

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](mailto:canceranswers@yale.edu) and the phone number is 1-888-234-4YCC. This week, Francine is joined by Dr. Anthony Kim. Dr. Kim is Assistant Professor of Surgery in the Section of Thoracic Surgery at Yale School of Medicine and he joins us this evening for a conversation about robotic surgery for lung cancer. Here is Francine Foss. Foss

Let's start off by talking a little bit about yourself. When did you come to Yale Cancer Center and what is your area of expertise? Kim

I joined the Yale faculty in the fall of 2009 and I was in practice in Chicago for a few years before I came over here but there was tremendous opportunity to work with such wonderful leaders in the field of cancer, lung cancer specifically, and so I came over here and have been able to perform lung cancer operations and a variety of other thoracic operations since my arrival. Foss

Can you talk to us a little bit about lung cancer? How common is it? What are the different types of lung cancer that we see? Kim

Lung cancer is actually a very common cancer. In the respective genders it is behind prostate and breast cancer. However, despite being second in incidence, they are leading killers within their respective genders. Generally, lung cancer itself is divided into two broad groups; the small cell variety and the non-small cell variety and their distribution is about 20% and 80%, respectively, that is 20% of small cell and 80% of non-small cell. Then within the non-small cell subdivision and within the small cell subdivision there are different groups, but for the most part people when they present, at least to a thoracic surgeon, typically present with surgical resectable disease or being considered for surgical resection, and those patients that present generally have non-small cell lung cancer, although there is a minority of patients who can't undergo surgery with small cell lung cancer. Foss

We have heard that there is an increased incidence of smoking, certainly in younger people and also in women compared to men over the last ten years? Kim

Statistically, I think amongst the younger people we are seeing a slight increase in incidence, and with respect to gender, I think there is also a rise in the number of women who are developing lung cancer, but in the United States, I believe those numbers are leveling off a little bit whereas in more developing countries, say in Asia, I think the incidence is actually rising. Foss

What is the youngest age where you have seen lung cancer? Kim

You see case reports of patients anywhere in their early 20s sometimes developing lung cancer, but 4:10 into mp3 file [http://yalecancercenter.org/podcasts/2011\\_0828\\_YCC\\_Answers\\_-\\_Dr\\_Kim.mp3](http://yalecancercenter.org/podcasts/2011_0828_YCC_Answers_-_Dr_Kim.mp3) I think that number is exceedingly small. I will say that we are seeing a decent number of patients, I should not say decent, but we are seeing a number of patients who are developing lung cancer say in their 40s or so. Typically you expect the rise to occur right around the age of 55 and

beyond you see the incidence spike up but we are seeing a certain number of younger patients. Foss

Tony, can you talk to us a little bit about risk factors? We obviously all know and hear all the time that smoking is the major risk factor for lung cancer. Could you tell us a little bit about those statistics and talk about other risk factors as well? Kim

Smoking by far and away is the strongest risk factor, like you said, for the development of lung cancer, but there are other risk factors such as occupational exposures to things like asbestos to things such as radon and there is also a genetic predisposition, particularly if there is a strong familial component to lung cancer, meaning that you have had immediate relatives that have had lung cancer this certainly puts you at risk. But the mechanism for this has yet to be clearly demonstrated. Using very general numbers, of all of the people that smoke, what percentage of them are going to develop lung cancer? Perhaps a little older number that we use is about 20% and people will say that 20% is an awfully low number, so I can continue to smoke, but smoking brings with it a bunch of other medical problems. If you look at patients with lung cancer and you look at it a different way, about 80% of those with lung cancer were former smokers. Foss

What about passive smoke exposure? Kim

There is definitely a risk of lung cancer with second-hand smoke, but it is not as obviously strong as smoking itself, but it is a valid risk. Foss

One question we might have since a lot of people worry about this is the whole issue of screening. If you are a smoker, what kind of screening should you have and if you are a nonsmoker do you need to be screened for lung cancer? Kim

