

Breast Imaging: Now...and the Future

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SOWEGA-AHEC Current Topics in Breast Imaging CURE Activity 01.17.12

Disclosures

- Disclosure
 - No real or apparent conflicts
- Significant Financial Involvement creating a conflict of interest
 - None
- Off label discussion
 - None

Objectives

- Confirm the appropriateness in ordering breast imaging exams.
- Review the next generation of breast imaging exams.

Caution-Wikipedia!

- “At this time, mammography along with physical breast examination is the modality of choice for screening for early breast cancer. Ultrasound, ductography, **positron emission mammography (PEM)**, and magnetic resonance imaging are adjuncts to mammography”

Breast Imaging-Controversy?

- In 2009, the U.S. Preventive Services Task Force recommended that women with no risk factors have screening mammographies every 2 years between age 50 and 74. They found that the information was insufficient to recommend for or against screening between age 40 and 49 or above age 74

MQSA

- Only took thirty years to standardize breast imaging!
- The **Mammography Quality Standards Act (MQSA)** was enacted by the United States Congress to regulate the quality of care in mammography. The act was officially effective in 1994. The U.S. Food and Drug Administration (FDA) began inspections of mammography facilities to ensure compliance in 1995
- MQSA requires facilities to “be accredited by an FDA-approved accreditation body.” Currently the only nationally-approved body is the American College of Radiology (ACR).
- State-level alternatives to the ACR are the Arkansas Department of Health, Iowa Department of Public Health, and Texas Department of State Health Services.
- BI-RADS system
- Still getting people in line...

ACR Guidelines

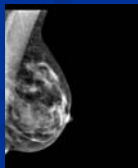
- "...a conscientious practitioner may responsibly adopt a course of action different from that set forth in the guidelines when, in the reasonable judgment of the practitioner, such course of action is indicated by the condition of the patient, limitations of available resources, or advances in knowledge or technology subsequent to publication of the guidelines"
- You have the power to order what you want

Current Standards

- Mammogram
 - Bread and butter
 - Screen film->Xeromammography->Screen film
 - Digital!!!
- Ultrasound
 - ACRIN->not a feasible screening option
- MRI
 - Lots of indications, but who pays?

Mammography

- "Periodic mammography screening of **age-appropriate asymptomatic** women is currently the only imaging modality that has been shown by the preponderance of data to reduce breast cancer mortality"



"Age-appropriate"

- *Every year at 40!*
- Until five years to live
- Probably should have "the talk" earlier

The Concept of "Sleepless Nights"

- Screener->Diagnostic
- Diagnostic->Biopsy
- Biopsy->Pathology
- Pathology->Surg/onc consults



Some Notes

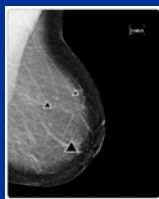
- Digital mammography
 - "Digital mammography has been shown to be at least equivalent in accuracy to screen-film mammography"
 - Lies, damn lies, and statistics
- CAD
 - Double reading and computer-aided detection (CAD) may slightly increase the sensitivity of mammographic interpretation, and may be used. However, this sensitivity is at the expense of decreased specificity with increased recall and, at this time, they are not considered standards of care.
 - Again...I call bullloop



Some Notes

■ CAD

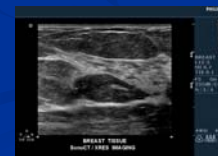
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Breast Ultrasound-2011

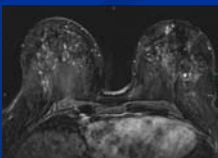
- Breast ultrasound should be performed with a high-resolution real-time linear array scanner operating at a center frequency of at least 10 MHz and preferably higher.
- Elastography, or tissue stiffness assessment, is among the new feature categories applicable to sonographic analysis of masses, to be included in the Associated Findings section in BI-RADS – Ultrasound, edition 2.



Breast MRI

■ High sensitivity, low specificity

- Breast MRI may detect abnormalities that are not evident clinically, mammographically, or sonographically. They may or may not be clinically significant. As with mammography or any other diagnostic test, false positive results can be expected, and the literature shows a wide range of specificity for breast MRI.



- Now you have to perform MRI bx if you are to be reimbursed for reading breast MRI. THANK GOD!!!!

Breast MRI-2008

Indications

- Surveillance of women with more than a 20% lifetime risk of breast cancer
- Screening of the contralateral breast in patients with a new breast malignancy.
- Breast augmentation - postoperative reconstruction and free injections

Breast MRI-2008

- Invasive carcinoma and ductal carcinoma in situ (DCIS) – Breast MRI may be useful to determine the extent of disease and the presence of multifocality and multicentricity in patients with invasive carcinoma and ductal carcinoma in situ (DCIS).
- Invasion deep to fascia
- Postlumpectomy with positive margins

Breast MRI-2008

- Neoadjuvant chemotherapy
- Recurrence of breast cancer
- Metastatic cancer when the primary is unknown and suspected to be of breast origin

Breast MRI-2008

- Lesion characterization – Breast MRI may be indicated when other imaging examinations, such as ultrasound and mammography, and physical examination are inconclusive for the presence of breast cancer, and biopsy could not be performed (e.g., possible distortion on only one mammographic view without a sonographic correlate).
- Postoperative tissue reconstruction – Breast MRI may be useful in the evaluation of suspected cancer recurrence in patients with tissue transfer flaps (rectus, latissimus dorsi, and gluteal).

