BRCA Genetics In The News: What Do I Do Next?

National Webinar Transcript
December, 2017

Presented by:

SHARSHERET®
Your Jewish Community Facing Breast Cancer

This program is made possible with generous support from

myriad WHEN DECISIONS MATTER

Pfizer Oncology

Contents

Presented in collaboration with:

FORCE
Facing Our Risk of Cancer Empowered

I. Introduction

Shira Kravitz: Good evening. I hope everyone had a wonderful Chanukah and is enjoying the holiday season. I wanted to welcome all of you to Sharsheret's national webinar, BRCA Genetics in The News: What Do I Do Next? We are excited that so many of you have joined us tonight and that many states across the country are represented this evening.

My name is Shira Kravitz, and I am the Support Program Coordinator for Sharsheret. I'm happy to be here moderating tonight's webinar.

We would like to thank Myriad Genetics and Pfizer Oncology for their ongoing support and for sponsoring tonight's program. We would also like to thank FORCE, who is our partner in collaboration for this evening's event. Sharsheret supports young Jewish women and families facing breast and ovarian cancer at every stage. We help you connect to our community, whatever your personal background, stage of life, genetic risk, diagnosis, or treatment.

The media is flooded with stories about genetics, testing, and guidelines that sometimes are confusing or seem to contradict each other. This media frenzy especially picked up after Angelina Jolie disclosed that she was BRCA positive and was open about her decision to have prophylactic surgery. We recognize that those of Ashkenazi Jewish decent, meaning those who have ancestors from Eastern Europe, can experience heightened concern about this information because of an increased genetic risk.

As many of you know, 1 in 500 individuals in the general population carries the BRCA mutation. For those individuals of Ashkenazi Jewish decent, that number is 1 in 40. Ashkenazi Jews are 10 times more likely to carry the BRCA mutation, resulting in as high as 80% lifetime risk of being diagnosed with breast cancer, and as high as 44% lifetime risk of being diagnosed with ovarian cancer. We at Sharsheret are always confronted with questions from our callers asking for clarity on genetics in the news. Tonight's webinar will answer your most commonly asked questions.

One more thing before I introduce our speaker for the evening. You can ask questions throughout the webinar by typing in the question box on your dashboard, on the right side of the screen. Please keep your questions broad in nature so that everyone on the call can benefit from the discussion. We will try to get to as many questions as we can after the presentation. Those of you who are not joining us via computer, please know that you can call Sharsheret at any time with your questions and we will be happy to discuss them with you.

II. BRCA Genetics In The News: What Do I Do Next?

It is now my pleasure to introduce our speaker, Ms. Peggy Cottrell. Peggy is a graduate of the Sarah Lawrence College Master of Science and Genetic Counseling program. At Sharsheret, as our Genetics Program Coordinator, Peggy consults with women and families and answers individual questions about their family histories, BRCA mutations, and personal risks of hereditary breast and ovarian cancer, and contributes to the development and implementation of Sharsheret's hereditary cancer resources and programs. Peggy is also a certified genetic counselor in the regional cancer center at our partner, Holy Name Medical Center.

Peggy, the floor is yours.

Peggy Cottrell: Hi, thank you so much for that lovely introduction Shira.

So very often when news stories show up in the paper it can be very tricky to try to interpret exactly what the story is trying to tell us. And why is it so tricky? Partly I think because of the use of medical jargon. Sometimes if you don't understand all the terms that are being used it can be impossible to try to figure out what the story is telling you. And the second thing that can make it tricky is sometimes even the reporters themselves are not really understanding exactly what the information is and may get certain key facts wrong. And so how are we going to possibly be able to get the correct information from the media? And the misconceptions that occur can additionally fuel this confusion. Sometimes news may be old but if you haven't heard it before then it's going to be new to you.

So what are some of these misconceptions? So while I'm talking you can feel free to take a look through this list of misconceptions. And I bet many of you will read these and say, "Oh of course, I know that's not correct." But I bet many of you might also find one or two of these that you would say, "Wow I didn't realize that that was really true." So what we're going to do tonight, we're going go through some of the information that's been in the headlines in the last year or two, what that means for us. And then we're going to tackle these misconceptions and give you the correct information. And then finally to wrap up, give you some good tools to be able to interpret what's in the media in the future.

So this was a recent news headline, just really was in the last two months. And it was a breaking news story on CNN. A couple of people in our office who get news alerts got this in their inbox. Breast cancer genetics study reveals that 72 new mutations have been discovered. And I got a bunch of emails from colleagues saying, "What do these headlines mean? Is this the next BRCA gene?

Is this BRCA3 or BRCA4? What are these 72 new genetic changes that are causing breast cancer?"

So as it turns out, there are different kinds of genes that increase the risk for cancer, and these genes vary both by how commonly they are found within individuals, and they also vary by how much risk for cancer they cause. So if you look on the top left of this picture you'll see the rare to very rare high risk alleles. And these are genes like BRCA1 and BRCA2, which you see up there, in addition to some other high risk genes that have been identified. And these are old genes that are available for testing on some of the big panels that are offered by many of the cancer genetics labs and tests that are available.

If you slide down a little bit, down into the right, you see the rare to moderate risk alleles. So these genes don't cause as high a risk for cancer as BRCA1 and BRCA2. And some of you may have heard of genes like PALB2 or CHEK2 or ATM. These genes are also relatively rare, they're not common, but they cause a more moderate risk of cancer.

