**Prostate Cancer: What Have We Learned?**

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And the cancer assist 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. We're recording this in in November, which is Movember and mustache time for people who are really concerned about prostate cancer, which is just about every man. We're going to talk about prostate cancer and advances in the management of prostate cancer with Dr. Sebastian hot too. So associate professor in the department of oncology at McMaster University, and also the committee chair for the general urinary committee of the Canadian cancer tumor group. So he's the right person to talk to you about prostate, prostate cancer. So welcome to the program.

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Thank you very much, Bill. It's great to see again.

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So prostate cancer is pretty common. It's the most common cancer among Canadian men and a third leading cause of death and translate that into numbers like gathers around 23,000 new cases of prostate cancer identified in Canada and 2020 and translate to about 4300 deaths. So a really pretty important cancer that concerns a lot of men and the statistic is one in nine will get prostate cancer in their lifespan. So I guess most men are concerned about it. And maybe we start with just talking about what symptoms should men look for in prostate cancer and how does it usually get diagnosed?

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Right. So you know, prostate cancer is extremely common as you mentioned, even there's there's been some series of older series where men who've died who consented to autopsies actually, if you look at the prostates of most men who've died of other causes, they will have some amount of prostate cancer within within the prostate Thankfully, though, many are most men will not have an aggressive form of prostate cancer. As a medical oncologist, I unfortunately see, the men who tend to have the more aggressive ones are the ones that have developed it and come back and and progress to metastases, so that spread outside of where it started. There are a number of ways that men can be alerted to that there may be something wrong with their prostate. Certainly, there's the whole controversy still around PSA testing. So pa PSA is stands for prostate specific antigen, it is a blood test. Right now, most of the guidelines do not recommend that men without any specific risk factors, and that is men with family history or man of African American descent, not not get tested on a regular basis. However, I think there's going to be some changes of that over the next few years. And the reason for that is because most prostate cancers are not lethal and by that I mean are not likely to result in someone passing away from their disease then there is the concern of overdiagnosis and overtreatment, so not all men with a diagnosis of prostate cancer should have their prostate cancer treated because sometimes the treatment is worse than the disease. However, men certainly need to be aware of it and conscious of it so they need to talk to their family doctor about PSA testing and whether that is something that should be considered despite the guidelines not recommending it for everyone. They should also talk to their family doctor about a digital rectal exam, which is a you know the whole finger exam that people like to make fun of and and be uncomfortable with and that that will show if there's an enlarged or hard prostate in terms of the symptoms. Most of the early symptoms are urinary so if you're having more difficulty with your urine sort of lesser stream the stop and go some dribbling. Now a lot of that is often seen with common benign changes of the prostate so prostate gets enlarged as we get older, so it could be all what we call BPH or benign prostatic hypertrophy. So an enlarged prostate and then the family doctor and potentially a referral to urologist can determine what's watching. Sometimes pain in the in the rectal area can can be a concern and the major symptom that would suggest that the cancer has spread beyond the prostate and has gone to other organs and for prostate cancer. It's specifically the the bone woman's prostate cancer loves to go to the bones and he would be painting the bones that no we all have aches and pains that come and go but something that that is staying that is not going away. And X rays would usually show a change that's that's concerning for for cancer having spread to the bones. And then further diagnosis needs to further testing needs to happen. So

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the PSA is not a proven screening test and so controversial, he suggested maybe it's going to change what would change the recommendation to have screening or PSA screening for men?

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Well, I know that there are some efforts underway to revamp and and review the guidelines. So guidelines are really that's what they are, they are guidelines, and they're not hard and fast rules. And with newer evidence, newer information, sometimes the recommendations change. So I know that's being reviewed right now. And then we'll hopefully in the next year or two, probably hopefully in the next year, we're going to have some revised guidelines, what may change is that, right? Now, guidelines are a one size fits all, and we know that people patients are not a one size fit all. And a blanket statement may not be appropriate. So that there are some, you know, populations that are some men that may be at higher risk of of having the more aggressive the more lethal prostate cancer, and it that often is the younger men. And yes, we're going to diagnose less of those men, because it's less common, but those that we do diagnose are likely the ones that have more aggressive cancers that they're likely to, to lead to, to some, you know, to aggressive advanced disease and a lethal disease. So to diagnose these men earlier, would be helpful. So I think there's probably going to be some changes there as to who still who has, for whom it's recommended to do the PSA testing and for whom it still is not recommended to do without any symptoms or or or to do routinely,

