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Lung Cancer Screening

Guest Experts:

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Welcome to Yale Cancer Center Answers with doctors Francine Foss and Lynn Wilson. Dr. Foss is a Professor of Medical Oncology and Dermatology, specializing in the treatment of lymphomas. Dr. Wilson is a Professor of Therapeutic Radiology and an expert in the use of radiation to treat lung cancers and cutaneous lymphomas. If you would like to join the conversation, you can contact the doctors directly. The address is canceranswers@yale.edu and the phone number is 1-888-234-4YCC. This week Lynn Wilson welcomes Lynn Tanoue and Frank Detterbeck to the program. Dr. Tanoue is Professor of Pulmonary Medicine, Director of the Winchester Chest Clinic and Medical Director of the Yale Cancer Center Thoracic Oncology Program and Dr. Detterbeck is Professor of Surgery in the Section of Thoracic Surgery, Chief of Thoracic Surgery and Surgical Director of Thoracic Oncology. Here is Lynn Wilson.

Wilson Let us start off by having you both tell us a little bit more specifically what your roles are?

Tanoue I co-direct thoracic oncology with Dr. Detterbeck. I am a practicing pulmonologist and I am part of the multidisciplinary team in the Thoracic Oncology Program. Dr. Detterbeck and I also co-direct the new Yale Lung Cancer and Lung Nodule Screening Program.

Detterbeck I am a practicing thoracic surgeon, so I see patients mostly with lung cancer, sometimes with nodules that turn out not be lung cancer, but that is what I do day in and day out. I am also very involved in a lot of other academic activities and I actually co-chair the ACCP Lung Cancer Guidelines, which are undergoing revision right now.

Wilson Frank, what is the ACCP?

Detterbeck It is the American College of Chest Physicians. It is an organization that among other things has been providing guidelines for quite a while and is viewed as one of the model societies to look to in terms of how evidence based guidelines are done.

Wilson And what sort of guidelines do they provide, things for screening, treatment, who should be evaluated? What sorts of things are offered?

Detterbeck They do guidelines on a lot of different areas, but one I have been involved in for quite a while now, a decade actually, are lung cancer guidelines which involve diagnosis, treatment, basically the etiology, the reasons behind lung cancer, all sorts of different things. We also are currently working on a guideline for CT screening.

Wilson Obviously you both have a tremendous amount of expertise in thoracic diseases and lung cancer. Tell us how common lung cancer is? Is this a substantial problem in the United States?

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- Tanoue Lung cancer is a huge problem in the United States and globally. Lung cancer accounts for more death from cancer than the next three most common causes of cancer death combined; breast, colorectal, and prostate. Lung cancer has actually caused more deaths in women in the United States since about 1985, many more than breast. And globally lung cancer has become an enormous epidemic; more than a million people will die annually of lung cancer in the decades to come.
- Wilson And what are some of the causes of lung cancer?
- Tanoue The factors that contribute to lung cancer vary, but clearly the most important and most common risk factor is cigarette smoking, but there are many other factors that contribute, including genetics. If you have a positive family history your risk is also higher, carcinogenic exposures to things like air pollution, asbestos, radon and so forth, and other work place exposures such as hard metals, for instance.
- Wilson Are we doing any better? I understand there have been some advances in lung cancer in terms of our treatments and diagnosis. Are we doing better today than we were 20 years ago, for example?
- Detterbeck There have been a lot of advances. I will start off in the surgical realm because that is what I do, and the vast majority of operations we do are minimally invasive with very small incisions and the patients typically go home in two or three days and that is a dramatic difference from how it used to be. We have advanced a lot in radiation as well. We deliver much more tightly targeted radiation so that there are a lot less side effects and it is much more effective. There have been a lot of advances in chemotherapy, particularly in targeted chemotherapy, so that identifies a particular mutation in the genes of the cancer cell that are driving that cancer cell to grow and it kind of flips the switch and turns those cancer cells off. It is amazing to me, but there are people with incurable lung cancer that nowadays we can often manage as a chronic disease, something they can live with for years, which a decade ago was pretty much unheard of. So, there have been a lot of advances, and having said that, we still find most lung cancers at a fairly advanced stage, often at an incurable stage, and so, we are kind of behind the eight ball most of time when we discover it.
- Wilson Frank, tell our listeners a little bit about VATS surgery. What is that?
- Detterbeck VATS stands for video-assisted thoracic surgery, so we use a camera, and the size of the camera is about a quarter of an inch, so a pretty small incision, and then some other small incisions are made that are about a half inch in size and we can work through those small incisions inside the chest

