

SPECIAL REPORT | DETECTION AND TREATMENT

Getting personal: a custom approach

Diagnoses and treatments are becoming more tailored to the individual.

By **LISA LIDDANE**
THE ORANGE COUNTY REGISTER

In the world of breast cancer, the days of a one-size-fits-all diagnosis and treatment in the United States belong to a bygone era.

Instead, think customization, from diagnosis to treatments. This is largely a result of scientists discovering genes associated with breast cancer and the ensuing technologies to understand and target those genes.

But beyond knowing about breast cancer genes, health-care providers also can tailor treatments because they now have much more information about what has worked, and what hasn't, in addressing various types of breast cancer. A woman who is past menopause may have a different treatment plan, for example, than would a woman in her 30s. And that can be true even if both women have the same type of cancer.

The great hope with all of these developments is to uphold the quality of life — that as more women survive breast cancer, they won't have severe side effects or compromise their physical and psychological health later in life.

Here is a snapshot of the research conducted in the past year that helps doctors better personalize breast cancer diagnosis and treatment:

Biopsy vs. other diagnostic methods: The Agency for Healthcare Research and Quality this year released a study finding that diagnostic methods, such as an MRI or PET scan, can find cancers in women who have had an abnormal mammogram. This reduces the need for biopsy, a surgical procedure. But each

test also may miss some cancers. Bottom line: None of these tests can replace the biopsy at this point. Studies are needed to see if combining these tests may improve their accuracy, according to a report from the nonprofit advocacy organization breastcancer.org. Dr. Jay Harness, medical director at St. Joseph Hospital Comprehensive Breast Center in Orange, says a PET scan dedicated to breasts might be better at finding breast cancers in more than one location, and might help determine whether chemotherapy is working.

Gene expression profiling: Tests such as the Oncotype DX can be used in determining whether a patient needs chemotherapy. It's limited to patients whose cancer has not spread to the lymph nodes but which is estrogen receptor positive, Link said. Here's how it works: After tumor tissue is biopsied, it is tested to measure the amounts of specific genes. The test calculates what is called a "cancer recurrence score." The results then are sent to your doctor so that you can discuss treatment options.

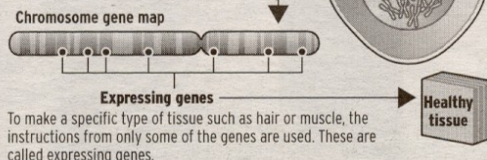
Lapatinib: This is an experimental pill that generated excitement at a major cancer conference earlier this year. Lapatinib, also known by its brand name, Tykerb, targets the HER2 protein and blocks it inside the cells. Researchers say that it may be an option for women with advanced breast cancer whose cancer has stopped responding to trastuzumab (Herceptin), an intravenous drug that blocks the same HER2 protein on the surface of the cell. A study released this year showed that lapatinib,

Decoding breast cancer

Oncotype DX is a new method of testing breast tumors that can help determine whether a cancer is likely to recur. It also assesses whether a patient may need chemotherapy. The test is useful only in early-stage (Stage I or II) tumors that have not spread to the lymph nodes. How the test works:

GENETIC BLUEPRINTS

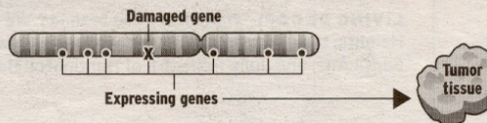
The human body uses instructions found in its genes to build and repair itself. The genes, made of strands of DNA, are contained in the chromosomes of the body's cells.



To make a specific type of tissue such as hair or muscle, the instructions from only some of the genes are used. These are called expressing genes.

Bad instructions

If the DNA in any of the expressing genes is damaged, then its instructions might result in the wrong kind of tissue. This can create a tumor. Because there are many genes involved, the genetic cause of a tumor can vary greatly.



THE TEST PROCEDURE

Oncotype DX is designed to identify which genes were active in creating the tumor.

Preparation

A small amount of surgically removed tumor tissue is preserved in paraffin and shipped to a lab. There, the sample is sliced into sections and subjected to a procedure that extracts RNA. RNA is a copy of the instructions contained in the DNA of the genes.