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it's certainly been a debate that's been going on for a lot of years, isn't it, but whether to whether to screen or not to screen, whether the government should fund it or not, etc. It certainly led to a lot of pickup of quotes prostate cancer south of the border, where screening has been very common, the whether it's led to a lot of overtreatment, and perhaps more morbidity for a lot of men, because treatment is not without its consequences, right? We're gonna we're gonna get into that in some detail in a moment. So it is a challenge, I guess, to differentiate when you have just the benign enlargement of the prostate versus a malignancy that's causing some of these urinary symptoms. And so how does that get sorted out? What what are the tests that the neurologists would use to make the diagnosis? Well,

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there's, there's a number of things that that can be done. And again, I think it's important to state that I'm not a urologist, thankfully. And so, these are not the men that I see routinely. But what ends up happening most of the time is they will again have that digital rectal exam as I mentioned, they will have often serial PSA tests to try to determine they may have an ultrasound a specific ultrasound that is that looks at the way the prostate is composed. So is it all kind of baggy soft prosthetic tissues, or is there a hard mass that is being seen, and more and more men can also undergo a an MRI, so a very specific very sensitive imaging test of the prostate to see if there's those small nodules at that point. The PSA tests can also be divided into different types of PSA. And that can give the urologist a bit of an idea whether it's more likely to be the BPH or it's, you know, there's a possibility of prostate cancer. You know, you did mention that that possibility of overdiagnosis and overtreatment, and that is a very real thing. I think one of the main advances and actually that's been driven by by Canadian investigators and and Canadian groups in large part is the concept of surveillance or active surveillance that we call so you know, with with proper education and discussion, men that are thought to have a very small amount of cancer or a slow growing cancer so some of those men were you actually see that um, no matter um normality, there's a conversation with the urologist as to whether or not there should be a biopsy. So, you know, with a needle, get some pieces of the tissue examined and on the microscope. And if you do see prostate cancer, then you give it a grade. And the most common kind of grading is called a Gleason grade. There's, there's also there's newer ones that are coming out. But what most men are going to hurt hear about or read about is the Gleason grade. And if you have a very low Gleason grade, then it's very unlikely that this cancer is going to become a clinically important cancer. And if their PSA is not going up very quickly, then active surveillance is probably the way to go. And that's something that has been very well studied. You know, volunteer men across the country have been really good at participating in those studies and have shown that we are not doing a detriment. So we're not causing excess deaths by not doing aggressive therapy, and we are sort of withholding or making it to that, no, we're, we're not doing too many tests and harm. We're not causing harm with those with those tests. Interesting. The

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terminology active surveillance, I guess, in some places used to be called watchful waiting or, and I think a lot of men were kind of nervous about this waiting concept. But if there's active monitoring, or active surveillance, it sounds like people are keeping on top of this. And if something's going bad, they're going to manage me appropriately. Right. So it's less less, perhaps worry when you use the right words. Exactly.

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And it's really, I think, it's I think it's, it has to be clear that it's not a rinky dink approach, there is a set, you know, and the patient has to play their role in that they have to show up for the appointments, they have to to get those tests done, they also have to be proactive at at letting the specialists know that there are some changes so that if the these can be caught, and if if both the physician and the patient do their role through that very structured approach, then it's it's something that can be very effective at controlling the cancer, keeping an eye on the cancer and avoiding excess harm. Now, you

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mentioned the Gleason Gleason score, and I was always a bit confused about how they did that. But as my understanding that, you know, you do multiple biopsies, and because the cancer may not have the same level of malignant change in all the cells that can be well differentiated look a lot like the normal cells, and they can be at the other end of the spectrum and look very, we say the word anaplastic, so they look look scary under the microscope. And so they're rated from one to five, training, low grade is a one very well differentiated b one and very scary solid B A number five, and then you you add those together, and times two, and you get a number. And I guess if it's six or less than that's considered sort of relatively low risk, but over that seven and above is the kind of more aggressive disease where you're going to have a different therapeutic approach. So this, a lot of men will have heard of the Gleason score around, particularly if they've had a diagnosis of prostate cancer. And those numbers are, are important to them, and probably well understood. So it's a combination of the size of the tumor, the Gleason score and the age of the person that's going to determine largely how aggressive the management will be.

