Cancer Connections: Understanding Risk, Treatment and Women's Gynecological Health

National Webinar Transcript

February 5, 2026

Presented by:

SHARSHERET
The Jewish Breast & Ovarian Cancer Community

This program was made possible with support by:

Eisai

Genentech
A Member of the Roche Group

Melissa Rosen:

Welcome. Welcome, everyone. Thank you so much. I am so glad that we could be here together tonight. The focus of tonight's webinar, entitled Cancer Connections: Understanding Risk, Treatment, and Women's Gynecological Health, will explore different gynecological cancers, including ovarian and endometrial and others. We're also going to explore the connections between these cancers and how risk for or treatment of might impact risk for other diagnoses.

But as always, before we begin, I have a few housekeeping items to share. First, I want to thank Eisai and Genentech for their sponsorship of tonight's webinar. Their generosity allows us to continue to offer important programs, including tonight's program.

As always, this program will be recorded, but no names or faces will show on the recording other than those of the presenters. But if you wish to turn your video off for privacy now, the option to do that is on the bottom of... it's in our chat box, the directions, but on the bottom left hand of your screen. You can also choose to rename yourself to remain anonymous, and you can do that by clicking the three dots on the top right of your square.

We now also have closed captioning. To display live captions, on the bottom bar, click Captions, and then Show Captions. Depending on your screen, that might be under More. You will be notified when the recording and the transcript of today's program is posted on the Sharsheret website. Please feel free to share that link with those who may be interested or benefit from tonight's program.

As a reminder, we invite members of our Embrace Community, those facing metastatic breast or advanced ovarian cancer, to stay on at the end of tonight's webinar for an intimate breakout session with Dr. Kahn and Bonnie Beckoff, our director of Support Services. We received a good number of questions, a lot of questions through the registration process. But as questions arise during the presentation tonight, please use the chat box and we will address them or do our best to address as many as possible during the Q&A session at the end of the webinar.

As a reminder, Sharsheret has been providing telehealth services to the breast and ovarian cancer communities for 25 years, because cancer is so much more than simply a physical experience.

As we move into the webinar itself, 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. The information provided tonight by Sharsheret and our speakers is not a substitute for medical advice. As always, please seek the advice of a qualified healthcare provider with any questions you may have regarding your medical condition.

So, before we ask tonight's expert to join us, I want to introduce you to Angie. Angie is a different type of expert. She's one who has personal experience with more than one gynecologic cancer. She will share her story with us tonight. I'm going to bring you up to the screen, and thank you so much for being with us tonight.

Angie:

Thank you so much for inviting me to speak tonight about my cancer journey. First of all, I'd like to thank Sharsheret. Sharsheret was with me from day one of my cancer diagnosis. And I appreciate the opportunity to offer you a patient profile of someone with gynecological cancers and Lynch syndrome, hereditary cancers.

I was diagnosed with uterine and ovarian cancer in May of 2020. I'm grateful at this point I am a five-year survivor. My story began in late summer. In the fall of 2019, I had started to experience frequent and abnormal menstrual bleeding in between my regular cycle. It was alarming. It was new to me. It was

something different. It started in my late 40s. And I had visited my gynecologist. And in December of 2019, she did an invasive exam of my uterus and found several polyps and cysts, and also an ultrasound of my ovaries, which at the time looked very normal. And after the sample was taken from my uterus, I had no cancer cells at that point.

But we had decided at my age that we would do a hysterectomy, and the idea was to leave my ovaries in. As I approached my hysterectomy surgery a few months later, not knowing I had cancer growing inside, I had my hysterectomy and my doctor had noticed that my right ovary had a large white cyst on it. Not knowing what it was and not wanting to poke at it, thank you, she removed it. In between that surgery and my second surgery, they had discovered that my uterine wall had developed several growing, sort of like lily pad, tumors, and that they had submitted my organs for research from which they took a sample and found that I had Lynch syndrome, which is the hereditary cancer. I did a blood sample, or I did a sample, and I was confirmed to have Lynch syndrome with MSH6 gene mutation and FANCC, sometimes they call it FANCC, hereditary cancers as well.

Just before I finish up here, my dad had colon cancer at 69, and he survived that. He had a colon resection. His sister had breast cancer, and she survived that after a lumpectomy. And on his line, I have a grandmother and a great-grandmother with gynecological cancers and prophylactic (surgeries), which was pretty progressive at the time.

So, a month later, I had my second debulking surgery with my gynecologist-oncologist, and I had my second ovary removed and my omentum. And thank goodness that was all free of cancer. And from there, I continued with six months of chemotherapy and did my baselines. And because of my Lynch syndrome diagnosis and colon cancer being sort of the mothership of that, I have a yearly colonoscopy and an EGD.

So, with that, I feel as though with the help of Sharsheret and my doctors, I'm trying to stay ahead of it and being informed and learning more about my cancer journey. So, thank you for having me tonight.

Melissa Rosen:

Thank you so much, Angie. It's a very personal thing to share your story. But you have so clearly taken the bull by the horns. I guess that's a great... You've educated yourself. You're being proactive. And what a great role model you are for all of us in that vein. So, thank you. Okay.

Angie:

Thank you very much.

Melissa Rosen:

Absolutely. I want to introduce tonight's main speaker. Dr. Ryan Kahn is a gynecologic oncologist at Baptist Health Miami Cancer Institute. He specializes in minimally invasive surgical techniques, particularly robotic-assisted surgery.

Dr. Kahn incorporates clinical genetics in his practice to improve care and prevention strategies for patients and families carrying BRCA and other hereditary breast and ovarian cancer gene variants. He also specializes in ovarian cancer cytoreductive surgery, which aims to remove all visible disease during ovarian cancer surgery. This approach has been consistently linked to improve patient survival.

After earning his bachelor's degree from Johns Hopkins University and a master's in biochemistry and molecular biology at Johns Hopkins Bloomberg School of Public Health in Baltimore, Dr. Kahn earned his medical degree with research distinction at the University of Miami Miller School of Medicine. He completed a four-year obstetrics and gynecology residency at New York-Presbyterian Hospital, Weill

Cornell Medicine in New York City, and remained in New York for four more years to complete a gynecologic oncology fellowship at the prestigious Memorial Sloan Kettering Cancer Center.

During his fellowship, he was actively involved in research focused on innovative immunotherapies for ovarian cancer, and his positive research results offer a promising rationale for clinical trials in patients with advanced ovarian cancer. He also conducted research on the regionalization of care for gynecologic malignancies. Dr. Kahn has published his research work in medical journals and textbooks and presented his findings at many national symposiums.

Dr. Kahn, thank you for being here.

