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Welcome to Yale Cancer Answers with your host Dr. Anees Chagpar.

Yale Cancer Answers features the latest information on cancer care by welcoming oncologists and specialists who are on the forefront of the battle to fight cancer. This week, it’s a conversation about focal therapy for prostate cancer with Doctor Preston Sprenkle.

Doctor Sprenkle is an associate professor of urology at the Yale School of Medicine where Doctor Chagpar is a professor of surgical oncology.

September is Prostate Cancer Awareness Month. Tell us what’s new and interesting in the world of prostate cancer.

Well, we’re making a lot of advances in the treatment of high risk advanced disease with many new medications that have been released in treatments on the diagnostic side, we’ve continued to pioneer
improvements in noninvasive diagnostics such as prostate MRI. And we’re very excited to continue to identify patients who may not need evaluation. Or maybe we can avoid a prostate biopsy. Wow, that all sounds really interesting.

Those are two very different ends of the spectrum, so maybe we will take each of them in turn and work our way from prevention all the way up to metastatic disease. In terms of prevention and detection, you mentioned that you have been doing some great work in terms of detection. Tell us more about that and what are the current guidelines in terms of what people should be doing in order to either prevent prostate cancer or find it early.

Prostate cancer screening, which is evaluation of risk factors for prostate cancer, has been somewhat controversial over the last decade. Fortunately, within the past five or six years, it has become pretty clear that screening for prostate cancer remains a very important part of men’s general health. So we screen for prostate cancer starting in men at around the age of 50.
If a man has a higher risk feature for potentially having prostate cancer, which currently is a first degree relative with prostate cancer or being of Afro Caribbean descent, those men can be screened even earlier at around age 40 to 45. And by screening, this entails a PSA blood test. So it’s a simple blood test as well as a physical examination of the prostate with a digital rectal exam. Are those recommendations in terms of if you don’t have one of those high risk features, every man at the age of 50 should have a PSA and a digital rectal exam? As you say, it’s been so controversial and it seems like it gets really confusing. They say everybody should do this, sometimes they say, well, you should really talk to your doctor about pros and cons. So where are we at right now? I think the large part depends on who you talk to. Unfortunately, the US Preventive Services Task Force which is given the power to review and make recommendations on what kind of screening is necessary,
In 2016, prostate cancer screening became more likely to be beneficial than not in terms of prostate cancer screening. So it is still something that not everyone does routinely. For a man who is concerned about possibly having prostate cancer, they definitely should be screened. There are men who preferred not to, and the language used in many of the guidelines is informed decision-making. And informed decision making is a challenging term because who is informing the patient? Very often primary care physicians do not have time to have a full informed discussion with their patients about what are the risks and benefits of prostate cancer screening. And so it is kind of challenging for them to be able to figure out when they should screen and when they should not. As urologists we are very comfortable having those discussions, but it’s hard to say that across the board everyone should be screened. I think I’m still a little confused because, you know, at least coming from the breast cancer world, which is kind of my neck of the woods,
It seems to me that screening allows people to detect cancer earlier, so if you told a woman you can get a mammogram, but it’s really up to you, most women would say, well, I want to detect cancer early so that it can be treated more effectively and it reduces my chances of dying of the disease. So what does that conversation really look like in terms of prostate cancer? When you’re talking to a man about should you get prostate cancer screening or not? Let’s suppose that they don’t have one of those high risk features. They haven’t had a family history and they are not of Afro Caribbean descent, but they are your regular 60 year old Caucasian gentleman who really doesn’t have family history of cancer but doesn’t want to be the first one to get it either. And doesn’t want to find it late. What does that conversation look like? How do men make that decision? because it seems to me that a lot of gentlemen are going to do whatever you recommend. I think you hit it on the head when you said men don’t want to be the first one to get it.
first one to be diagnosed with it either.

I think there is a large component of fear.

And as we discussed mens health,

many men do not necessarily take care of themselves to the extent that women do,

and so in a sense, we,

as urologists and as physicians that are concerned with men’s health,

as a large part of it is

an information campaign to reassure men that we do have ways of managing these scary diseases,

so the conversations are a large part about information,

and helping men assess what is their actual risk of having prostate cancer.

