


UWhealth

Breast Cancer

Diagnosis and Surgical Treatment

*Roland Vega MD FACS
Clinical professor of Surgery
Department of Surgery*



ACS 2007

Five-year Relative Survival (%)* during Three Time Periods By Cancer Site

Site	1974-1976	1983-1985	1995-2001
■ Breast (female)	75	78	88
■ Colon	50	58	64
■ Leukemia	34	41	48
■ Lung and bronchus	12	14	15
■ Melanoma	80	85	92
■ Non-Hodgkin lymphoma	47	54	60
■ Ovary	37	41	45
■ Pancreas	3	3	5 †
■ Prostate	67	75	100
■ Rectum	49	55	65
■ Urinary bladder	73	78	82

*5-year relative survival rates based on follow up of patients through 2002.
†Recent changes in classification of ovarian cancer have affected 1995-2001 survival rates.
Source: Surveillance, Epidemiology, and End Results Program, 1975-2002, Division of Cancer Control and Population Sciences, National Cancer Institute, 2005.

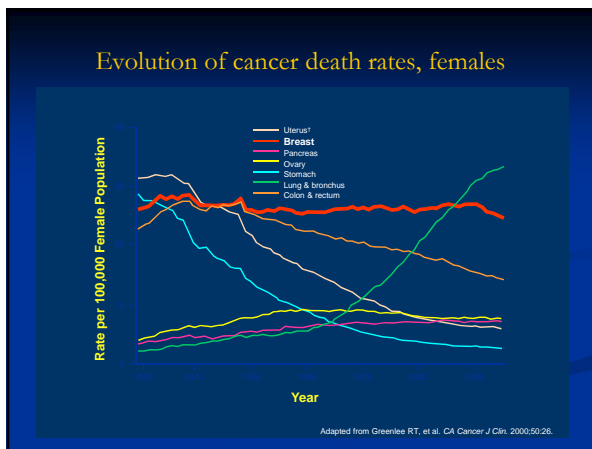
In the US how many diagnoses/deaths/yr?

	Diagnoses	Deaths
Breast	200,000	44,000
Lung	160,000	152,000
Colon	100,000	48,000
Prostate	171,000	34,000
NHL	47,000	23,000
Pancreas	26,000	26,000

RISK OF DEVELOPING BREAST CANCER

By Age	Risk (one in:)
25	19,608
30	2,525
35	622
40	217
45	93
50	50
55	33
60	24
65	17
70	14
75	11
80	10
85	9
ever	8

Feuer (1993)



- ### Risk Factors for Breast Cancer
- Increased age
 - Personal history of breast cancer (0.5 - 1% per year)
 - Atypical hyperplasia, LCIS, or DCIS
 - Known cancer gene mutation
 - Strong family history of breast cancer

BRCA 1 and 2

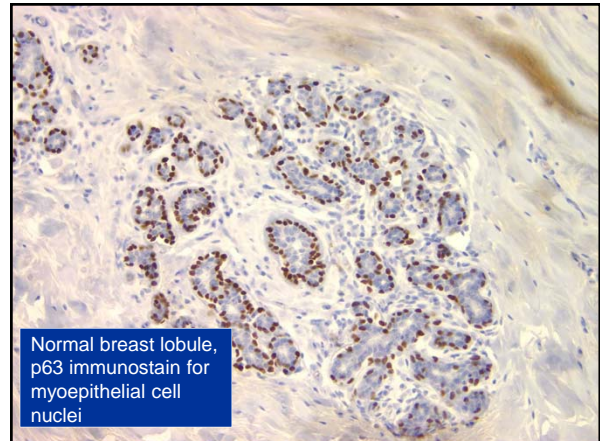
- Tumor suppressor genes, DNA repair
- First degree relatives with premenopausal cancer, bilateral
- Families with breast and ovarian cancer
- Male breast cancer with BRCA 2
- Ashkenazi Jewish ancestry
- Autosomal dominant....PATERNAL also

Histologic Classification

- In situ (non-invasive) carcinoma
 - has not broken through the myoepithelial cell/basement membrane layer
 - no lymphatic channels here, so no metastases
- Invasive carcinoma

