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Welcome to Yale Cancer Answers with Doctor 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 recent advances in breast imaging with Doctor Kiran Sheikh.
Dr Sheikh is an assistant professor of clinical radiology and biomedical imaging at the Yale School of Medicine, where Doctor Chagpar is a professor of surgical oncology.
Originally I was always kind of interested in medicine. My parents were both in medical careers, so I was always kind of going towards medicine. But in general, I ended up in radiology later on in my career.
I was in medical school and gearing towards actually neurology.
And then as I kind of went down my path,
I met a lot of radiologists and they were amazing mentors and they introduced me to the field of diagnostic imaging and I kind of started figuring out that besides being involved in the care and the treatment of patients, I actually started becoming a lot more intrigued about just the initial impact of diagnosing disease and being a part of the forefront of imaging and so that’s kind of how I ended up in radiology. And then specifically within breast imaging, it was actually when I was in medical school I again I had those radiologists that kind of were my mentors and then ended up in radiology residency and saw the unique relationship that the radiologists had with our breast patients and how important breast imaging was for population screening and the kind of larger impact that they could have. So that’s how I ended up in breast imaging. A lot of us know a little bit about breast imaging in the sense that most people know about the importance of getting a mammogram. But what tends to be a little bit confusing right now is what really are the
recommendations for screening imaging for, let’s start with people at average risk. Let’s suppose you don’t have a huge family history, or at least not a family history that you know of. You don’t have a genetic predisposition. You’re just a regular individual in society. The recommendations for breast imaging seem to be a moving target. Where are we now and what do you recommend for your patients? What is breast imaging? So in general, we have different types of imaging modalities that we do for breast imaging. We do mammography, ultrasound, MRI for screening evaluation. Mammography is our gold standard screening exam for breast cancer. It’s noninvasive, it’s effective. It allows us to have early detection of cancer. And so that’s actually the initial screening evaluation. So now our Society of breast Imaging recommends that women with average lifetime risk of breast cancer begin screening at the age of 40.
there is a lot of confusion just because of the fact that there are lots of different imaging studies out there that have been discussed about what’s the best timing to start the screening. And so different countries with different risk profiles of their population start screening at different times. And so in essence, you have some areas where they’re recommending from 40 to 45 that they can just have the option to start screening and then 45 to 54 you start annually. And I would say the most important thing that we always know is that mammography is the most effective exam for early detection of cancer. And since the advent of mammography, we’ve actually reduced mortality by 30% and that’s been documented since the 1990s. So all this early detection of breast cancer through mammography screening is important to figure out. I mean it’s the main reason why we have the significant decrease in breast cancer mortality. So we have to kind of figure
out and parcel out what’s the most important thing. Everyone recommends again starting screening at the age of 40 and on the option of an annual basis. Once women get older and their breast density starts to decrease, that’s actually the reason why. Then in other countries they have the option of doing it every other year. And the reason is, if the breast density decreasing confers a slightly decreased risk of breast cancer because there’s less vibrant glandular tissue and so that’s the reason why these recommendations end up being where it could be switching off to every other year or less and less. But we do recommend that women with average risk still continue screening as long as they have an expected life expectancy of 10 more years. So for some that may be in their 80s and others with very good lifespan they might be later. It’s a discussion that women would have with their primary care physicians. What about for women who are at
higher risk? So let’s suppose you have a family history of breast cancer or maybe you have a genetic mutation. High risk women are women with greater than 20% lifetime risk of developing breast cancer. And for those women, that’s a certain subset of women and that could either be women that may have a mutation like BRCA 1, BRCA 2. They may have had a history of chest radiation between the ages of 10 and 30, strong family history possibly like a premenopausal breast cancer diagnosis in a first degree relative or they have certain genetic disorders and those are our high risk patients. For those patients we do recommend they actually start annual screening mammography at the age of 30 and it could actually even be as early as 25. So if let’s say I am a 25 year old female and my mother got diagnosed with breast cancer at 35, I can actually begin screening at 25, but we don’t recommend earlier. just because of the degree of dense tissue and it limits the sensitivity of mammography. So we start mammography as early as 25,
but recommend at the age of 30 for high risk.
And then in conjunction with that we do recommend also breast MRI.
So as we alluded to breast MRI is actually a very effective type of imaging modality and for screening evaluation and we perform it in conjunction with mammography in these high risk women.
And breast MRI is in essence an imaging exam where we give them contrast and MRI images are obtained. And what it allows us to do is see very small lesions that may be missed on mammography because of that contrast enhancement. So it’s showing us tiny little vascular lesions that are enhancing and then they’re seen as discreet amongst the non-enhancing breast tissue, so breast MRI is helpful in these high risk patients.
One of the things that we notice a lot of people get confused, they say well if breast MRI is so sensitive then why do I even have to do mammography at the age of 30, why wouldn’t I just do breast MRI? And the important thing to note is that although it is the most sensitive
In what the highest cancer detection rate, it can be sometimes so sensitive, it could be difficult to distinguish between normal and abnormal findings. So it can potentially lead to unnecessary biopsies. So that’s why we don’t recommend breast MRI routinely on average risk patients. We specify for these high risk patients and we always do it in conjunction with mammography because it also actually doesn’t always detect stage zero breast cancer or what we call DCIS. And that sometimes may show up more discreetly as calcifications on mammography. Mammography is our gold standard, which can allow us to see very, very tiny, subtle, faint calcifications and then also breast MRI, which allows us to see very, very tiny vascular lesions. And so in these patients where you’re recommending annual mammography and you’re also recommending annual MRI, one question that often comes up is should you do the two in conjunction? So for example, every year get a mammogram and an
0:09:04.3 –> 0:09:06.256 MRI at about the same time
0:09:06.256 –> 0:09:07.97 or should you stagger them?
0:09:07.97 –> 0:09:10.826 So have your mammogram say in
0:09:10.826 –> 0:09:13.97 January and your MRI say in July,
0:09:13.97 –> 0:09:18.702 and that way you still have each test every year,
0:09:18.702 –> 0:09:23.31 but have a six month interval between tests?
0:09:23.31 –> 0:09:24.478 What do you recommend?
0:09:25.09 –> 0:09:27.258 I think that’s just as you labeled
0:09:27.258 –> 0:09:29.42 it, it’s very helpful to space
0:09:29.42 –> 0:09:31.852 it out by six months and what that allows
0:09:31.852 –> 0:09:34.42 you to do is that you’re getting some
0:09:34.42 –> 0:09:36.92 screening evaluation every six months
0:09:36.92 –> 0:09:39.33 the breast MRI’s at one point and then
0:09:39.33 –> 0:09:41.26 six months later and do the mammography.
0:09:41.26 –> 0:09:43.476 It’s also helpful because of the fact that
0:09:43.476 –> 0:09:46.078 you are giving contrast with the breast MRI.
0:09:46.08 –> 0:09:48.126 If you did do mammography and
0:09:48.126 –> 0:09:50.22 breast MRI on the same day,
0:09:50.22 –> 0:09:52.41 you would have to make sure that you did the
0:09:52.465 –> 0:09:54.46 mammogram first and then the breast MRI.
0:09:54.46 –> 0:09:56.96 Otherwise the contrast enhancement
0:09:56.96 –> 0:09:59.7 in the breast would affect the
0:09:59.7 –> 0:10:01.18 results of the mammography.
0:10:01.18 –> 0:10:03 So we will recommend every
0:10:03 –> 0:10:05.21 six months so you do one.
0:10:05.21 –> 0:10:07.261 Either a breast MRI and mammography and
0:10:07.261 –> 0:10:09.388 then the other exam six months later,
0:10:09.39 –> 0:10:10.632 and that allows us to see
0:10:10.632 –> 0:10:11.84 you also every six months.
0:10:11.84 –> 0:10:14.038 You’re being evaluated every six months and
0:10:14.038 –> 0:10:15.84 you’re getting imaging every six months.
So, you know, this brings us to another question, which is one of the newer modalities that is coming into the fore is something called contrast enhanced mammography. Can you tell us a little bit more about that and how is that the same or different from standard mammography and how is that the same or different from MRI and how does it fit into standard practice now or does it? Yeah, it’s very exciting. I think, you know, in general our goal is. Radiologists were always trying to positively impact patient outcome. We’re always trying to try to diagnose these diseases as early as possible and with that trying to kind of keep on pushing the envelope for our imaging modalities. And what we notice is that if we can use more of these functional based methods, meaning this imaging with contrast, so breast MRI or contrast enhanced mammography, then we’d be able to see these tiny lesions and the great thing is, the contrast enhancement mammography is the combination of them both where you do the mammography, you can see these very tiny, subtle fine pleomorphic calcifications.
that could represent stage zero breast cancer carcinoma and then you can also have the breast MRI which allows the contrast enhanced, evaluation of these tiny enhancing lesions. So the way we do contrast enhanced mammography is that it’s kind of a dual energy exposure. Where you take the images prior to giving the contrast, then you give the contrast through the IV as if you were giving it for any exam on contrast enhanced CT exam or MRI exam. And then you do a subtraction of the two of the contrast image and then the non contrast image and allows those areas that are enhancing and then you can visualize those enhancing over the non enhancing tissue and you have the combination of the two. If we do see any abnormality with the contrast enhanced mammography, we often can actually target just based on that and we are still really great that we’re able to now actually target.
unconscious enhanced mammography.
And if for some reason we think that there’s a solid mass there that we can see on ultrasound we will recommend a targeted ultrasound to evaluate it. And potentially if there’s a lot of findings on contrast enhanced mammography where we feel as though further dedicated evaluation with the breast can be performed then we can also recommend that too.