Dr. Ryan Kahn:

Thank you so much, Melissa. That was an unbelievable introduction. I'm going to have you do that for all of my talks moving forward. Thank you, Deborah. Thank you to Sharsheret. I want to apologize again deeply for last week. I was on call, and as we'll get into a little bit with GYN oncology and what we do, unfortunately, we had a patient emergency at this exact time last week. So, thank you all for coming and rejoining.

Thank you to Angie for such an amazing and inspiring story. As we have more patients moving forward and in practice, it's so great to hear these stories from patients. Once women face new diagnosis and diagnoses of things that you've been going through and telling them that there are patients who go on and live long, fulfilling lives afterwards, so it's really such an inspiration. So thank you. And that's why we do this.

So, I'm going to share my screen. Hopefully this works. We were practicing this. Took me a couple minutes to figure this out. Let me just make sure. Great. If there are any issues, please let me know. Is this working?

Melissa Rosen:

We can see it, but you should put it in presentation mode.

Dr. Ryan Kahn:

Presentation. Okay. Hold on. Let me redo that. Sorry. Some technical difficulties. Hold on. Okay. Hold on two seconds. So I go to presenter view, okay. Hold on.

Melissa Rosen:

It's always the tech that's the most challenging part of any presentation.

Dr. Ryan Kahn:

Okay. And then I'm going to go to Presenter View here.

Melissa Rosen:

Yes, perfect.

Dr. Ryan Kahn:

Excellent. So this works well.

Melissa Rosen:

Yep.

Dr. Ryan Kahn:

Great. So, thank you all. I want this to be informal, like I talked to everybody before. And then afterwards, we are going to have a breakout session. So, at any point, any questions come up or any comments that you want to discuss further, please write them down or put them in the chat, and we'll get to them afterwards to the best of our abilities.

So, we'll start off with what exactly does a GYN oncologist do? So, we diagnose, treat, and manage cancer and complex conditions of the female reproductive system. This includes mostly ovarian, uterine/endometrial, cervical, vulvar, vaginal cancers as well. Surgery, chemotherapy, radiation, other advanced techniques are in our armamentarium of our treatment strategies. And oftentimes, a lot of these different types of disease settings require multiple different types of treatment strategies. And other complex GYN surgical conditions, whether it's obstetrical emergencies that require complex surgery or fibroids or endometriosis as well.

So, I always like to start off with a quote, and this is especially telling when we talk about, and what we're going to talk about, prevention, genetic testing, getting screening. So, "You can't go back and change the beginning, but you can start where you are and change the ending." And that's especially telling for a lot of the GYN cancers.

So, we're going to go over GYN cancers from a bird's-eye view. Then we'll separate them, go into ovarian cancer, endometrial and cervical cancer. Then a little bit into the genetics, screening and prevention recommendations. And finally, exciting advancements as we move forward with what we're researching.

So, this is just to give you an idea of the incidence and prevalence of the GYN cancers out there. So, in regards to incidents or new cases per year, cancers of the endometrium and uterus are the most common right now in the United States. And a large part of this is driven by obesity and the obesity epidemic as adipose and fat cells drive a lot of the high estrogen that's produced in the endometrium and increase the risk of these cancers.

However, even though uterine corpus is a lot more prevalent, the mortality rates for ovarian cancer are quite similar in the sense that the treatments are a lot more effective when caught early for uterine cancers. And we have proper ways to screen and easier ways to screen for uterine cancer than we do ovarian right now.

It is important to note that this is in the United States. However, across the world, cervical cancer remains one of the top three diagnosed cancers in all of women, once again, across the world. And a lot of this has to do with lack of HPV testing and screening and lack of appropriate Pap screening in a large majority of populations across the world. So we are quite lucky here in the United States to continue to see the cervical trend going down, and we'll get into that a little bit at the end as well.

So, first, we'll start off with ovarian cancer. And with ovarian cancer, what we're starting to learn is it may actually be a little bit of a misnomer in the sense that a large majority of ovarian cancers we're finding out actually start in the fallopian tube and the fimbriated end of the fallopian tube. And we'll get into how this affects risk-reducing strategies and testing for different types of cancer.

So, every year in the United States, there are about 21,000 new women diagnosed with ovarian cancer. And unfortunately, over 12,000 women will succumb to death at the end of each year from ovarian cancer itself.

Uterine cancer, this includes the uterine corpus, so sarcomas, but also endometrial cancers and endometrioid, which are commonly seen in Lynch syndrome, very similar to what Angie was talking about earlier, and as well as some of the lower uterine segment and endocervical cases as well.

So, here, a lot more prevalent, 70,000 women roughly. And a lot of this, once again, is due to obesity and added morbidity for risk factors for endometrial. And about 13,000 women with uterine cancer will die each year of disease.

Lastly, cervical cancer, much less than endometrial cancer, United States, about 13,000. However, millions of women worldwide with cervical cancer, as we mentioned. And about 4,000 will die from the disease. Much less because we do have a very, very good way of screening and preventing cervical cancer. So we are going to continue to see this number to go down, which is very exciting. I always put in a misnomer whenever I give lectures. I will not test you on these numbers. I gave this lecture with these slides to medical students the other day, and I always joke that you don't need to know this number. This is just to put it in perspective for you.

So, starting with ovarian cancer. So, when we talk about ovarian cancer, and in a large majority of BRCA, Ashkenazi Jewish women, when we hear ovarian cancer, family member, loved one, or friend, a lot of times what we're referring to is epithelial ovarian cancer. And a majority of those are what we call high-grade serous. So, for all intents and purposes, and what we talked about ovarian cancer tonight, let's focus on epithelial high-grade serous ovarian cancer. So, about 9 out of every 10 ovarian cancers are epithelial, and about 70% of those are these high-grade serous types.

So, like we talked about, there are newer studies that show that they don't actually originate in the ovary, despite the name, but actually start in the fimbrial end. So you can see this end here. It also looks like projections that come out the end of the fallopian tube. That's kind of where the egg is caught by the fallopian tube and brought into the uterus biologically to have children. But the cellular metaplasia and turnover there is what they think increases the risk of this turnover to ovarian cancer.

So, once again, you don't need to know this, but just so you know, the studies and research going on. So it starts with what's called a p53 signature in the fallopian tube, and it's almost a spectrum. So, as it goes on a timeframe to then become a STIC lesion, which is a serous tubal intraepithelial carcinoma lesion, then produces fallopian tube cancer, which then seeds onto the ovary. So, for years, we've always thought this was just ovary going to the fallopian tube. We're now seeing this as fallopian tube going to the ovary and seeding to distant metastasis throughout the abdomen.

