

Dr. Lynn Wison, Meet the Host of Yale Cancer Center Answers September 26, 2010 Welcome to Yale Cancer Center Answers with Dr. Francine Foss and Dr. Lynn Wilson. I am Bruce Barber. 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 1888-234-4YCC. This evening Francine is joined by her new co-host Dr. Lynn Wilson. Dr. Wilson is Vice Chairman & Clinical Director of the Department of Therapeutic Radiology and Professor of Therapeutic Radiology and Dermatology at Yale Cancer Center. He specializes in the treatment of patients with lung cancers and cutaneous lymphomas. After receiving his Masters in Public Health from Yale and his medical degree from George Washington University School of Medicine, Dr. Wilson returned to Yale for his internship and residency in Internal Medicine and Therapeutic Radiology. He then served as Chief Resident at Yale before joining the faculty in 1994. Dr. Wilson is one of only a few radiation therapists in the country that performs a specialized kind of treatment called total electron beam radiation, which is specifically for patients with a rare disease called cutaneous T-cell lymphoma. It is a very complicated procedure in the field of radiation oncology that Dr. Wilson has extensive experience with. In 2008, Dr. Wilson won the David J. Leffell Prize for clinical excellence and the Francis Gilman Blake Award, an award designated by the senior class and presented to a member of the Yale School of Medicine Faculty for exceptional teaching of the Medical Sciences. Here is Francine Foss with Dr. Wilson. Foss We are going to start by talking a little bit about your background Lynn, and how you became involved in the treatment of cancer. Wilson That is a bit of an interesting story and I think I was fortunate. I grew up in Bethesda, Maryland, which is a Washington DC suburb and happens to be the place where the National Cancer Institute resides. So as summers rolled around during college, I was very fortunate to get a summer job at the National Cancer Institute and the first laboratory I worked in dealt with neurologic diseases and did a fair amount of laboratory bench research looking at central nervous system tumors, and that was an excellent experience and I started learning about oncology at that time as a college student and I developed more of an interest in biology. Then I continued those summers at the NCI through college and actually into medical school which I was able to do since I went to George Washington University School of Medicine in Washington DC, and my summer job transitioned into a different laboratory which was also in the National Cancer Institute but was in the radiation oncology branch. So that is when I first learned about the field of radiation oncology early on as a medical student during the summer. It was fortuitous that I happened to live in the Bethesda, Maryland area over the summers, which is where the NCI is and that is how I really got my first exposure to the field of radiation oncology. Foss What is your current focus in cancer now? Wilson The primary areas are cutaneous lymphoma, so you and I obviously collaborate very closely in that area, and I see all types

of patients with lymphomas of the skin and make recommendations regarding their treatments specifically in regards to radiation treatment, and the other area that I primarily see patients is in lung cancer. Those are the two main areas.3:48 into mp3 file <http://yalecancercenter.org/podcast/sept2610-cancer-answers-wilson.mp3>Foss

Can you clarify for our listeners the difference between a medical oncologist and a radiation therapist, or a radiation oncologist?Wilson Both of these physicians primarily take care of and evaluate patients with cancer. The medical oncologist generally is involved in the administration of systemic or chemotherapies or hormonal therapies depending on the type of malignancy, but generally the type of treatment that the medical oncologist is recommending and has expertise in are therapies which provide therapy and are circulating around the entire body. Medical oncologists are also boarded in internal medicine, so they have completed a full internal medicine residency and additional training in hematology and medical oncology, or perhaps just medical oncology. Radiation oncology also involves one year of internal medicine, generally as an internship but then four years of specialized residency training in the field of radiation oncology and during that time that type of physician learns a lot about oncology and how to administer radiation treatment for all of the different cancers or malignant diseases and the radiation treatment can be given in many different forms but that is an additional four years of training after internship. Those are the primary differences. One provides radiation treatment and the other provides systemic treatment which is usually in the form of chemotherapy.Foss Lynn, when I trained at the National Cancer Institute, it was true that the radiation therapy physicians and the medical oncologists often times worked together, often times had the same conferences and had training programs that allowed them to overlap to see the other side of things.Wilson Right, so that is really important. You were at a place that did that very early on, there are still some medical centers that do not have much what we call multidisciplinary interaction in that way but it's really essential and is something that we think is very important here at Yale. We work very closely together and in this way the patient can get an opinion and a treatment plan which is synergistic and the physicians are working together, and it's also efficient for the patient, so that the patient does not have to go to multiple different buildings or offices to see a variety of different specialists. It is really one-stop shopping, as you and I take care of cutaneous lymphoma patients together, we are working closely together, we are talking, we are looking at the images together, we are consulting together, and trying to do the best we can for that patient.Foss Lynn, could you help us to understand a little bit how you decide whether or not a patient is a candidate for radiation therapy?Wilson So that is a good but complicated question and it really depends on the situation. There might be five different types of patients that you and I see in a given week with cutaneous lymphoma, but two of them we might feel are excellent candidates for radiation and the others may not be, and it depends on the stage of their disease, what type of lymphoma they have, whether this is a primary presentation of their disease that has just been diagnosed for the first time, we take their age and other medical problems into considerations, logistical complications, and side effects of treatment. The