What is the drawback to screening?

What is a drawback to having a simple blood test,

which can be exceptionally reassuring if it’s normal and a little bit anxiety provoking

if it’s not.

But then what are the benefits of doing that?

So there are more extended risk benefit discussions on a pretty routine basis.

Overall the important thing to understand is that prostate cancer is common,

but it’s not so common that everyone gets it.
It’s common enough though, that most men as they get older are at risk and it’s worth having some simple tests to evaluate if you are at higher risk than others. Because cancer can definitely be treated and stopped in his tracks, right? So it sounds like the general recommendation, and I know that we don’t always want to give general recommendations, but it seems to me that in general this is something that people really should consider and talk to their doctor about in terms of getting screened. So let’s move on to the next kind of phase after screening comes detection, and you alluded to some of the really interesting work that’s been happening and pioneered really here at Yale. Tell us more about that work and where we are in terms of state of the art detection for prostate cancer. The first step as you mentioned is screening so that the first test with a PSA blood test and a prostate exam are the initial ways that we evaluate if a man may be at risk for harboring a prostate cancer. As you mentioned, Yale was one of the first sites around the country to
be interested in use an MRI or a non invasive imaging test to evaluate a prostate and look at a prostate for possible cancers within it.

It’s really interesting as the prostate is the only solid organ until we started doing these mris, for which we did not have cross sectional imaging that could look inside the prostate. So this has been a real boon in terms of our ability to diagnose prostate cancer in a non invasive manner. And so if somebody’s PSA comes back high or somebody finds a lump in their prostate on digital rectal exam, is that the next step? It is at our institution. It is not the next step everywhere, because the reading and performance of the mris is an acquired skill and it does take experience. It is becoming more widespread to use an MRI of the prostate as the next step, and there recently have been some publications in major medical journals, including the New England Journal of Medicine, looking at MRI of the prostate,
and really the important thing about MRI is combining it with a targeted prostate biopsy. So then using that information from the MRI and if suspicious areas are identified using that information to target or direct prostate biopsies to detect prostate cancer, the MRI alone is very useful, but it’s really in combination with the biopsy.