Now where are we within the span of it being in screening versus diagnostic? I would say in academic centers everyone is pretty much doing it now definitely for research reasons trying to see what is the increased cancer detection rate and prove that it’s something that would be helpful for the screening population. So in general if you just think about screening population, every 1000 women has just a routine 2D mammogram. You can detect about anywhere from about 3 to 7 breast cancers. And then what it does is the contrast enhanced mammogram actually allows you to even actually get an additional 10.
So it’s very helpful. What we need to do is just look at the risk of the procedures anytime you’re giving any contrast you have make sure that you have staff that are able to put in an IV, that the patient can tolerate the IV contrast and then also if there’s any kind of contrast reactions. But these things are handled by the radiologists on a routine basis with all contrast imaging studies. So that’s something that’s easy to do. It’s just really making sure about the cost and just seeing the effect on the patient experience that they’re able to tolerate it. And then once that’s really been proven, then I really do think that it’s going to become our main mainstream way of screening all patients. Great, we’re going to learn a lot more right after we take a short break for a medical minute. Please stay tuned to learn more about improvements in breast imaging with my guest, doctor Kiran Sheikh. Funding for Yale Cancer Answers comes from Smilow Cancer Hospital, where their liver cancer program brings together a dedicated group.
of specialists whose focus is determining the best personalized treatment plan for each patient. Learn more at smilowcancerhospital.org.
The American Cancer Society estimates that over 200,000 cases of Melanoma will be diagnosed in the United States this year, with over 1000 patients in Connecticut alone. While Melanoma accounts for only about 1% of skin cancer cases, it causes the most skin cancer deaths, but when detected early, it is easily treated and highly curable. Clinical trials are currently underway at federally designated Comprehensive cancer centers such as Yale Cancer Center and Smilow Cancer Hospital to test innovative new treatments for Melanoma. The goal of the specialized programs of research excellence in skin Cancer Grant is to better understand the biology of skin cancer, where the focus on discovering targets that will lead to improved diagnosis and treatment. More information is available at yalecancercenter.org.

