**Breast Cancer Detection and Advancements**

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The cancer cell show hosted by Dr. Bill Evans and brought to you by the cancer assistance program help when you really need it.

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Well, welcome to the cancer assistance programs Podcast. I'm really looking forward to our conversation today because we're going to talk about advances in breast cancer. But just before I introduce our guests, just remind people if you've never attended one of our podcast before, just to let you know a little bit about the cancer Assistance Program, it's a program based here in Hamilton it supports patients are going to the health care facilities in our city particular to the Juravinski hospital and Cancer Center. And it makes available to cancer patients, equipment loans, free of charge, various nutritional supports, free rides, and even support if needed food services, as well as some other services like head coverings and, and mastectomy bras. So there's a variety of services I want people to be aware of who are listening to this podcast. Now if you're listening from some other location outside of Hamilton, maybe you could stimulate people in the cancer center there to develop a cancer assistance program like we're blessed to have here in Hamilton. Today, we're going to start what I hope will be a series of podcasts on advances in cancer, and particularly focusing on what we call the big four cancers breast cancer, lung cancer, colorectal cancer and prostate cancer. And today we're focusing on breasts and I'm just delighted to have as our guest, Sean Mukherjee, who's an associate professor at McMaster University, in in the Division of Medical Oncology at the Juravinski hospital and Cancer Center. And Sean has an interest not only in breast cancer, but in education. So he's going to be educating us but He, in his main job at the Juravinski does a lot of education with regard to the medical oncology trainees, and he's the program director there the at the cancer center. And Ashley is also the National Program Director and for medical oncology, you have a lot of weight on your shoulders. It's all these trainees. So yeah,

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I should just say, well, thank you very much. First of all, it's a real pleasure to be here today. And I look forward to doing the podcast. I did stepped down from my role as program director last year, but still very involved with education

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would be because he really enjoyed working with the residents. I know. Well, when I was actually caring for patients, and particularly breast cancer patients, I think things were a lot simpler. You know, patients may have had their cancer diagnosed on a mammogram or maybe they found a lump. They saw a surgeon, they had a biopsy, they might have had a total mastectomy. But during the years of my practice, gradually partial mastectomies came in with radiotherapy afterwards. And then adjuvant therapies, if people had positive lymph nodes, and the drugs we had available for metastatic disease we've had they're limited at that time regimens, we can't see an F three drug regimen or fac. But there weren't the range of drugs that are available to an oncologist today. So the purpose today is really to tell people how much therapies have changed and how much diagnosis is changed. And a good place to start to think is with mammography and how much things have evolved from filling demography to what we're doing today. So maybe just sketch in how things have changed there, Shawn, for our audience, absolutely,

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I'd be happy to do that. So for most women, they would undergo screening mammograms every two years between the ages of 50 and 74. And you're right in the past, they were actually on films that you could hold in your hand, and you could walk around and carry them from doctor to doctor to look at. But nowadays, everything is digital, so we can see the mammograms on a computer screen. We can go back and forth and compare the last mammogram to the new one. And and it's at our fingertips. We can pull up mammogram images from outside hospitals that were done in other imaging centers. So big advantage in having it digitalized.

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You can also adjust the density or the contrast that you see between tissue like fibrous tissue and maybe tumor tissue versus the fat in the breast and see contrast and sort of make it easier on the eyes to identify abnormalities.

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Yeah, there are definitely some advantages to having a digital. And as you mentioned, one of the key ones is that you can make the screen certain aspects of the screen darker and certain aspects lighter. Also, you can zoom in on various abnormalities such as microcalcifications that appeared that might be hard to see normally but when you zoom in, they're very obvious.

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And then there's some newer techniques or they're not I don't even know how to pronounce some of these Thanks. But we use MRI for one, right and then particularly in very dense breasts. Absolutely.

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So probably the one that that's gotten a lot of attention most recently is something called breast tomosynthesis.

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That was the word I couldn't print couldn't come up with.

