Navigating Breast Cancer through Pregnancy and Beyond

National Webinar Transcript

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Melissa Rosen:

Hey. Thank you so much for joining us this evening. Welcome. My name's Melissa Rosen. I am Sharsheret's Director of Training and Education. This evening's topic, Navigating Pregnancy through Breast Cancer and Beyond, is not an easy one, but tonight we're going to learn together. Before we begin, I want to take a moment to thank the Cooperative Agreement 24-0061 of the Centers for Disease Control and Prevention for their support of tonight's webinar and to thank our program partner for tonight's webinar, the Miami Cancer Institute.

Today's webinar is being recorded and will be posted on Sharsheret's website alongside a transcript. Participants' names and faces will not be in the recording. Still, if you'd like to remain private, you have the option to turn off your video and rename yourself. You can also call into the webinar and instructions are now in the chat box for how to do both options. Additionally, we now have closed captioning available. To display live captions, on the bottom bar, click captions and then show captions.

You may have noticed that you were muted upon entering the Zoom. Please stay muted throughout the call. We received a number of very moving and important questions during the registration process, but if you have any questions now or any that arise during the presentation, please type them into the chat box. We will be monitoring the box for them.

If you prefer to ask your question anonymously, please do so through the chat box, but send it directly to “Devorah Silverman, Questions” and she will send those to me and then they will be asked anonymously.

I want to remind you that Sharsheret is a national not-for-profit cancer support and education organization and does not provide any medical advice or obviously perform any medical procedures. The information provided by Sharsheret and by tonight's speakers is not a substitute for medical advice and so obviously you should not use this information to diagnose or to treat a health problem. If you have any questions that are specific to your medical care, always seek the advice of your physician or a qualified healthcare professional. Before we welcome our doctors to the screen. We are so happy to have with us Erica tonight. Erica is a Sharsheret caller whose personal experience reflects tonight's subject. Erica, welcome to the screen.

Erica:

Hi. Thank you for having me. When I was 22 weeks pregnant with my youngest, I found a lump in my breast. I didn't really think anything of it at first. I just kind of assumed my milk was coming in early and a milk duct had clogged and you get those little blubs in there. But I saw my midwife a few days later and I went ahead and brought it up. She did a breast exam, took some measurements and told me that she was concerned but thought that we could just monitor it for now. I reminded her that both of my grandmothers had had breast cancer, so I wanted to go ahead and get it checked out just in case.

They sent me in for an ultrasound, since I couldn't have a mammogram. At the University of Iowa Hospital is where I was treated. I went in the day before my 42nd birthday. At that point, I was 26 weeks pregnant. I was still convinced or in denial that it was just a clogged milk duct, so I went by myself that day. Once they started the ultrasound, I knew something was wrong because they kept leaving the room to get consults and bringing other people in, and then they told me they were going to take me straight for a mammogram, that the benefits outweighed the risks and they were going to just load up my belly with those lead blankets. After the mammogram was over, they told me to go get something to eat and call my husband and be back in an hour for a biopsy.

That was when it became reality that something was really wrong. My husband left work to come up to the university to be with me and I called my mom. I hadn't told her about the lump because I didn't

want her to worry and I broke down and filled her in. The following days were the most terrifying days of my life. Not only were we worried about my life... Sorry, I've never spoken about my story like this before.

We didn't know what was going to happen to our baby. He was our last child and our only son. We didn't know if I was going to be able to start treatment while I was pregnant. We didn't know how it would affect the baby. If I would be strong enough to carry him to term, would he be healthy? Would I even have a chance to hold my only son? The more I thought about it, the more upset I got. Plus I had three other children to worry about. After the five longest days of my life, the test results came in and I was brought in to meet with a surgical oncologist. I was officially diagnosed with stage 2B, grade three, estrogen and progesterone positive, HER2 negative invasive ductal carcinoma with metastatic adenocarcinoma. After meeting a surgical oncologist and a medical oncologist, I was assured that I would be safely treated while pregnant and the baby would be fine.

I was immediately transferred from my midwife to the high-risk obstetrics team at the university, and everything had to be approved by both the OB team and the oncology team. I would be starting ACT chemo treatments and I could do the adriamycin and the cyclophosphamide, also known as the dreaded red devil. I could do those while I was pregnant, but I had to deliver before the Taxol could be started. And they immediately started looking at induction dates and informed me that I wouldn't be able to breastfeed. Those two things were the hardest for me out of everything.

I had been planning to have another home birth and I had breastfed all of my kids. It was something I had worked very hard to do and considered one of my greatest achievements. Even now, this part hurts my heart and I have a hard time talking about it. Normally during this time, you have a PET scan to see if the cancer is spread past the lymph nodes, but I couldn't safely have one. They did x-rays and ultrasounds of the paths they would expect the cancer to take if it had spread and as far as we could tell, it hadn't gone past my lymph nodes.

I had my first chemo infusion on December 30th, 2023. It was terrifying, but the medical team was amazing. They were all very sensitive to my situation and they did their best to make me as comfortable as possible. The chemo started to take effect on me very quickly. I very quickly got to the point where I slept most of the time. It was all I could do to go up a flight of stairs. I had to use motorized carts at the store and I had next to no appetite. The only thing I could get myself to eat was chicken strips from Steak 'n Shake and once in a while, one of their burgers.