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and do all kinds of major chest operations that way. With small incisions like that it is just a very different experience for the patient than what it used to be.

- Wilson I would take it that there is a fair amount of experience that is required to adapt to doing these procedures. It is not necessarily something that you can just read about and start doing, is that correct?
- Detterbeck There is a learning curve and it does take a little bit of time, but it is certainly something that we do as our standard approach. We do this pretty much every day, certainly most of the operations, but it is still the minority of hospitals and institutions that are doing a large amount of VATS thoracic surgery.
- Wilson Lynn, I have heard a lot of information about screening for lung cancer, a lot of things in the news, patients have asked me about it. It seems like there is a lot of chatter, a lot of things are going on. Tell the listeners about what your feelings are and give us some updates.
- Tanoue This has been a really important year for those of us whose work is focused in lung cancer because for the first time it appears that there is a screening intervention that is of benefit in terms of decreasing deaths. The National Lung Screening Trial was published this summer. It was an enormous study that basically demonstrated that screening for lung cancer in high risk and very well-identified high-risk individuals can decrease mortality. Frank, did you want to comment on that?
- Detterbeck I just want to echo that effect. I think it is one of the most exciting things that has come along in a longtime. This was a 20% reduction in lung cancer deaths in the people that were screened with CT and I think if you look at how big of a program lung cancer is, if one intervention here can cause a 20% reduction in lung cancer deaths, that probably is going to turn out to be the biggest single intervention in cancer overall in the past decade or next decade, it is huge.
- Wilson You mentioned CT, Frank. CAT scan was the intervention that was used, not chest x-rays for example?
- Detterbeck Yes, that is right. There actually was another screening study that was also published this year. It is called the PLCO and they looked at chest x-ray compared to nothing and found that chest x-ray actually was not useful. The NSLT study looked at CT scans versus a chest x-ray and found the CT was clearly better than doing a chest x-ray alone. It is not really surprising because the amount of detail that you see on a CT scan is vastly more than what you can see on a chest x-ray.

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- Tanoue So, the fact that there is a screening tool, a low-dose CT scan, is incredibly important. The other three major causes of cancer death all have a screening intervention. Breast cancer has mammography, prostate cancer has PSA, and colon cancer has colonoscopy, but we have never had a tool that we could use to identify patients with lung cancer at early stages and as Frank already pointed out, most of the lung cancer cases that are diagnosed today are late stage and at that point our ability to intervene and extend life and cure is limited, but if we can find more patients with early stage disease, we have a much better chance of longer survival and even cure for those patients.
- Wilson This seems like it is something that everybody should be thinking about, a slam dunk so to speak, but there must be some other issues that potentially could be downsides. Are there issues with cost? What happens if you find something on someone's scan, it is not lung cancer but it may be some other problem and it is benign, and there costs and things associated with chasing that around. What are some of the other issues?
- Detterbeck It is very complex, and so to illustrate it maybe a little, when we talk about people who are at risk for lung cancer and should be screened with a low dose CT, we're generally talking about something like a risk of 1% over 10 years, maybe 2% or 3%, but somewhere in that range, and so if you start to think about it, a 1% risk over 10 years, if we start doing annual CT scans, each year there are going to be a lot of people that are getting a lot of CT scans with very few that actually are destined to develop lung cancer. So, that is a problem, but looking at it differently, there is a 20% reduction in lung cancer mortality, and that is huge, but if you look at it over a population of people, for example a thousand that are getting screened with low dose CT, you are actually only going to prevent three lung cancer deaths in that thousand patients. That is because most of those thousands patients are not going to get lung cancer. So that is one of the difficulties, we are doing a lot of scans. Now the other problem is that when you do a CT scan, in about 25% to 50% of those people, you will find some small abnormality, and those abnormalities, or the vast majority of them, are nothing, but you find something. So, now what do you do? We have to deal with that, you have to figure out what to do. So those are complexities that make it not quite so simple to implement.
- Tanoue As a pulmonologist, I think that latter point is incredibly important. We know from the National Lung Screening Trial, as well as many other studies that looked at CAT scans as tools for screening in patients who were high risk on the basis of smoking for instance, that in the NSLT its 25%, and in other studies 50% or even more of individuals, would have at least one abnormality found. So, if an individual undergoes a CAT scan screen, it is, unfortunately, very likely that there will be something found that is not normal and the important thing to remember is that the vast