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So you know, from the typical or the traditional two dimensional mammograms tomosynthesis is a machine that goes on a bit of an arc and is able to take pictures of the breast at various planes, and is able then to combine all of those images into what looks like a three dimensional representation of the breast. And you can see inside you can see where things are located. So as opposed to the two dimensional, traditional men, mom, mammograms, the three dimensional tomosynthesis is done in select situations where we really need to get more detail. So it's not done routinely. But certainly, in many cases, it's done to help us better visualize the tumor.

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And with this level of detail that you can see, are we at risk of finding things that would never affect the woman and that we ended up treating as breast cancer and then actually over diagnosing and over treating some women. Yeah,

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so I think the risk of either false positives or false negatives are always there. You know, and so that's why we often do have to go to additional tests, such as ultrasound, and biopsy, eventually, to make sure that we're really 100% sure that we know what we're dealing with. You know, depending on the radiologists interpretation and recommendations, sometimes they may request additional views, or the patient might have to come back to take some additional mammogram images or tomosynthesis. And sometimes they might even have to have an MRI.

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Right. So a diagnosis gets made. And one of the big changes has just been on the extent of surgery not only to the breast but also under the arm and the armpit where the lymph nodes are that many of the breast cancers drain into. So tell us about how that's changed the approach to the initial management of breast cancer? Absolutely,

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probably many, many years ago, I want to say 20 to 30 years ago, surgeons would remove all of the lymph nodes under the armpit on the side of where the breast cancer was located. But since then, we've come a long way. And now, the surgeon will inject a dye around the tumor and see where the which lymph node is being taken up, which is taking up the die, they will remove that lymph node and that's called the sentinel lymph node. And the procedure is called a sentinel lymph node biopsy. And for most patients who have breast cancer, we're able to only remove that lymph node and maybe one or two others in the area, as opposed to removing all of the level one and level two lymph nodes which could sometimes be up to 25 or 30 lymph nodes and certainly that the problem there is that there would be a higher risk of lymphedema where the whole arm could swell up. So nowadays, with these new techniques of removing only the most important lymph nodes, we're seeing much lower rates of lymphedema and other problems that arise.

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And that can be pretty disabling for women, particularly if it's on her, you know, she's right handed and it's a right sided surgery and it gets a very swollen arm and it can be painful and, and skin can break down have infections I've seen in the past many of those ladies, I'm glad that we moved away from that and that the risk of having lymphedema is very much lower today than it was back then. And the recurrence rate in the Zillow hasn't got any worse has it. So it's kind of a win win to go to less, less aggressive surgery. And it's one of those situations in medicine where actually more or less is more, right. Less is more. Absolutely,

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yeah, no, I think you've summarized it quite nicely that, you know, taking fewer parts of normal tissue out of the body is probably not a good thing to do. Right?

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Well, then we get into really sophisticated things because of a woman, pre menopausal woman. We want to know whether she's hormone receptor positive breast cancer or not. And also, we have to talk about her to new and triple negative is where breast cancer suddenly becomes much more complicated than ever used to be. But there are ways now using genomic testing to minimize again, the amount of treatment that's given to some ladies right. So I don't know where you want to start with that, but maybe you should discuss just discuss a little bit about with maybe the three main types of breast cancer Based on hormonal status, and then we'll go from into the genomic testing. Absolutely.