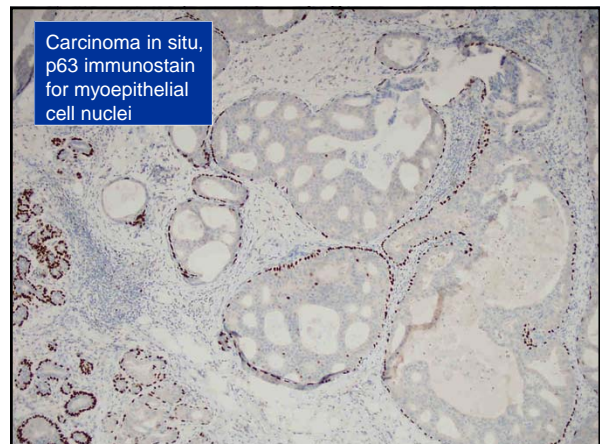
Pathogenesis of Breast Cancer

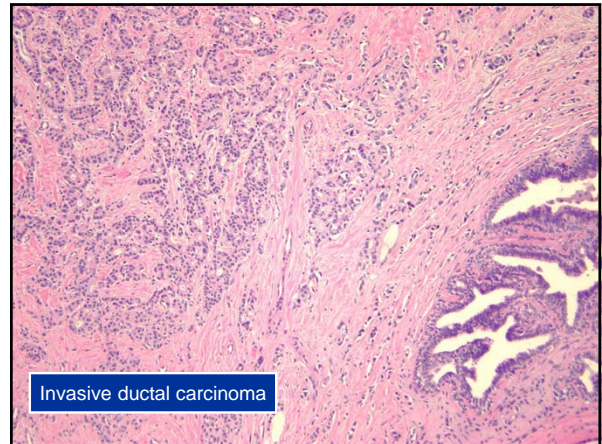
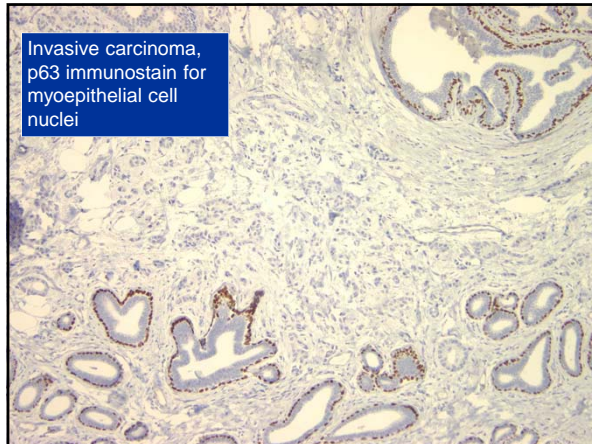
- Some with inherited genetic mutations
 - e.g., BRCA mutations
- Hyperplasia of epithelial cells
 - may be in response to hormonal influences
- Genetic instability leads to “atypia”



Pathogenesis of Breast Cancer

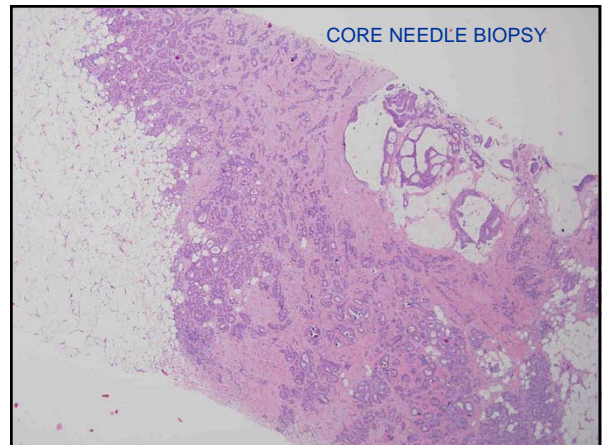
- More genetic/cellular alterations lead to carcinoma
 - increased expression of oncogenes
 - decreased expression of tumor suppressor genes
 - loss of cell adhesion molecules
 - increased expression of proteases