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majority, 95+ percent of those, are going to be benign, but those abnormalities need to be evaluated and they need to be evaluated by a physician who understands the nuances of the individual patient, the scan, the risks, and so on.

Wilson Based on the data that has become available is this something that you are both instituting in your clinics now? Is this something you feel is standard? When you come across a patient who would fit the screen criteria, is it something you are recommending?

Tanoue We have actually put together a new program at Yale Cancer Center, a lung cancer screening program, to address this issue for patients who should be screened for lung cancer.

Wilson That is terrific. We were going to take a short break for a medical minute. Please stay tuned to learn more information about screening for lung cancer with Drs. Tanoue and Detterbeck.

*Medical
Minute*

There are over 12 million cancer survivors in the United States right now and the numbers keep growing. Completing treatment for cancer is a very exciting milestone, but cancer and its treatment can be a life changing experience. The return to normal activities and relationships may be difficult and cancer survivors face other longterm side effects of cancer including heart problems, osteoporosis, fertility issues and an increased risk of second cancers. Resources for cancer survivors are available at federally designated comprehensive cancer centers such as one at Yale Cancer Center, to keep cancer survivors well and focused on healthy living. This has been a medical minute, brought to you as a public service by the Yale Cancer Center. More information is available at yalecancercenter.org. You are listening to the WNPR Health Forum on the Connecticut Public Broadcasting Network.

Wilson Welcome back to Yale Cancer Center Answers. This is Dr. Lynn Wilson and I am joined by my guest today Dr. Lynn Tanoue and Dr. Frank Detterbeck and we are discussing screening for lung cancer. Lynn and Frank, in the first part of the show we covered a fair amount of ground and it sounds like there is a tremendous amount of exciting information and a lot of advances that have happened with lung cancer, but let's drill down and be a little bit more specific. I would like to hear more, and I am sure the audience is interested in some of the details associated with the Lung Cancer Screening and Pulmonary Nodule Program here at Yale and at Smilow. Can you tell us a little about that?

Detterbeck In screening I think that the details are incredibly important, how you set this up, who you screen, how you interpret the scans, and what you do with all the little nodules that you find, and I think

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you have to be really careful that it is done well. I think there is a huge potential for benefit with screening. We have already talked about that, but if you are not careful about the details, there is also a big potential for harms, for unnecessary procedures, for radiation, for biopsies that people do not need. So, I think that those details are incredibly important and that is what we spend a lot of time actually paying attention to.

