Welcome to Yale Cancer Center Answers with your hosts doctors Francine Foss and Anees Chagpar. Dr. Foss is a Professor of Medicine in the Section of Medical Oncology at the Yale Cancer Center and is an internationally recognized clinician and clinical researcher. Dr. Chagpar is Associate Professor of Surgical Oncology and Director of the Breast Center at Smilow Cancer Hospital at Yale-New Haven. Yale Cancer Center Answers features weekly conversations about the most recent advances in the research diagnosis and treatment of cancer and if you would like to join the conversation, you can submit questions and comments to canceranswers@yale.edu or you can leave a voicemail message at 888-234-4YCC. This week you will hear a conversation about lung cancer with Dr. Gaetane Michaud. Dr Michaud is Associate Professor of Pulmonary Medicine at Yale School of Medicine. Here is Dr. Anees Chagpar.

Chagpar Let's start off by having you tell us what exactly it is that you do?

Michaud I am a lung doctor that specializes in cancers that affect the lungs, it can be either a primary lung cancer or it can be a breast cancer or lymphoma, any other type of cancer, that can go either to the lungs or the chest cavity.

Chagpar There are many different kinds of lung doctors. There are doctors who read x-rays, there are doctors who do surgery, and there are doctors who give chemotherapy, is there a particular brand of lung medicine that you do?

Michaud Yes, I am what is called an interventional pulmonologist, which means that I spend a lot of time doing procedures with the aim of either diagnosing cancer or doing sort of local treatments on cancer, so oftentimes I will use a laser to core out cancer from the windpipe to be able to help people breath better or to keep them from bleeding. I also do a lot of procedures in the chest cavity to remove fluid so that the lungs can expand and people can breathe more normally.

Chagpar Laser treatments for lung cancer are not something that we often hear about. Tell us more about how that works, is that something that every lung cancer patient can get? How do people get to you?

Michaud I see patients that are referred by my colleagues, by medical oncology, by radiation oncology, or alternatively by the thoracic surgeons. More often than not, when treating more advanced stage cancers is when we would use the laser because the tumor has spread to the point that it either pushes on the airways or invades the airways and blocks them, so it is usually for either stage

III or stage IV cancers that have affected the lungs and the windpipe. Often I am referred patient's that are already known to, in my case, Smilow Cancer Hospital and so I help my colleagues by helping the patients open up the airways and breath more comfortably.

Chagpar Is this what you would think of as a palliative modality, something that helps peoples' quality of life rather than being more curative, or does this have a role in curing cancer?

Michaud Usually what I do is palliative. I do not actually change the duration of someone's life, but usually it has a big impact on how they live the rest of their lives. There is nothing more frightening than

3:27 into mp3 file http://yalecancercenter.org/podcasts/2014_0323_YCC_Answers_-_Dr_Michaud.mp3 either suffocating or bleeding to death and so that is how I got into this field, I noticed very early in my pulmonary career that it was very disturbing to me to see people having trouble with their breathing, and so I took it upon myself to be one of the first people in my country, I am from Canada, to go into this field. I was the second person in Canada trained and was one of the first women in North America to do this type of pulmonary medicine, and I trained overseas because at the time that I got into this area there were not any training programs in Canada and there were only two training programs in the US.

Chagpar So this is not something that you can get at your local pulmonary doctor?

Michaud No, there are a few centers of excellence in the United States. Previous to coming to Yale I was at Harvard, which at the time was the highest profile institution and for the most part these types of procedures have been around for about 10 years, so although I am not very old, I am kind of one of the most senior people in my field.

Chagpar Let's broaden the discussion a little bit, what if you are unfortunate enough not to be in the vicinity of a center of excellence and you happen to have lung cancer and it happens to be compressing your windpipe or you are bleeding from it, what happens to those people if they cannot avail themselves of the kinds of therapies that you offer where you can actually impact their quality of life? Is surgery an option for these people, is chemotherapy an option or is it just kind of, "well, we are very sorry but that is the way it is."