It's hard to fully explain what I was going through at that time. I was just so exhausted all the time and I honestly didn't see how we were going to make it through. Most of my waking time was spent at the university. I literally had appointments three to four days a week bouncing between the OB and oncology. They had decided to place a port and that was a terrifying experience. I had to go in and have them monitor the baby's heart rate for an hour before and after the procedure. I was awake for the procedure, which was very disconcerting. I think for me, that was one of the most nerve-racking things that I've ever done. I was terrified that something would go wrong for the baby and I would end up in an emergency C-section.

Thankfully, my worrying was for nothing. Throughout all of this, my sweet little Bubby, which out here in a non-Jewish world, we use Bubby as a term for brother, so not grandma. We call him Bubby because he's little brother. But sweet little Bubby was perfectly healthy the whole time. The OBs were very pleased with how he did. I was scheduled to be induced at 38 weeks, which I didn't want to do. I had never been induced. But sweet little boy, he had other plans. A week before I was scheduled to be induced, I started what was my normal prodromal labor. For those that don't know, that is when a woman has contractions in the weeks leading up to delivery, but you never go all the way into labor. It just kind of primes your body for it and then you have a fairly quick delivery.

My contractions went on longer than normal for prodromal labor, so I called the hospital. They weren't concerned though because my contractions were not consistent. My baby shower was that day, so I decided to go ahead and go, but had decided that I was going to go to the hospital afterwards if I was still having contractions.

Well, Bubs decided that he wanted to make his shower extra special. My water broke while I was opening gifts. My husband rushed me to the university, but we didn't make it far. We live about 40 minutes away. We were five minutes down the road when I had the urge to push. I gave birth to our last baby and only son on the side of the road in my husband's brand new car, by the way. He'd had it for a month and I have not lived that down yet.

I was hemorrhaging, so my husband called an ambulance and we were taken by ambulance to the hospital where Eddie was given a clean bill of health. At three weeks early, he was eight pounds on the nose and 19.5 inches long. Not being able to breastfeed him was hard. I had ended up not having the induction that I didn't want, but there was no way to make breastfeeding work. The nurses at the hospital sat with me while I fed him and talked to me to help me through the bottles. They knew it was killing me to have to do that and I appreciate that they helped me through that. I was able to take him home 24 hours later. I did eventually get used to the bottles, but it kills me to this day that I wasn't able to nurse my last baby. Eddie is now a happy, healthy 18 month old boy. He has no lingering issues from the chemo. He is right on target for his growth and development and gives his older sisters a run for their money.

After I had Eddie, I was able to continue my treatment with no further restrictions. I completed chemo, had a lumpectomy and did radiation. I'm now labeled no evidence of disease. This was the most terrifying experience of my life, but Eddie was worth every moment of fear and worry. He was worth all of the extra work we had to do to make my treatments work and he was our silver lining. And I'm going to share a picture of my sweet little boy, if I can. Here we go. Is it showing him? It is from the other day - we home school and that was a field trip we were on and he's eating a dried mango.

Melissa Rosen:

Beautiful eyes.

Erica:

That's what we hear a lot is his eyes. He's got doe eyes.

Melissa Rosen:

Yeah, that's exactly right.

Erica:

Okay, how do I stop sharing now?

Melissa Rosen:

On the bottom it should say stop sharing, but I don't know if you can see this because you're looking to stop the share, but there are lots of hearts going up the screen in reaction to that picture.

Erica:

He stole his mommy's heart, that's for sure.

Melissa Rosen:

Yeah, absolutely. Erica, thank you so much. I know it wasn't easy to share the story, but it was a hopeful story. And seeing that picture, it was wonderful to hear your story, and thank you again so much. And I know that you have to go now, your plans changed unexpectedly, but we are really grateful that you're here with us now and have a lovely evening.

Erica:

Thank you, you too.

Melissa Rosen:

All right, bye-bye.

Erica:

Bye.

Melissa Rosen:

Wow, that was good. Okay. We are so excited to have two groundbreaking doctors with us this evening whose work with pregnant women with breast cancer continues to lead us to more promising outcomes. Dr. Starr Mautner is a board certified surgeon with clinical expertise in breast surgical oncology of the Breast Center at Miami Cancer Institute, which is a part of Baptist Health South Florida. Dr. Mautner specializes in breast surgical procedures including breast conserving lumpectomy, sentinel lymph node biopsies, skin sparing mastectomy and nipple sparing mastectomy. She completed a breast surgical oncology clinical fellowship at Memorial Sloan Kettering Cancer Center and completed a general surgery internship at St. Vincent's Hospital in Manhattan, and a general surgery residency at New York Presbyterian Hospital Weil Cornell Medical College, also in New York City, where she was Chief Resident.

Dr. Mautner also completed a research fellowship at Memorial Sloan Kettering, where she focused on ways to tailor surveillance and treatment for women with lobular carcinoma in situ and patient quality of life after contralateral prophylactic mastectomy. She received her medical degree from the University of Miami Miller School of Medicine, and she's a member of the American College of Surgeons, the Society for Surgical Oncology, the American Society of Breast Surgeons and the Association of Women's Surgeons.

Our second doctor with us today is Dr. Elyse Cardonick. She's a professor of obstetrics and gynecology at Cooper Medical School of Rowan University and a member of the division of Maternal-Fetal Medicine as a perinatal consultant. She earned her medical degree from the Medical College of Pennsylvania and then completed a residency in obstetrics and gynecology at Albert Einstein Medical Center. Subspecialty training in maternal fetal medicine was completed at Thomas Jefferson University Hospital. Dr. Cardonick is board certified in obstetrics and gynecology and in the subspecialty of maternal fetal medicine. She's a member of the American College of Obstetricians and Gynecologists as well as the Society for Maternal Fetal Medicine.