And then as we move down to the lower, further right hand end we see common low risk alleles. And I bet if you looked at the names here you're not likely to recognize any of these and that's because these are not genes that are routinely tested for. These are common changes that are present in many people. These are not rare. But they don't increase risk a lot, they increase risk a relatively small amount. And part of what makes them hard to identify is that they have such a small risk in and of themselves. And so the activity of these low risk alleles tends to occur more as you have dozens of small things that together can add up to something bigger. And so what do we call these kind of low risk alleles?

So we call these SNPs, or single nucleotide polymorphisms, and you can see with a big name like that why we need an abbreviation. So SNPs are single differences in the DNA alphabet that occur between groups. And so these tiny changes don't break the protein, so it's not like a mutation where now the activity of that particular protein is lost, but it just subtly alters the function.

And, so for example, if we looked at the purple part and the strand of DNA that we're following, we see that purple letter A. So let's imagine that most people in the population have this A. If we were going to do a sequence in this particular section of the DNA, we would find the majority of people had A. And A is neutral. But let's say we go down now, we see the blue strand. And we see instead of A, this small group of people instead of A have a G. Again it's a different level in the DNA alphabet. And what happens in this case, when somebody has G, is they may have a slightly higher risk, because again we're not talking about a particular gene here, but let's say this is a gene that helps

control cancer risk. So somebody with a G, this protein still works, but it allows for a slightly increased risk of cancer.

And then in another small group in the population, the yellow strand, these people have T. And T actually reduces the risk of cancer. So some of the SNPs can increase risk, some of them can decrease risk. But the difference is subtle. We're talking about something that's less than one percent effect. And so by itself these SNPs, one or two here and there, are not enough to make a difference in terms of disease.

So now we see, and this is a similar graph to the one we looked at before except sort of reversed in style. We see SNPs on the left hand side, and these are the common variants that we're beginning to be able to look at. So Myriad, one of the labs that does genetic testing, has just come out this year with a test that's looking at SNPs. And so the way this test works, there are two parts to the test. There's a risk assessment portion called Tyrer-Cuzick, and this is a risk model that evaluates family history and other factors about a person, if they've had a biopsy, how old they are, height and weight and other factors. And in addition, Myriad has collected and validated about 86 different SNPs that have been shown to have an effect in breast cancer. And when they run a myRisk test, they do this test in addition to try to provide some additional information about the risk of cancer.

Now Sharsheret does not, by talking about this test that's being offered by Myriad, we're not saying that this is something we recommend or don't recommend. There are a lot of labs available to do genetic testing, and there are different advantages to different ones. We're talking about this tonight because this is really a new area where we're really trying to be able to understand how these SNPs and low impact genetic changes can have an effect on risk.

And so when you get a report with this test, it's going show first of all a percentage that comes just from the Tyrer-Cuzick genetic model, and that's something that your doctor or your genetic counselor can run. You don't need to have any SNP testing to figure that out. And then it shows the additional either increased or decreased risk for that individual based on the SNPs that have been identified. Next slide.

So at first glance this sounds like an amazing test, but as it turns out it has some pretty significant limitations, and I'm going to talk about those. The first limitation is that SNPs are very variable between one population and another. So SNPs that might be present in for example a Caucasian population are not necessarily present in an Asian population or in an African population. And so the test, the risk for test is only validated for women who are 100% Caucasian. Now Caucasian for the purposes of this test includes people with Jewish ancestry. But if you have one parent who's Jewish and one parent who's

Hispanic, for example, the test is not going to run. So again, only for women who are 100% Caucasian, and that's because SNPs are complicated in different populations.

This study is only validated for the 86 genes which were first selected, and so this test does not include the newly discovered 72 genes that we talked about from the headline, and it also doesn't include any additional genes that will be covered in the future. So while it's not giving an incorrect result, on some level the result is possibly somewhat incomplete, because there may be other factors that are coming into play.

The test is only validated for women who don't have a diagnosis of cancer, or even a precancerous finding. So if someone has for example atypical ductal hyperplasia, which is sometimes a finding that is present on a biopsy. In that case, myRisk is not validated and won't be run. That doesn't mean we think the SNPs don't have any affect in people who've been diagnosed with cancer or people who have a precancerous finding, but just that the testing is not validated. And right now it's not offered as a standalone test, because insurance is not paying for it so it's only offered in conjunction with running a full myRisk test.

So let's talk about some of the misconceptions, and then we'll get back to some stories in the news. And this is a misconception that really goes along with the additional testing. So if I have a client who has genetic testing done, a big panel for cancer susceptibility and the results are negative, that doesn't mean that the cancer in the family is not inherited. And that's because, besides the SNPs that we are aware of, there a lots of other things that are unidentified at this point that we're not able to look for when we do a genetic test. And so whenever a test result is negative, we have to interpret it based on what else is going on in the family.

So for example if you have the test and nobody else in your family has ever been tested, then we kind of have to say that the risk is not fully clarified, and that's because the cancer could be inherited, it could be related to undetected mutations in other genes that are not included in the test and may be still unknown. And so generally it is recommended that the cancer risk should be based on the pattern of cancer in the family.

If you have a genetic test for a specific mutation that has been identified in the family, then that information, a negative result in that case is much more informative. And that means your risk for cancer is probably similar to the general population risk. Notice the use of the words probably and similar, and that's because we're really not sure, even in a case where someone tests negative for a mutation in the family that there aren't other factors that may be present that could be increasing the risk for cancer.