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Yeah, and the size of the tumor in large part means that you, you do mention that there is a number of biopsies that are being done through the prostate. And those biopsies, those are done geographically throughout the prostate, so in most areas of the prostate, so then you get a sense of where that cancer is, is it the whole prostate is on one side is it just a small part of it, and then depending on on that amount, and also, with with the MRI and other testing, depending on whether it looks like it's, it's going outside of that prostate, prostate is a little bit like a wall nut. So if it looks like it's going outside of the wall of that wall, not then different treatments would would be recommended because of just the, the, the amount of cancer that there is obviously, the more the higher the Gleason score. So like you mentioned sort of seven or higher, then the more likely it is that that cancer will want to just continue to grow and divide and go elsewhere. So it often requires more aggressive therapy, and obviously somebody who You know, is 92 years old with other issues will likely be treated differently than somebody who's 56 years old. And you know, a lot of things need to be taken into consideration what obviously most important what the patient wants there not every man is willing to have surgery or radical radiation or receive hormone therapy? What is most likely to control the cancer? And then what are the comorbidities? So what are the, the the different other medical problems that the patient has, that may make some treatments less of a possibility than others? Now, I

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know you're not a urologist, but I have to ask you a question about the biopsies because these biopsies I gather ultrasound directed, but they're trans rectal, or they say transparent, Neil, and maybe 10 of them. And I just wonder what the experience is like for a patient? How, how uncomfortable is this? Yeah,

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it's actually it's up to 12 a lot of the time. And, you know, once you've once you've had 10, sort of what's another to the, the approach is starting to switch as well, from transrectal to sort of transparent Niall or, or sort of cleaner ways, I always say that the risk of transrectal is the risk of infection. It is uncomfortable, but they they have very good ways of freezing the area. And so it's a little bit like having a tooth pulled except you're having that tooth pulled in, in your rectal area, and you will be sore usually for a day or two. Depending on the approach, there may be a need for antibiotics for a few days as well to to prevent that. That infection. Bleeding is usually not a big problem like because of the the way that they do the biopsies, but there's always a risk of some a bit of bleeding and bruising.

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Well, I'm getting older, so I had to ask just in case. Alright, so most prostate cancers are going to present as a localized malignancy and, and so it gets down to localized therapies to start and we'll get to the treatments for metastatic disease, or even the high grade localized disease in a minute, but the men are presented with, I guess, at least two options sort of the surgical approach, take the prostate out, or radiotherapy approach, which might be with either sternal beam or with actually the implantation of radioactive sources. So there are some other different approaches which are questionable, but we can touch on just to dismiss them perhaps, but those are the two. It's always struck me that if you go to see a radiation oncologist who get radiotherapy, we go to see a urologist to get surgery. But there are pros and cons of both approaches. And I think men should be fully aware of it. And I almost hope that every man who has a prostate cancer, had a consultation with both specialists at the same time and heard both stories of risk and benefit. So they could make a good judgment about what to do. Is that reasonable?