The nonsmoker question I will answer first. I do not know that there is enough data to say whether or not you should go ahead and get the screening CT scan. And I use the term screening CT scan because just recently in The New England Journal of Medicine there was essentially a landmark study published that suggested a reduction in the lung cancer mortality associated with screening CT scans compared to screening chest x-ray, and so in that group there were patients that were eligible between the ages of 55 to 74 and they found that among the patients that underwent the screening CT scan there was a 20% reduction in the lung cancer related mortality. In order to be eligible the patients had to have at least a 30-pack per year smoking history, which just means that if you multiply the number of years by the amount of cigarettes they smoked or packs they smoked, half-a-pack or whatever, as long as that number was greater than 30 then they fell into this risk group and they went on to get randomized into those who got screened and those who did not and there was, like I said, a reduction in the lung cancer mortality. 8:20 into mp3 file [http://yalecancercenter.org/podcasts/2011\\_0828\\_YCC\\_Answers\\_-\\_Dr\\_Kim.mp3](http://yalecancercenter.org/podcasts/2011_0828_YCC_Answers_-_Dr_Kim.mp3) Foss

In that study, the patients who did not get randomized to the CT scan had chest x-rays? Kim

Yes. Foss You talked about risk factors and the 30-pack per year history of smoking, what is the story if you are a smoker that is in a group that is less than that, if you have not quite met that 30-pack-year history, are the risks the same and should you be screened? Kim

I think there is a definite link between the

amount of tobacco burned, if you will, to the risk that you have of developing lung cancer. So, just because you smoked less than a 30-pack-year history does not mean that your risk of lung cancer is next to the person that did not smoke at all. I do not think that is case. I think that there is almost a linear risk of lung cancer that increases with the amount that you smoke, and from the time you quit smoking you sort of level off at that risk for the rest of your life with a possible tail end increase as you get older. Relative to a person that is a lifetime nonsmoker, your risk will never go back down to that nonsmoker level. No matter how long you have quit smoking. But it will be definitely less than had you continued to smoke for more years. Foss So, it is always good to stop smoking. Kim Yes, absolutely. Foss When you talk about this New England Journal of Medicine article, this landmark study, how do we translate that from an article in a journal to an actual change in our practice standards for how we screen patients? Kim That is a great question and I think that is a story in evolution right now, because a lot of the thought leaders, some of which happen to be at Yale Cancer Center, are trying to establish guidelines for how to move forward with this information and I think it spans a bunch of different disciplines. Just say from a pure patient perspective, should I get the screening CT scan? I think there need to be more guidelines set as to who falls into this category because you are going to see a lot of people with that less than 30-pack year history wanting to get a CT scan and you are going to have less firm data upon which to determine what is the best thing to do for this group, and that is where guidelines help. From a pure reimbursement perspective, an initial screening CT scan right now, for most insurance companies, is not covered. So, there need to be guidelines established to say, hey this is a legitimate screening test that needs to be on par with prostate screening or breast cancer screening that needs to be reimbursed. That is the another area where guidelines will help determine how these tests get paid for and then guidelines need to be established for how to deal with these nodules that are picked up from abnormalities on the chest CT scan and I think that is something that needs to be further delineated. One of things, like I said before, is that with such wonderful leaders in lung cancer care at the Yale Cancer Center, we are 11:45 into mp3 file [http://yalecancercenter.org/podcasts/2011\\_0828\\_YCC\\_Answers\\_-\\_Dr\\_Kim.mp3](http://yalecancercenter.org/podcasts/2011_0828_YCC_Answers_-_Dr_Kim.mp3) trying to develop a programmatic approach to dealing with patients that call in with these screening CT scans, whether they have gotten them at Yale or whether they have gotten them elsewhere. We want to let them know, hey we have a system for how to deal with these depending on which silo or bucket you fall into out of everything that I have mentioned. Foss That brings up another really important question, which is that we see a lot of patients who get a chest x-ray for whatever reason, maybe not even for screening, and we find these nodules or these abnormalities on the chest x-ray. How often does that actually turn out to be cancer and what is the standard practice for how we approach those? Kim That is sort of a difficult question to answer for a few reasons, one of which is I have a very skewed perspective on this simply because it seems that most of the people