So here's another story that was in the news last year, and scientists are looking more at men with prostate, and the headline here is, "It Turns Out That Metastatic Prostate Cancer Needs Genetic Testing And Here's Why." This study was published in the New England Journal of Medicine last year, and it took a group of men who had been diagnosed with metastatic prostate cancer, which means these men had prostate cancer that had traveled to another part of their body. And the fact that the cancer had traveled to another part of their body indicated a particularly aggressive type of prostate cancer, not the more indolent type that somebody may have and never is going to really cause any big harm.

So a group of people with metastatic prostate cancer were given a genetic test, and almost 12% of the men who had metastatic prostate cancer, regardless of family history, were found to carry a mutation in a hereditary cancer gene. Now some of the genes you see in this pie chart are genes that we've known all along can increase prostate cancer risk, especially BRCA2, BRCA1, CHEK2. But many of these other genes are not really genes that we thought of as being prostate cancer genes. And again, this is something that had an effect this year on the NCCN guidelines. And NCCN is an organization that sets guidelines for how we take care of people who have cancer, it's a nationwide organization. And this year the NCCN guidelines changed to reflect this study by stating that individuals with metastatic prostate cancer should be offered a panel of genetic testing.

So while we're talking about men and hereditary cancer I thought we should talk about the misconception that you only inherit risk for breast cancer from your mother's side of the family. Or secondly that men don't have to worry about being carriers for hereditary cancer.

So it turns out that men are just as likely as women to carry mutations in hereditary breast cancer genes, and that's because people can carry mutations that are more likely to affect the opposite sex. And so men very often carry mutations in breast cancer genes. They're much less likely than women to get breast cancer. Men never get ovarian cancer. However men do have some risk to develop with prostate cancer or pancreatic cancer when they carry a mutation in BRCA1 or BRCA2.

If I took a whole group of women who had BRCA1 or 2 mutations, I would expect on average that half of them would have inherited it from their mother, and the other half would have inherited it from their father. And so it's always very important, whenever you're looking at a family tree, to consider both sides. You can inherit mutations in BRCA1 and 2 from either parent. And unaffected men who carried the mutation and don't have cancer can pass those mutations to their daughters, and then unfortunately those may be the individuals who can develop cancer.

Another misconception that only Ashkenazi Jewish individuals carry mutations in BRCA1 and 2.

As Shira pointed out earlier, Ashkenazi Jews have a much higher chance to carry a mutation in BRCA1 and BRCA2 compared to other populations, but overwhelmingly we find mutations in all populations around the world. Sometimes people think, "Well people from Asia, they don't really have BRCA1 and 2 mutations, people from Africa, they don't really have to worry about that." That is really not the case. Everyone needs to be aware of family history. And the Ashkenazi founder mutations, and these are the three common mutations that are more likely to be found in people with Jewish ancestry, have been in the Jewish population for more than 2000 years. And so we do see them not only Ashkenazi families but in lower frequencies among Sephardic Jews and sometimes Founder mutations may be seen in non-Jews as well.

Another misconception, that Ashkenazi Jewish individuals only have to worry about carrying mutations in BRCA1 and BRCA2, and mutations in other genes are very unlikely.

So this is not the case. Certainly if I had somebody with Ashkenazi ancestry, if they have an inherited mutation it's overwhelmingly more likely to be BRCA1 or BRCA2 than anything else. Those are definitely the most common. But individuals with a strong personal or family history of cancer should really consider testing with one of the bigger panel tests that look at other genes like PALB2, like ATM, like CHEK2, and others that can also predispose to cancer and we do find all of these mutations in people with Jewish ancestry.

So another misconception is that if you have a family history of just one kind of cancer, like let's say breast cancer, that the only kind of cancer that you have to worry about getting is breast cancer. So if I have a couple of relatives who've had breast cancer, the best way for me to deal with that is to get my mammogram and sonogram every year, get a breast exam by a doctor, perhaps even consider a breast MRI.

So as it turns out, breast cancer may be inherited with other types of cancer and we know this, especially with BRCA1 and 2, that mutations in these two genes increase the risk for both breast and ovarian cancer. And I've listed a couple of other genes that can also increase the risk for both breast and ovarian cancer.

Sometimes we see a pattern that is a combination of breast and colon cancer. And this can be a result of mutations in CHEK2, or sometimes genes that are associated with a Lynch syndrome, which is mainly a pattern of colon cancer but includes other cancers as well. Sometimes we see breast and pancreatic cancer traveling together, and we can see pancreatic cancer with BRCA1 and BRCA2, but also significantly with two other more moderate risk genes, PALB2 and ATM.

And so if we see these two cancers together we want to make sure that we include these other genes.

Breast, uterine, thyroid, colon, pancreas, stomach. This is a big group of cancers, includes genes like PTEN and STK11. Lobular breast cancer along with colon and diffused gastric cancer can be related to CDH1 and finally TP53, can cause breast cancer as well as other rare cancers. And so it's important when deciding what testing is going to be done to take a full look at the family history, and then it gives us an opportunity depending on what we find to offer additional medical management to take care of the risk for other cancers as well.

So very often people feel if they've had cancer already, cancer susceptibility test is not really going to be helpful to them. The cancer has already happened, it's too late to try to improve things with a genetic test.

And this is really far from the truth. It turns out that from the point of view of genetics, the person who's had cancer is often the best person to test if they are available. And that's because instead of testing six children and a couple of siblings to see if they carry this mistake, if we test the person who's actually had cancer, it helps us to know first of all what are we looking for, and if we don't find anything then other unaffected family members may not even benefit from testing. The person with cancer themselves is also going to benefit from testing, not just the family members. So it's possible if somebody has been diagnosed with breast cancer on one side, that if there's something inherited there they may be at high risk to develop a second primary tumor on the other breast. And so sometimes people who have positive genetic results might consider a different surgery, perhaps a bilateral mastectomy, to ameliorate this risk. And then again there may be risks for other kinds of cancer. So somebody who's diagnosed with breast cancer may find out they're at an increased risk for ovarian cancer, and might consider having their ovaries removed.