- Wilson Lynn, when someone calls or wants to get in to see you, and I know you have got a busy schedule, how does that happen? Talk me through that process. Someone has heard the show, for example, and they are interested in being screened.
- Tanoue The Lung Cancer Screening Program number, for anybody who wants it, is 203-688-LUNG, which is 5864 that is actually the main number for the thoracic oncology program. For the Lung Cancer Screening Program when we do a phone intake, we ask the individual about their risks. The National Lung Screening Trial clearly identified a population which we would say is the population that should be screened and those individuals in that study were ages 55 to 74, and they had smoked 30 pack years or more, and a pack year of smoking is essentially the equivalent of one pack per day for a year. Those individuals also did not have a prior history of lung cancer and the National Lung Screening Trial really did not take into consideration other lung cancer risk factors such as family history, occupational exposure, emphysema and so forth that we discussed before, and I think what we can agree on from the get go is those individuals ages 55 to 74, 30 pack years of smoking, no prior history of lung cancer, should be screened.
- Wilson If, for example, I am younger than that but have a 60 pack year history of smoking and I' am really worried, does it mean that we can at least have a meeting to talk about it, what do you recommend to that sort of person? I realize there are a lot of people who probably fit the criteria just right but I can also imagine there are probably a lot of folks that you might, on an individual basis, feel are at high risk, but do not fit the criteria.
- Tanoue Absolutely, and I think you have identified the big problem, that we do not know about all those populations, we do not know if CT screening will decrease their lung cancer death rate, but certainly, they should have screening considered, but that should probably be done on an individual basis, and for that sort of evaluation we will be happy to see those individuals. Risk modification is going to be a big part of that evaluation. For instance, smoking cessation has to be part of the equation for somebody who is a heavy or even a light ongoing smoker.
- Detterbeck That really gets to one of the aspects of what we believe to be a part of a well-organized

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comprehensive screening program, you have a good way of assessing risk, modifying risk where you can modify it, and not just have some flat criteria, and we will be able to discuss that and go through that. There are a number of risk models out there that kind of determine what somebody's risk is likely to be and I think that there are a lot of people that are worried about lung cancer, but I think if you can really do a careful risk assessment and then give them some information about what the risk actually is, if it really is so low that it is unlikely that screening is ever going to make a difference, I think they feel more comfortable if they know what their actual risk is likely to be, rather than just have no idea. That is definitely part of the program, to do an evaluation of that and to try to sort that out together with them and I think that goes a long way towards making people more comfortable that they are making the right decision with you about whether or not to have a screening CT.

Wilson Once we have someone identified who fits the criteria and everyone is comfortable with moving forward with screening, talk to us for a minute or two about quality control, do CAT scans look different at different institutions and different hospitals, are they all the same? How do we account for those potential differences in quality?

Tanoue It is important to recognize that screening should be done with low dose radiation. The amount of radiation that is delivered with the CT scan can be quite variable. There have been lots of publications that document that, and in NLST there was a very strict protocol on how the low dose CT scan was performed to ensure that the amount of radiation was indeed low dose. So it is very important that that protocol, that radiation physics protocol, be worked out if a hospital or group is going to offer low dose CT screening. An annual CT for a lifetime could confer potentially a lot of radiation and that is something that has to be considered, that the risk of that radiation, even if it is low in terms of its own cancer risk, it is a factor.

Wilson Let's take a patient who comes into your program, and you feel is a good candidate. They get screened. What happens at that point? What sort of follow-up program is there for the patient? What exists for your plans?

Tanoue Predictably 25% of those individuals will have an abnormality on that scan that will need to be evaluated. I will get to that later. The other 75% who have a negative screen do not need another study for a year, and that would be following the protocol of the NLST. For the 25% of people that we anticipate will have an abnormality, a very small minority will actually have a cancer, and that is the medically challenging part, and that is the reason we have put this program together, because that evaluation requires education on the part of the patient by our team planning for diagnostic evaluation if it is indicated, or watchful monitoring if that is deemed appropriate and then follow-up for that patient with those abnormalities.

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Detterbeck I just want to jump in there, I think if the scan is done well, and we already touched on quality controls and so forth, but for a large majority of those people that have one of these abnormalities picked up on the CT scan, you can actually quite confidently tell that this is not a nodule that we need to really do anything about. We can just do another scan down the road and if you are careful about how you have done the scans, and you are careful about your system of what you are looking for and when to get worried about it, actually, the majority of those people do not have anything to worry about. That is important, as I said, the details are important because if you start chasing down every single nodule, that ends up being on a lot more interventions, a lot more radiation, you know, a lot more issues, and for most people you can sort through whether this is something that needs to be worried about and chase down further, or if it is something that you can just leave alone and look at again in a year or maybe in six months.