decision making process is fairly complicated which again gets back to the advantages of the 7:06 into mp3 file <http://yalecancercenter.org/podcast/sept2610-cancer-answers-wilson.mp3> multiple physicians working in concert together in a multidisciplinary fashion and come up with the best plan for the patient. In lung cancer, for example, it is the same type of thing. We may see a patient and surgery may be the best treatment for them. Perhaps it is chemotherapy alone, chemotherapy plus radiation, or a combination of all three. With the advanced knowledge that we have regarding the diseases and the complexity that comes along with the diseases, we understand now in 2010, that these decisions are complicated. Foss How do most of your patients come to radiation oncology? Is that something that the patient needs to decide on his or her own or are they referred in by the surgeons, the medical oncologists, or other physicians? Wilson It is almost always another physician and in most cases it depends on what type of cancer it is. In the case of cutaneous lymphoma, for example, it might be yourself as a medical oncologist and in areas or institutions that have significant expertise it may often be a dermatologist which is often the case at Yale because that patient will be referred to a Yale dermatologist who has expertise in skin lymphoma from their outside dermatologist. In the case of lung cancer, most of the patients that I see are typically referred to me either by a medical oncologist or a surgeon. I also do some breast cancer work and the same thing for those patients, it is usually either a medical oncologist or the surgeon who is referring the patient to me because they have obviously seen the patient first and they have decided that radiation may possibly play a role in the patient's care. Foss When a lot of people hear the word radiation therapy or radiation they conjure up a lot of negative images in their mind. People are afraid of radiation and perhaps because they do not really understand what radiation therapy is. Could you go through some of the details about radiation therapy and what it is? How do you do it? Is it safe? Wilson There are a variety of different forms of radiation treatment. The type of radiation that we use most often is called external beam. It is generated by a device called a linear accelerator, which is very expensive, it is very high-end technology, extremely modern technology, and it generates an x-ray beam which is aimed at the tumor and the design and shaping of that beam and getting the proper aiming at the tumor is a complicated business and involves a lot of treatment planning, a lot of computer work, a lot of input from the physician. That is one type of radiation treatment. There are other types, brachytherapy for example is a type of radiation where we would implant radioactive seeds into a tumor in the head and neck or in the prostate for example and that is another type. There are several other types but those are the two primary types of radiation that we use, but it can be concerning because I think everybody gets a pretty good sense of what surgery is. We have an operation, a tumor is removed from the body and the patient is closed back up, but since radiation comes in these different forms and is not something that is really well understood by the patients, it can be very scary and because of potential problems that could come along with radiation there is an incredible amount of quality assurance that goes into not only an individual patient's treatment program, but also an entire department