And is MRI covered by insurance for people who are at risk of prostate cancer or people who have an elevated PSA and so on, are most insurance companies covering this? I would say most are and especially now after some of those recent articles, including the one in the New England Journal, there is more support of that, but there still are some insurance companies that will not pay for an MRI as an initial diagnostic biopsy, they still require an initial transrectal ultrasound guided prostate biopsy, which is the goal which has been the gold standard for 30-40 years. They will require that first,
and only if that does not detect cancer they would pay for an MRI targeted biopsy.
I believe we’re continuing to see a shift, though toward use of MRI as an initial diagnostic tool.
In the United Kingdom it actually is mandatory. Anyone with an abnormal PSA that next step is an MRI, and they use it as a screening tool. We’re not quite to that point yet in the United States.
That’s so interesting because we always think about the UK as being a country that really does put a premium on value in terms of healthcare costs and so on and their National Health System. It seems if they’re adopting it, they have such a rigorous process to make sure that things are cost effective, that would be reasonable to adopt.
I think we’re starting to get into some of the nuances of the health care systems and some of the cost and price disparities across providers that we see in the United States, which is a much bigger and more complicated discussion.
But in general MRI is significantly cheaper across the pond than it is here. Interesting, so the next step, as you mentioned that goes hand in hand with the MRI of course is the biopsy. So tell me a little bit more about some of the work that’s been going on with prostate biopsies. I understand that people are now looking at artificial intelligence and machine learning to improve biopsies of the prostate. That just sounds so avantgarde. Well it is. It is one of the directions that we are embracing technology to improve what we do using that same MRI image in an MRI of the prostate, we are able to make a 3D model of the prostate gland and we combine that with a real time ultrasound 3D model of the prostate to guide our needle biopsy in the office in the outpatient office so it’s different than doing it in the MRI scanner where you do have an image and you have a 2D image and you can place the needle by using 3D imaging which allows us to perform the procedure in the office in the outpatient.
setting in a more convenient and for
many patients more comfortable way.
The machine learning is
enhancing our modeling so it is
making the way that we target
the biopsy is much more accurate.
We need to do delve more into that,
but first we need to take short break
for a medical minute. Please stay
tuned to learn more about prostate
cancer with my guest doctor
Preston Spenkle.
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This is a medical minute about Melanoma.
While Melanoma accounts for only
about 4% of skin cancer cases,
it causes the most skin cancer
deaths. When detected early,
however, Melanoma is easily treated
and highly curable. Clinical
trials are currently underway to test
innovative new treatments for Melanoma.
The goal of the specialized programs
of research excellence in skin cancer
or spore grant is to better understand
the biology of skin cancer with a focus
0:15:02.063 –> 0:15:04.585 on discovering targets that will lead
0:15:04.585 –> 0:15:06.81 to improved diagnosis and treatment.
0:15:06.81 –> 0:15:08.914 More information is available
0:15:08.914 –> 0:15:09.966 at yalecancercenter.org.
0:15:09.97 –> 0:15:15.13 You’re listening to Connecticut public radio.
0:15:15.13 –> 0:15:15.55 Welcome
0:15:15.55 –> 0:15:17.64 back to Yale Cancer Answers.
0:15:17.64 –> 0:15:19.901 This is doctor Anees Chagpar
0:15:19.901 –> 0:15:23.055 and I am joined tonight by my
0:15:23.055 –> 0:15:25.155 guest doctor Preston Sprenkle.
0:15:25.16 –> 0:15:27.36 We’re talking about diagnosis and
0:15:27.36 –> 0:15:29.56 treatment of prostate cancer and
0:15:29.629 –> 0:15:31.945 right before the break Preston you
0:15:31.945 –> 0:15:34.39 were talking about this really cool
0:15:34.39 –> 0:15:36.868 technique of using MRI to diagnose
0:15:36.868 –> 0:15:39.34 prostate cancer and what was interesting
0:15:39.34 –> 0:15:42.296 was that you were talking about how
0:15:42.296 –> 0:15:44.804 that really gets paired with biopsy,
0:15:44.81 –> 0:15:47 but you’re not doing biopsies
0:15:47 –> 0:15:48.312 in the MRI suite,
0:15:48.312 –> 0:15:50.986 which I can imagine is just
0:15:50.986 –> 0:15:52.751 claustrophobic and not the most
0:15:52.751 –> 0:15:54.867 comfortable setting in the world for men.
0:15:54.87 –> 0:15:58.047 But tell me a little bit more about how
0:15:58.047 –> 0:16:01.355 you take that MRI guided image
0:16:01.36 –> 0:16:04.86 to actually guide a biopsy that you’re
0:16:04.86 –> 0:16:07.7 doing with ultrasound in your office.
0:16:08.56 –> 0:16:10.912 Yeah, so there are a few different
0:16:10.912 –> 0:16:12.59 technologies that are available.
0:16:12.59 –> 0:16:15.875 We talk about this as sort of a fusion.
0:16:15.88 –> 0:16:18.448 How do we fuse these two images
and we can use cognitive fusion which is using the human brain to look at 2 pictures side by side and say OK this looks like where they line up. We then use computer fusion which is what we use at Yale with our Artemis Device. And then there are quite a few of these computer fusion devices that exist around the world. And we like using this Artemis device because it has, like I mentioned earlier, the ability to take a 3D model of the prostate from the MRI. We use Artemis Device to create a 3D model of the prostate with the ultrasound and then we overlap those and we’re moving towards the computer having the ability to overlap them. Right now the urologist and surgeon are very involved in making sure the pictures lineup, but then the artificial intelligence side is learning what are the shapes of these prostates and can we predict how these prostates are going to deform and change and really matching up that fusion product or that model up that fusion product or that model of the prostate so that it’s much more precise and this translates to more accurate biopsies. The Artemis Device, just so that
I've got this straight, I kind of get the idea that the man goes in and gets an MRI of the prostate, just like you get an MRI of your knee or your brain or whatever else. They get an MRI of the prostate. This Artemis device kind of takes that image and transforms it into an image that you could get with an ultrasound so that it can overlay it well. Interestingly, we still rely very much on non human interpretation so the radiologist takes the MRI, so a man will have an MRI of his prostate, the radiologist will read that and will evaluate and look at the MRI for any areas that look suspicious, they grade it on a standardized grading scale that was helped developed by one of our radiologist here at Yale, Jeff Weinreb. So it’s an international scale and is now the gold standard, and that was partly designed at Yale, so they’ll get a score of any lesions that are in the prostate. The radiologist then outlines the prostate and those images are imported into our Artemis device, or one of our other urologists.
We similarly use an ultrasound to make a model of the prostate and, then the job of the computer and what we're trying to improve with some of our mathematical models and artificial intelligence has now improved how those two pictures of the prostate, look or if they look different, why are they different and how do we correct for that difference?

