

Yale CANCER
CENTER

answers

WNPR Connecticut Public Radio



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Detection and Interventional
Techniques for Lung Cancer

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Yale Cancer Center Answers

is a weekly broadcast on

WNPR Connecticut Public Radio

Sunday Evenings at 6:00 PM

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Welcome to Yale Cancer Center Answers with Dr. Ed Chu and Francine Foss, I am Bruce Barber. Dr. Chu is Deputy Director and Chief of Medical Oncology at Yale Cancer Center and Dr. Foss is a Professor of Medical Oncology and Dermatology specializing in the treatment of 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 1888-234-4YCC. This evening Ed welcomes Dr. Jonathan Puchalski and Dr. Lynn Tanoue for a conversation about lung cancer. Dr. Puchalski is an Assistant Professor of Pulmonary Medicine and Dr. Tanoue is a Professor of Pulmonary Medicine.

Chu Why don't we start off with may be a kind of brief overview on lung cancer and Jonathan or Lynn may be one of you can kind of tell our listeners kind of what's the magnitude of the problem with respect to lung cancer.

Tanoue Lung cancer is an enormous health problem in the United States and in the world. It is the leading cause of cancer death in our country and globally and in the United States about 160,000 people will die this year of lung cancer. It is not as common a cancer as breast or prostate, but it unfortunately does cause more death.

Chu And, I guess in terms of risk factors we commonly associated smoking with lung cancer. Is that the only cause or are there perhaps other causes of lung cancer as well?

Puchalski There are other cause smoking is by far the leading cause, but lung cancer does occur in nonsmokers. There can be different occupational exposures such as asbestos, radon, not radon you see in the home, but other exposures that cause lung cancer. So, smoking is certainly the number one risk factor, but there are others.

Chu And this incidence of secondhand exposure, so you know, perhaps relatives or loved one who don't smoke, but are exposed to someone who is a big smoker, it that a real problem or is that kind of more hyped up than what is reality?

Tanoue Well, I think secondhand smoker, passive environmental tobacco exposure is important and fortunately in this country, we have made in-roads in prevention of that. I think if you put it in perspective, the increase in risk from passive tobacco exposure is about double, what it would be if you didn't have that and you have to put that in the context of primary cigarette smoking, so somebody who is smoking themselves, the risk increases 600 plus fold. So, I think it is a real but small risk.

Chu And I have heard it said that if we would eliminate smoking altogether, we could pretty much eliminate the vast majority of cases of lung cancer, is that correct?

Tanoue That is true. In the United States, still more than 90% of cancers in men of the lung and only an access of 80% in women occur in smokers, but we know that 15% or more percent of lung cancers

in women occur in nonsmokers and in the rest of world the incidence of lung cancer in nonsmoking women is considerably higher particularly in Asia. So, I think if we could eliminate smoking, which will be a great thing, the majority of lung cancer would go away, but it wouldn't become zero, and I think it's important to recognize that for women in particular if you look at the absolute number of women in the US who die of lung cancer who are nonsmokers, it actually exceeds the number of women who died of ovarian cancer. So, it is a large number.

Chu And Lynn what do we know about the underlying cause of lung cancer in those Asian women, is it a genetic component or?

Tanoue Genetics definitely seems to be a part of it. We know a lot more about molecular biology of lung cancer than we used to even five years ago. You would be an expert in things like that. In Asia, there is a very high prevalence of a particularly gene in a molecule called EGFR and that seems to predispose. Those mutations seem to predispose those women to getting cancer. Those women also have different exposures. So, for instance in many Asian countries women still cook over open flame with different sorts of oils and those volatilized oils have carcinogens in them. I think we are just starting to understand that why people who don't have the most common risk factors of smoking get lung cancer.

Chu And Jonathan, a question for you, if a person, who say was a heavy smoker, quit smoking 10-15 years ago, does the risk factor for developing lung cancer go back zero or is there still kind of a residual, you know, increased risk for individual to develop lung cancer down the road?

Puchalski So certainly it decreases, people who stop smoking for those people its certainly advantages to do so because the risk drops off after about 10 or 15 years, and the further and further way the lower and lower the risk, but is always somewhat elevated compared to a nonsmoker.