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Yeah, no, I think it is quite reasonable. And there actually are some, some centers that are trying to move towards that a lot. I know the Niagara group as has moved quite quite well, with with that in having a urologist and radiation oncologist at the same time, at least in the especially in the more aggressive types of of, of, of, or the more controversial aspect there are some situations where it's very clear that surgery makes the most sense or it's very clear that radiation makes the most sense. So with radiation, if you have one of those Gleason six, let's say disease and it's involving a fairly minor portion of the prostate, then to to go through a prostatectomy may not be in your best interest and, and having more localized therapy and then the gold seed implants where we call Brockie therapy, which is radiation from the inside because those gold seeds are radioactive and they basically are able to kill the cancer from the inside as opposed to the external beam radiation, which is those usual machines that you lay on you lay flat on and and you get that X ray beam that that kills the cancer cells. So those are usually less controversial, but there are some especially the cancer, there's more aggressive or a little bit larger. When there is there needs to be pros and cons of both both types of therapies and there are some times where you need to have both the the radiation the keep the surgery, and because of the way that the cancer has spread have the radiation either immediately after or at the time that the PSA starts to rise when we are, we know then for sure that there's still some cancer cells that are left because that's one of the things that that can that we know for certain if you have surgery, if your whole prostate is removed, then the only thing that can produce PSA is prostate cells, whether they're cancer cells or normal prostate sells. PSA is the only thing that a prostate cells are the only thing that can produce PSA. So any measurable PSA after your prostate has been removed is from cancer and radiation that may still be some viable normal prostate cells left so to have a completely undetectable PSA may still be normal without and so that makes it sometimes a little bit more complicated. In terms of the various approaches. I think it's important to talk to not only two necessarily both a urologist and a medical oncologist but sometimes different neurologists because there's different approaches of of surgery that are that may or may not be possible depending on the type of the aggressiveness of your cancer, the location, the amount of it, so can you do what we call nerve sparing prostatectomy? So can you save the nerve that is responsible for having erections? Will you have the extent of the the the prostatectomy? How likely is it to result in incontinence? So having some some accidents of urine and and what methods are you going to have a we called an open prostatectomy? So it's just a normal incision? Would it be laparoscopic with the cameras or even now robotic? So can you know is there any advantage of having robotic prostatectomy? Or is it just a fancy tool? And there may be some situations? Yes, yes, its advantages often is just not really going to change outcomes or, or it may become more just a fancy tool so that to speak to a few people is I think always important, especially if there's the time to do that. Obviously, if there's a very fast growing aggressive cancers and things have to happen right away, then that's, that's some, you may not have that opportunity. But if there's the ability to do that, I think it's important to to keep your options open.

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Now we do have access to robotic surgery in Hamilton and to Vinci robots, and I've heard the neurologist talk about it and I think in the Bahamas, sort of a precision of dissection and less blood loss. But the trials that had been done suggested it probably isn't any different than a radical prostatectomy done in the hands of a good and experienced

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neurologist. And yeah, and that's always the difficulty with some of these trials is that often the people that the centers that have the robot, or that do those serve that those those those those studies are experts at both. So you know, they may have better outcomes independent of that. And I think you you're you're quite correct, that a lot of the trials now are showing that it may not be very different, at least from from a from a sort of the general population point of view, there may be some some specific populations where it makes more sense to do one versus the other. And I think having a chat is is important, but you know, if your center does not have robotic, does not have the DaVinci Robot or if it is recommended to not proceed with it does not mean that it's going to be inferior surgery, I think that's important to note that they're there you can have really good prostate surgery without using the robot and the outcomes. And the probably the complication are no different in most situations.

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So really important to have those conversations and as I said at the beginning, I really ideally would like to see patients sit down with with radiation oncologists and surgeon and maybe in what you were just saying is surgeons with different skills perhaps hard to manage in a in a complex healthcare system, but it's certainly the ideal and I guess it's a message to people listening that, you know, look for information and try and understand the pros and cons of the different approaches. Don't just go with the first then you hear from the first consultant you refer to. Now, I think with the really the earlier disease with a low grade Gleason score, then the local therapy may be all you might get, right. But if you have either a rising PSA, or you were more higher risk because of the Gleason score, then that's when we get into the whole business of additional therapies, hormones and maybe radiotherapy dimension nodes and surrounding area. But let's get to the area that you're really expert in. And that's the, the hormones and other drugs. So androgen deprivation therapy is kind of a key part of the management of prostate cancer. And just for listeners, androgens basically refer to the male hormones, testosterone being the main one, but there are other male hormones as well that are under that umbrella term of androgens. And we're trying to lower them because the prostate cancer really grows on those hormones. Right? So getting rid of them. So how do we get rid of them? I guess there's surgery again, but there's mostly medical approaches correct.

