

Metastatic Breast Cancer

GENOMIC TESTING:

An Approach to Treatment That Is Promising, But Not Yet Standard

BY ERIN ROWLEY

Genomic testing is done on a tumor sample taken during a biopsy (or, less often, on a blood sample). It looks for *mutations*, or changes, in the genes that make up a tumor. Those mutations may cause the cancer to grow. This is different from genetic testing (see “Genomic Testing or Genetic Testing?” at right).

If a genomic assay, another word for test, shows the cancer has certain mutations, you may be able to join clinical trials of new medicines being studied that target those mutations. Or, you may be able to get a medicine that isn’t FDA-approved in breast cancer but is approved to target that mutation in another kind of cancer.

But most mutations don’t yet have treatments that can target them. And it’s not yet known if a treatment chosen because of your genomic testing results will be better for you than the standard treatments your doctors would have suggested. Because of this, it can be hard to get insurance companies to cover the cost of testing, and paying thousands of dollars out of pocket is not an option for many people.

Genomic testing is promising, but it continues to be under study. Still, many people are excited about how it could affect breast cancer treatment.

‘I’m In’

Genomic testing can be done on an existing sample or doctors can obtain a new sample through a biopsy. New samples may be especially helpful after the disease has spread, to learn if the DNA of the cancer has changed.



GENOMIC TESTING OR GENETIC TESTING?

Though they sound similar, genomic and genetic testing are two different things. *Genetic testing* looks at the DNA found in every cell in your body to see if you were born with a mutation that increased your risk of breast cancer. Genomic testing looks at the DNA of the tumor itself, to find mutations that appeared later in your life.

Some people are born with a *BRCA1* or *2* mutation, the most well-known mutations that genetic tests look for. Inheriting those mutations raises a person’s risk of developing breast cancer. But it’s also possible for someone to have been born without a *BRCA* mutation, and still develop a metastatic breast cancer tumor that has a *BRCA* mutation. To learn more about targeting a *BRCA* mutation in a tumor, see “Common Mutations” on the last page of this article.

Some people who get genomic testing have also had genetic testing. The genes you inherited don’t change. But the genes in the cancer can change, adapt to treatment and develop new mutations as time goes on, so your doctor may recommend a new genomic test each time the cancer grows or spreads.

"Every progression is an opportunity to see what's going on," says **Liz Santarsiero, MSN, RN, CRNP, NP-BC**. Ms. Santarsiero is a nurse practitioner, and also an account executive at Foundation Medicine, one of several companies that offers genomic testing.

Take, for example, someone who has bone mets that are stable or improving but liver mets that are growing, she says.

"There's an argument right there to say, 'Let's get a biopsy of the liver [tumor] and see what's going on and do further analysis. ... Are we able to find a mutation here that potentially tells us why this liver [tumor] is progressing?'" she says.

Foundation Medicine's FoundationOne genomic assay looks for mutations in 315 tumor genes. The company has done more than 90,000 genomic tests. About 10,000 of those have been for people with breast cancer.

Lori Pescatore, 52, from Doylestown, Pennsylvania, was diagnosed with metastatic breast cancer early this year. When doctors told her genomic testing could help them learn more about the cancer and possibly qualify her for clinical trials, she had two words — "I'm in."

Like many other major medical centers, Memorial Sloan Kettering Cancer Center, in New York City, where Lori gets treatment, uses its own genomic assay. Within a few weeks, the results of that test came back. Lori got a long sheet of paper with information about the cancer. It pointed out one particular mutation for which there is a clinical trial at Memorial Sloan Kettering.

Before Lori's test results came back, she began treatment with letrozole (Femara) and palbociclib (Ibrance). But the disease grew and Lori is now talking to her doctors about other treatment options, including possibly joining that trial. She thinks of the information provided by the genomic testing as "more ammunition for me."

Not Yet Standard

Oncologists say it's important to remember genomic tests are not yet considered a standard of care.