Chu And also does the risk of lung cancer increase in say someone who has underlying lung disease or does it really not matter whether or not may they have, say bronchitis or emphysema?

Tanoue You know all of those things matter, risk factors for lung cancer are additive. So, for instance if you smoke and you have emphysema, the risk of the lung cancer is more than just the smoking and more than just the emphysema. There is some risk that seemed to multiply each other asbestos, and smoking seem to behave in that way, but the more your risk factors are, the higher the likelihood unfortunately that you will get it.

Chu Okay, and what are the types of symptoms that one would began to get a little concerned that perhaps there might be a lung cancer growing?

Puchalski So, there is not necessarily a specific symptom and just because somebody has one of the symptoms that I am going to mention, certainly does not mean they have lung cancer. It can be

just actually fairly common respiratory symptoms or person may simply have a cough. Sometimes they may notice by coughing a blood, they may feel short of breath, more short of breath than usual and may have a new wheeze. These types of more common respiratory symptoms those certainly are nonspecific to cancer. A lot of times people are completely asymptomatic and it may just be discovered at whatever stage.

Chu Yes, so the symptoms that you just mention, really sound like the symptoms that would be associated with kind of normal pulmonary respiratory illnesses and not necessarily cancer.

Puchalski Yes. That's right.

Tanoue I think it is important to remember that we all get those symptoms, but persistent cough, persistent shortness of breath, chest pain things that I think and we all recognize that its not normal to have the symptoms persist for weeks or months. That's should trigger a call to your doctor.

Chu Yes, I was just going to ask, so when you say persistence, and Lynn for our listeners out there. So, if the cough or shortness of breath or wheeze last for, you say, one month, two months that they should go and may seek medical attention, longer than that.

Tanoue I think for somebody who coughs or wheezes regularly. Lots of my patients who have underlying lung disease, they would notice a change, I think in the quality or that intensity of those symptoms. For somebody who never has those symptoms often those are, you know, in the context of a simple respiratory infection, but they would resolve then usually within the span of a week to several weeks, and if it last longer than several weeks, I think again that's worth a call to your doctor or a visit.

Chu And the person that, that individual should call would it be the primary care general internist or should they actually go ahead and seek the attention of a lung specialist like the two of you?

Puchalski I think it's always important to maintain the relationship with you know the physician who knows them best and certainly all physicians are well aware of it and so I think that if there is something unusual, something that still has not been able to be figured out, they could easily be referred thereafter, but maintaining their communication and visits with their primary care physician are essential.

Chu So, an individual with new symptoms, persistence symptoms goes to see their primary care physician and then what would the process be from there?

Tanoue It is easier for the patient and probably more efficient for their physician to call because there is always a need for transfer of information and that patient's physician is probably the person best able to put that in a context that will get the patient the appropriate care quicker more efficiently

and without the patient having to do a lot of that leg work. I think at a time when an individual may be very concerned about the possibility that there is something bad going on like a lung cancer, that's the time their own physician can really help them most is to make that referral easier and let the patient deal with just getting to the appointment and not worrying about transferring information.

Chu And, what types of tests would be done to try to figure out what's going on in that patient with symptoms?

Puchalski Usually, one of the first tests is going to be a chest x-ray to see what's going on. Although, other tests depending on the circumstance may be needed, but usually the first test is going to be a chest x-ray.

Chu Now, I am just curious, so you know, for colon cancer we have got the colonoscopy and for breast cancer we have mammography and obviously for cervical cancer we have, you know, the Pap smear. You know, is there such a screening early detection test for lung cancer?

Puchalski There a lots of, there have been lots of investigations into this, but so far there has not been a test that has been able or that's been proven to detect lung cancer cells. Over the past several years, many investigators were looking at the role of CAT scans for screening, but that really did not pan out yet and at least it is recommended by the American College of Chest Physician, ACCP, its not recommended to routinely get a CAT scan unless one is particularly involved in a trial or something else within the medical community, but just go out request a CAT scan really has not been proven to be efficacious.

Chu And I guess in that regard a kind of a routine chest x-ray would also not be a very reliable test for trying to pick up an early lung cancer?