Michaud Oftentimes chemotherapy does not work fast enough. In some cases, if you have small cell or in some types of lymphoma, you can give chemotherapy and you just have to bridge the gap until those therapies work, but for the most part, the chemotherapy is a little bit too slow. There are radiation options. The concern about some of the radiation is that you can get swelling from radiation, so if you have a critical blockage, you have to be very careful giving radiation alone because you can get swelling and it can actually worsen a blockage. There are some surgeons that do these types of procedures, but as far as pulmonologists are concerned, we have been a little bit slow to the game and the way this specialty of pulmonary medicine came about was in Europe. They had too few thoracic surgeons and so what ended up happening was pulmonary physicians, out of necessity, learned to do procedures that traditionally were considered thoracic surgery procedures. So there are thoracic surgeons that do some procedures, usually it does not involve an operation. We try to avoid taking people that have advanced stage cancers to the operating room because the last thing you want is to put someone through a big operation that is not going to improve the duration of their life and a lot of these palliative procedures have now been taken over by the pulmonologist. There are an evolving number of centers and we actually have a training program here at Yale to train other physicians in how to do these procedures. Historically, over the last ten years, this has been a moving target and we have been training people who have been populating the larger centers. If you live in an area where the services are not necessarily

available, there is usually a center within fairly close proximity, that will accept your care and we certainly take people from all over Massachusetts, all over the state of Connecticut, New York, etc., and we work a lot by referral from other hospitals and transfers from other hospitals.

Chagpar Tell us more about these procedures. Are these things that can be done as a day procedure or are these longer duration procedures that require overnight stays in the hospital, how does that work?

Michaud It varies. Some patients are very sick and in other institutions and require life support even to bridge them till they can have a definitive procedure performed. Other times, they are outpatient and we bring them in for a day procedure. It really depends on the severity of the disease itself, what other

comorbid illness they have, other associated illnesses they have, and the degree of blockage, obviously. For people that have a small amount of blockage, but do need management because they are bleeding, those usually are not a big deal, we can do those as a day procedure. People that have really big blockages and require some life support for a day or two, those tend to be more intensive procedures, but usually we get our procedures done in a couple of hours.

Chagpar We have talked a little bit about procedures, but we have not really defined what the scope of the procedures is. You mentioned laser beam as one of them, what are the other things? What are the other tools in your toolbox to make the lives of lung cancer patients better?

Michaud We do a lot of drainage procedures. When patients have more advanced stage cancer it can affect the lining of the lung, and I like to explain it as the lungs have no other way to complain, or the lining of the lung has no other way to complain that to weep, so you weep fluid into that space and what it does is as it accumulates, the chest is sort of a closed box and as the fluid accumulates, it pushes the lung down from the outside and that can be very uncomfortable for patients. I have actually had a lot of experience putting little drains and semi-permanent drains into the chest to act somewhat like a sump pump to keep the fluid at bay and allow the lung to expand and make people more comfortable. I do some telescopic procedures, where we put a little telescope through the chest wall, go and look around, take samples, and we use something that basically is akin to talcum powder that actually causes the lining on the lung and the lining on the chest wall to become irritated and stick together and seal off that space. I do a lot of what we call pleural procedures, with the lining on the lung and the lining on the chest wall. In addition, we do a lot of ultrasound type procedures, so we do some advanced imaging. We do imagining through the wall of the wind pipe to look at lymph glands and vascular structures outside of the airways and it allows us to be able to take samples, to be able to help the oncologists figure out the stage of disease and whether or not they are candidates for some novel therapies. I also do not just hot modalities, because laser is considered a hot modality, we also use cryotherapy in airways. There is a lot of innovation going on in the chest space. Lung cancer being the most rapidly escalating cancer and the number one cancer both in men and women now, it has even taken over for breast cancer as a number one killer of women from cancer, and as the number of procedures we can actually do evolves, so does our toolbox.

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Chagpar That is great. How do you figure out whether to use a hot

modality like laser or a cold modality like cryo? Do you use them for different things or do they have different efficacies? Is one kind of cancer better for some things and other kinds of cancers better for another?