that we end up seeing that fall into that scenario end up getting a CT scan and end up coming to see me for the removal of what is strongly suspected to be a lung cancer, and more often than not it turns out to be a lung cancer. I think that in dealing with this you have to contextualize everything in terms of the history and the story that the patients bring with them to the office and I think you can better assess by dealing with the patients and also reviewing the films and examining the patients and determining if this is something that needs to be removed. I do not know, and maybe I should, but I do not know of all the people in the world to get chest x-rays what percentage of them have these incidental nodules. I will say though, that is not an uncommon presentation for us as thoracic surgeons to see. Foss

So that should reassure most patients out there that just because you may have one of these nodules, that does not necessarily mean that you need to run in and have an operation right away. Kim

That is absolutely true. Say you screened 100 patients and they all get chest CT scans, the actual percentage of patients that have true bona fide lung cancer from that is very small, having said that, a fair number of these patients will have abnormalities that are deemed actionable, that need some sort of intervention, say perhaps another CT scan. But the actual percentage of that that actually turn out to be lung cancer is relatively small. Foss

We are going to take a short break now for a medical minute. Please stay tuned to learn more information about lung cancer and particularly about robotic surgery with Dr. Tony Kim. MedicalMinute

There are over 11 million cancer survivors in the US, 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. Following treatment, the return to normal activities and relationships may be difficult and cancer survivors may face other long-term 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 the 15:11 into mp3 file [http://yalecancercenter.org/podcasts/2011\\_0828\\_YCC\\_Answers\\_-\\_Dr\\_Kim.mp3](http://yalecancercenter.org/podcasts/2011_0828_YCC_Answers_-_Dr_Kim.mp3) 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 Yale Cancer Center. More information is available at [yalecancercenter.org](http://yalecancercenter.org). You are listening to the WNPR Health Forum on the Connecticut Public Broadcasting Network. Foss

Welcome back to Yale Cancer Center Answers. This is Dr. Francine Foss and I am joined today by my guest Dr. Tony Kim and we are here discussing lung cancer and robotic surgery. Tony, before the break we talked a lot about patient's presenting with abnormalities on chest x-rays. Can you tell how does the average lung cancer patient present? Do they have symptoms? Kim

Again, that is a bit of a loaded question simply because patients present in a variety of stages. The majority of patients actually present with either locally advanced or distant disease and in that group, typically, they do present with symptoms. In the earlier stages it is difficult to know if they present with symptoms simply because a lot of times they present with these incidental findings on imaging

studies or they have very minimal symptoms. I think that is one of the scary things about lung cancers. It is a silent sort of disease initially and while that is not universally true, by the time a lot of people start to have really profound symptoms, they have fairly advanced disease. Foss

When does the surgeon usually get involved? Kim Typically, curative intense surgery is performed for the earlier stages, having said that, there are protocols and paradigms in which patients with stage III or what we call locally advanced disease, can be considered for surgery say after some sort of what we call neoadjuvant or induction therapy where they get chemotherapy or chemotherapy and radiation upfront and then go on to get surgery. That is a bit of an institution dependent philosophy, how you proceed, because some institutions will proceed with definitive chemo-radiation meaning that is what you get definitively. There is also a sub-group of patients with stage IV disease in which they may have an isolated metastasis to the brain or the adrenal gland or elsewhere and we feel that it is a true limited metastatic disease process going on and we would offer curative intense surgery for that group provided they jump through a few hoops before then, in terms of other smaller surgeries to rule out disease elsewhere. Foss