So, what increases your risk of ovarian cancer? Advanced age. The average age of high-grade serous ovarian cancer in the United States is anywhere from 60 to 65. Infertility. There is a protective effect of hormones. So oral contraceptive therapies do reduce your risk of ovarian cancer. Therefore, not having children, not having the hormones that come with that and having the unopposed menses each month do increase your risk of ovarian cancer. Genetic predisposition. So this is not only BRCA1 and 2, but also BRIP1, PALB2, RAD51C and D, and Lynch.

And I put a question mark with Lynch. And the reason is, and this is getting into the weeds a bit, but like Angie mentioned, there are five different mutations that are found with Lynch syndrome: MLH1, MSH2, MSH6, EPCAM, and PMS2. And we're starting to see that there are several that have a very high risk of ovarian cancer, and there are several of those mutations that may not carry as much of a risk as we thought. And as we get into recommendations, if you're a premenopausal woman without any ovarian findings with one of these, that doesn't cause such a high risk of ovarian cancer in the Lynch syndrome family, should they undergo oophorectomy or not? And that's not for here or there.

So, what decreases your risk of ovarian cancer? Previous pregnancies, so once again, halting menses and stopping that hormonal cycle. Breastfeeding. Combined OCPs, also IUDs do decrease your risk of ovarian

cancer. And probably the biggest risk reduction, what we're finding, we'll get into this in exciting new advancements too, is removal of the fallopian tubes before this has a chance to shed onto the ovaries.

So, what are some of the early symptoms? So, one popular acronym and what we stress to women is knowing your bodies and looking out for these signs and symptoms. So B is for bloating. E for eating changes, so change in appetite, usually earlier satiety or the sensation of feeling fuller early on. A is for abdominal, so abdominal pain or distension. And T is talking, talking to your primary care physician, seeing, "Is this something that's normal? Is this something I should look into more?" And usually, the reason that a lot of ovarian cancer, so about 75 to 80% of ovarian cancers are found late, in stage 3 and stage 4, is because, as you see, a lot of these symptoms are pretty nonspecific. So bloating, appetite changes, abdominal pain could be from a whole multitude of things, whether it's IBS, gastritis, GERD, gastric changes. So a lot of these things are indirect and oftentimes go amiss.

So, I always say frequency and severity. So, if this is something that's been happening for more than four weeks and seems more severe than what you've experienced in the past, go seek help. Oftentimes, if you do start having bowel issues for a few days, maybe something else. But if it is frequency and severity, that's when you go and seek help.

So, workup for ovarian cancer. CAT scan of the abdomen, pelvis, and chest are often our gold standard and what we go with. Also, tumor markers. For majority of ovarian cancers, CA-125, which is cancer antigen 125, is the most specific and most sensitive marker. And what we use as physicians, there are the 1 out of 10 ovarian cancers, some of the more rare types, like germ cell, sex cord stromals, we do look at other tumor markers. But for the most intents and purposes, the CA-125 is what we're looking at for most of these.

Angie kind of commented on this, and I'm happy she did. Don't go poking around the ovary. And a large reason is... And this is a question we get a lot from patients in the sense that the upfront management a lot of times for suspicious ovarian masses is to take it out. And the reason for that being is, unlike liver or breast cancers, you can't just stick a core needle biopsy in and take a little piece out because it's salt tissue around that. Usually, as you could see this darker fluid-filled structures, these are cysts within the ovary. A lot of times these cancer lesions are filled with fluid that have cancer cells. So if we were to stick a needle in, we would inadvertently pop the ovary, which would then leak this fluid out around the abdomen, upstaging disease, causing more risk of spread and peritoneal spread and advanced cancers. Also, possibly requiring chemotherapy when it may not have required chemotherapy before in an earlier stage.

So, with this slide, it's not a mistake when I say effective ovarian cancer strategies. Unfortunately, nothing's listed. Because right now, we don't have effective screening strategies for ovarian cancer. And one of the main studies that looked at this was the UKCTOCS, which was done in the UK. And what they did was looked at the National Health Service's center, a wide database retrospective study of... Oh, sorry, this was a prospective study. This is a randomized controlled study, looking at women who underwent annual multimodal screening, which was transvaginal ultrasound, CA-125, one of each, both, or no screening on the 1:1:2 ratio.

And what they found across, whether it was somebody receiving both methods, the transvaginal ultrasound and the CA-125, whether it was somebody getting the CA-125 or the ultrasound, or somebody who didn't undergo screening at all and just went to the physician when they were feeling some of these symptoms we talked about, there was no significant reduction in cancer deaths. So, true, we did find a bit more cases and probably earlier on, but it did not make a difference in the overall survival or mortality of the disease.

And this is why the U.S. Preventive Services Task Force, which we use a lot for our screening guidelines for ovarian, breast, you name it, has a grade D for recommending against ovarian cancer screening in asymptomatic women and even in high-risk women, such as women with BRCA1 and 2.

And this is also a question we get daily from all patients and family members. "Why couldn't we have caught this sooner? What did we do or what could we have done differently?" And honestly, the answer is, you did nothing wrong. There is no screening modality yet that has been shown to be effective. For cervical cancer, we have Pap smears. Breast cancer, we have mammographies. Colonoscopies for colon cancer. These are all excellent across the population. We, unfortunately, right now, do not have that for ovarian cancer. We are working on it and we do have multiple studies going on. This is why a place like Sharsheret is so important, too, because awareness is one of our key tools right now. And research funding, getting out there, getting your voices heard is so important for preventing and catching early ovarian cancer.

So, getting into uterine cancers now. And when we speak about the hereditary genetic backgrounds of uterine cancers, mostly we're talking about the endometrial cancers, which is this inner lining here. So I always tell patients, your uterus has three main sections. That is this outer layer. I say it's like, the skin of the uterus, almost like a grape. You have this middle layer, which is this kind of shiny part, looks like bacon on the inside here of the uterus. This is the muscle layer. When you have your cramping during periods, this is what contracts and pushes out the blood products on the inside. When you have a child and you're in full term and you're ready to push that baby out, this is what pushes those contractions. So, very, very thick muscle layer there. And that's where most women get benign fibroids. Adenomyosis as well originates in this layer.

The bread and butter when we talk about uterine cancers is this very, very thin lining on the inside. So bordering this muscle layer on the inside, this is the endometrium. This is, I don't know if you remember from biology class in high school, this with your hormone curves, the 14th day of your menstrual cycle, when you have the estrogen, LH and FSH peak, this pushes the endometrium to get a little bit thicker with these kind of spiral vessels of the endometrium in hopes of catching an egg that comes from the ovary, goes through the fallopian tube and implanting in the endometrium. Now, if you get pregnant, you go on to produce a corpus luteal cyst that produces progesterone and keeps this endometrium getting thicker and thicker. However, if you don't get pregnant, which is a majority of women once a month, you then shed it off with your menses at the end of the cycle, and that's kind of this whole cycle.