Centers of Excellence

- The new standard
 - Formal weekly multidisciplinary breast conference
 - Low % of excisional biopsies
 - Certification
 - Mammography by the ACR (or an FDA-approved state accrediting body),
 - Stereotactic Breast Biopsy by the ACR
 - Breast Ultrasound by the ACR

Centers of Excellence

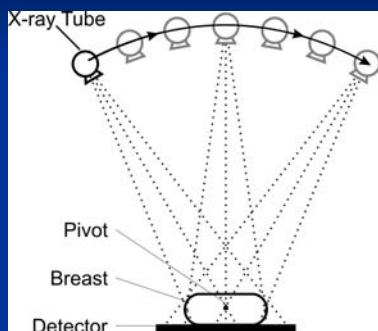
- I THOUGHT it was a big deal...
 - 18 accredited facilities found for GA (~240 total)
 - 3 facilities under review found for GA



The New Kids

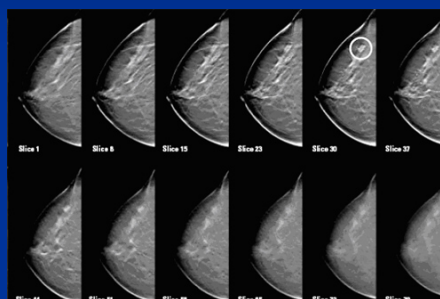
- Tomosynthesis
- Breast Specific Gamma Imaging (BSGI)
- Contrast-enhanced dual energy mammography

Tomosynthesis

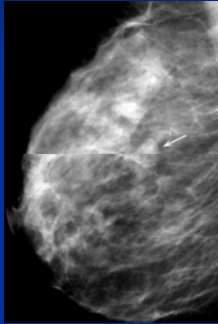


Tomosynthesis

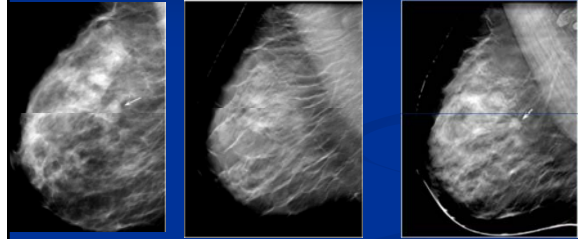
- FDA approved last February



Tomosynthesis



Tomosynthesis



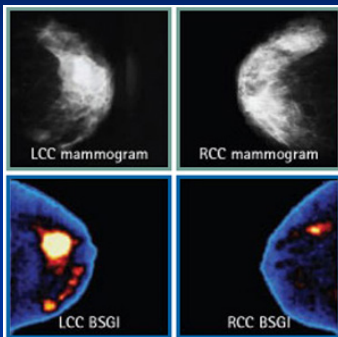
Breast Specific Gamma Imaging



Breast Specific Gamma Imaging

- We are getting one, yay!
- Analogous to MRI
- According to the national Medicare average, BSGI costs \$219.43 compared to \$994.43 for breast MRI.
- Wayyyy more comfortable. And you can put them in breast centers easily!

Breast Specific Gamma Imaging



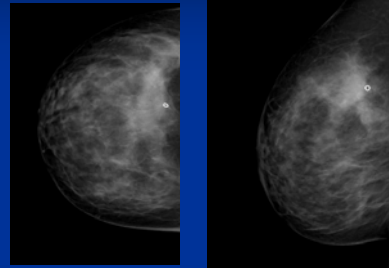
Invasive Lobular Carcinoma: Detection with Mammography, Sonography, MRI, and Breast-Specific Gamma Imaging

- A total of 28 biopsy-proven invasive lobular carcinomas were included in the study group.
 - Mammogram: sensitivity of 79%.
 - Sonography: sensitivity of 68%.
 - MRI: sensitivity was 83%.
 - BSGI: sensitivity of 93%.
- No statistically significant difference in the sensitivity of BSGI, MRI, sonography, or mammography, although there was a **nonsignificant** trend toward improved detection with BSGI.