Can you tell us about the multidisciplinary approach for lung cancer? Kim

Sure, it is an approach in which we evaluate the patients from all different perspectives, meaning that just because you see a surgeon or medical oncologist or radiation oncologist, our cases are presented during a Monday morning conference with all the disciplines represented including pulmonary medicine, radiology, nuclear medicine, and social work support, and we discuss the patient in a comprehensive manner, and we try to determine what the optimal way is to treat the patient and everyone gets a fair say, in that there is no one dominant voice or dominant philosophy. Patients really benefit from this in that they get a truly well rounded approach to managing their cancer. 18:45 into mp3 file [http://yalecancercenter.org/podcasts/2011\\_0828\\_YCC\\_Answers\\_-\\_Dr\\_Kim.mp3](http://yalecancercenter.org/podcasts/2011_0828_YCC_Answers_-_Dr_Kim.mp3) Foss

At that point, most patients have had a biopsy and various kinds of CT scans I presume? Kim

Yes, I mean we see patients in all stages of their workup, and so some may come with the biopsy some may not, some may not need a biopsy and we may be able to make that decision to proceed with a type of therapy based on the information that they have again, without the biopsy, and I think this is the benefit of a multidisciplinary approach because some physicians might say you do not need the biopsy, whereas others will say you do, and then we enter a debate as to what is the best way to treat the patient in the context of their presentation? Foss

You mentioned robotic surgery as a new approach for lung cancer, can you talk about what robotic surgery is and how does it differ from regular surgery? Kim

Before we even talk about robotic surgery, I think it is important to talk about minimally invasive surgery in general. The old fashioned way of taking out a lung tumor was to do a thoracotomy, which is essentially opening up the skin on the side and then dividing the muscles and then dividing the ribs and spreading the ribs and taking out the tumor. The more commonly practiced minimally invasive surgery is called a VATS, or

video-assisted thoracoscopic surgery where we make about four or five small incisions and we do not spread the ribs and using an approach that is very similar to laparoscopic surgery in the abdomen where we can remove the lung and I am happy to say that all the surgeons in our thoracic oncology program do surgery in that manner. Robotic surgery is an advanced platform of that minimally invasive surgery. What makes robotic surgery nice though is that it allows a surgeon to have a little more freedom inside the body because the robotic arms allow the end instruments to articulate more freely, so people say that robotic surgery a lot of the time is like doing thoracoscopic surgery, the minimal invasive surgery, in a very open like feeling because your hands or your instrument are moving inside the body in a manner similar to how they would move if the case was open. It brings the benefits of both approaches together and allows for a really good cancer surgery. Foss

If I were standing back watching you do of a robotic procedure what would I see? Would I see you manipulating a machine or would I see you manipulating tools that are going inside the body? It is hard to picture what that actually looks like. Kim

What you would see is my assistant at the table and I would be initially there at the table making initial incisions and these initial incisions are strategically placed incisions in which we place what we call the trocar, sort of the barrels through which the instruments go outside the body, and so we place those in and then we deploy the robot and the robot is a machine on a roller that comes in over the patient and through the barrels that we deployed inside the body we deploy the robotic arms. And then once that is safely deployed and in place, what I do is I break scrub and I sit down at a console, maybe about 6 feet away from the patient and through the console which is fitted with three dimensional vision, I am able to manipulate the hands or the arms of the robot with my finger tips and so it looks a little bit like a science fiction movie but it is actually very nice. 22:46 into mp3 file [http://yalecancercenter.org/podcasts/2011\\_0828\\_YCC\\_Answers\\_-\\_Dr\\_Kim.mp3](http://yalecancercenter.org/podcasts/2011_0828_YCC_Answers_-_Dr_Kim.mp3) Foss

I was just going to say Star Wars. Kim Right. Foss patients are candidates for this approach? Are there certain criteria? Kim