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So we're really right now talking more about early stage breast cancer, which would be stage 123. That's potentially curable. And, you know, after a mammogram ultrasound biopsy, surgery, then we have all the tissue to look at. And we look at the size of the tumor, how fast it's growing. We also look at estrogen receptors, progesterone receptors and her two receptors. And really that estrogen and progesterone receptors help us determine whether that breast cancer might be sensitive to some anti estrogen treatment, and whether or not it's using estrogen as a food to help it grow and sustain itself. So by looking at the estrogen receptors, we're able to really help select a tailored treatment plan, that that will include endocrine or hormonal therapy, and really we say hormonal therapy, but its anti hormonal therapy or anti estrogen type treatment. So there is another biomarker or test that we do called her to new. And that's a protein on breast cancer cells that about one in five women who we see with breast cancer will be her two new positive. And that's a really separate type of breast cancer, where there's various specialized treatments. And I'm sure we're going to get into that a little bit later. But those are the three important biomarkers that we do on every woman who's diagnosed with breast cancer, to help determine what is the best treatment for them? Is it anti estrogen treatment? Is it anti her to treatment? And is chemotherapy necessary? And to answer the last question, is chemotherapy going to be helpful? We do have evidence that for women who have estrogen receptor positive breast cancer, we can take some of the tumor and send it away. There's a test called Oncotype DX, there's another test called MammaPrint. And really, what these tests help us do is they help us determine whether or not chemotherapy could be beneficial in trying to help eradicate the tumor and, and really get rid of those tiny, tiny little cells that we can't see on regular testing. They could be hiding there. And that's why for some women, chemotherapy may be necessary. But certainly, you know, 10 to 20 years ago, we didn't have these technologies, are these genomic tests available to determine who really should be getting chemotherapy and who should not? So we would often have to estimate the risk of recurrence, and then based on that present the options of chemotherapy versus no chemotherapy. Nowadays, it's much better because we're able to quantify what the percent benefit might be with chemotherapy, and should they receive chemotherapy or not, it's helped make these conversations much, much easier, and I think relieves a lot of the patient's anxiety. And at the end of the day, where a lot fewer women are needing to have chemotherapy, in this early stage breast cancer setting,

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this is clearly an advance to be able to identify and classify women at high risk versus low or intermediate risk. And I gather those that are scored low and medium don't get the chemotherapy, they just get the hormonal therapy, when they're hormone receptor positive, right? And now there's a group of women, I don't know how large a group it is, but who are we called triple negative, so they don't have the Eastern receptor, you don't have the progesterone receptor and they don't have her to new receptor. How large is that population? And what do you do for those individuals because hormones clearly wouldn't work there. And some of the treatments we'll talk about for her to new won't work there. So

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absolutely. So triple negative breast cancer is when the estrogen progesterone and her two receptors, all three of them are negative, hence the term triple negative breast cancer. Those breast cancers make up about 10 to 15% of all breast cancers that we see. And we definitely know that they tend to be more aggressive than the other types of breast cancer, partly because we don't have any anti estrogen therapy that we can give them for five years or potentially longer to reduce their risk of cancer coming back. So with triple negative breast cancer, we often do treat these women with chemotherapy after surgery to reduce the risk of recurrence however we do look at all of the variables, including the size of the breast cancer, how fast it was growing under the microscope and the lymph nodes. But more, a lot of the women with triple negative breast cancer will receive chemotherapy to really decrease that rate, because we don't really have a lot of other options for them.

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For the hormone receptor positive, it used to be Tamoxifen was the drug you're used all the time, it seems to me, but even that's changed, right? And so we're into different drugs to interact with the estrogen receptor into, as you described, that take away the food that's fueling the breast cancer. Talk a little bit about the options and the duration of that therapy because it's gradually seem to creep out longer and longer as I read the literature.

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Yeah, so there are really traditionally we would talk about tamoxifen, which was the really the first pill that we had that reduced the risk of breast cancer and was really deemed a life saving drug and still is used quite a bit in women with who are pre menopausal who have not yet gone through menopause. But you're right that nowadays, there are drugs that have been around now for a while and that would include drugs like letrozole and Astra Rizal and XMS stain. Those are three aromatase inhibitors that really decrease the amount of estrogen that is produced in fat cells by an enzyme called aromatase. So the aromatase inhibitors, we found that they do reduce the risk of breast cancer recurrence. But they're really for the post women with postmenopausal breast cancer or that they have gone through menopause. So they're a candidate for those newer drugs. So that in terms of the duration of treatment, we're looking for most women at about five years of treatment with anti hormonal treatments. There is data from other trials that have come up in the last few years that in some women 10 years of anti hormonal treatment is a little bit better than five years. But we do have to weigh the side effect profile, the additional benefit for each individual woman, because a woman whose say had a lot of lymph nodes that have breast cancer in them would be at a higher risk of their cancer coming back. So that woman might be better off extending the hormonal treatment, whereas a woman who had a very tiny breast cancer that did not appear aggressive with no lymph nodes involved, we may favor more five years as opposed to 10. You

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mentioned side effects. And that's always a balance in oncology, isn't it the risks of side effects versus the benefits you get from and in general, we think of these hormone treatments is relatively benign, but there are side effects and, and I have some friends who have actually had a lot of side effects from them. So it isn't actually trivial. And maybe just describe some of the main things with aromatase inhibitors.