And the reason I got into that is, the reason when we talk about endometrial cancer, and one of the largest risk factors, beyond genetics and Lynch syndrome and other genetic components, is unchecked estrogen. So unopposed estrogen continuing to push this layer thicker and thicker and thicker until eventually getting atypical findings in the cells. Those atypical findings then converting into intraepithelial neoplasia, which is basically cancer in situ or precancer, and then progressing towards cancer. So, a lot of the risk factors, a lot of the prevention methods, a lot of the treatments revolve around hormones and this estrogen-progesterone ratio.

So, increased risk. Obesity, one of the biggest risks. And one of the reasons for that is adipose tissue. So fat cells, when in excess, can produce a lot of estrogen. And a lot of times when your fat cells produce this estrogen, it's not offset by the progesterone to thin that lining. So, other things. Yeah, the unopposed estrogen. Chronic anovulation. And what that is is not having your period or the LH, FSH, and different levels of hormones in your brain promoting and suppressing the different hormone levels each month. Late menopause. This is women who get their menopause later than the age of 55. And the reason for that is because your ovaries are still producing this estrogen that go to the endometrium. And genetic syndrome, such as Lynch syndrome is the one that's most closely linked to endometrial and, in

some cases, ovarian as well. And these are the genes that we mentioned. I have them on a slide later for reference.

So, as far as evaluation for uterine cancers, we talked about CAT scans for ovarian. For uterine and endometrial, transvaginal ultrasounds are very accurate at assessing the endometrial lining, the endometrial thickness, and any lesions that may be harboring inside that endometrium.

When we do this transvaginal ultrasound, usually women, after they hit menopause, shouldn't have this thickened endometrium because their ovaries aren't producing this estrogen cycle every month because they're not trying to have babies anymore and their ovaries aren't producing estrogen. So, if you do have a thickened endometrium past 4 millimeters in the postmenopausal stage, it is recommended to undergo an endometrial biopsy, which is an outpatient procedure. I say easy, but it is still a little bit of cramping pain. We don't cut anything. What we do is we go in with this very tiny straw through the cervix. So yeah, you can see here we go in through the vagina at the bottom here through the cervix and the cervical canal, which is this chunk of tissue here, and eventually get to this area. So you can see usually it'll start on this inside area and branch outwards towards that myometrium, towards that serosal layer, and eventually towards the pelvic side wall.

So, what we do is we go in with this straw in hopes of suctioning some of the cells and tissue of that cancer tissue. Whereas ovarian cancer, once again, the only real best way to diagnose and find out the pathology is to take the whole ovary out so you don't rupture it. With endometrial cancer, we have a very easy and effective way of doing it in the clinic without the fear of spreading it or anything like that.

So, now, getting into cervical cancers as well. Cervical cancers, for a large majority, there's a very, very rare subtype, but for all intents and purposes, are not genetically driven. So, with ovarian cancer, we talk about BRCA1 and 2, BRIP1, PALB2, the Lynch syndrome genes, once again, endometrial cancer, Lynch syndrome. Cervical cancer, there is no genetic link, but there is a very, very, very strong link to the HPV virus or the human papillomavirus. And that is why it is widely prevalent across the world, especially in Third World countries, where they don't have great screening methods or ways of getting HPV vaccinations. And that is also why HPV vaccines are over 99% effective in preventing cervical cancer in women, and not only women, in men as well with head and neck cancers and herd immunity in preventing a lot of these HPV infections in women as well.

So, risk factors. HPV 16 and 18. There are nine serotypes that are most at high risk for cervical cancer. These differ than the HPV that causes genital or anogenital warts. Immunocompromised individuals, so your body is unable to shed off and clear the HPV virus for a long period of time. So patients with HIV/AIDS, patients with leukemia or lymphoma who may be undergoing chemotherapy are also at an increased risk of cervical cancer. Smoking, early intercourse, which increases risk of HPV association, multiple sexual partners, STIs, and low socioeconomic status.

However, the greatest risk factor beyond HPV is going unscreened. And I'll show this slide here for cervical cancer. I like to think of cervical cancer on a timeline or a spectrum. So, we all know about Pap smears in HPV testing. So, the difference between a Pap smear and an HPV test is, a Pap smear is taking a brush and swiping the ectocervix and looking for cells that may be atypical. And a lot of these atypical cells fall into this CIN 1 category. So, they're not quite normal, but they are way far before invasive cancer. Now, what HPV testing does is test for the actual virus itself in the cervical tissue to see if you do have one of those high-risk serotypes, such as 16, 18, 31, 33. And that also greatly increases your risk of future cervical cancer.

So, the reason I put this out there in the spectrum is because all cells start as normal, basement membrane, transformation, ectocervix, endocervical cells. As it gets to CIN 1, this takes time. This takes a few years to develop from normal to CIN 1. From CIN 1 to CIN 2, once you get into CIN 2, CIN 3, it's

considered high grade and a bit more risky. This also takes several years. So several years to CIN 2, several years to CIN 3. And then eventually, even from CIN 3 to invasive cancers takes anywhere from 5 to 10 years.

So, that is why when we talk about screening, and I could do a whole other lecture on cervical cancer screening and treatments and prevention, but that is why a lot of the screening recommendations say every three to five years. And a large part of that is, if we do find anything here, we have treatments and ways to deal with that with either biopsy or excisional procedures. However, if not found, it would be a good three to five years before we even get into this early, early stage.

And the reason I bring this up is it is so important to get screened, because early-stage cervical cancer, stage 1 and 2, is asymptomatic. Patients ask about, "What about postcoital bleeding? What about abnormal discharge? What about pelvic pain?" And yes, when the tumor is larger than 5 millimeters, it's able to produce a little bit of that bleeding and symptoms that you could see. But stage 1As, 1Bs, from 3 to 5 millimeters, 5 to 1 centimeter, these aren't going to be producing a lot of those symptoms. And the only way you could really get checked is to get screened. And when caught, even if it is in this invasive cancer setting, stage 1s, the cure rate's over 96% and usually with just a simple surgery. So, that is why it is paramount.

We're talking about... Sharsheret, and we'll get into genetics and ovarian. Ovarian endometrial are what we're talking about here. But if I could also leave you with one thing for cervical cancer, get screened, promote the HPV vaccines because it does save lives.

So, let's get into genetics. So, we talked a little bit about what I do, the ovarian, uterine, and cervical cancers I see. Genetics. So, who should get genetic testing? And so, the National Comprehensive Cancer Network is also a fantastic resource, but I always say it's a resource. It's a guideline. It's not a hard-and-fast rule. I have patients who fell outside of these testing guidelines, and we'll go over them specifically. But just to say that if you don't fall into this picture, but you have a family history or a more distant family history or you want to know your genetic risks, get tested. Right now, it is so widely accessible and low cost to undergo testing. And a lot of times now, it is covered by your insurances.

