



## **Update on Breast Cancer Prevention and Treatment October 2, 2013**

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**Overview:** The purpose of this presentation is to best identify and assess patient risk for contracting breast cancer, describe modern genetic testing initiatives that screen for breast cancer, learn to individualize treatment for different patients, and to best cope with cancer survivors.

Dr. Kaklamani's areas of special interest include breast cancer and cancer genetics. Her research interests include the study of high-risk families for polymorphisms of the TGF-beta pathway.

### **Breast Cancer Risk Factors:**

- Age
- Family History
- Hormonal Factors:
  - Early menarche, late menopause
  - Age at first birth
  - Lack of breast feeding
- Number of breast biopsies
- Exogenous estrogens
- Alcohol intake
- Dietary fat

While there are many ways to screen for breast cancer, mammograms, clinical breast exams, breast self-examinations, ultrasounds, and MRI's, the most effective screening is mammography. Mammograms should be conducted on women annually for women under 50, and more frequently for women who are at a higher risk.

### **Preventative Drugs:**

Tamoxifen: Studies show that taking Tamoxifen for 5 years decreases the risk of breast cancer by half. Furthermore, this decreased risk is maintained beyond the 5 years

Raloxifene: A trial compared this new drug to Tamoxifen for postmenopausal women at high-risk for breast cancer. 20,000 women were randomized in this clinical trial. The two treatments were relatively similar, but Tamoxifen proved to be a better drug. However, the side effects of Raloxifene decreased the risk of uterine cancer and thromboembolic conditions compared to the risk when taking Tamoxifen.

Exemestane: In a trial conducted with 4,560 increased-risk postmenopausal women against a placebo, Exemestane showed a decreased risk of breast cancer.

There are, therefore, three approved preventative strategies for women at risk for breast cancer: Tamoxifen, Raloxifene, and Exemestane. Tamoxifen is effective for pre- and post- menopausal women, while Raloxifene and Exemestane are only used on post-menopausal patients.

**Genetic Testing:** With the newer innovations of making genetic tests available to more women, we must better understand counseling and testing.

#### Who do we counsel?

- Patient with breast cancer if:
  - Under 50 at diagnosis for BC
  - Triple negative BC
  - Two primaries
  - 1<sup>st</sup> – 3<sup>rd</sup> degree relative with BC under 50 or OC or 2 relatives with BC and/or pancreatic
  - Combination of BC, uterine cancer, diffuse gastric cancer, thyroid cancer, sarcoma, adrenocortical cancer, brain cancer, leukemia, dermatological manifestations, or macrocephaly.
- Ovarian cancer
- Bilateral breast cancer
- Ashkenazi Jewish heritage (1 in 40 vs. 1 in 500 in general population)
- Male breast cancer

#### Who do we test for HBOC?

- BC under 45 or 50 with risk factors
- Triple negative under 60
- Two other family members
- Two primaries, one under 50
- Ovarian Cancer
- Male breast cancer
- Ashkenazi Jewish heritage

### What genetic test should be offered?

- BRCA 1 and 2 testing: although rare, these are the most common of the highly penetrant gene mutations
  - Comprehensive BRCA 1 and 2 testing offers a full sequence and 5 BRCA 1 rearrangements. The cost is \$3,340, but over 90% is paid by most insurance companies
- Reflex to BART: BRCA Analysis Rearrangement Test
  - Uncommon BRCA 1 and 2 mutations, but reasonable to pursue. The cost is \$700, and insurance coverage is generally poor.

**Tailoring treatments for patients:** Because assays were developed to look at genes and determine how to predict a prognosis for patients, scientists are now able to categorize patients into low risk, intermediate risk, and high-risk patients. Only the patients in the high-risk category can benefit from chemotherapy.

### Endocrine Therapy:

- SERMs
- Aromatase Inhibitors
- SERDs
- mTOR inhibitors

### Anti Her2 Therapy

- Pertuzumab
  - Inhibits ligand-dependent HER2 dimerization and signaling
  - Activates ADCC
- Trastuzumab
  - Inhibits ligand-independent HER2 signaling
  - Activates ADCC
  - Prevents HER2 ECD shedding

**Caring for breast cancer survivors:** As more and more women are surviving breast cancer, it is important to continue care after treatment and to tailor treatments to minimize side effects whenever possible.

### Treatments that may lead to late effects:

- Lymph node dissection
- Chest radiation
- Anthracyclines
- Trastuzumab
- Endocrine therapy

### Late effects:

- Lymphedema
  - Prevention and early detection is the best form of treatment, but arm elevations, massaging, pressure garments, and physical therapy also play a significant role in treatment
- Congestive heart failure

- Infertility
- Menopausal symptoms
  - Symptoms include hot flashes, mood swings, vaginal dryness, weight gain, sexual desire, osteoporosis, and heart disease.
- “Chemobrain”
  - Symptoms include short term memory loss, decreased attention span, slower thinking, difficulty multitasking, and lower resting brain activity
  - 20-50% of women receiving chemotherapy complain of “chemobrain”
  - Best treatment options include rest, brain exercises, following routines, and focusing on one task at a time
- Leukemia
- Angiosarcoma
  - Treatment involves aggressive surgical resection to obtain wide negative margins
- Fatigue
- Osteoporosis
- Uterine cancer
- DVTs