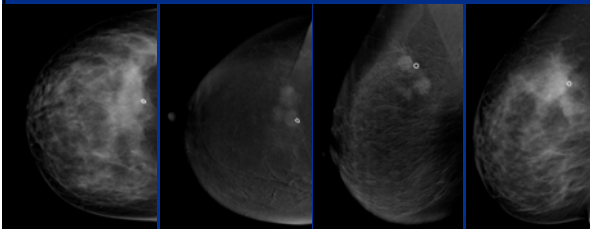
Dual Energy Contrast-Enhanced Mammography

- Uses two targets to produce photon beams
 - One with the standard low-energy beam designed for breast imaging
 - One with a higher energy beam designed to be absorbed by iodinated contrast
 - Able to see enhancing tissue by subtracting a precontrast baseline
- Need new mammo units ☹
- Need to place an IV in at least some of the diagnostic patients, maybe all depending on protocols ☹

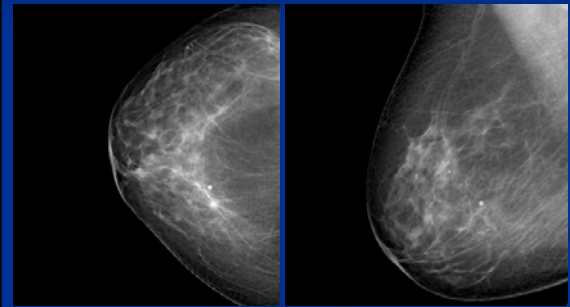
Contrast Enhanced Mammo



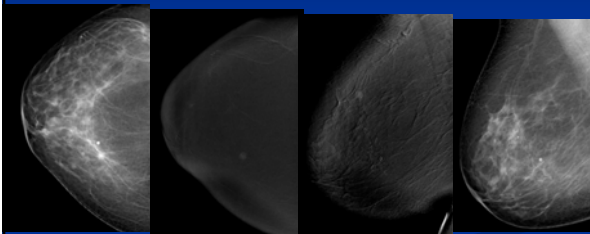
Contrast Enhanced Mammo



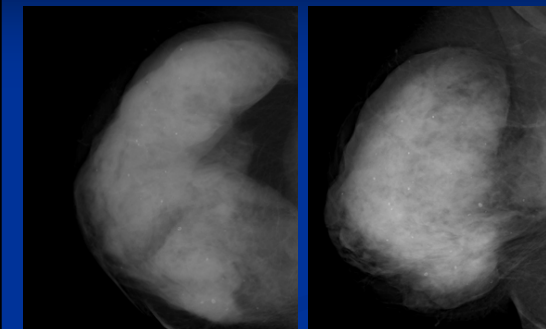
Contrast Enhanced Mammo



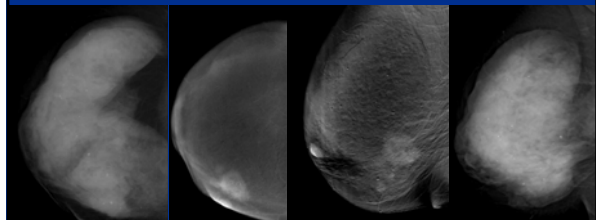
Contrast Enhanced Mammo



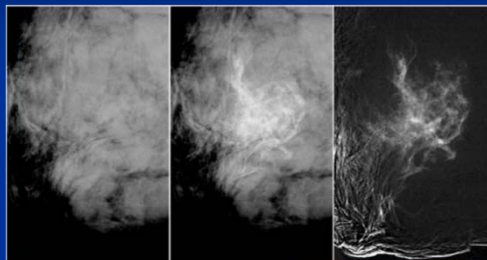
Contrast Enhanced Mammo



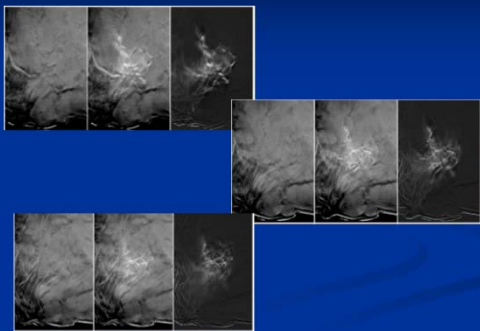
Contrast Enhanced Mammo



Tomosynthesis WITH Contrast



Tomosynthesis WITH Contrast



The Future?

- A good cheap imaging study?
- Maybe a nonradiologic preliminary screen?
- Tort reform?

- Thanks for your attention!

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Questions

- 1. What do radiologists hate about breast imaging?
- 2. What can the primary care physician do to optimize breast care?
- 3. What about self-exam/"self awareness" ?
- 4. What about prophylactic mastectomy?
- 5. What about whole-breast ultrasound and PEM?

Dec 11

- Dec 11: The Food and Drug Administration (FDA) has accepted the final premarket approval for Automated Whole-Breast Ultrasound (AWBU). This screening tool allows the radiologist to read images quickly, at a convenient time, while being free from doing the scan. And the technology involved in AWBU improves the visibility of small invasive breast carcinomas on the screen.
- Ultrasound, is relatively inexpensive, more sensitive than a routine mammogram alone and requires no injected ionizing radiation to produce a contrast in the image. A recent study showed that combining screening mammography with AWBU doubles breast cancer detection rates and triples the 1 cm or less invasive breast carcinomas found in dense breast tissue.
- It has been associated with an increased biopsy rate.



Questions?



Evaluation

<http://www.surveymonkey.com/s/CURE24>

<http://www.surveymonkey.com/s/CURE24Archived>