Michaud It is a really good question. There are about six different thermal modalities, meaning temperature, so hot or cold modalities that we can use and they all have their pros and cons and so when you are looking at a case, depending on what your skill set is, and I have used the vast majority of them so what I will do is I will look at a case and say, Hmm, this really looks like I need an immediate affect, because some things are not an immediate effect. With cold therapies, cryotherapy, what happens is you basically freeze the tissue and the cell slowly dies off, but you have to wait for them to completely die off and then you go back and you clean out the airway. You can imagine if you have a very big blockage, you do not really want to wait that couple of days till the tissue dies off slowly. You want something that is going to act more rapidly. So most of the heated modalities, other than some of the radiation, brachytherapy, for example, is also a slower modality photodynamic therapy, which is another modality where you inject a chemotherapeutic agent, the agent is taken up mostly by abnormal tissue, but also by normal tissue, and what happens is over 48 hours it washes out of the normal tissue, but it is held in the cancer tissue, and what you do is you light activate it by firing a laser at it and then it takes a couple of days to actually cause these cells to die and then you have to go and clean that area out. So those will be things that you would not want to do for something that needs immediate attention. Some types of cancers respond better to different types of therapies. For example, kidney cancer responds extremely well to photodynamic therapy and in fact, we have written a couple of articles about the use of photodynamic therapy for kidney cancer.

Chagpar That is fantastic and I want to learn more about photodynamic therapy, particularly because it seems like it is almost a targeted therapy and we talk a lot on this show about how we target cancers and use personalized medicine, but this might be another way of targeting those cancer cells. First, we have to take a short break for a medical minute. Please stay tuned to learn more information about photodynamic therapy and other local therapies along with screening for lung cancer with our guest Gaetane Michaud.

Medical

Minute It is estimated that one in six American men will develop prostate cancer in the course of his lifetime and that nearly 200,000 men in the United States will be diagnosed this year alone. The good news is that major advances in the detection and treatment of prostate cancer have dramatically decreased the number of men who die from the disease. Screening can be performed quickly and easily in a physician's office using two simple tests, a physical exam and a blood test. With these screening methods, early detection

and a healthy lifestyle, prostate cancer can be defeated. Clinical trials are currently underway at federally designated comprehensive cancer centers to test innovative new treatments for prostate cancer. The Da Vinci Robotic Surgical System is as an option available for patients at Yale that uses three dimensional imaging to enable

14:48 into mp3 file http://yalecancercenter.org/podcasts/2014_0323_YCC_Answers_-_Dr_Michaud.mp3 the surgeon to perform a prostatectomy without the need for a large incision. This has been a medical minute and more information is available at yalecancercenter.org. You are listening to the WNPR Connecticut's public media source for news and ideas.

Chagpar Welcome back to Yale Cancer Center Answers, this is Dr. Anees Chagpar and I am joined today by my guest Dr. Michaud. We were talking right before the break about lung cancer and all kinds of fancy schmancy therapeutic interventions that she does using lasers and cryotherapy and even photodynamic therapy to target cancers that may not be amenable to other forms of modalities. Dr. Michaud, tell us a little bit more about how you integrate into the multidisciplinary team, because a lot of times here on Yale Cancer Center Answers we talk about a team of people and it seems to me that you are part of that lung cancer team. Can you speak to that?

Michaud I feel very fortunate because I feel like I work with the best people in the world. I work with some very top notch medical oncologists, radiation oncologists, thoracic surgeons, and other pulmonary doctors and we are extremely fortunate here at Yale to have such a high powered team. We each have a role and we are really respectful of other people's skill sets and as a team we come together once a week and we discuss all of our new cases. So each patient at Yale really does get the benefit of everyone's expertise and the case does not go on to the next case until we are all in agreement as to what the next steps are. Part of what I do is not just therapeutic either. I do a lot with respect to diagnostics and I work really closely with the medical oncologists. Yale has been very involved in a lot of the targeted therapy trials, personalized medicine, what is the best drug and that being not just in lung cancer, but also in kidney cancer, in prostate cancer, breast cancer. So I work very closely with a lot of those oncologists. Some of the things that we are doing now is we are realizing that a tumor is not a tumor, is not a tumor over time, and so the cancers are somewhat like what we think about traditionally with respect to infections, how bacteria can change and evolve and become resistant. We are starting to realize that is happening with cancers as well. So overtime, the initial biopsy that we got to diagnose cancer may not be enough and with a lot of these new therapeutics we are obligated to go back time and time again to obtain more tissue to actually look for different receptors, to look and see whether or not the cancer has changed, and so I get really involved in that side of things, obtaining tissue.