Another misconception is that it's possible to deal with the increased risk for breast cancer just by ordinary screening, so a regular mammogram, sonogram and breast exam by a doctor. Additionally the idea is there a misconception that we can deal with the increased risk for ovarian cancer by having ovarian cancer screening, which would include a trans vaginal sonogram or ultra sound twice a year, and a CA-125 blood test.

So here we know that high risk breast cancer screening should include an annual breast MRI, in addition to the mammogram and sonogram. It's not always necessary that someone has a positive genetic test in order to get the MRI covered. And so the risk assessment tool that I talked about earlier, Tyrer-Cuzick, is a way to calculate a woman's lifetime risk to develop breast cancer. And if that risk is higher than 20% based on the factors in the risk model, which

include personal and family history related to breast cancer, then it's possible to get that testing covered even if the genetic testing is negative.

Secondly, so important to understand that there's no effective screening for ovarian cancer, and while the trans vaginal sonogram and CA-125 blood test may eventually identify the cancer, it's not finding it at an early stage. And it's really important for saving lives that women who are at an increased risk for ovarian cancer consider having their ovaries removed once they're done having children.

So another misconception that's out there, and this is something that's changed significantly in the last five years, is that genetic testing is very expensive, or that genetic testing is usually not covered by insurance.

And so I've had the experience sometimes speaking with callers who will call up to find out about coverage, and sometimes it's just a matter of sending the sample to the correct lab. Different labs have contracts with different insurance companies. And different insurance companies have different guidelines for testing. And so what's the best way to figure this out? How do you know what lab is the best lab to use and what your insurance is willing to cover? And this is where my colleagues, the genetic counselors that are out there all around the country, are there to help you navigate this genetic testing process. If you need to find a genetic counselor in your local area you can go to the National Society of Genetic Counseling website, which is here on my page, nsgc.org. And there's a searchable directory there where you can find genetic counselors in your area, you can call them up, find out if they take your insurance.

Another great way to figure out this problem is to call Sharsheret. Our employees can set you up with an appointment with me and I can answer all of your questions about whether you really need to be tested, what kind of test is going to make the most sense for you, can you participate possibly in some free testing? All of those are things that we can provide you with information to be able to understand.

So what's next? We're done talking about the misconceptions. What if you still have questions? What if you're not sure if you need to be tested? Or you've been tested and you're not sure if you need additional testing. You can contact me, you can check out the genetic information on our website. All the information we provide, and all of our materials are free.

So our Genetics For Life program, a lot of which is me, and if you have questions about genetics you can speak one on one with me. I've been a genetic counselor for more than 15 years and I've answered tons and tons of questions over the years. I'm up to date on all the new information about genetics, and I can help you figure out what you need to do next. If you want to talk about genetic

findings in your family with a number of family members we actually have free family conference calls. And a couple of family members can be on the same call and get some information that they can share comfortably with each other while asking questions from me, the genetic counselor. And finally we have great materials in our genetics packet. Your Jewish Genes is a great booklet that not only talks about the facts but describes the experiences of a number of our callers and what they've been through. And it can be a really great asset.

The final thing I want to finish up with is to tell you a little bit about a program on the website of one of our partners, and that's FORCE. And FORCE has a great tool on their website called XRAYS. And this stands for examining the relevance of articles for young survivors. And what FORCE does is they have someone find a headline, something that's published in the paper and maybe comes from a journal article, and then they're going to take that journal article and explain it without the medical jargon, in a way that can be understood by a layperson. And so XRAYS goes behind the cancer headlines and really provides important research backed information, education and understanding. So we recommend if you see something in the headlines that doesn't make sense to you, a good place to go is FORCE, and see if they have published anything about that particular article.

Shira Kravitz: Peggy, thank you. You've really provided us with just such clarity about what we've been hearing in the media and debunked so many common misconceptions. I know I personally, and I imagine many of our participants tonight, are walking away with greater knowledge and understanding. As Peggy mentioned, the conversation doesn't have to stop here. Please reach out to Sharsheret to continue the conversation with Peggy or a member of our support team.

III. Personal Story

It is now my pleasure to introduce Pamela. Pamela is a Sharsheret peer supporter, and will share her personal story about her family history and navigating her genetic risk. Pamela?

Pamela: Right, thank you Shira so much for that introduction. Peggy thank you as well. Good evening to everyone and thank you Sharsheret, thank you Shira for inviting me to speak. And I really appreciate all of you listening to my story. And I really hope that if nothing else you take away feelings of empowerment and support. I'll start by sharing with you about my background, the types of health decisions I had to make already, the healthcare decisions I'm currently dealing with, and how I handle learning about new studies and media coverage relating to breast cancer and BRCA.

So for me breast cancer was always a part of my life. When I was 13 years old my mother died of breast cancer. I watched her struggle almost a decade with the disease, and a few years later during my sophomore year of college my maternal aunt died of breast cancer. So after seeing two beloved women in my life suffer with this disease and the effect it had on our families, I knew for myself I had to do whatever it took to protect myself and my family from this disease hurting us. I never knew much about the BRCA gene, because my father was super anxious about protecting my own health, this is totally not the normal but at 14 I actually started doing breast screening, which is completely like I said unusual to start screening so early. But really those appointments were actually mostly educational for me and therapeutic. I mean I was still so young.