You’re listening to Connecticut public radio. Welcome back to Yale Cancer Answers. This is doctor Anees Chagpar and I’m joined tonight by my guest,
We’re discussing recent advances in breast imaging. And right before the break we were talking about screening modalities and some of the interesting work that’s going on right now in terms of research, looking at contrast enhanced mammography, which might actually blend together the best of both worlds in terms of mammography and MRI. Another question that comes up I think is with regards to the role of ultrasound. So many people will say, I know the data on mammography, my doctor always sends me for a mammogram. Why can’t I just have an ultrasound for screening instead of a mammogram? Can you speak to that? In a sense what the different modalities that we have in imaging, each modality kind of gives different information to the radiologist. Mammography is in essence a 2D mammography takes 2 pictures of the breast and then 3D mammography which we have is also called digital breast tomosynthesis, and takes multiple images of the breast at different angles and then that allows us...
to visualize the breast in different layers. And so we have optimized mammography with our 3D mammography and it now allows us to see abnormalities that previously were obscured by just overlapping tissue. And that actually has given us a higher cancer detection rate than just routine 2D mammography. And it’s giving us an additional 2 cancerous breast per 1000 now screening breast ultrasound was in essence recommended for women with dense breast tissue and to be performed in conjunction with mammography. And you may ask then, well, why are we doing breast ultrasound in patients with dense breast tissue and not in patients with routine breast tissue such as scattered or fatty tissue? In essence it’s a numbers game. Anyone who has heterogeneously dense or extremely dense breast tissue just has more fibroglandular tissue. So having more of the fibroglandular tissue just naturally increases your risk of developing disease. And then also there’s the fact
of that obscuring tissue.