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Absolutely. So for tamoxifen, we would see hot flashes, sometimes mood changes. I know weight gain is often a very difficult problem that a lot of our patients deal with. And you know, there are some serious side effects to that can come from tamoxifen, which we mentioned, but very, very rare or low percentages. For the newer types of medications called the aromatase inhibitors. We do see side effects like hot flashes, although it's less so than tamoxifen. We do see vaginal dryness and irritation. But probably the most troubling symptoms are the joint discomfort that women can get with the aromatase inhibitors and probably longer term. If women are on these medications for years, we can see the bone density go down, and that might increase their risk of fracture. So certainly, that's something we discuss with all these women and who are on aromatase inhibitor treatment and we do a bone density every one or two years.

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And I think that now you've even added more things onto the aromatase inhibitors, right, and the CD, k four, six inhibitors. Can you talk about them? And is that sort of standard for certain women who are hormone receptor positive and you're concerned about?

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Yeah, so in the adjuvant setting or the curative setting. We are not using the CDK inhibitors. And very often there's some very recent data, that there might be very, very select patients who might benefit but the benefits are small, and there's a lot of monitoring and the side effects are quite can be quite problematic. So there's not been a A great deal of uptake of that in the adjuvant curative setting. And I think we do think more studies are warranted. With that we are using however women with stage four breast cancer we are using that would be the standard first line treatment would be a CDK, four, six inhibitor. And the most common ones that would be out there would be drugs like palbociclib or ribociclib. And there's some new ones called abemaciclib that we combine with either in a Romanian very well,

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you don't trip off my tongue.

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Yeah, so the, the we combine those medications with an aromatase inhibitor, or another type of medication that we inject called fulvestrant, which is another anti hormonal treatment. So you're right. There are lots of new treatments. And certainly, even five years ago, the standard has changed to today for women with stage four breast cancer is first line treatment with estrogen receptor positive breast cancer, I shouldn't

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Okay, so now we can we sort of done that group. And then there's the group that are her two new positive, there's a whole set of treatments for that that are different, right?

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Yes, absolutely. So in the early stage setting, we always had a since 2005, we had a medication called trastuzumab or Herceptin that a lot of people know it by. Since then, there have been other drugs that have come along including Pertuzumab including trustee's Mab and Tenzin are a CAD sila and, and now we even have other anti her two treatments like neratinib and to catnip and trastuzumab direct to direct T can. So, so we linguist oncologist, just so yes, you're absolutely right, that it's the number of treatments now has really exploded in in her two positive breast cancer. And

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how do you make decisions for them? That's that's one of the things that with this sort of tsunami of different drugs, I really question how oncologists go about deciding which drug for which woman?

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Yeah, and, you know, it's not always an easy decision. And we really look at the whole picture. So we look at, you know, what is important to that woman? Where, where is it their disease is it you know, in what parts of the body, you know, is anti hormonal treatment with a medication like a CDK inhibitor. Usually, that's first line treatment standard. For most women with estrogen receptor positive breast cancer. For triple negative breast cancer, chemotherapy is typically the first choice we would go with. For her to new positive breast cancer, the standard treatment would be a combination of three drugs called Pertuzumab trastuzumab and a type of chemotherapy called a taxane. So there are, you know, very common regimens that we use, but we always take into account a patient's own preferences, for example, some women say that they really are concerned about hair loss. And so there are some treatments that we can sometimes use that avoid hair loss, at least initially. Or, you know, depending on the situation, we do factor in symptoms, side effect profile, and what's really important to the woman in front of us. So

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it's very much a personalized approach is what I'm hearing and when that takes account, the characteristics of the tumor, but also what the person values in their life and the quality of life they're going to have on that treatment. That