Interestingly, Dr. Cardonick maintains a registry of pregnant women diagnosed with cancer during pregnancy and follows closely the outcomes for mother and child. The second portion of the registry is dedicated to the pregnancy outcomes of cancer survivors who have children after completing their treatment. Dr. Cardonick is a medical advisor for the pregnant with Cancer Support Network and is also one of only two physicians outside of Europe to be invited to join the International Network on Cancer,

Infertility and Pregnancy, with whom she now collaborates. We are so grateful to have both of these experts with us tonight and starting this evening is Dr. Cardonick.

Dr. Elyse Cardonick:

Thank you so much for that introduction, and it was heartwarming to hear Erica's story. A few things have changed since she was treated. I am very glad to hear that she was treated during pregnancy and not told that she could not be. You can see my slides okay?

Melissa Rosen:

We can see your slides, although this time we see the next slide and it's not in slide mode. As always, tech is the most challenging part of our webinars.

Dr. Elyse Cardonick:

It is in the mode I want on my screen, which is interesting.

Melissa Rosen:

Yeah, I don't think it's a big deal as long as you don't mind.

Dr. Elyse Cardonick:

Okay. So you see the first slide, right?

Melissa Rosen:

We see the first slide and then a smaller version of the second.

Dr. Elyse Cardonick:

Okay, so we're going to talk about breast cancer and pregnancy, and what has happened is during my residency I didn't see any patients in the '90s who were diagnosed with cancer of any kind during pregnancy, and that's because I did my residency when the average age of pregnancies were happening between women between 20 and 24. And now we see as there are less women starting their first pregnancies in this age group and more and more women having children at later ages, and that is why during my fellowship is when I encountered women who were pregnant with cancer. And you can see that first pregnancies at 30 to 34 is on the rise, whereas first pregnancies in these earlier ages is on the decline.

And because we are seeing pregnancies happening at later maternal ages and we're seeing cancer in this pink line diagnosed around the thirties and forties, we are seeing a crossover in which pregnant women can find themselves diagnosed with cancer, and a delayed first pregnancy in and of itself may be a risk factor for breast cancer. So advanced maternal age is one of the risk factors for why we're seeing cancers during pregnancy.

As you can see here, any cancer can happen during pregnancy, but this is the part of the pie that's breast cancer, and that is by far the most common cancer that we see during pregnancy. One in a thousand pregnancies are complicated by cancer and the most common type is breast, as I said. One in five women diagnosed with breast cancer who are under 30, it will be in association with a pregnancy either during the nine months of pregnancy or within a year postpartum. And initially, when I was looking into this, we thought that inflammatory breast cancers would be more common in pregnant women because your immune system is different in pregnancy, but actually if you compare the type of

cancers that pregnant women get, it is very similar to what the same woman would get where she's not pregnant at the same age. So the biological features are very similar.

Unfortunately, pregnant women at least especially in the early publications were diagnosed at later stages probably because there was a delay in diagnosis because people thought it was a clogged milk duct or people were hesitant to do x-rays when pregnant women or hesitant to do biopsies. So some of that information that says that pregnant women are diagnosed at later stages is in part due to a delayed diagnosis. And for the purposes of this talk, I'm not going to talk about postpartum diagnoses of breast cancer, but just breast cancer during the pregnancy itself. So when a patient is diagnosed with breast cancer, there are many questions that they want to ask and that we want to address. And first of all, they want to know about staging. How do we tell if this is limited to the breast or if this is outside of the breast itself? As Erica was questioning.

Is the outcome affected for a patient, should she have the same cancer where she's not pregnant, is pregnancy going to make it worse? Is her survival going to be affected by the fact that she's pregnant? Can she get chemotherapy safely when she's pregnant? Can she get radiation or should the pregnancy be electively terminated? I'm going to start with this last question first and put it to rest. I like this quote from 1962, and I still feel that it's true today in most cases.

In the face of general enthusiasm for terminating the pregnancy, we believe the evidence is that the cancer should be terminated. So mother's diagnosis or stage and prognosis may affect whether termination is an option, and it depends on how advanced she is, it depends how early in the pregnancy, if it's a primary or recurrent breast cancer. What is the therapeutic plan that's recommended? And this cannot be... An OB-GYN, maternal fetal medicine can't do this without an oncologist as a part of a team. And as Erica said, both teams were talking and it has to be a multi-collaborative conversation. And the first conversation I usually have is what is the therapeutic plan? If this patient were not pregnant, would she start with surgery? Would she start with chemotherapy? And once I know what that plan is, my next question is, okay, she's X number of weeks pregnant. How long can I delay that plan without changing her prognosis?

As with Erica, when a breast mass was detected in pregnancy, we do start with ultrasound. That's not because you can't have a mammogram in pregnancy, you can have a mammogram in pregnancy and the radiation dose to the fetus is minimal. But we start with ultrasound for two reasons. One, it can distinguish between a solid and cystic mass, but also when you do a mammogram in pregnancy, the fat content and the water content of the breast are changing and it may not be as helpful to do a mammogram and you did the same breast. When she's not pregnant, you might get a different visualization. So we do start with ultrasound and again, that's not because mammogram is not safe. If we see a solid mass, we go with a biopsy. If it ends up being malignant, then you do your mammogram even though you have your diagnosis now you do your mammogram on both sides to make sure there's not more than one site of tumor in the breast that had the abnormal biopsy. And also to look at the other side.