So, yeah, the recommendations for NCCN are, if you are less than 50 years of age, this should be done in any woman with ovarian cancer or breast cancer to see if PARP inhibitors may be warranted and indicated for treatment. Also, in decision-making for high-risk HER2-negative breast cancer. Also, if you have any history before the age of 50, triple-negative breast cancer, multiple primary breast cancers, lobular breast cancer with a personal or family history of gastric cancer, male breast cancer, or if you're Ashkenazi Jewish. So, this is a large cast net, and a large amount of patients fall into this.

And if not under 50, any age with family history, so that's one or greater close blood relatives with breast cancer at an earlier age, if male breast cancer, ovarian cancer, pancreatic cancer, or prostate cancer, or three or more of any of the following.

Now, the reason I say this isn't a hard rule is, okay, so you're a woman, you have a family member at age 55 who was just diagnosed with breast cancer. Maybe this was diagnosed at a later stage. Maybe the breast cancer developed at an earlier age, at 49, 48, and then it was only caught at 53 or 55. So, once again, I wouldn't use this as, "Okay, they were found at 55. I don't need to get tested now." I think I tell patients everything's shared decision-making. If you want to know if it's something that you will take action on... And the reason we do genetic testing is because these mutations are actionable. There are things we could do to screen. There are things we could do to prevent. So, if you're somebody who would take action upon that, absolutely get tested. And we've done studies and looking at barriers to this and things like that.

So, this is, once again, a resource to use, resource for physicians to use, but I think it's important in the sense that it raises awareness for physicians that if you have a patient that falls into any of this who may be seeing you for something completely different, talk to them about genetic testing, because it may be for them. But I don't think this should be to deter patients from getting genetic testing if they fall outside of this, nor should it be for insurance companies to preclude patients from getting insurance coverage for genetic testing, once again, because they had a breast cancer relative at 53 instead of 50. I think that's silly. I think this... Yeah, I'll get off my soapbox now.

So, when we talk about ovarian cancer, about 20% of all ovarian cancers have a genetic background. So whether that's hereditary breast and ovarian cancer syndrome with BRCA1 and 2, RAD51, PALB2, BRIP1, whether it's Lynch syndrome, which makes up a component of this, whether it's MLH1, MSH6, 2, MLH3, PMS2, Li-Fraumeni syndrome, p53.

So, what does that mean about the other 80%? So, the other 80% is something we call sporadic. So, genes or inherited mutations are something you are born with, and you receive 50% from your mom, 50% from your father biologically. So, in 20% of ovarian cancer cases, we could say that whatever inherited variants that they had went on to cause this ovarian cancer. However, in 80%, this isn't the case. So, what's going on and causing this? So, this is requiring a lot more research. Things we're seeing are things called homologous recombination deficiency or HRD, which is also commonly tested by Myriad, Caris, Foundation, Color, Invitae.

And the reason we test for that, and what I mentioned before, is PARP inhibitors are kind of changing the game and the framework with a lot of these new Paramount studies that are finding cure rates in a lot of women who didn't have cure rates before. And a lot of times what we're seeing is, whether you have an inherited mutation, which is about 20%, or HRD, which is about 30%, so about 50% of all ovarian cancers have either an HRD or BRCA, and they are privy to having a PARP inhibitor. And what we're seeing with a lot of these HRD genes in breast and ovarian is they work very similarly at silencing some of the DNA damage. And that's why phenotypically we're seeing a lot of similar results in responses to treatment, increases risks of cancer. So, we're learning a lot more about HRD.

For all intents and purposes, right now, if you do not have cancer or breast or ovarian cancer, you do not need HRD testing. This isn't something you should go out and say, "I have HRD, but I don't have BRCA." Right now, from what we understand, just HRD if you are a cancer patient.

So, for breast cancer, obviously, BRCA1 and BRCA2 gets all of the headlines in the news. There are several more that are less frequently known, however, do significantly increase the risk of breast and ovarian cancer and, for all intents and purposes, should be treated the same way in regards to screening and management.

So, it's CDH1, PALB2, which means partner and localizer of BRCA2. So there you figure it's going to cause a lot of the same issues that BRCA2 mutations cause. STK11, and p53.

When we talk about ovarian, once again, not just BRCA1 and 2, this is talking about ATM, BRIP1, PALB2, RAD51C and D, once again, PALB52, kind of being this similar. So, a lot of these genes, what they do is they encode for proteins that go and your DNA is your message. I say it's like your... You've seen the IKEA manuals to build a couch. Your DNA is your manual for each cell to make new proteins, make new cells. And it's incredibly complicated. It's millions of these different nucleotides that mix and match and almost hit the nail on the head each time and are almost perfect. However, one out of every million cells goes haywire and produces a wrong code for... Your IKEA box may have a wrong screw from a different package. And that happens. However, our DNA also has a very, very good way at fixing itself.

And what BRCA1 and BRCA2 and PALB2 do is they load on these DNA-fixing mechanisms. It's almost like, in all the diagrams, to me, it looks like this big Zamboni. You ever seen a Zamboni in hockey that goes on

the hockey course and irons out the ice? So it kind of goes across the DNA and fixes all of those splicing and errors. However, when you have a mutation or a variant in this, your DNA is unable to fix itself. So, this one-out-of-a-million cell that kind of went haywire and built the wrong DNA then goes and progresses, and you don't have the BRCA or the BRCA2 to go and fix it. So that's why it's a tumor-suppressing gene that is mutated.

Once again, MLH1, MSH2, MSH6, PMS2, and EPCAM for endometrial cancer, and similar to what Angie was talking about earlier, these are all very highly associated with Lynch and endometrial. We're learning more about their affiliations with ovarian and figuring that out as well.

So, for BRCA1 and 2, for breast cancers, 50 to 65%. So if you are a woman with BRCA1 or 2, it's flip a coin basically at that point, 50% will go on to develop breast cancer, 50% won't. And sometimes there's no way to know which BRCAs do or don't. Pancreatic cancer, it does have a high prevalence with as well. Prostate cancer and ovarian cancer. So, BRCA1, about 40 to 50%. BRCA2, about 10 to 20%. Even the pancreatic cancer, 3%, 7%, you may say, "Hey, that's a pretty low percentage." Still much, much, much higher than the general population of the prevalence. So, the ovarian cancer risk in the general population is about 2%. Here it goes up about nearly 20,000% here.