of radiation oncology. There is not just a physician or group of physicians in the standard clinical sense that we're used to in a hospital or10:41 into mp3 file <http://yalecancercenter.org/podcast/sept2610-cancer-answers-wilson.mp3> a clinic, but we have a cadre or a group of folks called dosimetrists who are involved in treatment planning design with the physician and physicists who are involved in calibration of the machines and also involved in the quality assurance program, so it is really quite a large team so that safety is ensured for the program and for the care of the patient.Foss How common is it to find a center that delivers radiation therapy?Wilson It is actually very common most places in the United States, all major cities have radiation oncology and even rural areas now-a-days, not too far away from any given location have radiation centers. They may not be particularly large; they may not offer the specific expertise of a very large academic center, but fortunately most places in the United States radiation therapy is relatively easily accessible.Foss When one thinks about radiation therapy and potential side effects one thinks about skin burning and inflammation, for instance, from the beam, but there could potentially be other side effects as well that people are worried about, often times the worry is not justified. I wonder if you could just go through for us what the side effects of radiation therapy are.Wilson That is an excellent point because a lot of times I will meet a new patient and they all have heard a lot about radiation or perhaps they will have a friend or a family member who had radiation, who has had certain side effects and problems. Not all of those side effects and problems apply to that new patient who I have just met, it really depends. The key is the part of the body that is involved. When I treat the skin, for example, obviously the skin can get inflamed, sore, red, skin side effects. If I am treating someone with a lung tumor, for example, they may get fatigue or their blood counts may go down a bit. They may get some soreness in the swallowing tube or the esophagus or irritation of the normal lung, but there may be other parts of the body that we're treating where the side effects are quite minimal, it is really site specific. It depends on the dose of radiation, how large the radiation fields are, and another key component is, are we doing the radiation in combination with chemotherapy? And we often do that so that we can have a better outcome in terms of tumor control but sometimes, unfortunately, that is at the price of some increased toxicity.Foss Most of the side effects associated with radiation therapy are reversible, is that correct?Wilson That is correct. Sometimes, again depending on the part of the body, they can cause problems but usually they almost always resolve after the treatment is completed within several weeks. There can be some situations where there can be some longer lasting affects of radiation. Some scar tissue can form. There can be scarring of the lung, for example, in the event of treating a lung cancer patient or scarring of other tissues, but this is something that we take into account very very carefully and we have made major advances in the field in the last even 5 to 10 years at limiting the amount of normal structures and normal tissues that get exposed to the radiation and the main benefit is trying to curtail these side effects both acute, that might happen while the treatment is13:54 into mp3 file <http://yalecancercenter.org/podcast/sept2610-cancer-answers-wilson.mp3>

cancer-answers-wilson.mp3 being administered over several weeks, and long term, which the patient may have to face over a period of years. Foss Another question that people ask is, is there any age restriction for radiation therapy? Do you do it in infants, and is there any upper age limit for administration of radiation therapy? Wilson There is not an age limit in either direction. Dr. Kenneth Roberts actually takes care of all of our pediatric patients at Yale, and the decisions regarding who should receive radiation and age limits on the lower end are made purely on what the best treatment is for that patient. Sometimes there are some very very young patients where radiation will give them the best chance of cure or combining radiation with chemotherapy. In terms of older patients, again, we do not hold age against anybody, it depends on the clinical situation and what we think is best for the patient. We give the patient full information regarding the side effects and potential benefits of the treatment and it is really a decision that is made by the patient with their family members and the physician. Foss This has been an excellent introduction into our discussion about radiation therapy but we are going to need to take a break right now for a Medical Minute. Please stay tuned to learn more information about radiation therapy from Dr. Lynn Wilson. Foss Welcome back to Yale Cancer Center Answers. This is Dr. Francine Foss and I am joined today by my new co-host and guest tonight Dr. Lynn Wilson. Lynn Wilson, as I previously mentioned, is a radiation oncologist at Yale Cancer Center and we have been discussing the topic of radiation therapy. Lynn, can you tell us a little bit about how radiation therapy has changed since you first started getting involved in it a number of years ago? Wilson Yeah, as I said, I first got involved in the 1980s actually as a medical student and things have evolved tremendously over that time span since the 80's, and what's really evolved is our ability to target tumors more accurately. We have incorporated new imaging modalities such as PET17:04 into mp3 file <http://yalecancercenter.org/podcast/sept2610-cancer-answers-wilson.mp3> scanning, and although MRI has been around for a pretty long time, we have gotten better at using MRI and PET scan, and of course CT scans, for designing our treatment fields. We use all of these images, we can fuse them together so that we can use metabolic, what we call functional, and anatomic information to design the best treatment plan, the most accurate treatment plan possible for a patient. Not only are we able to target tumors much better now than we used to be able to even 10 and 15 years ago, but a real key to that is eliminating normal tissues that do not need to be exposed to the radiation treatment. Not only are we ensuring that we are doing a better job of hitting the target we intend on hitting, but we are doing a much better job of avoiding normal tissues, normal organs that do not need to be exposed to any radiation. We can hopefully have a better treatment outcome in terms of curing the tumor and less side effects, or less toxicity profile for the patient, so that is where the main change has taken place over the years, better targeting, better ability to plan, better dosimetry and treatment design. Foss I understand that there are certain dose limits for certain normal tissues and that somehow dictates the way that you actually do radiation therapy. Wilson Right, and those are exactly the kinds of things that you learn during your training,