And after I graduated from college, and even more information had come out about the BRCA gene, I knew I was going to be making larger decisions about my future and how to protect my health. And luckily, and I think this is why my dad wanted me to start screening so early, is I had a doctor who had become my surrogate mother, and she informed me of all of my options going forward, which was genetic testing and then eventually possibly getting a prophylactic mastectomy if I was found to be BRCA positive. And until I was ready to get my genetic testing done, my doctor just continued screening me as if I was BRCA positive. So every six months I alternated between getting a mammogram or a breast ultrasound. And she never pressured me about getting tested and she honestly gave me the best advice that anyone has ever given me, which I feel like applies to so many areas of my life now. She told me not to ask a question unless I was prepared to get that answer.

So I really spent my 20s trying not to think about getting tested. It was hard not to. I remember I thought a lot about my mother, what she would have done had she known about the genetic testing and how it might have changed her outcome and our lives. I thought about how long she must have struggled to beat the disease and how she battled to stay alive for herself and for me and our family. And I just couldn't help but think that I owed it to her to fight for my life too.

And I already struggled with body confidence issues and I worried like what if this makes it worse? How is this going to affect me dating and meeting someone and I wondered when is it really the right time to tell a partner that you have this gene and what that means? And what would I look like after I had surgery, would I still be attractive? I mean these were all things that swirled around in my head.

By the time I reached 30 I just couldn't wait any longer, so I got tested. And it took about two weeks to get the results. And they don't let you get the results over the phone, so I just remember waiting in two weeks of purgatory, and then

I visited a genetic counselor who told me that I had tested positive for the BRCA1 mutation. And honestly most of that conversation is a total blur. So I immediately set up an appointment with a therapist I was seeing at the time, and I got all my close girlfriends together for a night out. I also through myself into a really regimented workout schedule, and I figured that at least I would start getting my mind and my body stronger and ready for what I knew I was going to do, which was getting the mastectomy.

But before I had that chance I got the scare of my life. During a routine ultrasound they actually found what they thought could be cancer. And although I was reassured that it was a cyst, I just couldn't help but think that I had waited too long. I had just gotten married, and all I could think about was my husband and the future that now just seemed completely unattainable. After the biopsy came back normal I called my doctor and scheduled my mastectomy and reconstructive surgery for two months later.

As surgery became a reality I was so lucky to participate in a support group for the first time. I had no idea what it was going to be like and I was completely blown away by the women's openness, warmth, and their immediate sharing of such extremely personal experience with me. For me, they all shared the same worries and fears that I had, and the loneliness I had been feeling melted away. And I just felt so inspired and humbled by these women and the fact that they would just bear their souls to me, a total stranger.

And that's really when I started to understand the power of our community and the power of women and why Sharsheret is so important. And then three years after my surgery I'm feeling powerful. I'm feeling fearless and I'm hopeful. And for the first time I really feel proud of my body and I appreciate her in a completely new light. And after my experience I knew I had to find a way to connect with other women, share my story and give back the support that I was so graciously given. I found out about Sharsheret and immediately contacted them, and I just wish I only had sooner.

Since connecting with Sharsheret I've already utilized their peer counseling program to help me connect with other women who I can support, but also who I can receive support from too. I mean my journey is not over. I'm still hoping to stamp out this gene from my legacy for reproductive options. I still have yet to decide when I'm going to have my ovaries removed. So far I've actually undergone three rounds of IVF and I had my embryos genetically tested for the BRCA gene. And IVF is expensive and it's extremely emotionally, physically draining but my husband and I both agreed that we owed it to my mother and our future generations to protect them from having to make the choices that I made.

And that leads me to my final thoughts about reading about any media coverage and the new studies about breast cancer and BRCA specifically. My first strong reaction, and as Shira mentioned, to media coverage of the BRCA gene was when Angelina Jolie talked about her BRCA status. And I just remember thinking that everybody seemed to have an opinion about her decision to have the prophylactic mastectomy. And I remember reading the comment sections in articles and I was shocked as to some of the strong negative opinions about the choices she made. And for a really long time I was fearful to read anything for fear of feeling judged for the decisions that I had, or that I was thinking about making. And in fact I would actively ignore anything related to BRCA.

But after going through IVF and thinking about the possibility of having a little girl, I actually now take comfort in reading about new discoveries they have found, and identifying new genes and new methods for reconstructive surgery. And I also find hope. I know that if IVF doesn't ultimately work for us we might have to think about having kids naturally without being able to protect our future children from BRCA. So I feel hopeful that with all of the new genetic discoveries and studies, that even if I have a little girl with the BRCA gene, that by the time she has to make the decision that I had to make, that her options are going to be drastically different than mine. I like to imagine that all she might have to do is maybe take a shot or some sort of daily medication that will quell the gene that's living inside her.

And I also like to believe that even if she has to make the same decisions that I did, that she's going to have a strong mother to guide her and she'll be blessed to be part of the Sharsheret community, and to be able to connect with so many brave and fearless women. So I'm sure that all of you listening have been touched by breast cancer in some way, and Sharsheret can connect you with whatever you're looking for to get involved. Luckily you have Peggy to speak to a genetic counselor, to talk about screening, raise awareness or get involved, to help or support other women, or learn to better support friends and family and Sharsheret can connect you with all of those resources that women all over so much need. And women like me. And as a community we're so much stronger together, and through Sharsheret I've finally been able to further my healing process. So I connect with others and share my story. So thank you all tonight for listening.