Tanoue There have been lots of studies actually looking at that and you think that that would be the case that having routine x-rays should pick up lots of cancers and it turns out that's not actually true and the studies really date back all the way from the 1970s to the present and they don't seem to be able to decrease the mortality associated with lung cancer, and unfortunately what chest x-rays and CT scan thus far have demonstrated is, is that they pick up a lot of small abnormalities, the vast majority of which are benign, but evaluation of those small abnormalities creates a lot of worry, a lot of medical intervention, and so we are still with lung cancer left in this limbo where we don't have a good screening evaluation, which I think points out that your relationship with your primary physician and maintaining good heath and good health maintenance is really key.

Chu And, so will the same recommendations hold also for say an individual who might be deemed or felt to be high risk for developing lung cancer?

Tanoue Those are the recommendations because the studies were actually done in people who are identified as having risk. So to put that in perspective, the more recent studies were done looking at CT scanning in people who smoked and so they all had the major risk factor, which was cigarette exposure, and in those individuals depending on where the study was done in this country around the world between 12 to over 50% of individuals on a single CT would have abnormalities. Its a lot of abnormalities and of those an access of 98% were benign and so the vast-vast majority of people who entered those studies who were found to have abnormalities, which were actually most of them ended up undergoing sometimes very invasive evaluation for what was benign disease and so the lesson from that is that CT scanning is very sensitive, but it is not a good screening tool. There is a big study going on right now in the US that just is completing enrollment and it is evaluating chest x-ray versus CT scan again as screening tools in people who have smoked, and the results of that National Lung Cancer Screening Trial, the NLST should be out within the next year or two.

Chu Well great, so it will be interesting to see what those results turn out to be?

Tanoue So, there is definitely news coming down the road that we are very anxious to hear about.

Chu Great, well you are listening to Yale Cancer Center Answers and we are here in the studio this evening discussing lung cancer with doctors Dr. Jonathan Puchalski and Dr. Lynn Tanoue from the Yale School of Medicine.

*Medical
Minute*

It is estimated that over 2 million men in the US are currently living with prostate cancer. One in six American man will develop prostate cancer in the course of his lifetime. Major advances in the detection and treatment of prostate cancer have dramatically decreased the number of men who die from this disease, screening for prostate cancer can be performed quickly and easily in a physician's office using two simple tests, a physical exam and a blood test. Clinical trials are currently underway at federally designated comprehensive cancer centers like the one at Yale to test innovative new treatments for prostate cancer. Patients enrolled in these trials are given access to experimental medicines not yet approved by the Food And Drug Administration. This has been a medical minute and you will find more information at yalecancercenter.org. You are listening to the WNPR Health Forum from Connecticut Public Radio.

Chu Welcome back to Yale Cancer Center Answers this is Ed Chu and I am here in the studio with Dr. Jonathan Puchalski and Dr. Lynn Tanoue from the Yale School of Medicine, the Yale Cancer Center discussing the role of detection screening and treatment of lung cancer. And before the break we were talking about the role for early detection screening for lung cancer and we were talking about say an individual who may new symptoms or persistent. So Jonathan, as you were saying that individual will get a chest x-ray and say for instance an abnormality was seen, say a mass was seen on the chest x-ray. What would be the next step taken for that individual?