So this is interesting because you're taking two different pictures of the same organ done by different modalities, and if I understand this correctly, you're putting both of them into this Artemis system, which kind of lines them up and says what you saw here on the MRI is what you see here on the ultrasound and kind of making this image that when you see that on the ultrasound, that really is that area that was on the MRI and that’s what you need to go after with your biopsy. Do I have that right? Yep, you’re absolutely correct,

two things side by side.
You can imagine these two pictures just merging into one and overlapping and we make sure that where those overlap appears correct and so then that is a real boon because then you can use something that is patient friendly like an ultrasound and do the biopsy in the office. I mean that is just such cool technology. I wonder if the same thing can be done in other organ systems. Do you know if this Artemis devices is being used in other diseases? It isn’t really because if you think about many other lesions, in liver lesions, many of those are very well visualized with ultrasound, and so the real time ultrasound is actually as good or better at characterizing where the lesion is than MRI or CT. That kind of fusion that we need to do for the prostate is kind of unique compared to, for example, the brain where you have a solid calvarium around the brain and the ability to predict and do stereotactic localization within
this solid structure is much easier than with a soft, malleable organ that is very able to move around within the pelvis. So the process is really kind of a unique location and a unique target given all these sort of anatomic limitations. Moving on from once you get the biopsy, let’s talk a little bit about getting screening or a gentleman went and got screening, he got his MRI, he had this really cool artificial intelligence thing happening so he could have his biopsy in the office and he gets diagnosed with early stage prostate cancer because he found it really early. Tell us a little bit more about what’s new and interesting in terms of the management of early prostate cancer. In the field of urology we are becoming much more comfortable with active surveillance or really a deferred treatment for men with prostate cancer. And that’s based on many large studies. Now with long term follow up as well as a better understanding of the genomic nature of prostate cancer. So not only are we typically talking
about things like the Gleason score when we are diagnosed with prostate cancer and the higher the Gleason score, the sort of worse the prognosis, or the more aggressive prostate cancer we are now able to sub-stratify many of these patients using genomic testing which is specialized testing of the cancer cells themselves that tells us if it is at a lower risk and intermediate risk or higher risk of progression and developing metastasis. So I think one of the many exciting things is we feel more comfortable knowing who does not need treatment and really can avoid many of the side effects that we associate with treatment. And part and parcel of that is, I know that many gentlemen who get their prostate biopsy, they’ve got a low Gleason score and they’re put on this watchful waiting regimen. But for some of them, that’s really anxiety provoking, right? Because they’re sitting there and we already talked before the break about how fearful some people are with a diagnosis of prostate cancer. Here you are telling people
you’ve got a prostate cancer, but it’s really pretty indolent, we think, so you don’t need to be treated, but it sounds like with genomics you can get a little bit more personalized and say no, we’ve looked at your tumor, this is a very low score, but are there some people who would normally be in the watchful waiting category who, based on genomic analysis, you think, geez, I need to be a little bit more aggressive? I just want to caution and correct the terminology just for a second. So active surveillance is what we do for men with low grade, and low risk prostate cancer. Watchful waiting is what we characterize men with prostate cancer who do not want to treat it, nor do they want to do any follow up of it. Because prostate cancer is so slow growing, there are some men who are diagnosed who are elderly or have other health problems that decide they do not want to treat it because prostate cancer is so slow growing it will
not cause them a problem ever. Those are sort of who we say are on watchful waiting because we’re waiting for them to have any symptoms of their prostate cancer before we treat. Active surveillance is kind of the other end of the spectrum where men have a very low grade, low risk prostate cancer and we are actively surveilling their cancer for any signs that it has progressed or gotten to the point where it may require treatment or we may advise treatment, but you’re absolutely right with a genomic testing we can now have a much more confidence and much more security and telling some men that it’s appropriate to watch their cancer and not treat it. And you’re right, anxiety is a major component. Very understandably, I think we gain confidence with data in the genomic testing, we can more strongly tell our patients with security that they don’t need treatment. They are not in danger from this cancer. Let’s say there are some men though that do really want to have treatment.