Shira Kravitz: Pamela, thank you. That was really amazing. We're so grateful that you shared your hard earned wisdom with us. I can just imagine many of our participants tonight nodding along as you described some of the fears that you had and what a relief it was to connect with others who understood what you were feeling. So really thank you. And on that note, if you're looking for support or someone else to connect with like Pamela mentioned, please do call Sharsheret and speak with a member of our support team.

IV. Question & Answer

We will now begin our question and answer period. Again, you can type your question in the text box located to the right of your screen. We have been receiving questions throughout the webinar so we are going to delve right in.

The first question we got is, "I am being told that I should probably be tested again for the BRCA gene as the test has been advanced to include more. Do you think this is true?" Peggy, can you take this one?

Peggy Cottrell: Yes I can. It's a very good question and I get asked this question often. And it depends what kind of testing was originally done. So especially when people have Ashkenazi ancestry, they may have had a test that was only done for the three founder mutations, and was not done for the entirety of BRCA1 and 2. Or there may be, there's an additional part of the test, besides the sequencing, that looks for large deletions or duplications that could be present in BRCA1 and 2. And that deletion/duplication portion of the test was not part of the test originally. And so if you were tested possibly more than eight years ago then you may not have had the full test. And so it's important if you're not sure if you had enough testing done, to go to your healthcare provider or to give us a call and we can take a look at what was done in the past and recommend if you need to have additional testing done.

Shira Kravitz: That's great, that's very helpful. Pamela, I have a question for you, but before I ask it I just want you to know that we have a feature on our end that we can have people applause after a presentation and we are getting a lot of applause for your presentation. So congratulations. The question is, "I am also BRCA positive and really relate to that feeling you mentioned of feeling judged by the public for your decision. I still often feel that way by both the public and my family. Can you talk about how you turned your feelings of being judged to something more positive?"

Pamela: Yeah sure. Thank you so much. So for me, I totally understand that feeling. I actually struggled a lot with feeling the same way. I had a hard time talking to my family and my friends about it because they all had really strong opinions and I was a little shocked that people are very comfortable sharing those with you. So I would say that I found the most support by actually talking to a peer counselor through Sharsheret or going to a support group, by talking to women who are actually dealing with the exact same issue as I was, was the most comforting to me. And I think that that was the way that I, by sharing with those women, I think I was finally able to I guess release myself from that judgment, because I didn't feel alone anymore. And I think that was, for me, at first it felt very isolating. And to be able to share with other women was the most important way for me to get over that.

Shira Kravitz: Absolutely, that makes so much sense, thank you.

Peggy, we have another question for you. "What information for risk does the new testing for SNPs give us for ovarian cancer?"

Peggy Cottrell: So the new test probably, I would say, has very little to do with ovarian cancer, it's really about breast cancer risk. And so if the test finds a mutation, then the new risk or part is not run, and then you just have that information about risk for ovarian cancer. And we would base risk for ovarian cancer possibly on family history. So if you had a strong family history of ovarian cancer, no matter what the risk score was, it might be a good idea to consult with a gynecologic oncologist about the possibility of having surgery.

Shira Kravitz: Okay, and you know another question tying into ovarian cancer is, "Does risk reducing surgery for ovarian cancer always include the fallopian tubes? And does ovarian cancer begin in the tubes?"

Peggy Cottrell: Another very good question. Over the years scientists always knew that fallopian tube cancer was highly associated with BRCA1 and 2. So right from the beginning it was always recommended to remove both the ovaries and the tubes. And what scientists discovered when they would examine the ovaries and tubes of women who had prophylactic surgery, was that overwhelmingly the precursor legions seemed to be occurring much more in the tubes and not so much in the ovaries.

And so at this point, many scientists believe that a significant portion of ovarian cancer actually starts in the fallopian tubes. So it would be an incorrect procedure, if you were having risk reducing surgery, to remove the ovaries and they did not remove the tubes. They are definitely high risk and should be taken out. And if you don't have ovaries, there's not really anything you need the tubes for. So it's kind of a no brainer that they come out as well.

Shira Kravitz: Okay great. We have a number of questions still coming in. "Are just the Jewish BRCA mutations checked or are all the BRCA mutations checked?"

Peggy Cottrell: So it would depend on how your healthcare provider orders the test. And so if someone has a very strong personal and/or family history of cancer, it's appropriate to not only do the full BRCA1 and 2, but to also look at some of the other genes that could be implicated. However, if someone's risk for cancer is very low because they have Jewish ancestry but they really don't have any relatives who've had breast or ovarian cancer, or perhaps they only have one relative who may have had breast cancer at an older age, then it would not be unreasonable to just do the three founder mutations. And that's because a person who has a family history of one family member who had breast cancer at an older age, and here we're talking about someone in the general population,

somebody who is not Jewish. That person is not going to meet guidelines to have testing done.

So in other words, a person with Jewish ancestry who doesn't meet guidelines to have testing done, that person is probably a good candidate to have just the standard mutations tested. Does that make sense?

Shira Kravitz: Yes absolutely, thank you. Another question Peggy, tying into that question actually. "Do we all have BRCA genes and do some of us have mutations in the genes?"

Peggy Cottrell: Another good question. Everybody has BRCA1 and BRCA2 genes. And I always like to take the opportunity to say that BRCA1 and BRCA2 are the good guys, they prevent cancer. And everyone has them. The mutations, the mistakes, are what cause them to not work correctly. And this is really true for all cancer predisposition genes. There are no special genes that just cause cancer and are only there in people who get cancer. All of the genes we look at are normal genes that everyone has, and we're looking for mistakes in them.