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And, and, and you're quite correct that prostate cancer is very, if not fully dependent on male hormones to grow, at least that at the beginning. And that's because at the surface of the prostate cancer cells are receptors and receptors are basically antennas and androgens that testosterone and others are the signals that attach to that that antenna sends the signal of growth down down the chain within the cell to the brain of the cell, which is the nucleus and then gives that, you know, that message of growth and division, you know, sort of one cell becomes two becomes four, that's how our cells kind of regenerate themselves normally, but cancer cells kind of stop having the message that you can't do that, willy nilly, you just do it all the time. And that's what cancer cells do, they don't die when they're supposed to, and they grow when they're not supposed to. And that grow when they're not supposed to is in large part because of that signal of the male hormones. So we need to remove that. And the main, the main producer, the main factory of testosterone is the testicles. And they have a signal from the brain to the you know, to a gland called the pituitary gland, to the testicle through various chemicals to create testosterone, and there are injections that are given either monthly three, monthly four, monthly six, even once a year, that will stop that messaging from from happening and the testicles lack of a better word sort of fall asleep and stop making mail and they stopped making testosterone and then that feeder that that goes on to the antenna is no longer there. And the many of those cancer cells are not able to, to survive because they don't have that growth signal. And then the PSA usually goes down and they the the amount of prostate cancer cells that we have goes down.

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Right and, and that can last for quite a long period of time, but not indefinitely, I guess that there's ways that the tumors can continue to grow. Because that shutting down of the signal to the antenna, as you describe it, great analogy doesn't necessarily block out all of the production of the of the male hormones can come from other sites. Let's talk about that in a second because I just think it's maybe time to drop in a little word from the cancer Assistance Program. And then we'll be right back and carry on with that thought.

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We'd like to take a moment to thank our generous supporters, the Hudson Family Fund and Becker creative studio, who make the cancer assist show possible. The COVID 19 pandemic has not stopped cancer. Instead, it has added to the isolation and challenges already faced by cancer patients and their families. The cancer assistance program remains committed to providing free essential support to cancer patients in our community, whether it be transportation and equipment, loans, personal care and comfort items to parking, practical education. With no sustainable government funding, we need your help so we can continue to be there for those who depend on Cath to stay safely at home. individual and corporate support of signature events third party fundraising and financial gifts are greatly needed. 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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So we're back with Dr. Sebastian Han talking about the signals from the pituitary gland and that stimulate the prostate cancer growth, but also that there are other factories for the male hormones in the body. And so we're not necessarily shutting everything down when we get medicines that turn off the pituitary signals. So that's led to the development of other drugs that either interfere with the synthesis of the hormones are blocked, the receptors are that that antenna and that's been one of the advances really that's made a big difference in the management of prostate cancer, I think. Yeah,