We also can do other studies in pregnancy. We can do CAT scans of the chest. We used to do a chest x-ray, but now you can do a CAT scan of the chest with contrast if you need to evaluate the lungs. An MRI of the abdomen without contrast may be more helpful than an ultrasound of the liver. If someone is having a skeletal pain, you can do an MRI of the skeleton and an MRI and ultrasound do not have radiation exposure to the fetus. But you can't do contrast with an MRI like you can with the CAT scan.

Even though you may not want to do a PET scan in pregnancy, you can do a low-dose pet CT if you need it. We still try to limit the evaluation to what is going to change management during the course of the pregnancy. If the patient is otherwise asymptomatic without bone pain and you're going to start with surgery or chemotherapy anyway, you may not need to do the PET CT to see exactly everywhere the

cancer may be because it's not going to change management during the pregnancy. What has changed from when Erica underwent her mammogram, however, is that shielding is no longer recommended for any imaging of pregnancy, and that even though shielding the abdomen may make the patient and even the biologists feel better, it's actually increasing scatter to the pregnancy. So we do not use abdominal shielding anymore for x-rays in pregnancy.

Now, the other thing that we want to realize is that there is some belief outside of obstetrics that the only time you can do surgery in pregnancy is in the second trimester, and that's not the case. You can do surgery at any trimester of the pregnancy. If the first step for breast cancer is to do lumpectomy or to do a mastectomy, that can be done at any trimester of pregnancy, you want to give the patient the choice she would choose where she's not pregnant, she can do lumpectomy or mastectomy. It's not affected by pregnancy, whether she has to do that or not. There's no survival advantage if you compare pregnant patients who do mastectomy over lumpectomy. But if you have a lumpectomy, you do need radiation later in the pregnancy. And because of that, we have to fill that time gap between lumpectomy and pregnancy and radiation postpartum with chemotherapy. We do want to delay reconstruction of the other breast, of the affected breast so that it matches the other breast postpartum, so we don't do that during pregnancy.

You can put spacers in, but we don't do the full reconstruction. What about sentinel lymph node mapping? That can be done in pregnancy. You want to use the radioactive material and not the blue dye. It seems that you would think that blue dye might be safer than radioactive material in pregnancy, but it's the opposite. Moms can have an allergic reaction to the blue dye, whereas the radioactive tracer does not affect the fetus. It doesn't go throughout the body to the pregnancy. Chemotherapy is what we want to spend the most time talking about and we have to talk about non-exposure of the fetus to chemotherapy or no chemotherapy. It's exposure to the fetus versus the exposure to untreated cancer. And that's the same for any medical disorder in pregnancy. It's what is the risk of not treating that disorder in pregnancy? And if this is going to mean that the cancer is more likely to spread, if we wait for the duration of pregnancy and don't treat her, that is certainly not worth the risk and we have to think about chemotherapy in pregnancy.

We do avoid that in the first trimester, because that's when the organs of the fetus are developing. But you can give adriamycin cytoxin, as Erica received, and you can give it every two or every three weeks, most commonly every three weeks. But dose stents has been reported safely in pregnancy. There are some cases, especially in Europe where they use epirubicin instead of doxorubicin. But anthracycline only chemotherapy is not optimal treatment for breast cancer in pregnancy. And now it is safe to use Taxols in pregnancy, and we would not have had to delay that electively until after delivery. We have a lot of data showing that babies can tolerate this.

They may be statistically smaller, but they are otherwise cognitively as healthy as the other types of chemotherapy. Hydration is important, because patients do complain of contractions during or after chemotherapy, especially with Taxol. The timing of delivery needs to have about a three-week time period between adriamycin cytoxin and pregnancy, so we don't give that after 34 weeks, but weekly Taxol can continue until 35 or 36 weeks. We do want to aim for a term birth and try not to do elective preterm births. Elective preterm births were more common before we had information about Taxol and if someone did finish adriamycin cytoxin by 28 weeks, we certainly didn't want to wait nine weeks for them to receive Taxol after delivery. So a lot of times we did electively deliver patients around 35 weeks when we thought the fetus would do well and then mom could start on her second type of chemo.

But now that we know Taxol is safe in pregnancy, we don't electively do preterm births. We want to remember that patients should get the same regimen they would get if they weren't pregnant at the same dose, and we use the actual weight in pregnancy. We do not look at pre-pregnancy weight or ideal

body weight. You change the dose based on the weight that increases in pregnancy, and we don't use Herceptin or Trastuzumab during pregnancy.

What's most important for pregnant women to know and why we started the registry is that knowing a baby is not exposed during the first trimester does tell you that the organs won't be affected, because they have already developed before you started treatment. But the brain continues to develop throughout pregnancy and we wanted women to have information on the cognitive development of children as they got older, not just their appearance at birth. So we started the registry to follow these women and the children long-term. And every year on the baby's birthday, we contact a pediatrician to see if they're meeting milestones. And then after we accumulated enough cases, we brought in a blinded psychologist to do developmental testing on these children. We looked at 55 children of mothers who had cancer, 35 had needed chemotherapy during their pregnancy. 22 patients still had cancer but didn't need chemotherapy.