Tanoue I would like to point out that, that evaluation is best done in a multidisciplinary fashion, the way we discuss the patients who have lung cancer at a tumor board, and the physicians that would be participating in that sort of nodule board, if you will, would be pulmonologists and thoracic surgeons, radiologists, potentially pathologists, people who comprise the regular tumor board, but in this case the focus of the discussion would really be to address the points Frank is identifying, of which of the nodules is extraordinarily unlikely to ever cause a problem and we would reassure those patients not to worry, or which of the nodules is likely to cause a problem, or of enough concern that they should be monitored closely, and when that sort of opinion is rendered by a collective group of experts, it is a much stronger and well founded opinion for the patient.

Detterbeck I think the advantage of the tumor board is that you have the benefit of a collective judgment and collective wisdom. Everybody has their own area of expertise, but if you can put a bunch of areas of expertise and judgment coming from a lot of different angles together, I think that is much better.

Wilson That is one of the advantages of the thoracic oncology program at Yale. It is not a matter of you seeing a patient, Frank, and then calling me up or calling Dr. Tanoue up, but everybody is in the room together looking at everything at the same time, all of the cases on a very, very regular basis. Let us jump over to smoking for a minute, you both mentioned it, it is obviously critically important. Smoking is probably responsible for Lynn, what would you should say, 85% to 90% of lung cancers maybe?

Tanoue It is a part of at least that many patients.

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- Wilson Obviously it is really critical for smokers to try to quit smoking and it sounds like it is also an essential piece of any sort of screening program. Give us some more of those details?
- Tanoue We have known since the 1950s that cigarette smoke is linked to lung cancer. It wasn't until 1964 that the Surgeon General's report came out stating that in the United States and since that time the number of people smoking in the US has certainly dropped, but we are stuck at about 20% of adult Americans are habitual smokers and we have absolutely got to decrease that number. It is very hard to quit smoking and that is why people keep doing it, even though there is no question of the health hazards of the habit. We are really fortunate at Smilow to have a very robust smoking cessation program, which is intimately linked to the Lung Cancer Screening Program. Dr. Ben Toll is the lead on that and we have smoking cessation as the risk modifying intervention for anybody who comes to our program who is still smoking.
- Wilson Could you both comment, we just have about a minute left, but in terms of spectrum of disease, lung cancer, I think historically, has always been something that many have considered extremely dreadful, but we have made a lot of advances. There are a lot of new treatments that are very successful. Screening obviously is now an important part of the picture. Frank, what are your thoughts on spectrum of disease, now, compared to 10 to 20 years ago?
- Detterbeck It is definitely changing and we used to always think of lung cancer as just one thing, it was bad and it was all the same and so forth but there actually is a spectrum. There are some cancers that are fairly well behaved and they are not that aggressive and then there are some that are very aggressive, and one of the issues I think with screening is that you pick up a disproportionately higher number of those less aggressive, more well-behaved tumors, and I think that that is another thing that we have to be careful about that we intervene in an appropriate way and do not fire a cannon at a mosquito, but take that into account when we define a lung cancer and going about trying to treat this.

Dr. Frank Detterbeck is Professor of Surgery in the section of Thoracic Surgery and Surgical Director of Thoracic Oncology at Yale Cancer Center and Dr. Lynn Tanoue is Professor of Pulmonary Medicine, Director of the Winchester Chest Clinic and Medical Director of the Yale Cancer Center Thoracic Oncology Program. If you have questions or would like add your comments, visit yalecancercenter.org, where you can also get the podcast and find written transcripts of past programs. You are listening to the WNPR Health Forum on the Connecticut Public Broadcasting Network.