

41st Annual Cancer Convention

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“Beyond Mammography”

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<http://new.doctorsaputo.com/a/beyond-mammography>

Breast Cancer Risk Factors

- BRCA 1 & 2 account for 5-10% of breast cancers
- Menarche before age 12
- Menopause after age 50
- First child after age 30
- HRT and BCP's
- Alcohol increases the risk of breast cancer with one drink daily
- Postmenopausal weight gain
- Insulin resistance
- It is claimed that 70% of breast cancers have no identifiable risk factor...really? Is this a mystery?

The Cause of Cancer is not a Mystery

- Cellular malfunction causes all disease
- Four pathways
- Epigenetics determines genetic expression
- We know enough about what causes cancer to prevent the bulk of it today!
- Yet we focus on early detection...why?

Early Detection is not Prevention!

- Lifestyle is the best preventive strategy
- This includes epigenetic factors:
 - Diet
 - Exercise
 - Stress management
 - Adequate restful sleep
 - Weight management
 - Avoidance of toxic exposures
 - Having meaningful purpose in life
- Think before you pink!

What is the Natural History of Breast Cancer?

- We don't know!
- Which breast cancers do we need to identify?
- Do some cancers spontaneously disappear?
 - MMG studies: Arch Int Med 2008 Nov 24;168(21):2311-6. Incidence of invasive cancers 22% higher in screened group. 1268 vs 810 per 100,000 population over 6 years.
 - Autopsy findings: Ann Int Med Dec 1 1997: Invasive cancer in 1.3% & DCIS in 9%

What are our screening options for breast cancer?

- Mammograms (screening vs diagnostic)
- Digital mammograms
- Tomosynthesis
- Ultrasound
- MRI with contrast
- Nipple aspiration
- Breast specific gamma imaging (molecular breast imaging)
- Positron emission mammography (PEM)
- Breast thermography

Emerging Controversies in Breast Imaging

- Several highly trusted resources have questioned the effectiveness of mammography
 - Arch. Int. Med 11.2008: Breast cancer can regress & may not be life-threatening
 - JAMA 2009: for every Br Ca death saved, 838 women need 6 yrs of screening causing XS screening, biopsies, & over-treatment
 - New York Times: Otis Brawley, MD of ACS: MMGs are exaggerated
 - Peter Gotzsche, Cochrane Database: MMGs result in over diagnosis & treatment of DCIS.
 - USPSTF: MMGs are over-sold.

About Mammograms

- Test of anatomy
- Tissue density determines the image
- Problems with fibrocystic breasts
- Women with fibrocystic breasts have 4-6X increased incidence of breast cancer
- ACS Study MMG sensitivity:
 - Grade 1: 95-98%
 - Grade 2: 83%
 - Grade 3: 68%
 - Grade 4: 55%

The BCDDP "Gold Standard" Study

Baker, I. Breast cancer detection demonstration project: Five year summary report. *Cancer*, 1982, 32:194-225.

- 283,000 women between the ages of 35-74 were studied with CBE, MMG and MMT. There were 4400 cases of breast cancer. MMTs were discontinued after 2 years (30 years ago). Sensitivity 39% and Specificity 82%.
- Breast palpation showed an average overall detection rate of 60%
 - 47% detected for cancers less than 1 cm
 - 66% detected for cancers between 1-2 cm
 - 79% detected for cancers bigger than 2 cm
- Mammography in the 40-59 age range had a false negative rate of 20-30%. The overall ability of MMGs to detect cancer was about 70%
- Only one in six biopsies were positive for cancer when done on the basis of a positive MMG or CBE—the combined false positive rate was 89%

BCDDP Study MMGs Under Age 50

- Overall ability of MMGs to detect cancer was only 70%
- False positive rate: only 1 in 6 biopsies were positive for cancer (17%)
- Over 10 years 50% of women will have a false positive & 20% will be biopsied
- For every \$100 spent on MMGs, \$33 is unnecessary

Breast Density

- Mammography not well suited for patients with dense breasts, implants, or on hormone therapy
- Fibrocystic: XS fibrous or glandular tissue & less fatty tissue
- Women with fibrocystic breasts have 4-6X increased incidence of breast cancer
- ACS Study Cancer MMG sensitivity rates:
 - Grade 1: 95-98%
 - Grade 2: 83%
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Risk of Rupture of Encapsulated Breast Cancers

- Twenty two pounds of pressure can rupture the tumor capsule (Hoekstra)
- Mammograms today use 42 pounds
- Does this promote cancer spread?

Risk of Radiation-induced Breast Cancer from Mammograms

(Radiology 11.16.2010)

- Screen annually from 40-55, biannually through 74 with *digital* MMGs
- Cause 1 cancer for every 1163 MMGs & 1 death for every 9100 MMGs
- Should women with BRCA gene defects get MMGs?

Do Digital MMGs Have Less Radiation than Regular MMGs?

- Digital MMGs have 22% less radiation
- However, they use more views in 20% vs 12% with regular MMGs
- Overall, they use 17% less radiation
- Doses vary with the manufacturer; Fugifilm and Hologic Selenia use more radiation than a mammogram!