We did the age-appropriate test for their development, which was in their age 18 months to three years of age. Although this included all cancer types, because breast cancer was the most common, this was the majority of babies were exposed to AC. And there were some cases exposed to ABVD for lymphoma, which still has the same adriamycin in it.

95% of these babies performed on cognitive tests in normal limits, and this is consistent with the general population that 70% were above average in math and 79 in reading. And when we compared the babies exposed to chemotherapy versus no chemotherapy, there was no difference in cognitive skills or academic achievement. And there was also no relationship to how the mother was doing, how many treatments she had, and when she started her chemotherapy. But most importantly, that for every week in which the baby was delivered later and not delivered pre-term was a 2.3 point increase in their cognitive score. And this supports our feeling that we should not electively deliver babies preterm, because the preterm gestational age had more of an impact on their cognitive outcome than the chemotherapy exposure. And the INCEP group that we spoke about did the same study looking at the same age group and they found similar outcomes.

Next, we waited for these children to get a little bit older, and looking at them at six years of age, looking at a larger number of children, now 132 children exposed to chemotherapy. Again, we looked at controls and whether they were exposed to chemotherapy or radiation surgery or new treatment and performed neurologic testing. Parents also completed a health questionnaire. We looked at their IQ and we looked at their memory, and happy to say that there was no statistical difference in their IQ scores between babies who were born to mothers who had cancer, babies born to mothers who had cancer with chemotherapy, and babies born to mothers that had no problems during the pregnancy at all. Their control group was from the normal population.

The IQ was also not related to the number of cycles that the patient had or the estimated radiation dose in some cases of non-breast cancer radiation. There was a significant difference in verbal scores, but it was less than one standard deviation and it was still within normal limits, but that's something that we'll talk about. And the children by age six who were in the group of mothers of cancer did have a little bit of increased emotion and less impulse control, not necessarily due to chemotherapy, but perhaps knowing that their mother was ill, that we have seen this in non-pregnant patients, that babies of moms who have cancer may have some emotional ability as well. There was no difference in retention memory or short-term memory, no difference in health outcomes. But we did find that the children from the chemotherapy group were three times more likely to need glasses than the controls.

Three years later, now there's a collaboration between our registry and European investigators looking at children that are now nine years of age. And it's reassuring that as a brain continues to develop and we have more information that these babies are doing well, we can reassure women that if they need to

have treatment during pregnancy that their babies can do well. And looking at their mean cognitive and behavioral outcomes, they were in normal range and there was no difference between the treatment types. And it was again, reassuring. And we did find associations with preterm birth, maternal education, and unfortunately maternal death.

And it may be that for those young children who had a lower verbal score, it may be that at young ages, if your mom is not doing well or your mom is in treatment and not talking to you and reading to you, that may be the impact. And it's not the chemotherapy, but it's the absence of the mother at the critical time. So we have to remind families if mom is still in treatment or mom unfortunately is not doing well, that other people need to read to the baby and engage with the baby very early for their verbal IQ.

But even though it was lower, it was still within the normal range of the population. This is the oldest age group to date that we've collaborated on. Now we're getting into the early teenage years, 12 to 15 years of age, and again doing the age appropriate testing for them, looking at their verbal IQ. And again, the only vulnerabilities that we saw in the verbal memory and attention were linked to either prematurity or maternal death, and not maternal cancer or its treatment during pregnancy.

So how can we help women like Erica who are diagnosed with breast cancer and pregnancy? We can make the best difference by avoiding delays in diagnosis, not be afraid to image a mass that we feel, not being afraid to biopsy a mass that we feel and to make an early diagnosis. I am asking the same questions I asked when patients are diagnosed, when I first saw a patient in pregnancy and now 30 years later doing the same thing. And that is, how would she be treated if she were not pregnant? We want to aim to treat the patient the same as if she were not pregnant whenever possible. We try to avoid radiation, which is really not that relevant for breast cancer since we have chemotherapy that can be done in surgery. No trastuzumab in pregnancy because of low amniotic fluid that's been reported in babies that have been exposed to this trastuzumab, although it does usually recur when the medication stops. But we don't use herceptin in pregnancy.

We aim for term birth avoiding elective preterm births. We want three weeks between the age of adriamycin and Cytoxin in pregnancy or seven to 10 days after weekly Taxol. What about breastfeeding? Two things to know. If you do have that three weeks time between stopping chemotherapy and pregnancy and delivery, you can breastfeed for most of the agents, that there have been enough half-lives that have passed between your chemo and pregnancy and delivery so that you can give either the colostrum or some breast milk. If you need to restart your chemo though, you've paused at 35 weeks, enough time has passed, you can breastfeed for a few weeks, but once you restart your chemotherapy, you should not breastfeed.

Another thing for patients to know if they've had chemotherapy during pregnancy is that in the registry, women do report being disappointed that compared to their other children, they did make less breast milk. So it's just something to be aware of so they're not to stress about it. A word about the Cancer and Pregnancy Registry, you can follow us on Instagram. We love seeing pictures of moms and babies really inspiring us to continue this work and to really have pregnant women be treated as closely as possible as if they weren't pregnant so that they are here to raise their children.

And also to be aware that Hope for Two is a support group where someone like Erica who didn't have... Luckily she knew a peer, but you can call now this 800 number and someone at Hope for Two or match you with someone who's already delivered their baby, they had the same cancer and they've had treatment or didn't need treatment for whatever reason, but they have elected to be a support person and will be a support person throughout the pregnancy. And some women have formed friendships that they continue beyond the pregnancy.