Shira Kravitz: Pamela, we have another question for you. Our caller was wondering if you were able to tell us a little bit about your experience of telling your friends and family, finding out that you are BRCA positive.

Pamela: Yeah sure absolutely. So telling my family actually felt much easier, only because like I had said, breast cancer had just been in our lives since forever for me, that's what it feels like. So I think it felt very natural to share with my family. I was more nervous telling them because I'm the youngest sibling and I feel like sometimes they baby me a little bit. So I think my family was just a little nervous about, I don't know, how I was going to be able to handle it, which I'd like to think I did very well.

With my friends it was really hard who to decide I should share this with, and who I should. And I think that's when I realized who my real close inner circle was, because if I felt like I couldn't share this with you ... I don't know, it kind of made me reevaluate the friendship. But it also made me actually really appreciate all of the friends that I did have who spent many many nights listening to me. And I think the people that I felt the most comfortable sharing were the people I think who just listened.

But it was really nerve-racking to tell people, but most of my friends were really really supportive about it. So I don't know if that answers the question well.

Shira Kravitz: It does, it does. That's very helpful, thank you.

So, Peggy, we have a number of questions that are more personal, so I think they're going to be very helpful for everyone but I just want you to answer broadly so everyone is able to really benefit. So the first one is, "I had a mastectomy in 2011 due to a BRCA2 mutation. What needs to be removed in regards to ovaries and is it just ovaries or also fallopian tubes?"

Peggy Cottrell: So with the BRCA2 mutation it's both ovaries and fallopian tubes. And our friends at NCCN who make these guidelines recommend that a good time to remove the ovaries is somewhere between 40 and 45. That doesn't mean you can't remove them earlier and you certainly can remove them later, but the best risk reduction comes with that timing between 40 and 45.

Shira Kravitz: Okay thank you. Another one asks, "My daughter is BRCA2 positive and has been advised to have transvaginal ultrasound every three months in addition to MRI and breast ultrasound. What are your thoughts on that and do you think that the transvaginal ultrasound is valuable?"

Peggy Cottrell: So the only time when a transvaginal ultrasound is useful in BRCA is the time period between when a young woman knows she has mutation and when she's ready to have her ovaries taken out. And there can be a role to use that screening earlier on, but that's something you have to discuss closely with your doctor and make sure that your doctor understands the limited role that that testing can play in screening. So if someone is planning to have their ovaries and tubes removed when they turn 40, and then between 35 and 40 their doctor decides to do that screening, that's not an unreasonable choice to make. But to think that you could just have that screening and never worry about developing ovarian cancer is a bad idea.

Shira Kravitz: Another one is, "I'm BRCA1 positive and have a yearly MRI and mammogram with tomonsythesis. Should breast sonograms also be part of my treatment plan?"

Peggy Cottrell: I think that that's probably an important question for your doctor. Many doctors think that a sonogram is an important part of the screening process. Each one of those modalities, the mammogram, the sonogram, and the MRI, uses a different kind of physical wave. So mammograms using Xrays, sonograms using sound waves, MRI using magnetic forces. Each one looks at the breast in a little bit of a different way, and while we generally recommend all three, it's really an individual question and something you can ask your doctor about.

Shira Kravitz: Okay great. And switching gears a little bit, this is really a question for both of you, Pamela and Peggy. Talk a little bit more about the emotional component. "How do you recommend people handle the emotional aspects of knowing they carry a BRCA mutation? I am BRCA2 positive and struggle with feelings of

hopelessness, even though I am planning prophylactic surgery." I'd love to hear from both of you.

Peggy Cottrell: I guess what I would say first is that if an individual is really struggling with making these decision or feeling hopeless or having difficulty in coping, then you want to talk to your doctor or your genetic counselor about getting some professional assistance. And sometimes a couple of counseling sessions can really be beneficial to help put things in their proper perspective and place. And that's also something that you can call us here at Sharsheret and we can try to provide you with some insights. But those are things that probably just need to be perhaps talked through with a professional.

Shira Kravitz: Absolutely. Pamela, is there anything you want to add to that?

Pamela: I actually have to say I completely agree. I had a therapist at the time who I felt like it was extremely helpful to have when I was going through everything. So for me, aside from my friends, my family, obviously but having a therapist, a professional to actually talk to about it was immensely helpful, in addition to the support group. So I really agree with Peggy.

Shira Kravitz: Okay great, thank you. We're only going to have time for one or two more questions so if anyone's questions don't get answered please do call the Sharsheret office and we will still be able to address them after the webinar. But just one or two more. "I am BRCA1 positive and my 32 year old daughter has chosen not to get tested yet. Is it the case that her insurance should cover the high risk screening for breast cancer even if she chooses not to get tested?"

Peggy Cottrell: My understanding has always been that a person who has a 50% chance to have inherited BRCA1 or 2 mutation qualifies for the high risk screening. And based not only on the fact that they may test positive, but also their family history, that makes sense. I think insurance companies don't like to pressure people to have testing done, so that's totally fine. Now it's possible that that person is going through unnecessary screening, but that's, I think, sometimes it's hard for people to make the plunge into having the test done. And that's totally fine.

Shira Kravitz: Sure, thank you. And our last question for this evening is, "How do you assess risk with Ashkenazi survivor families with very little family history?"