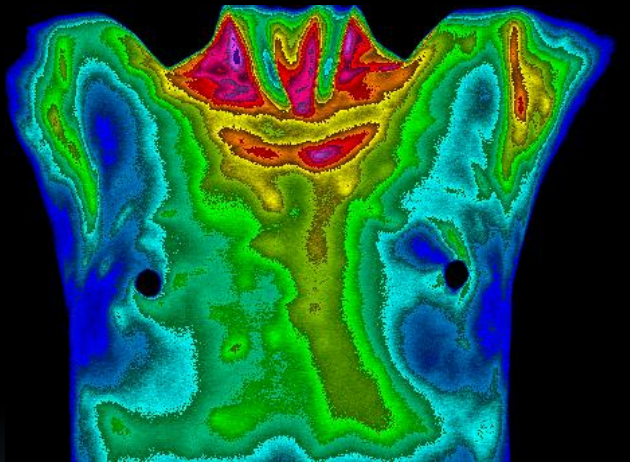
Radiation risks from other breast cancer screening tests

- One breast-specific gamma imaging test (molecular breast imaging) increases the risk of cancer 20-30 times
- One positron emission mammography test increases the risk of cancer 23 times
- These increases are not just for breast cancer but for all cancers

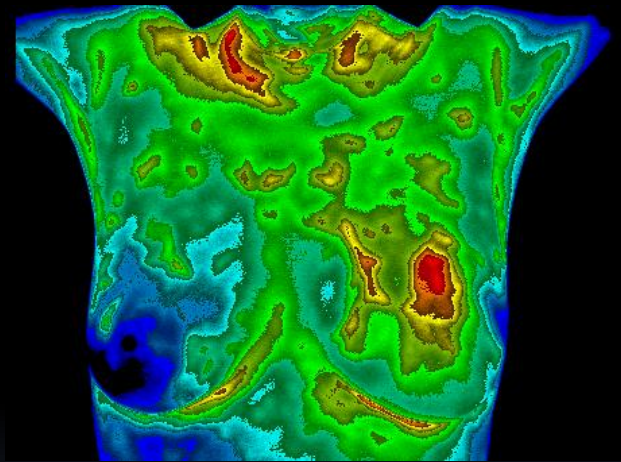
Is Tomosynthesis Better Than Digital Mammograms?

- It is basically a limited CT of the breast
- Creates 3-D reconstruction of breast
- Increases the CA detection rate by 9%
- Decreases the recall rate from 12% to 8%...a 30% lower recall rate
- It has twice as much radiation as a mammogram (Radiology July 2013)

BREAST THERMOGRAPHY



Normal Breast



Cancer

About Breast Thermography

- Measures infrared light emitted from breasts; 90% sensitivity & 90% specificity
- Is a test of physiology, not anatomy
- Helps differentiate benign vs malignant
- Cold stressor test exposes cancers
- Each person has a stable thermal fingerprint
- Get a baseline at age 25
- Is FDA approved as an adjunct to MMGs

Limits of Breast Thermography

- Do we need more data in a prospective, randomized controlled study to assess sensitivity & specificity?
- Consumers have no guarantee for credible testing or interpretation
- Lack of standardization of training, equipment, and protocols
- No standardized software for readings

Clinical Research Supporting Breast Thermography

- *Cancer*, 1980, Vol 56, 45-51
- *Biomedical Thermology*, 1982, 279-301
- *Thermology*, 1986, Vol 1, 170-73
- *The Breast Journal*, 1998, Vol 4 245-51
- *American Journal of Radiology* Jan 2003, 263-69
- *Minnesota Medicine* Dec 2009

Cancer

(1980; vol 56; p45-51)

- 58,000 patients with breast complaints were evaluated & followed
- 1245 with abnormal Th 3 scores had normal MMG, US, CBE, & biopsy
- 38% with normal breasts & 44% with mastopathy developed biopsy proven breast cancer within 5 years
- 90% with Th 4 or 5 had diagnosis made on their first visit.

The Breast Journal

(1998; vol 4; p245-51 Keyserlingk)

- Retrospective study of 100 patients with biopsy proven cancer using pre-op clinical exam, mammography, and infrared imaging.
- These cancers were: DCIS (4), stage 1 (42), stage 2 (54).
- Sensitivity: 83 patients with breast cancer were identified using MMTs, 66 by MMGs and 61 with clinical exam.
- The combination of CBE & MMG identified 83 cases. Adding MMTs increased sensitivity to 98%.
- Infrared imaging picked up 31 of 39 cancers missed by clinical exam and 10 of 15 by MMG. Infrared imaging missed 17 cases.
- The average tumor size using MMGs was 1.66 cm & was 1.28 cm using MMTs.
- The issue here is specificity, which is very low. However, if all three tests are negative, the risk of cancer is only 2%.

Biomedical Thermology

Gautherie et al 1982; p 279-301

- Followed 10,834 women with symptoms 2-10 years with CBE, MMGs, and MMTs
- Followed 387 people with normal CBEs and MMGs & followed Th3s for < 3 yrs
- In people without symptoms 33% developed breast cancer
- In people with mastopathy 41% developed breast cancer

Thermology

(1986; Vol 1; 170-73)

- Compared the effectiveness of MMG, CBE, and breast thermography in the detection of breast cancer
- Thermography had the best results of the 3 modalities
- When all three were used, there was a 98% effectiveness in finding breast cancers

American Journal of Radiology

January 2003; 263-69

- Reported MMT had a 99% sensitivity in finding breast cancers
- However the specificity was only 15%
- A negative breast thermogram in this setting is powerful evidence there is no cancer

Highlights From Breast Thermography Studies

- Advances in infrared technology and data on 300,000+ women show that breast thermography can identify 90-95% of breast cancers with 90% accuracy
- Breast thermography is safe, easy to do, is private, and affordable
- Breast thermography is FDA approved
- Begin breast cancer screening at 25
- It works in women with dense breasts

My Personal Comments

- There is ample data today documenting the value and safety of MMTs. We should try it in clinical practice
- Breast thermography adds to identifying breast cancer in combination with existing technologies
- Conflicts of interest and naïve arrogance play a powerful role in stopping progress.
- Don't make decisions without knowing the facts
- Breast thermograms have nothing to do with MMGs; the question is, "Do they add to our ability to identify breast cancers?"
- Is there any stand alone test for breast cancer screening?