- Puchalski So, I think most of the time after that patients will get additional tests of course and that's often a CAT scan of the chest, possibly other tests such as a PET scan depending on the exact circumstance but to further determine what that mass looks like on a more sensitive test or a high resolution test per se. The CAT scan is often the next step.
- Chu And so CAT scan is done, visualizes, and confirms that a mass is present. What's next?
- Puchalski So usually at that point in time, the patient is going to be referred on for additional tests to figure out exactly what it is. Certainly, not all generic masses are going to be cancer. There can be a host of things. And so the next step is often going to entail tests specifically confirm what's been found on those radiographic imaging and there are a lot of newer diagnostic modalities available that can really facilitate obtaining a specific diagnosis for these masses.
- Chu Now, you are the head of the Thoracic Interventional Program and you have been actively involved in trying to develop some new technologies. May be you can tell us a little bit about that.
- Puchalski So, it's really an exciting time for these new technologies and for pulmonary and really all those who deal with lung cancer. There have been a lot of really revolutionary developments that have come to the forefront over the past several years that enable us to better diagnose these areas and often that's done through something called a bronchoscopy and the bronchoscopy is similar in some respects to what everybody has heard, say you have a colonoscopy, which looks up the colon and bronchoscopy simply looks at the airways leading to the lungs, but rather than being limited just to the airways that we can see with the bronchoscope, these new technologies have really allowed us to look beyond the airway walls and further into the lungs themselves to find these masses that have been found on your CAT scan or your x-ray. So, there are several technologies including endobronchial ultrasound something called electromagnetic navigation and various other tests that will let us better diagnosed lesions by being able to find these lesions with the bronchoscope and direct our biopsies and other means of diagnosing the masses more accurately.
- Chu So at Yale, if someone would come to you, so would anyone with a suspicion for lung cancer undergo these procedures?
- Puchalski Usually it's the next test and it certainly depends on where in the lungs this is. So, sometimes its more appropriate to get a biopsy through a CAT scan, CT-guided biopsy, but with evolution of these new technologies, we can actually diagnose things within the middle of the lung and even far out into the lung by being able to direct ourselves with this endobronchial ultrasound and electromagnetic navigation.

- Chu And I am sure people who are listening there this evening might ask the question, you know, is there any potential danger in undergoing any of these procedures or you know any pain or discomfort that a patient might experience?
- Puchalski So it's very, not only is it exciting to have the technology but these procedures are very low risk. The complication rates from these is extraordinarily low and so compared to more invasive techniques that have been employed in the past, we are now able to not only obtain the diagnosis more accurately but also on a very safe environment. So, the complication rates are very low.
- Chu Great. And Lynn once a diagnosis of lung cancer is made, well I guess may be first question is, is lung cancer just one disease or are there many different diseases or subtypes within lung cancer?
- Tanoue Well, we certainly understand a lot more about biology of lung cancer than we used to, although I think we still have a lot to learn. So, lung cancer is divided into two big groups, small cell, which includes about 10% to 15% and non-small cell, which is the rest. And in the non-small cell category, in particular since that really affects most patients, we are really beginning to be able to define differences in subgroups within that bigger category and than it is starting to have major implication for treatment, prognosis, outcomes, and so forth. So, its very important that the diagnostic piece is done very well, very thoroughly so that gives the patient the most options and the best options for directed care. So the kinds of biopsies that Jonathan is able to do now really allows us to define histology, to define the pathology of the cancer without having to do a surgery and I cannot emphasize how much these minimally invasive bronchoscopic techniques have really changed our ability to do that sort of comprehensive evaluation often without any surgery in our patients. So, histology is very important because it increasingly affects the kind of treatments that are offered to the patient.
- Chu And I guess, you know, one of the real important aspects of approaching a patient with lung cancer is the multidisciplinary nature and obviously as co-director of the thoracic oncology program, it really is a multidisciplinary effort and may be you can tell us a little bit about that Lynn.
- Tanoue So, we put a lot of effort into creating this multi-specialty group a number of years ago and we practiced together, we see patients together, and we discussed them at tumor board together. And except for the very earlier stages of lung cancer, most patients will receive care from multiple specialties. So, often the diagnostic part falls to Dr. Puchalski and myself and other pulmonologists and then we stay involved through the care, because many of these patients do have underlying pulmonary disease that can become tricky during treatment and after. And most patients will require input from surgeons and radiation oncologist and medical oncologist. So, its very important that that care be very coordinated, so that the patient isn't running back and forth and where we put the program together we envision this as like a bicycle wheel with the patient in the middle and my concept ten years ago was that watching my patients was like watching them run up and down the spokes of this wheel without a tire around it and so its the patients

responsibility to run to the oncologist and run to me and run to the surgeon. And at a time, when they were emotionally and physically very stressed that was really awful thing for them and so the thoracic oncology program like all the multidisciplinary programs, the disease center programs at the Yale Cancer Center puts the wheel on, puts the tire on, so that the patient can stay focus in the middle and we run around the patient rather than the other way around. And again because the care for lung cancer like the care of almost every cancer is getting much more complicated now that there are different therapies and now that we know that its not one disease. I think these multidisciplinary groups are absolutely critical to streamlining the best care for our patients and all patients with cancer.