Peggy Cottrell: It can be very difficult to assess risk in a very small family and very often in Ashkenazi families they are small because of tragedies from the Holocaust. And that's why it's important to consider the option, even if you don't have a family history. If you have Ashkenazi ancestry and you have no history but it's a small family, consider having testing just to make sure that something is not there. What oftentimes happens is I will see women who don't have any family history, they get diagnosed with either breast cancer at a young age or ovarian cancer,

and then we do the testing and we're surprised. It wasn't in the family history, we didn't see it. And so if that's something you're worried about, most people who don't have a family history, their testing will be negative. But in a small number of cases where there's a finding, that can really save people's lives.

So again, if you have questions about a particular situation, don't hesitate to give us a call and we can answer those questions.

Shira Kravitz: Thank you. That's wonderful. We will share answers to our questions from tonight and questions that continue to come in in a blog post on our website. But please contact the office if you have any individual questions so you can talk to Peggy or a member of our support team.

So thank you, Peggy and Pamela.

V. Conclusion

You will be receiving an evaluation in your email box in the next couple of days. Please take a few minutes to complete the survey. Your feedback is valuable to us and we are committed to staying relevant by enhancing our program to reflect the growing and changing needs of the women and families of our Sharsheret community. A video and transcript from tonight's presentation will be available on the Sharsheret website. You can access it by going to www.sharsheret.org/resource/teleconferences-webinars.

I would like to again thank Myriad Genetics and Pfizer Oncology and our collaborating partner FORCE. I also want to thank again Peggy for masterfully helping us navigate genetics in the media and Pamela for sharing her story and bringing these issues to light.

I hope that tonight's webinar was a helpful guide to decoding genetics in the media, and that we can all walk away with a better understanding of how this information relates to us. You can visit Sharsheret's website at www.sharsheret.org, or call us at 866 474 2774 to discuss tonight's topic or any other concerns you're facing.

Thank you so much for joining us and have a great rest of your night.

VI. Speaker Biography

Peggy Cottrell, MS, CGC, is a graduate of the Sarah Lawrence College Master of Science in Genetic Counseling program. At Sharsheret, as the Genetics Program Coordinator, Ms. Cottrell consults with women and families and answers individual questions about their family histories, BRCA mutations, and personal risks of hereditary breast and ovarian cancer, and contributes to the development and implementation of Sharsheret's hereditary cancer resources and programs. Ms. Cottrell is also a Certified Genetic Counselor in the Regional Cancer Center, at our partner, Holy Name Medical Center.

VII. About Sharsheret

ABOUT SHARSHERET

Sharsheret, Hebrew for chain, a national cancer organization with three offices (New Jersey, Florida, and California), serves 70,000 women, families, health care professionals, community leaders, and students, in all 50 states. Through 12 national programs, Sharsheret provides culturally relevant support and information to women and families facing breast and ovarian cancer. While our expertise is in young women and Jewish families, all Sharsheret programs serve all women and men of all backgrounds. In fact, more than 15% of the women who reach out to the organization for support are not Jewish.

Bringing our cause to the national platform, Sharsheret is a member of the Federal Advisory Committee on Breast Cancer in Young Women, has been awarded two multi-year grants to develop support programs from the Centers for Disease Control and Prevention (CDC) and participates in psychosocial research studies and evaluations in partnership with federal agencies and major cancer centers, including Georgetown Lombardi Cancer Center. Sharsheret is accredited by the Better Business Bureau and has earned a 4-star rating from Charity Navigator for four consecutive years.

WHAT WE DO - Sharsheret:

- creates a safe community for women at every stage—before, during, and after diagnosis. We offer tailored resources, information, and support to caregivers, family members, and friends of women facing breast and ovarian cancer to guide them through the cancer journey.
- services are free, confidential, and easily accessed online and by phone, email, text, and livechat. All services are individualized and provided one-to-one by skilled and trained professionals.
- builds a strong community of “links in the chain” through education and outreach events for college students, healthcare professionals, and community organizations.

OUR NATIONAL PROGRAMS

Support Programs

- Peer Support Network, connecting women newly diagnosed or at high risk of developing cancer one-on-one with others who share similar diagnoses and experiences
- Embrace, supporting women living with advanced cancer
- Genetics for Life®, addressing hereditary breast and ovarian cancer
- Thriving Again®, providing individualized support, education, and survivorship plans for young breast cancer survivors
- Busy Box®, for young parents facing breast cancer
- Best Face Forward®, addressing the cosmetic side effects of treatment
- Family Focus®, providing resources and support for caregivers and family members
- Ovarian Cancer Program, tailored resources and support for young women and families facing ovarian cancer
- Sharsheret Supports, developing local support groups and programs

Education and Outreach Programs

- Health Care Symposia on issues unique to active women facing breast and ovarian cancer

- Beatrice Milberg Campus Program, outreach and education to students on campus and young professionals
- Florence and Joseph Appleman Educational Resource Booklet Series, educational and supportive publications for women and their families and healthcare professionals

VIII. Disclaimer

The information contained in this document is presented in summary form only and is intended to provide broad understanding and knowledge of the topics. The information should not be considered complete and should not be used in place of a visit, call, consultation, or advice of your physician or other health care professional. The document does not recommend the self-management of health problems. Should you have any health care related questions, please call or see your physician or other health care provider promptly. You should never disregard medical advice or delay in seeking it because of something you have read here.

The information contained in this document is compiled from a variety of sources ("Information Providers"). Neither Sharsheret, nor any Information Providers, shall be responsible for information provided herein under any theory of liability or indemnity. Sharsheret and Information Providers make no warranty as to the reliability, accuracy, timeliness, usefulness, or completeness of the information.

Sharsheret and Information Providers cannot and do not warrant against human and machine errors, omissions, delays, interruptions or losses, including loss of data.