Chagpar Let's take a step back, we talked about your role as doing a couple of things, the first was in managing symptoms often when the cancer has gotten to a point where there are very few other good options, but let's take the opposite extreme, when you have asymptomatic people who do not even have lung cancer yet, is the team involved at that point, what do people do in terms of screening and making sure that they do not get lung cancer? I am a breast cancer doctor and I can go on ad nauseum about breast cancer screening, but what is the state-of-the-art in lung cancer and what is the team doing with regards to that?

Michaud We have developed a lung cancer screening program in response to a very large study that was published back in 2010. For the first time ever in 2010, there was a greater than 50,000 patient study that actually showed benefit to lung cancer screening with CTs and it is a serial CT, so

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basically what happens is the patient who is considered a high risk person, and that is a person that smoked at least a pack of cigarettes a day for 30 years, they have stopped smoking less than 15 years ago, or are still smoking, and are later in an age frame where lung cancer is considered a higher risk, so 55 to 74. They have taken these high risk people and what they have done is, they are people that do not have lung cancer, they are asymptomatic and they have a CT scan at time zero and then one every year for three years and what they found was they were able to detect cancers earlier and 20% of those patient's lives were saved by the CT screening. The response to that, which is a pretty significant thing, the lung cancer screening trial, NSLT as it is called, the National Lung Cancer Screening Trial, has been very favorable in the community and we have started to have free lung cancer screening days at Yale, we have a screening program that includes not just a CT scan, which is the way it works in a lot of other institutions, but you can come in and get either your free or very cheap CT scan to look and see if you have cancer and also be seen by a cancer specialist or smoking cessation. We feel that it is very important to get counseling about your risk factors for lung cancer and look at the whole picture, not just a scan, and try and change some of those risk factors because as you know, smoking is the number 1 risk factor for the development of lung cancer so we are trying to do something very much like they do in cardiovascular health, which is to try and modify anything that is modifiable and certainly your smoking can be modifiable. We have come together as a multidisciplinary group that includes radiologists, a psychologist, a PhD whose area of expertise is smoking cessation, a couple pulmonologists, myself and Lynn Tanoue, a thoracic surgeon, Frank Detterbeck, and we have been running this program for two years now. We

have also developed some interesting tools to estimate what the probability of lung cancer is and we have an iPad app that can actually tell you based on all of these prior studies where they have done prediction models, we have them all integrated into one iPad app, and based on what your risk factors are it gives us an idea of what your risk is. The other thing that we have developed is an educational tool for patients because not everybody benefits from lung cancer screening and I think it is very akin to screening for any other type of cancer where we never want the risks of radiation to put you at a higher risk of developing a secondary cancer from radiation compared to your actual risk of lung cancer, so it actually helps people that are in a grey zone that have some risk factors but don't necessarily meet the criteria where it is a chip shot, we know for sure you are going to benefit from lung cancer screening, but it helps work through why they think screening is a good idea, what are the real risk factors, who is helping them to come up with the plan of action, whether to move forward, and it helps us identify areas that we can work with patients on.

Chagpar When I was thinking about screening I was thinking certainly about mammography where people can get a mammogram anywhere, and was thinking about lung cancer screening in the same way, perhaps the people who are as you say 30-pack a year smokers could get a CT scan anywhere, but it sounds like the program you have developed is far more than that. It seems to be a multidisciplinary effort.