- Chu And I guess, one of the important aspects of your program is that you and the surgeons, the medical oncologists, the radiologists, pathologists, are all seeing the patients together, in the same clinic, at the same time.
- Tanoue Absolutely.
- Chu If it is really important.
- Tanoue And we have a nurse coordinator and we have a social worker and we interact with palliative care and all facets really of the medical center and again as the care has become better, it has become more complex and so I can't imagine being a patient and trying to negotiate all of these different roads without a navigator and we see ourselves really as providing that role and we try to make this as little stress as possible recognizing that anybody who has a diagnosis of cancer, it's a very difficult time for them.
- Chu And so, diagnosis of lung cancers may _____ and so what would be kind of I guess just in broad strokes the different types of treatments that would be available for that patient.
- Puchalski So, the general treatments would be either surgery for early stages ranging up to chemotherapy, radiation therapy, combinations of those therapies, and then for advanced stages where even additional treatments are necessary. There can be bronchoscopic therapies that may help a patient breath easier, so those include things like airway stents or laser surgery or things that really improve the opening of airways so that the patients can breath easier. So, there is a whole range from complete care to palliation of more severe symptoms.
- Chu And if an individual is say being considered for surgery, does one need to consider whether or not you know there is preexisting lung disease and how the lung is functioning?
- Puchalski Sure and we as part of comprehensive evaluation for that patient certainly their lung function is evaluated. There are other tests such has pulmonary function test to look at how well the patient can breath and various other factors that are accounted for prior to undergoing a surgery.

- Chu And to say a patient undergoes surgery, the lung cancer is removed, what are the recommendations for followup of that patient?
- Tanoue We will follow that patient typically every six months for the first three to five years. Unfortunately, the patients with lung cancer can relapse and when that occurs it most commonly occurs within the first two years after the cancer so we tend to watch our patients very carefully during that period of time. And then beyond the five years, there are not good rules for that, but typically our standard of practice is that we will do some imaging study typically a chest x-ray thereafter on an annual basis because that patient is identified at a different risk and unfortunately anybody who has had one cancer is at high risk to have a second and in our patients with lung cancer that second lung cancer if it occurs is most likely to be in the lung again. So, that we have tried to create policies for ourselves for our thoracic oncology program even if national guideline don't exist and we are trying to contribute to the formation of those sorts of guidelines so that the care of these patients can be more standardized.
- Chu Great and in the 30 seconds that we have left, Jonathan are there any indications for say chemotherapy or radiation therapy after a surgical procedure or surgical operation has been performed?
- Puchalski There can be and it all depends on the exact case and the exact staging and it's a little bit more difficult to get into those exact scenarios now, but there are lots of different possibilities in the treatment and I think that's why its important to be involved in a comprehensive program where there are people from multiple specialties who all have an eye on the patient.
- Chu Great, and may be Lynn in the last few seconds for anyone who is interested in contacting the thoracic oncology program may be you can tell us the number again.
- Tanoue So, our main number and you can reach any of us through this number or schedule a visit is 203-688 LUNG, which is 5864 and our program coordinator will direct you to the right physician or give you an appointment to see us.
- Chu Great, well it's remarkable how quickly the time goes you know it will be great to have both of you come back to hear more about the thoracic oncology program and the thoracic interventional program.
- Tanoue Thanks it's been a pleasure.
- Puchalski Thank you very much.

Chu You have been listening to Yale Cancer Center Answers and I would like to thank our guests this evening Dr. Jonathan Puchalski and Dr. Lynn Tanoue for joining me this evening. From the Yale Cancer Center, this is Ed Chu wishing you a safe and healthy week.

If you have any questions or would like to share your comments, go to yalecancercenter.org where you can also subscribe to our podcast and find written transcripts of past programs. I am Bruce Barber and you are listening to the WNPR Health Forum from Connecticut Public Radio.