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is absolutely correct. I think the old days where a physician would walk into the room and say you must take this drug are kind of gone nowadays, we really have something that we call shared decision making, where we have recommendations based on our expertise and the guidelines that exist out there. But we also take into account what is important to the patient and what are their preferences, we look at their social situation. One really good example is I have a young patient with breast cancer, whose son was doing remote learning. And he was very young and, and she wanted to do everything she could to be at home with him and not have to have multiple appointments back and forth to the cancer center for chemotherapy, which would also result in hair loss. So we were able to find a treatment that did not cause hair loss. It was a pill, and we actually did a lot of the management remotely. So I would call her and check in with her. And I'd say I'd love to get your blood work online. I'm going to call in a prescription. Your chemotherapy will be ready for pickup they can the pharmacy will often deliver it to the patient's home. So really Aside from bloodwork, she didn't have to leave her son who was at home with her, and that was really important for her for her quality of life.

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Excellent. We're gonna take a short pause here for a little message from the cancer Assistance Program and we'll be right back with Dr. Mukherjee talking about advances in breast cancer.

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We'd like to take a moment to thank our generous supporters, the Hutton Family Fund and Banco media who make the cancer assist show possible. The Coronavirus has not stopped cancer. Instead, it is added to the isolation and challenges already faced by cancer patients and their families. From transportation and equipment loans to personal care and comfort items, parking and practical education. The cancer assist program remains committed to providing free essential support to cancer patients in our community. With no sustainable government funding, we need your help so we can continue being there for those who depend on cap to stay safely at home. individual and corporate support the signature events, third party fundraising efforts and financial gifts are greatly needed. Your support is vital. We can get through this together. Visit cancer assist.ca to see how you can make a difference in the lives of cancer patients and their families.

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We're back with Dr. Mukherjee talking about advances in breast cancer and hearing just how personalized therapies have become because of the therapeutic options that have become available and the genomic profiling that can be done on cancers that wasn't possible even a decade ago. And one of the things that many women heard about, of course, is genetic predisposition to breast cancer and awareness of braca one or b a BRCA one and two as genes that are hereditary and can be passed from mum to daughter or elsewhere to other members of the family and, and helps to identify people at risk, or they've been screened at an earlier time. And tell me how that's been benefiting patients to be able to do that kind of genetic testing? And to what extent can it prevent breast cancer?

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Absolutely. So there are some women who would qualify or who wouldn't be excellent candidates for it will be called genetic testing. And it's really looking for any sort of genetic underlying abnormality that would predispose a woman to having breast cancer in their lifetime. And potentially, depending on the abnormality could even increase the risk of other cancers such as ovarian cancer. Often these would be women who, when you ask them about their family history of breast cancer, they're able to identify at least one or two other women or family members who have had cancer, and often their breast cancer or ovarian cancer. So that the the number of indications or at least the list of the different situations where we're able to have the Ministry of Health reimbursed, the genetic testing has increased dramatically. And the number of genes that we actually test for, in the old days, we used to test for only braca one and braca. Two, but now there's at least 18 different genes that are tested in this multi gene assay. So really, we've come a long way. And in terms of what questions we ask women, or at least who is a candidate for genetic testing. Now even women who have triple negative breast cancer early stage who are less than 60, would qualify for genetic testing. Whereas in the past, that wasn't one of our routine indications. And really, if you have three or more people in your family, including yourself, that would also qualify you for genetic testing. And any any history of ovarian cancer in the family, in addition to breast cancer would qualify any male with breast cancer. So there are some indications and the number of tests has has increased greatly. So I do think that a lot of women who are diagnosed with breast cancer are worried about either their children or their other family members, including sisters or even brothers who could develop cancer or would have a higher risk of developing cancer in their lifetime. And, and I think it is helpful to know these sorts of things. Whether or not there might be something in their genetic background that could have predispose them because they might make decisions down the road that could reduce that risk if they ended up having a genetic abnormality. So it is a stressful conversation. Yes,

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I can imagine, but what are those decisions we have to make? So

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For example, if a woman is diagnosed with either braca one or bracket two, a conversation would be had with a genetics, medical oncologist or a genetics counselor team. And they would talk about whether or not either increased screening with breast MRI should be performed or even whether or not a bilateral mastectomy with sometimes breast reconstruction should be considered. And even sometimes, the ovaries could be removed as well. There may be additional screening depending on the exact genetic abnormality. But those would be the two most common interventions that would be considered.