Michaud We have been working together on this project for the last 3 years and we have fine-tuned it, and I think patients truly benefit because if they meet the criteria for the screening study we automatically do the CT scan for them and sort of push them down that way, but when people are

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Chagpar Because one of the things that I think a lot of people will say who are nonsmokers is, I know a friend who was a nonsmoker, who got lung cancer

and therefore I am scared.

Michaud Exactly, and that is a reason and it is interesting to see how people have interpreted this very large study because as a cancer researcher when we make recommendations about screening they are based on the patients that were studied, because that is our best recommendation. The results are the results of the 50,000 people and we know that those results are probably real but what has happened across the board via a lot of big societies is that they have taken that population that was studied and they have expanded on it, but we do not really know if that expanded population benefits. We do know that when we did not have this tailored population we did not see any benefit for screening. So in all comers we do not see a benefit but if we take really high risk people then there is benefit, but are all risk factors created equal if we say well, they have 3 people in their family that have had lung cancer, is that the same as a 30-pack year smoking history? That we do not know and so I think that where we are looking down the road is that expanded population and do they benefit as well? We are going to get a lot more experience, real world experience because a lot of the insurance companies, including Medicare, are actually opening themselves up for lung cancer screening.

Chagpar That is fantastic. Let's suppose that a patient gets a CT scan for a lung cancer screening, whether through your program or anywhere else because presumably they could avail themselves of this, and a lung cancer is picked up. Is that where you come in or is that where an interventional radiologist comes in, how do you get from here is the CT scan to, yes you have lung cancer?

Michaud In my clinic obviously if I have ordered the CT scan I have followed up with the patient so I am aware of the results. All of those cases were discussed in a Nodule Board and we sit and discuss them in a multidisciplinary fashion, so all the members of our team work together and we talk about these cases and we come up with the best diagnostic tool for the next step. The American College of Chest Physicians recently rewrote their lung cancer guidelines and I was very fortunate along with several of my colleagues here at Yale, including Frank Detterbeck, who is the key person for these guidelines and Lynn Tanoue who is one of the pulmonary doctors, to be involved. When you look at a solitary nodule, the current recommendations are if there is a solitary nodule, no evidence of lymph gland spread, no evidence of disease any place else, that if you have a high index of suspicion then the nodule has to come out, so there is no sense doing bronchoscopies or other types of radiology procedures because the truth is with a fine needle aspirate by radiology

27:48 into mp3 file http://yalecancercenter.org/podcasts/2014_0323_YCC_Answers_-_Dr_Michaud.mp3 it is a bit like a needle in a haystack, and if it is positive, great, we will operate and take it out, if it is negative then you say, but they are really high risk and I do not know that I believe it. So that does not really help you that much, so in those cases our group has stuck to these recommendations and the recommendation is that if it is a high risk patient, it is a solitary nodule that has radiology aspects that are making it look suspicious for cancer, then they go straight to surgery and we have a cut point of size even, so anything over a centimeter we would take out and a lot of the guidelines have been adopted by Yale and that is what we follow as our clinical practice and if there is a reason to go after tissue because the patient is extremely high risk and they are concerned about operability or if the patient is not a candidate for surgery at all and we are thinking about using a radiation modality, often times we still want tissue, so for those ones we there are alternative things we can do, you can do transthoracic needle, so a needle through the chest. There are also a lot of ways to get at it from the airway now and a lot of interesting types of imaging, so you can actually go in with the bronchoscope and use something that looks very much like a GPS to get out to the edge of the lung.

Dr. Gaetane Michaud is Associate Professor of Pulmonary Medicine at Yale School of Medicine. We invite you to share your questions and comments with Dr. Foss and Chagpar, you can send them to canceranswers@yale.edu or leave a voice mail message at 888-234-4YCC. As an additional resource archived programs from 2006 through the present are available in both audio and written versions at yalecancercenter.org. I am Bruce Barber hoping you will join us again next Sunday evening at 6PM for another edition of Yale Cancer Center Answers here on WNPR Connecticut's Public Media Source for news and ideas.