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and I think it's actually made a huge difference. So it used to be called, there used to be a term where men were on those androgen deprivation therapies, those injections, where the PSA started to go and their cancer progressed, that we would call that hormone refractory prostate cancer. And researchers found out that it wasn't quite true. And the fact is, is that there are other male hormones. There are other androgens that are being produced by our adrenal glands that sit on top of our kidneys. Some of our fatty tissues produce various androgens, but in large part the tumors themselves, the prostate cancer cells themselves produce their own androgens, so they in a basically fed themselves and that can be in very minut amounts. So even if we were to measure testosterone in the blood, we would not be able to measure this unless we use very, very sensitive sort of research. Tests for measuring those those male androgens, testosterone levels would still be would would be what we would call in a castrate range. So castrate resistant prostate cancer is what the new term that it's been coined, it's a bit of a difficult term, I think, for men who have cancer, because castration is not something that that we want to think about. But in essence, that's what we did with with the injections is that we, we stopped the production of testosterone from your from the testicles. So in essence, we did what we call chemical castration. So once we knew that those male hormones were still there, and by various ways, then there were efforts to block those. So either block the synthesis of those, so how they're made, and that involves a heart, an enzyme called sip 17. And that enzyme is very important, in in the formation of a lot of these androgens, and the tumors use that enzyme. And if we block that with a medicine called Abiraterone, or is it EGA, then you block that synthesis of new male hormones. And then once we started doing the trials, we found out that many if not most men would have then another response. So another remission or regression of their cancer, at least for a period of time. The other way that we could do this is having a block of that, that antenna like I talked about, so putting a very potent and strong cap on top of it, so that any of those androgens could not attach to the antenna and send a signal. And the first one that came was Enzalutamide. And the brand name of that is extending. So both Abiraterone and Enzalutamide were studied in men who had quite advanced disease who'd had previous chemotherapy, and had shown that men that get those treatments lived longer than those that didn't. And then as we saw that, then the way that we do research in oncology and cancer is once we see that it works in in men or in patients who have very advanced disease, then you bring it earlier and earlier in the in the in the history of the cancer. And that's what we've done with with with these medicines. And then we found that in men that are newly diagnosed with metastatic disease, which unfortunately we're seeing more because there's no longer PSA screening for everyone. Unfortunately, a bit more men, more men present to us with their first diagnosis of the cancer that has been that has spread what we should call metastatic disease. And in those men adding these types of hormone medication to the ADT, improved how long they live by a number of years on average. So that's really where we've had the biggest bang for the buck in terms of how well these medications work. And then there's been other ones that have been developed. There's been a cousin of Enzalutamide called apalutamide. And an even in men where their cancer has become resistant to the injections, but if we do bone scans and CAT scans, we don't see any evidence of the cancer that has spread, we know there's cancer there because the PSA is going up. And it's going up fairly quickly in that their PSA is doubling. So it goes from two to four from 10 to 20. In a space of usually sort of 10 months or less. And three different hormone medications were studied in different trials that Enzalutamide and apalutamide that I just mentioned, but a third one called darolutamide, which is similar but slightly different in how it looks chemically. And all of these have shown that we can delay the time the cancer is visible, has overt metastases by a number of years again, and that's really changed how how we we are able to control the cancer for these men and how well they can do with with very few side effects for long periods of time.

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So those are very significant advances in this we are focusing on the advances in prostate cancer to have these drugs that either block other sources of androgen production or block the intent I love your analogy. So that it doesn't continue to stimulate the prostate cancer and then moving on from the advanced disease situation and earlier stages where you see the rapid rise in the PSA, those are really important things for for men with prostate cancer. Unfortunately, these things eventually break down too don't they? So then there's the need to maybe try other approaches and and both. Chemotherapy may be a bad word to some people but still has value in this disease and many other diseases and even immunotherapy. Although the immunotherapy for prostate cancer hasn't been as stunning as for melanoma or even lung cancer, but there is a bit of a role for it. And in those patients who've failed some of these other approaches, I think,