"We need to remember that this approach is really exciting, but exploratory, work" says **Tiffany A. Traina, MD**. Dr. Traina is associate attending physician and clinical director of the Breast Medicine Service at Memorial Sloan Kettering. More than 10,000 people have had genomic testing there, and most of them have metastatic breast cancer, says Dr. Traina, who is also a faculty member in the department of medicine at Weill Cornell Medicine in New York City.

Dr. Traina encourages many people with metastatic breast cancer who she treats to get genomic testing. She thinks it's especially helpful in matching people with clinical trials that are testing new treatments. If you have several clinical trials to choose from, knowing your tumor's mutational profile can help you narrow down your choices.

Dr. Traina has seen breast cancer that progressed on standard treatments become stable and even shrink when a woman enters a clinical trial for a targeted therapy based on genomic markers. But she cautions that this isn't yet

backed up by research. Right now, she says, "We have no way to know that a treatment chosen based on a particular tumor mutational profile is going to be any better than standard FDA-approved treatments." She encourages the people she treats to explore genomic testing and consider joining clinical trials to test these important questions.

MaryAnne DiCanto, 59, from Amityville, New York, was diagnosed with metastatic breast cancer in 2013. She's had standard treatments. She's also had three courses of treatment that were recommended based on the results of genomic testing. Those treatments included a targeted therapy that kept the disease stable for about 8 months — the longest period of time she stayed on one course of treatment since her metastatic diagnosis.

A later biopsy and genomic test suggested another targeted therapy, everolimus (Afinitor), with an aromatase inhibitor would benefit her, but she stopped that combination because of side effects. Now she is getting chemotherapy that was chosen based on genomic testing results, and awaiting new genomic testing results that could once again shape her treatment in the future.

Getting the Test

It can sometimes be hard to get insurance companies to pay for genomic testing, or to pay for treatments the tests suggest may be helpful but that aren't FDA-approved for breast cancer.

Foundation Medicine works with the Patient Advocate Foundation to help people get access to testing and treatments, regardless of their financial situation. It also has its own financial assistance program to help people for whom cost would be a barrier. It took months for MaryAnne's insurance company to cover the cost of the test — \$5,800. But Foundation Medicine helped her get financial aid so she could get the testing right away. Some other testing companies, and some medical centers that have their own assays, also provide financial assistance or cover the cost of the testing themselves.

Before joining Foundation Medicine earlier this year, Ms. Santarsiero worked as an oncology nurse practitioner. She worked closely with people who had breast cancer, especially those who had cancer that was metastatic, inflammatory or both.

She and her colleagues recommended FoundationOne genomic testing to most people with metastatic breast cancer they treated, she says. They recommended it to everyone with triple-negative metastatic breast cancer. This subtype generally has more mutations than others and has no FDA-approved targeted therapies.

MaryAnne has had genomic tests from other companies besides Foundation Medicine, including Guardant360 and Caris Life Sciences. Some tests look at different mutations than others, or different aspects of mutations. For MaryAnne, different tests, done by different companies at different times on different samples, have shown different mutations. Some tests have shown a lot of targetable mutations. Others have shown very few.

It can be frustrating if a genomic test doesn't find targetable mutations, especially if you've gotten your hopes up. But, says Ms. Santarsiero, "If we find nothing or if we find mutations that aren't targetable, then there's the argument [that] you've really done everything you could possibly do. ... They can be satisfied with knowing that everything, literally, was done for them, even to looking at potential genomic alterations that can be targeted."



MaryAnne DiCanto

COMMON MUTATIONS

There are many, many mutations that can show up in a metastatic breast cancer tumor. Here is some info about a few of the most common, and most studied:

ESR — When this mutation shows up in the tumor of a person with estrogen receptor-positive breast cancer, it suggests hormonal therapy won't work well. Pairing other medicines, such as palbociclib (Ibrance), with hormonal therapy may help.