So, when we talk about screening, so for breast cancer in females, so going back to BRCA1, 2, if any of these mutations, it's recommended to undergo clinical breast exams every 6 to 12 months starting at age 25, breast screening beginning at age 25 to 29, with breast MRIs at a young age. And the reason for this is dense breasts in young women. A lot of times mammographies may not be the best imaging modality for this population because a lot of the densities may hide findings or there may be findings that may look like something and women undergo biopsies or treatments or surgeries that they don't need. So MRI for that age. From 30 to 75, annual mammography and breast MRI with and without contrast, so a combination of the two.

And this is very important here, discuss option of risk-reducing mastectomy or RRM. So counseling should be include a discussion regarding degree of protection, reconstruction, risks, family history. So, discussing with your care provider, your genetic counselor, your breast surgeon, your breast oncologist, a family member's breast surgeon or breast oncologist, it's so important, if you do have any of these mutations, to talk about this.

And another great thing in what we're able to do, especially now with technology and surgery getting much better, is, a lot of patients with BRCA1, BRCA2, BRIP1, PALB2, when they get their breast cancer surgery, I'm able also to go in very quickly, either before or after the breast surgeon does their work, to remove both either the fallopian tubes and/or the ovaries and/or the uterus at that time as well for a complete risk reduction. So, a lot of times a woman only has to undergo one surgery. It's not recovering from this, then going through another surgery. So it's better for all parties.

When we talk about ovarian and fallopian tube cancers with the genes I mentioned before, in a young woman, it is very important to talk to a reproductive endocrinology and infertility doctor. The reason for this is, as you saw with BRCA, a lot of these may form at an earlier age. But also, when you're considering with BRCA1, the recommendation is risk-reducing BSO between the ages of 35 to 40. And with BRCA2, it does develop a bit later, so anywhere from ages 40 to 45 for that variant.

Now, what we always thought was, when we're removing the ovaries from 35 to 40, and that's preventing any of the cancer cells that may be in the ovary from developing or spreading 10-15 years down the line. What we're seeing now, it's actually the fallopian tube, and removing the fallopian tube from 35 to 40 is the main driver in this risk reduction. Also important to take out the ovary because we do think from that time, there is some spread, and there's no way to prove otherwise, of a STIC lesion from the fallopian tube to the ovary. So, risk reducing removal of both fallopian tubes and ovaries, which

is a salpingo-oophorectomy, is important. But we are learning more about these STIC lesions in the tubes.

So, what are the advances? And the reason I brought that up is very important. An opportunistic salpingectomy is very exciting as we're learning more about the fallopian tube. So, like I mentioned, a large majority of these ovarian cancers start in the fimbriated end of the fallopian tube. So, what an opportunistic salpingectomy is, is... I don't have a picture. I probably should have put a picture of this. But when I was showing the fallopian tube and the ovary, a common misconception is that the fallopian tube has any biologic benefit or advantage other than childbearing, which is true. Your ovaries are the main hormone producers in your body. Your ovaries produce progesterone and estrogen. Your fallopian tubes have no clinical benefit outside of childbearing. Same thing with your uterus and cervix. Your uterus and cervix, the only thing it is, therefore, is for childbearing. Your ovaries are the hormone producing, like I said. Your uterus, cervix, and fallopian tubes are only there for child.

So, once you are done childbearing, surgeries that are recommended to either take these out, reduce your risk, don't cause any adverse effects outside of the risk of the surgery, of course, but don't throw you into menopause, don't decrease your hormone levels, don't affect your bone health, heart health, or neurovascular health. So, that's why removing the fallopian tubes when a woman is done childbearing may be a great middle ground so we don't have to take out your ovaries. So you're still able to derive the hormone benefits of bone health, heart health, Alzheimer's prevention that comes with having your ovaries in. But we could also do a great job in reducing the risk of ovarian cancer with a very pretty straightforward and easy surgery.

So, what we do is... It's minimally invasive. So usually it's just one incision in the belly button, which is about 5 millimeters, and one incision on each side around the belly button, both about 5 millimeters. What we do is we cut along the fimbriated end towards the cornua of the uterus and remove the fallopian tube through the port. You're able to go home the same day. There's no real restrictions in terms of lifting, exercise, driving, anything like that. So, yeah, pretty straightforward and easy surgery for something that can reduce your risk of ovarian cancer greatly.

So, we did a recent study that was published in JAMA that we were really excited about looking at opportunistic salpingectomy. And the meta-analysis we performed across literature found that doing an opportunistic salpingectomy... And the reason we say opportunistic is, oftentimes, whether it's for... You may have heard for years about a tubal ligation or tying the tubes. This is great for... Well, it's good for prophylaxis and birth control. It's not the best because we still get ectopic pregnancies that get caught in where they tie off. But now the recommendation is to just remove the whole tube. A, it's a better form of contraception. And B, what we're finding now is taking the tube out. So at times of contraception, taking the whole tube out. At times of C-section, if this is your last week, this is your third child, you're done, at the time of C-section, very easy to just take both tubes out and save you an additional surgery.

Now, what about women who aren't getting GYN surgery? So women who are having their appendix, gallbladder taken out, or hernia repair, you name it, bowel surgery. These are times where we could also go in and remove those fallopian tubes, which adds, what we found, about 15 extra minutes to the surgery, no added blood loss, and greatly decreases that woman's chance of having ovarian cancer of less than 80%.

So, with widespread implementation, has the potential, if we are to do this on a widespread population event, to reduce the ovarian cancer mortality in the United States by about 15%. So, we talked about about 12,000 women will die from ovarian cancer each year. So this will save close to 3 or 4,000 lives per year by doing an opportunistic salpingectomy. So, that's one exciting thing.

The last thing I'll leave you with is, we talked about immunotherapies and newer targeted therapies. We're getting very, very, very good at getting specific targeted therapies for a specific type of cancer that may be individualized to patients. Now, for decades, 1950s, '70s, '80s, '90s, we've been treating ovarian cancers with the same chemotherapy, carboplatin and paclitaxel for years. We still do. It's still very effective. But we haven't really made many strides up until the last 20 years. It's been pretty exponential once we've been getting better at molecular sequencing and genetic typing. And I always tell patients it's almost like a lock and key or a puzzle piece. And before, we thought about ovarian cancer as they're all the same. They start in the ovary. If you have ovarian cancer, your ovarian is like her ovarian cancer, which is like her ovarian cancer. We're finding no, there's actually probably 10 or 15 types of specific molecular subtypes of this type of ovarian cancer or this type of ovarian cancer.

And what makes it different is... Because they start in the ovary, so they must be the same. What makes it different is the molecular subtypes and these antigens or these proteins on the cell surface. So you see this TF is one, tissue factor, which starts on the surface here. It's basically a signal or a lock and key or puzzle piece that's specific to that specific cancer cell that a lot of your normal cells don't have in the body. So, what we are able to do and make these smart bombs is make a drug that goes and connects to that exact type of protein or antigen on the cell surface.