In Situ Carcinoma

- Ductal carcinoma in situ (DCIS)
 - a pre-invasive lesion—this lesion may progress to invasive cancer
- Lobular carcinoma in situ (LCIS)
 - a marker of risk for current or future invasive cancer anywhere in the breast tissue



Invasive Carcinoma

- Invasive ductal carcinoma
- Invasive lobular carcinoma
 - more often multicentric/bilateral
 - more difficult to detect by physical exam or by radiologic studies
- (Lots of other minor sub-types)

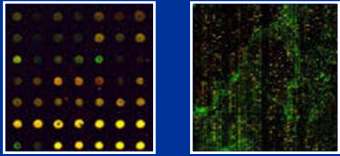


Biomarkers

Estrogen Receptor
Her2-Neu

Beyond Basic Histology: Developing Methods of Prognosis/Prediction

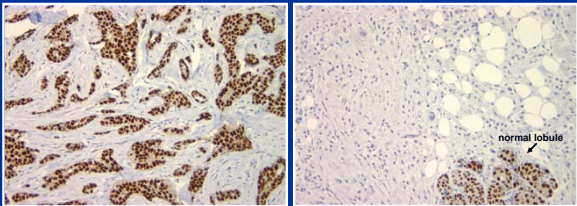
- DNA microarray (aka DNA chip, gene array)



- proteomics

Beyond Basic Histology: Routine Prognostic/Predictive Indicators

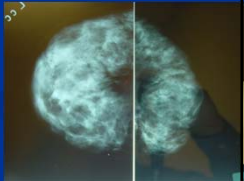
- estrogen and progesterone receptors
 - usually done by immunohistochemistry



estrogen receptor positive cancer estrogen receptor negative cancer

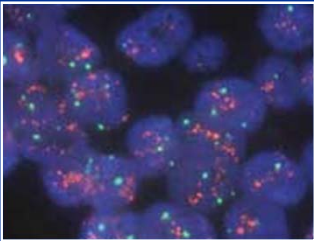
IMAGING

- Ultrasound
- Mammogram
- MRI



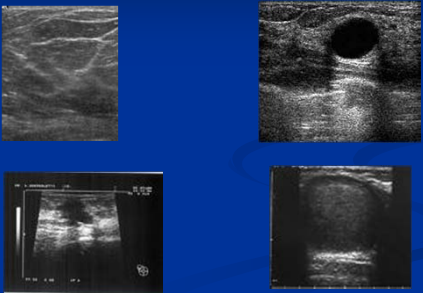
Beyond Basic Histology: Routine Prognostic/Predictive Indicators

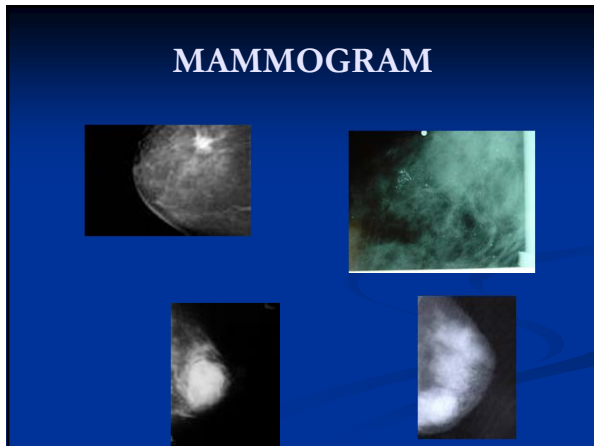
- Her-2/neu (a.k.a. c-erbB2) amplification
 - by immunohistochemistry or by FISH (as seen here)



green: chromosome 17 centromere
red: Her-2/neu gene

ULTRASOUND





Routine Presurgical MRI

- Associated with treatment delay
- Increased mastectomy rate (1.8 ratio)
- Not associated with improved margin status
- Not associated with decreased interop conversion to mastectomy rate

Morrow et al., J Am Coll Surg 2009;209:180-187

Breast MRI Conundrum

- High false positive rate
- Lack of randomized controlled clinical trials
- Lack of standarization of breast MRI techniques
- Surgical studies show no advantage in patient care
- Cost