So thank you for your attention. I hope I didn't speak too quickly, but I didn't want to go over time.

Melissa Rosen:

No, it was a lot of good information. So we are now I'm going to ask you to stop your share.

Dr. Elyse Cardonick:

Sure.

Melissa Rosen:

Thank you. And I am excited to welcome... There we go. To welcome Dr. Mautner to the screen, who is going to share from an oncology perspective.

Dr. Starr Mautner:

Hi. Thank you for having me, and thank you Dr. Cardonick, for such a amazing overview of the diagnosis and treatment of breast cancer during pregnancy. I think we learned a lot about that treatment, and I kind of want to tackle this from another viewpoint now. So I see a lot of young women being diagnosed with breast cancer to the point that over my past 10 years since completing fellowship, I definitely noticed an uptick in our women that are under the age of 45 being diagnosed with breast cancer. And due to that, I started a young breast cancer program, because a lot of these women have different needs.

And so we talked about the treatment of breast cancer during pregnancy, but breast cancer associated with pregnancy is actually defined as any breast cancer that is diagnosed during the pregnancy or up to a year afterward or during the setting of breastfeeding. So the first thing I want to tackle is just to touch on the treatment and actually the diagnosis of breast cancer in the breastfeeding woman, because it's a little bit different in terms of the initial workup and what you can do as compared to as when the woman is pregnant. Similar to breast cancer in pregnant women, breast cancer diagnosed during the breastfeeding period is often delayed, because it is very difficult sometimes to diagnose a woman with a new palpable mass in the breast. Is that actually being a cancer versus a mastitis or a clogged milk duct? And so there's often delays in diagnosis when a woman presents during the setting of breastfeeding.

But just like when a woman is pregnant, it's still important to not ignore these symptoms and to thoroughly work it up. So we have a protocol in place to image women who are breastfeeding and we ask them to pump before the mammogram to get as much milk out as possible, and then those women can undergo a mammogram. The mammogram may not show everything that we need to see, but it may have important details such as a speculated mass or microcalcifications that we're looking for. And especially when you compare side to side, you may see an asymmetry in the breast that's affected by the mass versus the breast that's unaffected.

In addition, in the breastfeeding woman, you can get a breast MRI with IV contrast, which you cannot do when someone is pregnant. And once again with breastfeeding, that may obscure some of the signs of the cancer, but you should be able to see a mass there, especially if it's palpable on exam, you would get more details with the breast MRI. We will perform an ultrasound guided core biopsy of any palpable mass that appears suspicious. And at that time, we also need to counsel patients that if they are breastfeeding and you undergo a biopsy, there is a risk of something called a milk duct fistula.

So basically, if the needle passes through the duct and you're making milk, that milk sometimes can then form a channel to the skin. And that is a risk that a woman would need to take if she is going to undergo a biopsy. But any suspicious mass that develops in the breastfeeding period still needs to be worked up and properly biopsied for diagnosis. If a woman is diagnosed with breast cancer during breastfeeding, we would treat them just as we would any other woman with breast cancer, if she qualifies for

neoadjuvant chemotherapy, that would be given. At that time, the woman would stop breastfeeding. And then in terms of surgery, we would want them to stop breastfeeding first, so you would lower the risk of milk duct fistula with surgery as well. So that's to touch on a woman who is breastfeeding.

But then another important point that we didn't really cover yet is what about the woman who has not had kids and is diagnosed with breast cancer? And so I am seeing this more often as the situation when I'm seeing women in their twenties and thirties who are being diagnosed with breast cancer and either they're partnered or they're not, but they haven't had their children yet. And so for these patients who are very young with breast cancer, oftentimes they will require chemotherapy as part of their treatment regimen, and they need to be appropriately counseled that that chemotherapy may impact their fertility for the future.

And so we try to get these women in immediately to see an oncofertility specialist and determine if they would like to harvest eggs prior to starting chemotherapy and treatment for their breast cancer. And there usually is a safe window of time before they start their chemotherapy or before they have their surgery that these women can harvest eggs safely. It's a very stressful situation, obviously these women have just been diagnosed with breast cancer, now they need to make a decision about preserving their fertility for the future, but it's really important to have resources in place for these women.

The process can be expensive. There are not-for-profits that will cover some of the expenses for the medications that are used for the in vitro fertilization for the harvesting of the eggs. But then oftentimes when you actually have to store the eggs or embryos and then re-implant them in the future, that process can be very, very expensive. And so I think that's one of the biggest barriers for these women who are dealing with a breast cancer diagnosis is now the financial strain of having to make big decisions like this.

My patients who have decided to store eggs have been very happy with that decision to do so because it just leaves the option open for the future if they do want to try to conceive. When it comes to counseling women who want to conceive after treatment for breast cancer, we will usually advise those women to wait at least two years after their diagnosis to try to conceive either naturally or with IVF or via a surrogate at that point in time. And the reason why we use that two-year benchmark as our advice for these women is that if you are going to reoccur with an aggressive breast cancer, the most common time for that to occur would be within the first two years.

In addition, for most women who have an estrogen receptor positive breast cancer, they're taking endocrine therapy during that time like tamoxifen. And we usually don't want them to pause that treatment initially during the first two years. But studies have shown that it is safe to pause it after the two-year mark. And we always would rely. Obviously. On the patient's medical oncologist to give the final say if they feel that it is safe for the patient to pause therapy at that time to try to conceive.