And what this does is twofold. So, one, it spares a lot of the normal cells in the body. So, instead of attacking hair cells where you may lose your hair or your GI cells that cause a lot of nausea and vomiting or cellular shedding, it really spares those cells and really goes after the cells that are highly expressing the tissue factor, which a lot of times may be either ovarian cancer or endometrials.

And then the second thing is it's highly effective at getting to these cells and finding those areas of target. And once doing so... I call it smart bombs, basically. So, it undergoes phagocytosis, where it gets taken up into the cell once it binds with this antigen. And you see these little starters here, these orange things. These are called linkers. The MMAE linker is something that... It's a actual chemo drug molecule that prevents DNA strands from breaking up. So, what it does is, this smart bomb goes into the cell itself. So this goes into the cancer cell, does not go into normal cells, and then releases these linkers, the MMAE drugs, which then go and kill off the cell from the inside.

So, I tell patients kind of like Armageddon. You ever see an Armageddon where there's the big asteroid heading for Earth, and if they shoot it with bombs from the outside, it's not going to do much. So, yeah, if you flood your blood with carboplatin, a little bit's going to bounce off the cells, may get taken in a little bit. But if you're able to put the actual drug inside the cell, it's going to be that much more effective. So, I don't want to spoil a movie, but they drill down to the middle of the asteroid and blow it up from there and cue the great Aerosmith song at the end.

So, there are three very exciting drugs that are antibody drug conjugates, which are FDA approved, which we're giving to our patients now, and which we're seeing fantastic results. So, MIRV, mirvetuximab is one, or ELAHERE, which is one that's given in the platinum refractory setting for ovarian cancer. Tisotumab, which is given in the cervical cancer setting. And trastuzumab deruxtecan.

Now, some of you may recognize the term trastuzumab. That's what HERCEPTIN is. That's the generic name. What deruxtecan does is basically, similar, instead of identifying tissue factor like tisotumab, trastuzumab deruxtecan goes and targets the HER2 protein on the cell and then gets taken in and then unloads its different type of payload into the cell. So, the great news is, is we have very, very effective treatments for very specific type of cancers. Now, the flip side of that is, there are only certain percentages of patients that have a high expression of tissue factor or have a high expression of HER2.

So, yes, these are great drugs for some of the women with HER cancer. We need better ways at trying to find better drugs for different types of proteins, because tissue factor is just one of hundreds of different of proteins that are highly expressed by ovarian cancer, not highly expressed by normal cells.

So, everybody's talking about AI and all these large database and mathematics. I do think AI is going to be very, very effective at figuring out proteins and molecules that are on ovarian cancer cells that are not on normal cells in individuals with different types of ovarian cancer, and then isolating that type of protein and then saying, "Hey, we have a drug that they're using in India on different brain tumors that is a very similar protein to what this is expressing in ovarian cancer. Let's try to use this." And I think that's going to be the multimodal approach using AI and technology now that's almost nearly impossible for humans to do from our science research. But I think that's going to be really effective and really exciting for the future.

So, one word that I'd love to-

Melissa Rosen:

Dr. Kahn, we have to... We're getting very late.

Dr. Ryan Kahn:

I'm sorry. Yeah, previvor, which is [inaudible 01:00:08], really.

Melissa Rosen:

Oh, okay.

Dr. Ryan Kahn:

That's all, folks. This is it. Thank you so much. Here's my information. You could always reach out, find me online. It has our office number, my office email. Please feel free to reach out for anything. Thank you.

Melissa Rosen:

Amazing. Amazing. I am sorry that I had to even say that because... Oops, we want to get you back up here for a sec. Yeah, there we go. Thank you. So much information and so many questions. We're going to try and ask a couple, but we can't ask too many because we have the Embrace Breakout session. There were a few questions that came up again and again. If we don't get to them, maybe we can get you to write a blog about it or something like that. We'll be in touch.

Okay. So, several people asked, do taking aromatase inhibitors or tamoxifen or anything like that increase or lessen the risk of a gynecological cancer diagnosis?

Dr. Ryan Kahn:

So, yeah, definitely not increase. Tamoxifen and aromatase inhibitors like a letrozole or anastrozole are actually treatments for some of the ovarian cancer that we see, especially the low-grade subtype. So, definitely does not increase.

Now, I wouldn't say giving it decreases or it reduces your risk. I don't think we have enough data on that because we're not giving it as a risk-reducing agent. I think hypothetically you could probably factor that it's probably similar to how OCPs work and, therefore, likely do decrease your risk in a hypothetical setting. But yeah, I'd say definitely don't increase. Maybe decrease. That's unproven. There's no data to

show that. But from a hypothetical standpoint, maybe. But yeah, definitely, if you're taking it for a reason, continue to take it and don't worry about other cancers.

Melissa Rosen:

Thank you. Let's talk about hormone replacement therapy for a second. Does it increase the risk of gynecological cancers for those who are at average risk and for those who are at high risk?

Dr. Ryan Kahn:

Yeah. So, definitely no increase in GYN oncology cancers. Now, I can't say the same for breast. Breast, there have been several studies. Right now, it looks like for breast amongst the average and high-risk populations of BRCA1 and 2, that it is safe right now, from what we understand.

If you do have a history of any hormone-positive cancer, whether that's an ovarian cancer that's ER/PR positive, an endometrial cancer that's ER positive, or breast cancer that's ER/PR positive, hormone replacement is not recommended in those populations. However, yes, BRCA1 patients, average risk, any hormone replacement therapy does not increase your risk of ovarian cancer, uterine, or cervical cancer.

Now, there is one caveat on that. So, when hormone replacement therapy is given correctly. So, when hormone replacement therapy is given with just estrogen and your uterus is still present, that unopposed estrogen can increase your risk of endometrial cancer. However, usually if a woman has their uterus still, it's standard of care and routine practice to give the estrogen with progesterone to counteract that estrogen in the endometrial lining. So, when given both the estrogen and progesterone, there is no increased risk of uterine, ovarian, or cervical.

Now, this was one of the studies, and this is getting into the weeds a little bit. So, there was one study that looked at, okay, just giving estrogen without the progesterone, if you don't have a uterus per se, that just giving the estrogen without the progesterone doesn't increase your risk of breast cancer. However, when we add the progesterone, that's what's increasing the breast cancer. Right now, it's been offset. There's not been nothing to really prove that since. So, from what we understand, right now, giving both estrogen and progesterone does not increase your risks of cancers.

Melissa Rosen:

Thank you. Several people asked, how reliable is the CA-125 to test for either new or recurrent cancer?