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It really is interesting to hear about all the other genes that are now being identified because we we've been aware there's families that are cancer prone families, but for a long time, all we knew about was the bracket one, bracket two. And I in my reading before this, I saw a long list of these different genes that can be identified that place women at a greater risk, and interesting that that's now available in Ontario for that kind of testing if you're in a cancer prone family. So I can only imagine that the knowledge of that is weighs heavily on individuals and even whether you want to have that knowledge because of you know, the implications. It's kind of like the sort of Damocles hanging over your head or maybe it's not that you don't know until you have the test. Right. So it's very challenging, but at least the knowledge base of these genetic previous predisposing genes, I should say, has increased and allows for intelligent conversation to take place. You know, in other areas of oncology, we've seen a huge explosion in the use of immunotherapy. You know, in lung cancer, it's been transformative melanoma, it's been transformative bladder cancer, quite a few others. But it hasn't been the same. And in breast cancer, I, I'm not sure we understand why I've read that maybe the mutational burden and breast cancer is less so there's fewer abnormal proteins for the immune system to attack. But is there a role for immunotherapy? And what's the state of research and in breast cancer with immunotherapy? So

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there were some studies looking at women specifically with triple negative breast cancer, that combined immunotherapy with a type of chemotherapy called a taxane. And initially those studies looked promising. And we did think that it's that that might be something that we could use one day. But in the end, the studies, the quality of the studies, and the study results weren't overly impressive. And so it's not something that we currently have as a funded option for our patients and not something we routinely recommend, outside of, say, a clinical trial. But it's certainly and patients are free to discuss that with their oncologist. But you're absolutely correct that certainly for early stage, Breast Cancer Immunotherapy is not really a one of our treatment options that would we'd have on the table. And even for women with stage four breast cancer, it's not something that's commonly used. But there are studies that have certainly looked at those questions, and there will continue to be more studies. But I think the reasons why breast cancer and immunotherapy haven't really, you know, joined hands to speak, so to speak, I think could be related to the tumor mutational burden. But, you know, I still think we we are, are fortunate that we have a lot of different options and different pathways that we can target. And I suspect that we'll continue to find other pathways that that will help women with breast cancer, but immunotherapy probably won't be one of them, at least, won't be a very common treatment. It

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strikes me that there's really been an explosion of drugs and understanding of pathways within breast cancer cells and sort of wonder how do you keep up with this and translate it into the clinic?

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Well, it definitely, you know, is it is a joint effort. We have a group of breast medical oncologists at the Germans Cancer Center, there are eight of us. And, you know, we all keep up in slightly different ways. But at the end of the day, we do attend meetings. We even meet ourselves every week and we discuss, you know, difficult situations where there are several different options to choose for a patient and we're not sure exactly, which would be the best so we bring it as a group where we have surgeons, medical oncologist radiation on Colleges, pathologists, radiologists, nurses, social workers, we all come together as a group. And we, we present our cases. And we talk about some of the tests that have been done the pathology, what the imaging looks like. And we make decisions together. And certainly the group will have a consensus opinion. And we learn at those rounds as well. Those are weekly rounds. And certainly if there's a new study or a new topic, a new drug that's come about, those are things that we would discuss it those rounds. And we also attend international meetings, either in the United States or in Europe. Most of us attend those meetings quite regularly to keep up.

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There's a big breast cancer conference yearly in San Antonio.

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Absolutely, yes. I think a lot of it's virtual now. But certainly there's that there's journals every two weeks, or every week, there are new journals that come out, there are meetings. So lots to keep up on. But I think we do a good job of keeping each other informed as well.

