Advances in Breast Cancer Diagnosis and Treatment

- Recommendations for Dense Breasts
- Intra-operative Radiation Therapy
Screening

- American Cancer Society
  - Women 40 and over:
    - mammogram and physician exam every year
    - monthly SBE
  - High risk women:
    - 5-10 years prior to age of family diagnosis

- US Health Task Force Recommendations:
  - Begin at age 50, once every other year
Benefits of Mammography

- Death rates from breast cancer have decreased steadily since 1990
  - Increased awareness
  - Improved screening
  - Earlier detection
  - Improved treatment

- Reduces death rate from breast cancer in women over 40

- Even more significant reduction in death over 50 with screening
Limitations of Mammography

- Sensitivity approximately 70-85%
- Dense breasts:
  - obscure detail
  - sensitivity is lower
- High call back rate (10%) for additional imaging
- Patient anxiety, discomfort
- Cost relative to number of cancers detected

Breast Density Notification

* Connecticut woman diagnosed with stage 3 breast cancer
* Never notified that her breasts were dense
* 24 states: law that requires imaging centers to notify women if their breasts are dense
* Some states: require insurance companies to pay for additional screening for dense breasts
Illinois

- 2014: Notification law passes
- Law requiring insurance coverage for additional screening tests
Your mammogram shows that your breast tissue is dense. Dense breast tissue is very common and is not abnormal but dense breast can make it harder to find cancer on a mammogram. Also, dense breast tissue may increase your breast cancer risk. This information about the result of your mammogram is given to you to raise your awareness in accordance with the state of Illinois requirements. Use this report when you talk to your doctor about your own risks for breast cancer, which includes your family history. For more information about breast density you may speak with your doctor.
Classification of Breast Density
What’s Wrong with Dense Breasts?

- Higher risk of breast cancer
- Harder to detect breast cancer
Higher Risk of Breast Cancer...

- Having dense breasts increase risk by 1.2-2.1 times average
- Having one first degree relative doubles risk
- BRCA mutation carriers have 8-10 times normal risk
Harder to Detect...

- Film mammogram sensitivity:
  - 85% in fatty breasts
  - 62-68% in dense breasts

- Digital mammogram sensitivity:
  - 82% in dense breasts

- Tomosynthesis: 3D Mammography
  - 87% in dense breasts

Mass in Dense Mammogram
RIGHT BREAST LONG
10 O'CLOCK 8 CM FR N
PALPABLE
Additional Screening...

- MRI: expensive, time consuming, high false positive rate
- US: time consuming, user dependent, high false positive rate
- Both have higher rate of cancer detection in women with dense breasts compared to mammogram
High Risk Women

- For women with over 20% lifetime risk based on family history
  - Cost effective to undergo screening with MRI or ultrasound
  - MRI: additional 8.5 cancers detected in 1000 screened
  - US: additional 3.2 cancers detected in 1000 screened

- Women with no family history of breast cancer
  - Minimal benefit of additional screening tests

Screening US

- In average risk women:
  - Meta-analysis showed only 6% of biopsies performed from screening ultrasound were positive for a breast cancer
  - No long term data showing decreased mortality
My patient received the new breast density letter. She wants to get additional tests to be screened for breast cancer.

Does she have a first degree relative (mother, sister, daughter) who had premenopausal breast or ovarian cancer, or a male relative with breast cancer? or Does she have a history of atypia (ADH, ALH) or LCIS on a previous breast biopsy?

YES

She would likely benefit from a breast cancer risk assessment. This could be performed by a physician with experience in breast cancer risk model selection and interpretation, or by a cancer risk assessment program.

NO

If the patient does not have other breast cancer risk factors, reassure her that her risk remains low. Educate the patient about the risks and benefits of screening MRI and ultrasound (higher cancer detection, but also higher false positive biopsy rates and short term follow-up recommendations). Many health centers have chosen not to offer screening breast ultrasound, in part because ultrasound depicts many fewer mammographically invisible cancers than does screening MRI. Tomosynthesis is an additional screening test with current results suggesting some increase in cancer detection and decreased false positives.

Explain that at most medical centers, additional screening tests are an out-of-pocket cost for the patient, unless they have been assessed to have high risk. Assist the patient in making the best personal choice to meet her needs based on these factors, using a shared decision making process.
Summary:

- Dense breasts:
  - Tomosynthesis is good, but not perfect
  - Family history: consider screening MRI or US in addition to mammogram
  - No family history, or other high risk factors: screening mammogram yearly
Summary:

- Mammogram, despite its imperfections, is still the only screening tool proven to reduce the death rate from breast cancer.
Goal: reduce risk of local recurrence

Early stage breast cancer

- Used in conjunction with breast conserving therapy
- Reduces risk of recurrence by >50%
The History of Breast Cancer Treatment...

- Modified Radical Mastectomy:
Current Breast Cancer Treatment...

- Breast Conservation (lumpectomy)
- Combined with Radiation
  - Reduces risk of recurrence
- Same overall survival as mastectomy
Radiation

- Whole breast radiation:
  - Radiates whole breast
  - Does not affect rate of new cancer in rest of breast
  - 4-7 weeks, 5 days per week, once per day

- Side effects:
  - Fibrosis, contraction, skin retraction, fatigue, surrounding affected structures
Radiation

- Partial breast radiation:
  - Radiates lumpectomy cavity
  - Same recurrence rate as whole breast radiation for ideal patients
  - Reduces treatment time: 1-5 days total
  - Less surrounding tissues affected
Partial Breast Irradiation

Types

- Multiple catheter brachytherapy
- 3D conformal external-beam
- Balloon or multi-lumen catheter
- Intraoperative radiation
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Intraoperative Radiation

- Delivers radiation dose during lumpectomy in one dose
- Surgeon removes tumor
- Applicator placed in cavity
- 25-40 minutes of low-dose radiation
Intraoperative Radiation

- Device removed, cavity closed
- If margins and nodes are negative, no additional radiation treatment needed
- If margins or nodes are positive, IORT dose used as a one week boost
Intraoperative Radiation
Intraoperative Radiation
TARGIT Trial

- Multicenter (28 institutions in 9 countries)
- Prospective trial
- Compared conventional radiation to IORT
- Low risk women: postmen, small tumors, node negative, negative margins
- Same recurrence in 5 years
- Excellent cosmesis, high satisfaction
Intraoperative Radiation

• Advocate System:
  • Good Shepard
  • Christ Medical Center
Intraoperative Radiation

**Goal for 2016:**
- Lutheran General IORT program
- Purchase of own unit, vs share and transport unit from Good Shepard
Caldwell Breast Center

- 20,951 Screening examinations
- 6,031 Diagnostic examinations
- 4,702 Breast ultrasounds
- 1,367 Biopsies - SCB, US, MRI and Needle Localizations
- 3 Tomosynthesis units out of 7
Caldwell Breast Center

* Seven surgeons
* 3 RN breast health specialists
* 12 Dedicated Mammographers - 10 per day
* 4 Dedicated Ultrasonographers - 3 per day
* 8 Radiologists
  * 5 Radiologists interpreting screening (1 per morning)
  * 3 Radiologists for Diagnostic, Biopsy and MRI (2 per day)