Testing

The RNA is multiplied by producing exact duplicates of it. A chemical is added that gives off a fluorescent glow if certain genes are present. The more of those genes are present, the brighter the glow — this is how the expressing genes in the tumor are identified.

Analysis

The identified genes are compared to a database of tumors with similar genetic structure. Using the recurrence rate of those tumors, the probability of the patient's tumor coming back can be determined.

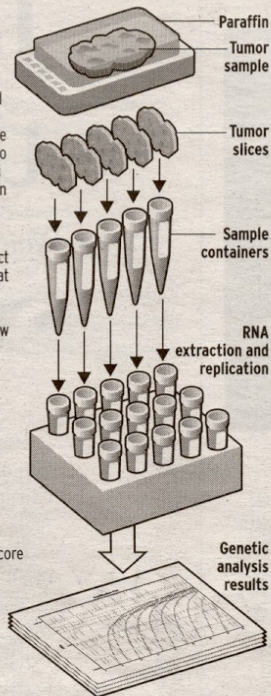
Results

The tumor is assigned a recurrence score between 1 and 100:

- 1-17: low risk of recurring
- 18-30: intermediate risk
- 31-100: high risk

This information can help the doctor and patient make a better treatment plan.

Sources: Genomic Health, Applied Biosystems



Phil Loubere / The Register

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CUSTOM: Treatments becoming tailored

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combined with the chemotherapy drug capecitabine (Xeloda), can retard the growth of cancer twice as long as capecitabine alone. It did not improve overall survival. The results are promising but preliminary. Side effects: diarrhea, rash, redness and tingling in the hands and feet. In Orange County, Dr. John Link is conducting a study on lapatinib. Link is medical director of the MemorialCare Breast Center at Orange Coast Memorial Medical Center.

Partial radiation: Instead of giving radiation to the entire breast, a high dose of radiation is directed at the tumor site. This spares the rest of the breast, according to breastcancer.org. It also entails a shorter period for radiation, compared with standard radiation. A study this year indicated that partial radiation is a promising option in reducing the risk of cancer recurrence. But before opting for partial radiation, women need to wait for the results of an ongoing study comparing it to standard radiation. It's un-

clear when that study will end.

Raloxifene vs. tamoxifen: A study in the Journal of the American Medical Association this year showed that raloxifene (Evista), a drug for osteoporosis, is as effective as tamoxifen (Novaldex) in reducing risk of breast cancer in high-risk, post-menopausal women. What's more, raloxifene involves fewer side effects, such as risk of developing cataracts, uterine cancer and blood clots, said Dr. Glen Justice, president of the American Cancer Society and medical director of the MemorialCare Cancer Center at the Orange Coast Memorial Medical Center.

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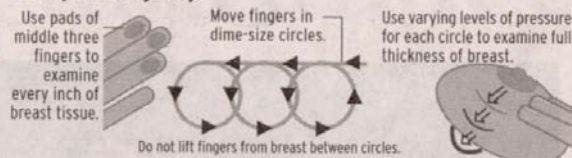
The study followed women for five years, so we don't know yet if there are any longer term side effects for raloxifene. Both drugs are SERMs - selective estrogen receptor modulators. They act by selectively blocking the action of estrogen in the cells, which in turn, may eventually lead to cancer cells starving and dying.

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Steps you can take for prevention

You can detect changes in your breasts by doing a complete monthly examination. Always use the same technique so that you'll notice any obvious changes.

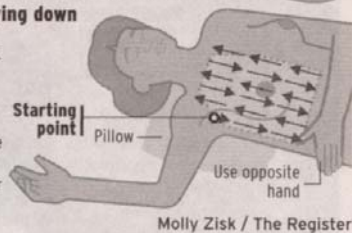
Feeling with finger tips



Examining breast area lying down

- Start in arm pit and move downward to area below breast.
- Move a finger's width toward middle and continue upward until you reach collarbone.
- Make at least six strips before nipple and four after nipple.
- It takes 10 to 16 strips to cover breast area.

Source: American Cancer Society



DID YOU KNOW?

You can take steps that may help reduce your risk of breast cancer. These steps include doing a breast self-exam every month and getting a mammogram, eating healthfully, exercising regularly, limiting alcohol consumption and breast-feeding.