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Well, I think what you were describing, which we call multidisciplinary case conferences is really important for patients to be aware of, that's not just Dr. Mukherjee decides he's going to treat you this way necessarily. It may be fairly standard and Doctor Dr. Mukherjee knows quite well what did the right thing is to do. But in difficult cases, you're really pooling the collective knowledge and experience of the breast cancer medical oncologist to surgeons, radiation oncologist at the German scanner. And I think that's a big change from the way medicine was practice even, you know, 30, a couple of decades ago, where a lot of it was kind of individual physician's opinion, which may be very good, but may also become dated and updated. And so that, that dynamic of having a lot of physicians together who have a lot of focus on breast cancer, but may have picked up something new from a meeting something new from a journal that they can share in those meeting, I think it's incredibly helpful to ensure that patients get the best care. And it's very reassuring when patients know that it's going on behind the scene as well. Yeah,

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absolutely. I also just wanted to mention that in Hamilton, because we're a teaching hospital, we and a research facility as well, we have a very large clinical trials department and I

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was going to ask you about that. That was the next question.

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Yeah, so we do have clinical trials at the Juravinski Cancer Center. And certainly, if there's a new medication or a new treatment method that's being investigated, we do participate in many of those studies. And that's another way that we learn about new medications that are on the horizon that are not yet part of routine clinical practice, but are being studied and evaluated.

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So what's your crystal ball show you about the future? You're involved in research studies? Where Where do you think things are going to improve? And you know, a lot of the emphasis has been on drugs and, and also personalizing therapy based on genetic profiles? Is it going to be more of the same? Or do you see something, some new avenue of research opening up? What's the future look like? You think? So.

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When I started practice, almost 15 years ago, I the number of options for treatment. And the way we treated breast cancer was very, very different. And I do feel like that in the last decade or more, we've come such a long way. And practice continues to change and evolve and the number of treatment options. It's a very exciting field, the number of options continues to increase almost every year or two. And so I do think it's very exciting. And it's hard to really know which way things are going to go. But certainly, I think the goals are to reduce the risk of cancer coming back with with newer treatment modalities, using new imaging techniques to find out which cancers are more likely to come back. Sorry, using genomic testing more frequently. And I do think that there might be a, I'm hopeful that down the road in my crystal ball I'm envisioning. Someone will walk into their family doctor's office and have a blood test and that we'll be able to screen for whether or not there's a any cancer cells that could be lurking, or any cancer DNA that we can find. And maybe that might lead to a test and an earlier diagnosis at a very early stage and an early intervention. So that's my hope and my vision. You know, I'm not sure when that will happen, but that certainly my vision

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may not be that far off, given the fact that we can detect a circulating tumor cells and quite readily. Now I can't let you go without asking about the impact of the pandemic on breast cancer diagnosis and screening and on treatment.

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Yes, I think That's an excellent point. And it's certainly been a challenge the pandemic. You know, I think that the number of women who have had screening mammograms did go down. And so we are a little bit worried that women who have delayed mammograms could potentially, you know, be at a higher stage of cancer than they would have been otherwise. But I think now, things are more or less functioning at at the pace that they should be in terms of screening coming, getting back up and running. And so I'm hopeful that women will certainly be mindful of that and make sure that they go in and have their screening mammograms and everyone that at the hospitals, we're all wearing masks and taking precautions. And so I do think that I strongly encourage everyone to make sure that they keep up with their screening, because that really, you know, finding things at an earlier stage is so important. But I also wanted to just briefly mention that prevention is really the best cure. And so eating a healthy diet and exercising and reducing stress, you know, we can't put enough emphasis on those factors, because that's really, you know, even before anything happens, you know, that's what you can do to sort of reduce your risk of developing any cancer in the first place.

41:25

That's probably a good point to end on, to leave that message about really healthy living and being conscious, and even not smoking because even smoking has been associated with some increased risk of breast cancer. So I had to get that plug in is an ex lung oncologist. This has been a fascinating conversation and really has underscored the advances that have taken place in breast cancer across the spectrum from, from early detection through the management of disease at various stages, and particularly, all the new drugs and in the shaping of therapy based on genomic profile. So it's a fascinating field, and I think it's been very enlightening. For our listeners, I just want to thank you very much for coming in and sharing all of your knowledge about breast cancer. Thanks very much.

42:11

Thank you very much for inviting me.

42:13

This has been the cancers this show, brought to you by the cancer Assistance Program.