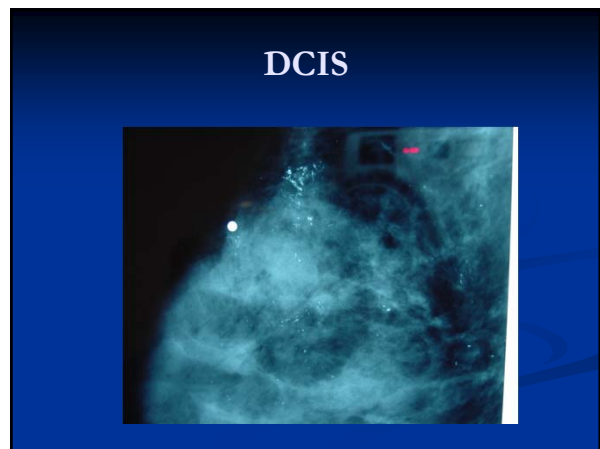
Diagnostic Breast Imaging & Biopsy Charge Comparisons

■ Diagnostic Mammogram	\$307
■ Breast Ultrasound	\$342
■ Stereotactic biopsy	\$2655
■ US biopsy	\$2352
■ Breast MRI bilateral	\$4177
■ MRI biopsy	\$4076

MRI False Positives

- Fibrocystic change
- Hormone effects
- Fat necrosis, scar
- Fibroadenomatous changes
- Papilloma
- Fibroadenoma
- Intramammary lymph node

Ikeida, D. Breast Imaging, 2004 p. 213



MRI

Cancer bright early then fades

EXCISIONAL

BIOPSY OPTIONS

- FNA
- Core – U/S or Stereotactic
- Excision - ? With needle loc

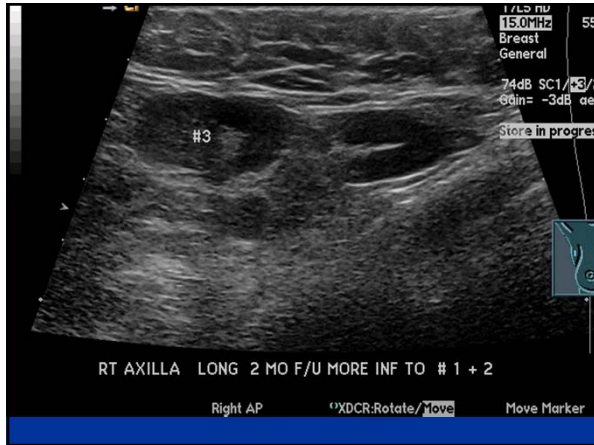
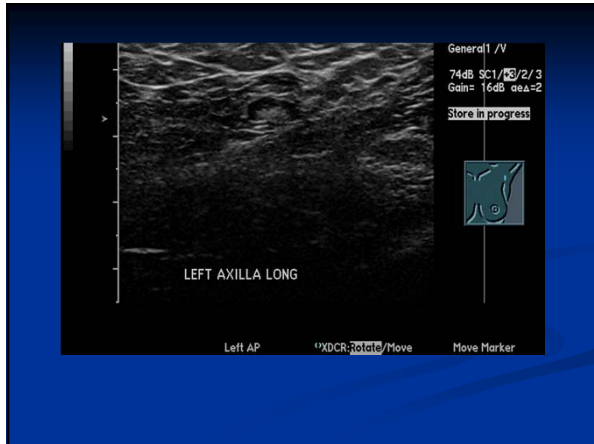
Axillary Lymph Nodes

- Normal lymph node has a thin smooth even cortex with large fatty hilum.
- Size can be quite variable—up to 5 cm and still be a normal fatty replaced node
- Identifying the artery and vein in the hilum can help identify the node

