ul style="list-style-type: none">• Lumpectomy and radiation• Lumpectomy and no radiation <u>due to patient age and low grade</u>• Mastectomy <u>due to extensive disease</u>• Bilateral mastectomy <u>due to positive genetic testing</u>• Bilateral mastectomy <u>due to patient choice</u>

Clinical Implications: Examples

Biopsy Result Final Treatment

- 1 cm infiltrating ductal carcinoma
 - Lumpectomy and SLNB with radiation and hormonal therapy
 - Lumpectomy and SLNB with post operative chemotherapy and radiation due to elevated genetic profiling score
- 2 cm infiltrating ductal carcinoma
 - Lumpectomy and SLNB with radiation and hormonal therapy
 - Preoperative chemotherapy followed by lumpectomy and SLNB with radiation therapy due to Her2 amplification.

The Future: No Surgery!

- Ablative treatment for benign disease include FDA approved techniques:
 - Cryoablation
 - Laser ablation
- Clinical trials are currently underway for both cryotherapy and laser ablation.

TAKE HOME: Cancer Treatment

- Minimally invasive diagnosis, and soon perhaps, minimally invasive therapy will be the norm:
 - Both in the breast and for axillary lymph nodes
- Targeted systemic therapies (ER, Her2) are extremely effective:
 - Especially preoperative treatment to reduce surgical interventions.
- Genomic analysis of the tumor and estimate of chemotherapy benefit is now standard

TAKE HOME: New Diagnosis

What to tell the patient with a newly diagnosed breast cancer?

“The biopsy did show breast cancer, but this is very treatable. I need to obtain further information and refer you to a specialist to know what the best treatment will be.”

TAKE HOME: Message to Patients

- First and most important:

SLOW DOWN!

- Experts believe that most breast cancers are present 3-5 years before they become apparent on exam or imaging.
- The key to the best outcome is to individualize treatment of your particular cancer.