Dr. Ryan Kahn:

Yeah. So, it's very good for recurrent cancer. So trying to catch a recurrence if your cancer initially had an elevated CA-125 level at the time of diagnosis. Now, once again, getting into the screening, so trying to catch cancer, it is not good for it, because up until the age of 35, every menstrual cycle, you're going to have a CA-125 surge. So, for premenopausal women getting CA-125s, oftentimes I see levels in 300, 400, 500, that's just for a benign endometriosis cyst. So that's why... And the large reason for that is, yeah, we may catch some things using CA-125. But more times than not, we're going to be doing more harm than good by taking the ovaries out of a premenopausal woman that may not have needed their ovaries out just because of an incidental finding of a somewhat elevated CA-125 and a small cyst. Yeah.

Hold on two seconds. I just have to plug in my charger real quick. [inaudible 01:05:32]. But continue, yeah.

Melissa Rosen:

Okay. So, two more questions. One is, can you talk about the relationship between fertility and infertility and cancer risk? Like, does taking something like CLOMID or other hormones increase risk for gynecologic cancers?

Dr. Ryan Kahn:

Great question. I would say no. There's been no data to show CLOMID, ospemifene citrate, anything... Yeah, especially too, because usually when taken for women, it's at such short durations and such infrequent intervals. It's not something you're taking for years. Usually when you do have these risk factors like smoking, for instance, not that I'm comparing the two, but usually it's a prolonged exposure that takes time to develop. Same thing with unopposed estrogen. It takes years to develop, months to year. So, if you are just doing clomiphene, there's no data to show that this increase your risk. So, definitely go ahead without any concern. Yeah.

Melissa Rosen:

Perfect. Last question. Several people asked it. What do you think about the new blood biopsy tests, multi-cancer blood biopsy tests?

Dr. Ryan Kahn:

Yeah. So circulating tumor DNA or ctDNA.

Melissa Rosen:

Yeah.

Dr. Ryan Kahn:

So, I do think this is going to be very helpful in the future. And we are starting to use it in practice. And when I say starting, I put the quotations because I do think it comes with a label and several things. So, I think it's effective for patients who have disease, who get ctDNA testing with known disease. What they're able to do and what's... Circulating tumor DNA takes the primary tumor. And what they do is they sequence it and get a full genomic profile on that exact piece of tumor. And what they then do is take, like, the 20 most frequently expressed genotypes in that entire piece and then will test that patient's blood looking for those exact 20 markers.

And over time... So, what we have right now for ovarian cancer, for instance, say I have a patient newly diagnosed with ovarian cancer. CA-125 starts out at 2,000. She has miliary disease across the bowel and stuff. I take everything out. I give her six cycles of chemo. There's no cancer at the end of any of that. Her CA-125 is now 10. Her imaging shows no cancer whatsoever.

So, now the recommendation surveillance and the gold standard is, for the first year, every three months or so, we get a CT scan and then we get a CA-125. This is after adjuvant chemo. And then eventually, we stretch it out. Every six months we get imaging, and then every year we get imaging. CAT scans, PET scans only really pick up tumors once they start getting to 1 centimeter or 2 centimeters. Then you start seeing it. But what about the cells that are spreading to develop that metastasis? So, what circulating tumor DNA is doing now is testing your blood to see if they could find these cancer cells earlier than just seeing it picked up on imaging or waiting for a tumor marker like CA-125 to go up. And the reason I put the label behind it is because right now, a lot of people are getting it. And in some instances, it's great because we do find things earlier. But there's no real... Because it is so, so early and it's almost like the wild west, we don't have good guidelines.

So, for instance, that patient I was telling you about, CA-125, 2,000, this is a hypothetical patient, no HIPAA, a hypothetical patient, she's disease-free two years, CA-125's normal, no evidence of disease on the CT. She feels great. There's a little bump in her circulating tumor DNA. What do I do with that information? Do I go in and take her for surgery? But there's no tumor in there. Do I give her chemo? Even though there's a little bump, but her CA-125 is normal. So, there's no real guidelines on what to do with an elevated thing.

My second thing... And I don't hold any stock in it or anything or in any of the other companies, so I'm not down talking or up talking it. One other thing is lead time bias, which is something in statistics where if you catch something earlier and start treating it, the survival is longer than something you caught later and treated for the same interval. So, my theory is also, say, for that exact same patient, that little bump in their circulating tumor DNA goes up, but their CA-125 is normal and there's nothing on imaging.

Now, three months later, we get another CT scan. Or six months later, we get a CT scan. Now they have a 2 centimeter lesion on the liver and a 2 centimeter lesion on the bowel. It's okay. I go and take it out, give them chemo and get another... No evidence of disease. They then respond to the chemo and go on and do great. Now, if I would've treated that two months before or two months after that, I still would have been able to remove all that disease with surgery and it still would have responded the same to chemo. So, how much of a difference is the circulating tumor DNA really making in that? I don't know. Once again, this is-

Melissa Rosen:

Time will tell. Time will come.

Dr. Ryan Kahn:

I don't know. Sorry, I spoke so long about that.

Melissa Rosen:

No. It's something every woman is interested in.

Dr. Ryan Kahn:

But moral of the story is definitely not for screening for cancer to see if you have cancer or not. Definitely not. For using it, if you have a tumor and something you want to use for surveillance over time to see if there's an increased risk of it coming back, yes, it has been shown to be beneficial. But what to do with that information, we don't know yet.

Melissa Rosen:

Okay. Thank you. I wish we had time for more questions. But I want to thank you, Dr. Kahn, for sharing your expertise and, clearly, your passion. I see in the chat box how many people learned so much. I know I found it educational.

Please, if you are staying for the Embrace Breakout, do not leave. We're about to start that. I want to thank Angie, too. Hearing from people who have been there makes such an impact, and you were so gracious to share your story. Thank you again tonight to Eisai and Genentech. You are, again, in the right place. If you're staying for Embrace, stay here. The rest of us are leaving.

As we conclude this evening, there's an evaluation link going into the chat box right now. It just went in, says SurveyMonkey. Please do that. It'll just take a couple of moments, and Bonnie will post it again after the Embrace Workshop.

Just remember that Sharsheret is here for you. Our social workers, our genetic counselors are here to answer questions, connect you with resources, provide support. And speaking of support, we have a new form of support. Next week, we start online support groups. We have two support groups, one for stage 0 to 3, and one for stage 4. I just put the link to register in the chat box. If you are interested, there are still some spots available.

Also, oh, I see somebody put the clinical staff email in there. We are totally encouraging you to call for any reason to get support.

Okay. The main program is over. If you are staying for the Embrace room, just stay right now. And everybody else, have a wonderful, wonderful night. Thank you, Dr. Kahn. Thank you, Angie.