As a general rule,
if they have very low risk and low risk prostate cancer, we do not treat them. Getting into an intermediate risk, some of those men actually don’t need treatment either. Some intermediate risk men may benefit from treatment, and again we’re using genomic testing to stratify that.

An one of the main reasons that we are concerned and we try not to treat everyone with prostate cancer is that there are side effects so there can be an impact on urinary function. There can be an impact on sexual function with any treatment for prostate cancer, whether surgery or radiation or even ablation. So we’re going to talk a little bit about that unless you had another question. I’d love to learn more about ablation, because it sounds like that might be a minimally invasive way to treat prostate cancer without having major surgery that can cause more side effects, so much of the discussion that we have in the urology community is, will ablation replace surgery?
or radiation?
I would say no, it is not a replacement for these gold standard treatments, but it is an alternative for the appropriate person and it is a good alternative.
So ablation is typically using some form of energy beacon. Heat, or we can use cold, we can use other things like light or ultrasound or electricity to generate heat, but we’re trying to destroy just the part of the prostate that has prostate cancer. By doing this, we can often avoid the structures and areas near the prostate that are associated with urinary control and sexual function, so we can have much less impact on someone’s quality of life while having a successful treatment of their cancer.
So do we know what the long term results of that are? I mean, do you get recurrence rates that are as low as you would get with surgery and radiation with ablation? It’s interesting, there have been no randomized trials comparing surgery or radiation to an ablation, so all we can do is compare the sort of data from the different studies. 
The combination of treatment with ablation tends to be quite successful, though because we’re held to a high standard, we are doing repeat biopsy’s and many of these patients who are having an ablation or treatment of this part of their prostate, and we find very greater than 80 or 90% success rate when we biopsy areas that were treated. The trick is that if we’re treating only part of the prostate and this is why it’s hard to compare to surgery or radiation. When we are treating just part of the prostate, there still is the other side of prostate or the rest of prostate that could develop cancer in the future. So you know, if we look at the areas that are ablated then yes, things like Cryo Ablation, irreversible electroporation, HIFU or high intensity focused ultrasound, those are very good techniques to destroy the cancer tissue in the area that is ablated but inherently it’s not treating the other side of prostate so it is a little bit of a trade off.
It’s a little bit less treatment. Meaning we’re not treating the whole prostate, but definitely associated with fewer side effects. So in terms of picking patients in whom this technique might be optimal, it seems to me that if you’ve got somebody who’s really worried about the side effects of radical surgery, has a relatively small prostate cancer, and wants a less invasive technique and may not have long to really wait and get a new prostate cancer in another part of the prostate, that might be a good candidate. Yes, definitely.

And this moves towards focal ablation so it is becoming more popular, especially in academic centers, and this has really grown out of the interest in it and the increased usage of these techniques has really grown out of the MRI in a targeted biopsy, because we now can localize prostate cancer within the prostate, which is new. It’s new since MRI. We can know where to treat. So one of the reasons we don’t
have long term data is this is all relatively new technology that has really been born out of our ability to identify and localized prostate cancer with much more accuracy.

Doctor Preston Sprenkle is an associate professor of urology at the Yale School of Medicine. If you have questions, the address is canceranswers@yale.edu and past editions of the program are available in audio and written form at Yalecancercenter.org.

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