Patients may try to conceive naturally at that point, but after three to four months, we would encourage them to go the IVF route so that they don't spend too much time off of treatment. And also important to note that studies have shown that women who do conceive after being treated for breast cancer do very well. When you compare them to women who do not try to conceive, they actually have a comparable overall survival, if not better. And part of this we think is due to some sort of bias called the healthy woman bias, that if they're healthy enough to get pregnant and carry that pregnancy to term that more likely than not they're going to do well overall in terms of their overall survival.

And so it's a little bit of a newer field of study because traditionally younger women weren't included in a lot of clinical trials. And so as we are seeing more and more young women being diagnosed with breast cancer, we are starting to follow these women prospectively to see what happens with them and how

they are able to carry pregnancies, that I think it's very important to offer women options to preserve fertility for the future.

And then to touch on the point about not being able to breastfeed after treatment for breast cancer, I have had women preserve the contralateral breast to be able to breastfeed in the future, but in women who have had bilateral mastectomies or in women that are advised not to breastfeed after their treatment, there is a company called Bobbie that provides free formula to these women. And I've had patients use that resource and found it to be very helpful. And so that is an option for women as well. So I think those are the main points that I wanted to cover. And then if I could just quickly share my screen, I think some of these pictures speak a thousand words and are very powerful to see the results of these women who have been able to conceive after treatment for their breast cancer. Let's see.

Melissa Rosen:

You should be able to share your screen.

Dr. Starr Mautner:

Okay. Let me know if you're able to see these photos. Are you?

Melissa Rosen:

No, right now it hasn't even come up that you're sharing.

Dr. Starr Mautner:

Okay, hold on. Let me try one more time. Oh, share.

Melissa Rosen:

Yep. Now it's it... We don't see it yet, but it says you've started sharing. Usually takes a second. Oh, there we go.

Dr. Starr Mautner:

Can you see these photos now?

Melissa Rosen:

Yes. Yes.

Dr. Starr Mautner:

Okay. So this is my patient, Dana, who was diagnosed about 10 years ago with breast cancer at the age of 29. She was recently married at the time and had not started having her children, and she was diagnosed with an estrogen receptor positive breast cancer. She required surgery, she underwent bilateral mastectomies plus chemotherapy, and she preserved embryos with her husband at that time.

And she, thanks God that she did because she said that she wasn't sure at the time if they would try to have children, but she wanted that option in the future. And so after several years of treatment and she took a pause in her tamoxifen and she was able to get pregnant via IVF and she carried two babies to term, so she now has a son and a daughter, and I keep in close touch with her and I love seeing these photos of her kids, and she loves being a mom and she's an amazing mom. So she's so happy that she decided to pursue preserving embryos before getting chemotherapy.

And then this is my patient, Stephanie, who has a little baby girl, Julia, who's about a year old, and she's a very interesting case as well. She was diagnosed with a stage four breast cancer and liver metastasis. That was HER2 positive, and she was a nurse. Her husband's a physician and they had recently gotten married, had not started having kids yet, but they decided to preserve embryos not knowing what her future would hold. She was not advised, obviously, to stop treatment as she has stage four breast cancer and is on maintenance herceptin basically forever at this point. But they were able to use a surrogate to conceive with their embryo, and so she went a different route, and surrogacy is obviously a very expensive option and not an option for everyone. But for her this worked and she's so happy that she's able to experience motherhood and she has a healthy, beautiful one-year-old daughter, and she's doing great as well.

And so I think that just shows the importance of looking at this over a few different angles, because we're just seeing so much young breast cancer that this is going to continue to be an issue with these patients and being able to offer them options for the future.

Melissa Rosen:

Thank you so much. Thank you so much for what you shared. Very helpful. We have a few minutes for Q&A and some great questions. So one that came in this evening was how from both of your perspectives do you navigate different opinions of an oncology team versus an obstetrics team during pregnancy and a cancer diagnosis?

Dr. Starr Mautner:

These cases are very complex, and so I think having the input of an MFM, an internal medicine specialist along with the breast surgical and medical oncology teams is very important. If there are decisions that need to be made that not everyone is in agreement with, then these cases usually get presented at our multidisciplinary tumor board conference where we can come to a consensus. Luckily, I have not been in a situation where we disagree with either the OB or the medical oncologists. Most of the treatment is very standard in terms of what to do.

I think where it gets very tricky is when someone is diagnosed extremely early on in their pregnancy where it's their first trimester, just pregnant, five, six weeks, where you can just detect a positive pregnancy test and they find out that they also have a cancer diagnosis. That gets tricky because it's too early to start neoadjuvant chemotherapy. You don't want to wait until the second trimester, but if you commit them to surgery at that point, what surgical procedure is that patient going to choose, and are you going to be within the window to be able to provide radiation after the pregnancy? It becomes a little bit trickier, but for the most part there's clear agreement usually between the multidisciplines. What about you, Dr. Cardonick? What have you seen?

Dr. Elyse Cardonick:

I would say that there is sometimes not so much disagreements, but an oncologist may not have had a patient with cancer before. It is so rare, that each physician may only have a few cases in their career, so they may not realize that there's now information on pregnancy. So I don't usually have oncologists hesitant to give the toxin for breast cancer, but when you get to finish that, and now there's seven weeks before term, there is some, not disagreement, but hesitation to give Taxol, and then it's about education and sharing articles and publications and saying, this is what we know about Taxol and having that discussion. What is the risk of her not having Taxol for the next seven weeks, versus the risk of a preterm birth in order to start that Taxol?