So what we did is we’ve been recommending breast ultrasound in these patients with dense breast tissue to see the tissue in a different way.

So besides X-ray with ultrasound waves, it penetrates the tissue and it allows us to see that same abnormality that maybe that mass that we saw in mammography.

But then it gives us additional information, is it a solid lesion or is it a cystic lesion.

When those sound waves penetrate through a cyst, which is very pliable and kind of soft, it shows up as marked fluid containing structure, while something that’s solid and has a lot of strain, it displaces those sonographic waves and shows up as something more solid and a different appearance on ultrasound.

And so that gives us a lot of information. Now for evaluating masses, it’s fantastic.

But the caveat is again is those tiny little calcifications, so fundamentally mammography, whether you have dense breast tissue or you have a fatty tissue if
your average risk or your high risk, it’s still fundamentally the gold standard screening evaluation because of the fact that it is the best way to evaluate those tiny ducts to see if any kind of subtle calcifications are existing. And that’s always our goal of screening evaluation, early detection. This brings up another question. Sometimes different populations of women may have questions about how to screen, particularly women who may have breast implants for augmentation, so they still have breast tissue and perhaps even have a family history of cancer, or perhaps not. But when they have implants in place, can they still get a mammogram? Talk a little bit about how they should screen for breast cancer. So when a patient has implants, oftentimes the implants now I would say routinely are placed behind the pectoralis muscle. So we call those retro pectoral implants and that does actually allow us to move the implant away from the glandular tissue that’s in front of the pectoralis muscle. And so by doing that,
we actually take two different types of pictures with mammography. We'll take a picture with the implant in view and then we'll actually displace the implant to the side. And so then we take that picture and then we can evaluate the tissue just as we would evaluate the tissue in any routine patient. And so again, we evaluate the tissue and evaluate if we see any calcifications, masses, asymmetries or architectural distortion in these patients. Now if they do again, the same thing, if they have dense breast tissue where they have a higher percent of fibroglandular tissue, we would recommend them to get a screening breast ultrasound. Some patients with implants if they’ve had a lot of surgical history either have had silicone injections and when they’ve gone to other countries and they’ve actually injected silicone within the tissue, that can actually then make the breasts a little bit more difficult to interpret.
So for those patients we would recommend a breast MRI to evaluate it just because they have a lot more post surgical changes and foreign body granulomas and so on within the tissue that it would be helpful to have that contrast. So it is a per case basis, but a routine patient with implants can definitely get screening evaluation as a patient without implants and they would be mammography. 1st as the gold standard and we would do the implant displays views and then if they have the dense tissue, we would do the breast ultrasound and then MRI on a per case basis. What about patients who have had bilateral mastectomies, maybe they’ve had cancer in the past or maybe they’ve had bilateral mastectomies prophylactically and they’ve gotten reconstructed, whether that reconstruction has been with implants or whether it’s been with using their own tissue, moving tissue around from their belly, etcetera to create new breasts. And now it looks like they have breasts, although they’ve had a mastectomy.
So should they have imaging for further surveillance or not?
And how do we monitor them for breast cancer risk?
That’s a great question.
And so I think the most important thing is that when anyone has had any kind of prior history of breast cancer, the relationship with their breast surgeons and plastic surgeons that they’ve had is a very crucial one. And so a lot of times when a patient has had mastectomy, they still actually have their routine visits with their breast surgeons and breast care team. And on these routine visits they will evaluate them and see if they’ve noticed any kind of differences in their breasts, have they noticed any pain or lump or any kind of new things, and if they had nipple sparing mastectomy, if they have any kind of discharge, or any new symptoms, and then that’s evaluated by that breast surgeon. If there are symptoms then we will do imaging. And so if the patients had mastectomy, there’s actually no more actual glandular tissue to really be
able to image on mammography. So if they have a little small palpable lump, we would do then a targeted ultrasound in that area to evaluate it and see if it’s something that’s associated with the skin, superficial skin lesion or if it’s something just underneath the dermis and possibly a recurrence. And we can easily see that with ultrasound if there is actually any other questions where we feel as though there could be additional abnormalities or anything subtle, then we would recommend breast MRI and get that contrast enhanced evaluation for evaluating something more subtle. But that would be the mainstay with patients that do have mastectomy and then end up actually having a tram flap those of patients. Then again like you describe having tissue kind of placed and put in that area, there is actually then tissue to do an X-ray of. So if they do have a palpable area in a tram flap then it can be done using mammography. And I would say that sometimes on occasion the mammography is helpful because a lot of times these
patients have post surgical changes like fat necrosis and they develop calcifications and so they have a very distinct appearance on mammography. And so then mammography can be helpful for us to delineate something that’s normal like fat necrosis in a tram flap versus something that’s abnormal like a recurrence at the edge of the flap.