STEREOTACTIC

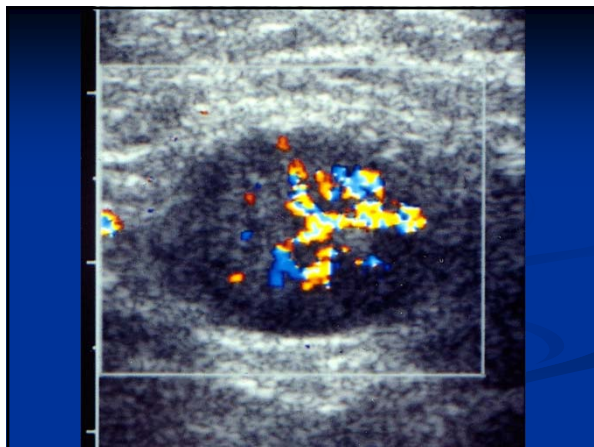
Lymph Node Characteristics

- Absence of fatty hilum—highly predictive of metastatic involvement (93%) according to Abe et al but not present often, Choi et al found a 4 fold increase in relative risk for metastatic involvement for nodes with absent hilum
- Presence of nonhilar blood flow—Abe found 78% PPV for this finding in metastatic involvement
- Size of lymph node is not helpful—we are able to biopsy lesions under 5 mm if suspicious on US



Surgical (local regional) treatment goals

- Remove primary tumor
- Address ipsilateral risk
- Stage / control axilla



MASTECTOMY



SLNBx

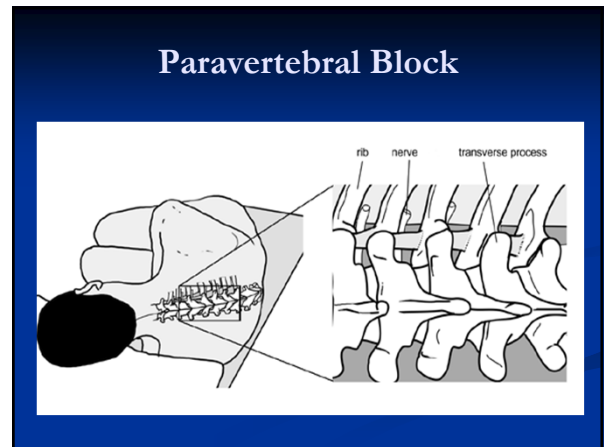
LAO

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Reconstruction

PARTIAL MASTECTOMY (lumpectomy)



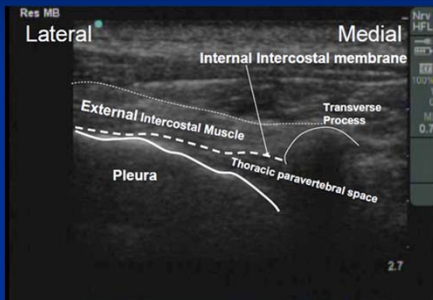
Paravertebral Block



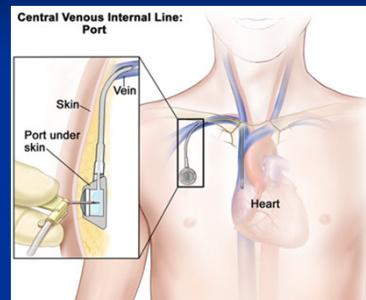
Paravertebral Block

- Mastectomy and axillary dissection
- Improved postop course
- Decreased recurrence rate ??

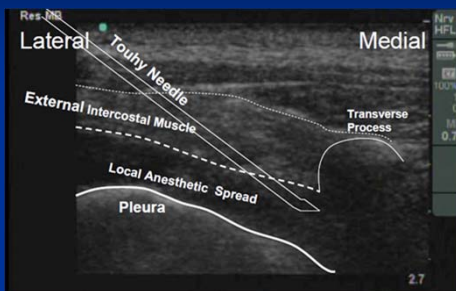
Paravertebral Block



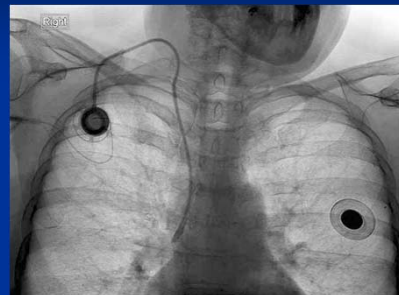
Venous infusion port



Paravertebral Block



Venous infusion port



Venous infusion port



Venous infusion port

- Repeated IV therapy and blood draw
- Low infection rate (3/1000)
- Insertion under local anesthesia
- Removal in office

Questions??