PIK3CA — This mutation suggests everolimus (Afinitor) may work well.

BRCA1 and 2 — BRCA mutations stop DNA from repairing itself as well as it should. A BRCA mutation in the DNA of a tumor may be best treated with a type of chemotherapy that damages DNA, such as a platinum, like cisplatin (Platinol) or carboplatin (Paraplatin). A targeted therapy called olaparib (Lynparza), which is FDA-approved to treat ovarian cancer, may also be an option.

LOVE IN COMMUNITY:

A Q&A With Lorenita Lucas

BY ERIC FITZSIMMONS



Lorenita Lucas

When Lorenita Lucas, of Washington, D.C., was diagnosed with metastatic breast cancer in October 2014, her doctors didn't expect her to live long. Like many people, she began to think about what she considered important in life and what legacy she would leave behind. Lorenita, 50, attended conferences, such as LBBC's Thriving Together: 2016 Conference on Metastatic Breast Cancer, in April, and support groups to speak with other people, and she heard from many with spouses and children. But she had trouble finding other women who, like her, are single and don't have kids.

Lorenita, who was born in Houston, Texas, has found support from her large community of friends, her father and her two sisters. She also finds strength in sharing her experience. She spoke with LBBC's copy editor and content coordinator **Eric Fitzsimmons** about her experience as a single woman living with metastatic breast cancer.

Eric

How has being single affected you?

Lorenita

When you go to conferences or workshops or people are speaking in general, they tend to speak about holding on to something that's bigger than you, and my experience is ... they are usually referring to kids or a husband. Not the nuclear family you were born into but the nuclear family you created.

If you're newly diagnosed or newly metastatic looking for help in these places and they're telling you to hold on to something greater, and then they're going on to define it as children and a husband, it kind of makes you think, like "Whoa, where do I stand?"

I think that's great and I think it gives people something. It just makes you think [as a person who is single and has no kids], "Well, OK, should I just put together my end-of-life plans now?"

"I am extremely, extremely blessed in that I have a huge circle of friends, colleagues and acquaintances."

Eric

What have you found that you hold on to?

Lorenita

I am extremely, extremely blessed in that I have a huge circle of friends, colleagues and acquaintances. My circle is probably unusual. I just know a lot of people so when stuff like this happens, people are willing to come and help.

I teach fitness classes. I am a member of two book clubs. I belong to a church, and these are just some of my activities. My community was extremely supportive, coming to visit me in the hospital, supporting me financially. Most notably, a couple, members of my church, invited me to stay with them for 3 months after I was released from the hospital. Having so many people around kept my spirit happy. Prayer, love and laughter is why I am alive.

I have a huge community and I am very satisfied. But, in my situation I have come across people who have been metastatic, who aren't married and don't have kids and it can be a very hard road for them.

One person, from meeting her when she was first diagnosed to a couple weeks later and going to see her, I could just see her kind of lose her light. If anyone came to visit me at any time of the day there were several people in my room when I was in the hospital, whereas sometimes, and I just met her ... I was the only person in her room.

That's how I get through it and that kind of makes me wonder about people who don't have big circles.

Eric

Do you think not having a husband and children has pushed you to become more involved and to look for a community?

Lorenita

I am not sure because that's how I was before, so I can't say I was pushed any more. ... If I go to a conference and I see someone [in a session] who is metastatic who might be in their 40s and they don't have children, they haven't been married, I might go up to [talk to her] first.

Eric

Do you have any advice for someone who is newly diagnosed and single and might also be feeling left out of discussions that focus on partners and children?

Lorenita

Rely on the community and family you have built for yourself, of course including the family you were born into. I shared my story and that helped. The way that you get help is to let other people know that you need help and a lot of people will be there. ... Remember there are people who don't share this with their families, and that's a personal choice. If you really want help and to be embraced in what people can consider a very dark period, one way to get light is to shed light. If you shed light on a situation, then you can get more light and love sent your way. 

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