What about men who get breast cancer? If a man has developed breast cancer and we know that about 1% of all breast cancers do occur in men and let’s say maybe he’s got a genetic mutation in BRCA 2 and he has a unilateral mastectomy. So we know that he is still at increased risk in the other breast. Does he need to get mammograms on a yearly basis just like his female counterparts? How do we screen for the other breast in men who are at increased risk of developing breast cancer? And that’s actually a great question and I think it’s something we’re always trying to pursue at least even within our research trying to figure out what is their risk profile and how often they should be screened. We will still actually do lifetime risks.
And so if they do have a mutation or if they have also again lifetime risk of you know greater than 25%, we do have a subset of males that we do routine screening evaluation if they have that very strong evaluation and they would get mammogram on the other side, but I would say more often than not they end up not being greater than that lifetime risk and so then it ends up being symptomatic. If they have any abnormality that’s felt on their routine follow up visits by their doctors, then we will do further evaluation with diagnostic exam with again mammogram, ultrasound, possible MRI to evaluate the abnormality. Perfect. Well, you know the other question that often comes up is that there’s always new technology that’s being developed. And oftentimes being marketed as straight to consumers, so things like Thermography or elastography. Can you talk a little bit about some of these technologies and whether you think that they play any role in terms of screening for breast cancer? Sure. I think it’s always a good thing
to always be thinking out-of-the-box. What are different ways for us to evaluate these abnormalities and see and look at the characteristics of it. So these other imaging modalities such as Thermography and so on, what they’re looking at is different characteristics of a cancer. So in essence, if the cancer has angiogenesis, that means some vascularity to it has blood flow to it. So we use contrast enhanced mammography and MRI to evaluate that. But then there’s also a functional art to the cancer. And so the thermography is pretty much based off of that. The only issues with these types of functional methods that we just haven’t gotten to the point where we can delineate them very well since they’re sensitive but they’re not specific. So in a sense they can show a degree of high signal in the sense where you’re seeing a lot of uptake, but then you don’t know what it is. There’s an area of inflammation, it actually a small cancer, is it an inflamed sebaceous cyst.
And so that’s the thing about these other functional based methods. And we still have to optimize it. So it’s not mainstream and I think the issue is that patients often then depend on these more functional based methods that don’t have that specificity and then they’re not doing the screening exams that have been proven to and that are still also non invasive and are more effective in detecting that cancer. Doctor Kiran Sheikh is an assistant professor of clinical radiology and biomedical imaging 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. We hope you’ll join us next week to learn more about the fight against cancer here on Connecticut Public Radio. Funding for Yale Cancer Answers is provided by Smilow Cancer Hospital.