Right now it again falls back on the optimal patients, or the ones that typically have early stage lung cancers, the ones that have stage I or stage II disease and I think that they are the ones that benefit the most simply because they have smaller tumors. The lung can be manipulated a little easier. If you have an advanced tumor that you are operating on, I still think that probably the open approach is the way to go simply because there are a lot of other factors to consider in the operating room and in the operation, and what robotic surgery allows for is such excellent visualization and such excellent manipulation of the tissue that you are getting such fine visualizations, fine results with the dissection, that it sets up nicely for the earlier stage lesions. Again, I think there will be a time down the road when more locally advanced tumors will potentially be removed robotically, but I think that in the more advanced tumors they are more difficult operations, and I think that you have to judge when the best time is to use the robot, and when is the best time to proceed in an open fashion. Foss

Do we

What

know yet whether the results with robotic surgery are better than that with conventional surgery? Kim That is a great questions, and one of the things that really needs to be pointed out is the use of robotic technology in lung surgery is still a relatively new occurrence. If you look at thoracic surgeons doing minimally invasive surgery, that is taking out lobectomies, the actual number of all thoracic surgeons say in the United States, that number is around 15%, maybe a little bit more now. I would say that the number of thoracic surgeons actually doing formal anatomic lung resections with the robot is much much smaller than that, so the number of robotic centers that are performing anatomic lung resections is really small and Yale has the luxury of being one of those centers. Foss Are we the only center in Connecticut that does this? Kim I do not know if we are the only center, I think there are a few others, maybe one or two others that do some robotic mediastinal surgery, meaning surgery for tumors say in the central part of the chest, but as far as lung surgery goes, we are if not the only one, we are certainly the one doing the most. Foss Can you talk about recovery after this kind of surgery as opposed to say an open procedure? Kim To lump all open procedures into one big group is difficult simply because there are different types of open procedures, but if you are comparing straight forward lobectomies to straight forward 26:01 into mp3 file [http://yalecancercenter.org/podcasts/2011\\_0828\\_YCC\\_Answers\\_-\\_Dr\\_Kim.mp3](http://yalecancercenter.org/podcasts/2011_0828_YCC_Answers_-_Dr_Kim.mp3) lobectomies done robotically, the patient's recovery is a lot faster. Typically we would like to keep patients after an open lobe on the order of about four days or so. With the robotic lobe, if the patient feels great they can go home either the next day, which is rarer, but typically it is day 2 that they are eligible to go home. Some centers that do minimally invasive surgery send their patients home the next day. We certainly could if the patients felt up to and they were doing fine, typically though, despite having small incisions, it is still a big surgery on the inside, but if you were to put a number on the stay, I would say they could go home around the order of 2 to 3 days. The recovery at home is a lot faster than with an open procedure. I have had patients leave the hospital and go back to work the day after that, whereas I have had open surgery patients stay in the hospital a little bit longer and also recover a little bit longer at home, on the order of 2 to 4 weeks. Foss Are there any complications to robotic surgery that are unique for that kind of surgery? Kim I do not know that there is anything unique to robotic surgery itself other than just getting used to the fact that you are not at the patient's side. That is probably the biggest mental hurdle for the surgeon to overcome, and I do not know that that sets you up for any complications. It is simply getting used to that fact that makes it a little more difficult. Foss We talked a lot about resecting these lesions in early stages of disease, but can you elaborate on whether or not robotic surgery plays a role in more advanced lung cancer? Kim Again, I think it may, I do not know right now that robotic surgery has a strong role in the more advanced lung cancers. I think its optimal role is in the earlier stage lung cancers where you can remove the tumor, and do a good lymph node

dissection. Down-the-road there might be a role for the advanced lung cancers, but advanced lungs cancers mean so many things, it means that there is central nodal involvement sometimes, it means that there is invasion of the central part of the chest, or invasion of the chest wall, things like that. So, I think that it is sort of heterogeneous, or group of diseases that cannot be lumped into one. Down-the-road, I suppose the robot can play a role in that. For now I think that it is best suited for the lesions that you would take out in say a VATS approach. Dr. Anthony Kim is Assistant Professor of Surgery in the Section of Thoracic Surgery at Yale School of Medicine. If you have questions or would like to share your comments, [visityalecancercenter.org](http://visityalecancercenter.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.