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yeah, so chemotherapy for sure gets gets a bad rap. However, in you know, the the main one being docetaxel, which been around for a long time, pretty much as long as I've been around because it was a new drug when I started a gazillion years ago. And it's older every day. The the, you know, especially used in earlier disease in terms of those those men again at present with that metastatic disease, and especially those men who have a fairly large burden of disease, or more aggressive cancers may actually be the best treatment because it's agnostic, it doesn't care about what how the antenna function, how that that androgen receptor functions, because it works in a completely different way. The way that that the you know, the, eventually these new medications Enzalutamide apalutamide Abiraterone stop working is that the cells actually develop ways that they can grow without that that receptor without that antenna, or it actually has changes to it that those antennas are always turned on. And so it doesn't really matter if there's something blocking it or not, it just it is automatically working. Chemotherapy does not work on that immunotherapy has been really quite disappointing in in. In men with prostate cancer. I've been involved with a number of clinical trials and I've seen some men where their cancer was their lymph nodes were full of cancer and their their PSA went to undetectable and things went away. And then we're now six, seven years. But unfortunately, that's the that's the exception not the rule. In the US there is a immunotherapy of sort, which is a kind of a vaccine type of therapy called SEIP bluesil T or Provenge it's not approved anywhere other than the US. And in large part it was because there was a minor survival advantage seen but no other clinical evidence of it working. So it didn't really improve the PSA. It didn't change how long the cancer was controlled or the time to the next therapies. There was some concerns about it. And it's also quite difficult to do you have to make it from scratch for each patient and it's extremely costly. So outside of a few places in the US it's really not something that's happening however, we are doing a lot of research in terms of figuring out So how we can get the immune system to participate in killing the cancer cells with us and a lot of trials that we have ongoing, I think what's been more exciting in in prostate cancer outside of chemotherapy and obviously the hormonal therapies we talked about is using will be called radiotherapy, Gnostics, and that's a big word that means that a radio is sort of radioactive substances that can be used as treatments and, and the earth. The first one of that is is radium two to three. And radium is it looks like calcium in in the periodic table of elements. And the body thinks if you give a big dose of that intravenously, the body thinks that it's calcium, and it goes where calcium is needed. And for men with prostate cancer to the bone specifically, they are trying to always remodel kind of repair the bone areas where there's cancer. And so if you put in a whole bunch of that radium, radium is is radioactive, so in a bystander effect, so that the cancer cells that are surrounding it can get damaged and die. And that treatment is shown to improve how long men with advanced prostate cancer to the bone specifically live and also helps with symptoms such as pain and need for narcotic medications and all that. The much more I think the exciting and promising therapy theranostic is PSM A, so P SMA is Prostate Specific membrane antigen. And so it's a little bit like PSA. But it's actually one of those antennas on the surface of the prostate cancer cells is that P SMA. And if you attach an antibody, so it's basically an anchor to that, that antenna. And if you put a little bit of radiation radioactivity to that to that antibody, then you can have a imaging test. So it's a little bit like an in it's a little bit like a PET scan. But instead of having radioactive sugar is that radioactive antenna, and it's very sensitive for prostate cancer cells. And we're actually there is a registry right now in Ontario. That's where where men can get these tests. And we are actually are, we are, Ontario has been very good at evaluating a lot of these new imaging techniques and an actually Hamilton old cog, specifically the the Ontario cooperative Oncology Group. With Mark Levine and others have been very good at evaluating whether these pet type scans are any usefulness or not. We're doing a similar thing with PSM a PET scan in Ontario, but it's really showing cancer much earlier. And for example, those men with more aggressive cancer they told you about that have castrate resistant prostate cancer but we don't see any evidence of cancer in the bone scan on the CT scan. If we do a PSM a PET scan, almost 100% of these men will have spots of cancer either in their bones or their lymph nodes or their prostate. And so it is able to localize very well. And it means that if we actually put in a bigger radioactive basically mini bomb for lack of a better word to that linker, then it becomes a therapy and and the first one is called lutetium PSM A. And recently at one of our large conferences, it's been shown to have into improved survival in men who've had a number of treatments previously, and will likely be approved by Health Canada very soon and already is being tested earlier and earlier in the disease so that we can have a very focused treatment because it only goes where PSM A is and it's so that the side effects are usually less but it can also go pretty much anywhere there may be prostate cancer cells so I think I'm quite excited about about this treatment, especially if we start to see the trials in earlier disease panning out.

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Well that's that's really very interesting to hear about and it is curious how some diseases have responded to therapies like immunotherapy dramatically and others have not but then a technique like the lutetium PMA is something that's very unique to prostate cancer and extremely encouraging. I think you've taken us across the whole gamut now, prostate cancer from its diagnosis to an early detection with screening Through the ADT, and then all these new drugs, which I think have been the big change in the, I guess the last decade or less, that have made a difference and extended survival of individuals with prostate cancer and sounds like the future is reasonably bright to with some very encouraging new therapies on the horizon, waiting for Health Canada approval. So we'll stay tuned. Sebastian, I just want to thank you for your expertise in explaining all this to our listeners. I think it's a very great help for them to have heard it firsthand from you. And I thank you for being part of this podcast. Thank

45:35

you very much, I think yeah, I think the it there's been a lot of changes in the sort of the 20 some years that I've been doing this and it's exponential, how much changes are happening. So I think the next five years will, will be will be even more exciting. So I'm looking forward to seeing what what happens. And we can talk about it some other time.

45:56

We'll have you back back if I was still doing these and five years ago, so this should be encouraging to all those who either have prostate cancer or may get prostate cancer sometime in the future. Anyway, thank you for listening.

46:12

This has been the cancer assist show, brought to you by the cancer assistance program. Thanks for listening