So I would say it's more of being uncomfortable treating a patient with pregnancy or just not seeing it before and not realizing that... I think in the beginning, about 20% of patients who are advised to terminate their pregnancy, and I'm happy to say it's down to about 12%. So I think it's just having that first patient, getting that experience, seeing that that baby's okay, then you're comfortable the next time.

The team has to be able to work together. Oncologists, OB-GYN, the NICU team, everybody together, and if a patient encounters a team that doesn't, the oncologist wants to do oncology and the OB wants to do OB and there's no discussion, she certainly can seek another opinion and try to get a team that wants to work together. You can't do it in isolation.

Melissa Rosen:

So I think that's the best advice. If there's a lot of disagreement, you need to find a team that will work together. Okay. Is it the hormones of pregnancy that could be the reason a breast cancer occurs or grows if it was already there, but undetected?

Dr. Starr Mautner:

So it's usually not the hormones that cause it, but it will cause exponential growth sometimes during pregnancy because you have such high surges and estrogen. So if you have an estrogen receptor positive tumor, number one, it may be going undetected while the breast is engorged and going through the changes of pregnancy, and so it's not initially detected, or the patient may be visiting even their gynecologist and saying, "I see these changes," but it's just very vague in terms of what's going on, and in the meantime it's growing very quickly under those hormonal influences,

Dr. Elyse Cardonick:

But terminating that pregnancy doesn't necessarily make it better.

Melissa Rosen:

Right. No, I understand that. Yeah.

Dr. Elyse Cardonick:

Okay, so that's right. It's hard to answer that question, because if you compare pregnant women with breast cancer to non-pregnant women with breast cancer matched for stage, it is very similar. So I do think the cancer was probably there before. And for what you're saying, that Dr. Mautner does become more prominent, or you're going to the doctor and getting a breast exam too. A lot of pregnant women don't go to the doctor. I mean, a lot of women don't go to the doctor until they're pregnant.

Melissa Rosen:

Right. That makes sense. I know that it was mentioned that you wait the two years because that is when it's most likely that an aggressive cancer will recur, but one of the questions that was asked is after those two years even, is it really safe to get pregnant after maybe years on tamoxifen or aromatase inhibitors, or honestly after any treatment, does having had that treatment, whatever that treatment is, impact a future child or the risk of recurrence for the mother?

Dr. Starr Mautner:

I would always defer to the medical oncologist, but in general the answer is no. If they've been treated at least their two years and then they want to try to conceive, it should be safe as long as the patient isn't being advised to continue treatment, because let's say they have stage four disease and they're at high risk of relapse or something like that. There are certain medications like Herceptin that they'll want to flush out of the system for several months before trying to conceive or tamoxifen. There's a period of time that they want the patient off tamoxifen because it is teratogenic and it can cause birth defects. But that's a period of a couple of months.

And so, the chemotherapy can damage eggs, and it just depends if you're going to be using eggs that were stored versus you're going to try to conceive naturally, how many months the oncologist tell you to wait before you actually try to conceive. But in studies that are matched, it's showing that women, as I said, that carry pregnancies to term actually appear to do better in terms of overall survival in the long term.

Dr. Elyse Cardonick:

Yeah. And the prior treatment doesn't increase your risk to have pregnancy complications or babies with birth defects or anything like that.

Melissa Rosen:

That is very comforting. That's very comforting. I wish we had more time, but as we begin to wrap up, I want to thank Erica for sharing her story. It was so meaningful, and thank you to both Dr. Mautner and Dr. Cardonick for not only their expertise but their passion on this topic. Speaking of passion, I know that our clinical team was so excited about this webinar because even though this is obviously not a common thing, there also aren't a lot of resources out there, and many of my colleagues said that they would be sharing the recording of this video frequently, as often as needed, because it's a resource that wasn't available elsewhere and they were very excited about it. Thank you again to tonight's program partner, the Miami Cancer Institute, and our sponsor, the Cooperative Agreement 24-0061 from the CDC.

We are putting a link to an evaluation in the chat box right now. You can click it now and still hear the last two minutes of our webinar, so please do take a moment to fill that out. And I want to make you aware that our annual Sharsheret Summit is about to begin. Each year during breast cancer awareness and ovarian cancer awareness months, we offer some special programs both as online webinars and across the country in local in-person events. The link to the summit website is in the chat box now and will allow you to easily see what's being offered as part of this year's summit. I do want to highlight one specific program that may be of particular interest to this group.

While the summit runs from September 26th through October 31st, on Monday, September 29th, we will host a webinar entitled Before Their Time, understanding the Rise of Cancer Among Younger Women. You can easily find a link to register for this event by clicking the link that's in the chat box for the summit, and you can also check out many more programs that may be of interest to you, including one on nutrition and one on managing Jewish high holidays while dealing with cancer. So I invite you to check them all out.

Please remember that Sharsheret is here for you and your loved ones. We provide emotional support, mental health counseling, and other programs designed to help you navigate through your cancer experience. All are completely free and completely confidential, and I just saw our contact information posted in the chat box. As we come to a close, we're going to put that evaluation link in the chat box one more time. I want to thank Drs. Mautner and Cardonick one more time. And thank you to everyone who is here tonight. Have a wonderful evening and good night.