what organ tolerance limits there are. What dose you can safely give to the lung or the esophagus? What dose is safe to give to the breast, and we do not just give as much radiation as we can until we get to the safety point, but in fact, the doses of radiation that we administer are predicated based on research studies that have been done around the world taking into account the doses of radiation that these tissues can handle, but in some cases, to give an example, certain tumors may be extremely responsive to very low doses of radiation, so those patients are going to not only do well in terms of cancer cure, but are also going to do very well in terms of the toxicity profile. Some other tumors, such as lung cancer to give another example, require much higher doses of radiation for us to have a chance of good success and that is where all of the targeting and the advances have come in over the last 10 to 20 years that have helped us deliver that higher dose. The doses really depend on what part of the body we need to treat, how much of that organ we need to treat, and what the cancer is that we are dealing with.

Foss When someone is comparing their experience with radiation therapy to another person's experience there are vast differences in how many treatments they had, for instance, and whether they were treated once a day, or more often, this is all predicated by the underlying disease and how the radiation oncologist does the treatment planning for that individual patient.

Wilson That's right. It is for the individual patient. There are some things that do dictate how many treatments we give based on the expertise and the technology that may be available at a given center. I will give you an example, stereotactic body radiotherapy for early stage lung cancer in a patient who for whatever reason, it is unsafe for them to undergo an operation to remove that small tumor. Stereotactic body radiotherapy is something that we might consider in that scenario and we have had that technology here at Yale for several years and we are actually a very busy center, so that type of treatment is as follows: Very careful treatment planning, of course, is devised, 20:40 into mp3 file <http://yalecancercenter.org/podcast/sept2610-cancer-answers-wilson.mp3> but that treatment may only be given to that patient in three, four, or five treatment visits. It is a very, very high dose which is centered on a small tumor though, and we are able to do that, we actually take the movement of the tumor into account because when we breathe, obviously a lung cancer is moving, so we account for all that, but stereotactic body radiotherapy is giving several fractions to a small area to a very high dose. At another center that does not have that technology, or does not have that expertise, they can still offer treatment to that patient but that treatment might have to be spread over 6 or 7 weeks, and in fact, that is how we did that treatment before we had the expertise here at Yale and the treatment technology to be able to do stereotactic procedures. Sometimes it is dictated by how advanced the center is, what sort of expertise they have, and what kind of technology they have, so for patients who say I have a colleague or friend who got the treatment in this many treatments, it really is dependent on the expertise of the center, it may be a part of a clinical trial, it often depends.

Foss Can you segue from that discussion and talk a little bit about clinical trials in radiation therapy? Are there trials ongoing here at Yale Cancer Center?

Wilson Yes, there are a vari-

ety of trials ongoing here at Yale and many of these trials are supported not just by the radiation oncology doctor, but again are provided for patients and patients can access these through a multidisciplinary type of evaluation. A clinical trial that you and I are in the process of opening is for total skin electron beam therapy for patients with skin lymphomas, you are involved, I am involved, Dr. Girardi from dermatology is involved, so that is one example of a trial in our particular area of expertise. We have lung cancer trials that are available looking at the combination of radiation treatment and chemotherapy drugs. In one trial, for example, we are considering trying to actually lower the dose of radiation by using other agents to sensitize cells to radiation treatment so that we can get the same cancer cure rate but eliminate some of the toxicity by using multiple therapies at once. We have a variety of central nervous system trials available that Jonathan Knisely is supervising, who is one of our central nervous system radiation oncologists. We have clinical trials in almost all of the organ systems that are available and usually there are radiation based trials trying to address a question for radiation dose or radiation treatment planning, sometimes it may be a chemotherapy, medical oncology, or surgical question, and there may or may not be radiation involved. Foss We also have a group of scientists working in the radiation oncology department here at Yale who are looking at the basic mechanisms of radiation damage to cells and are doing some real cutting-edge work that will help us to better understand the biology of cancer as well as the mechanisms for radiation therapy. Wilson We actually have one of the largest sections of radiobiology in the United States. Dr. Peter Glazer, the Chairman of the Department of Radiation Oncology at Yale, is considered an international expert in the area of DNA repair and he supervises all of the laboratory operations. We have many scientists working at the very fundamental basic level trying to come up with solutions, explanations, trying to understand better how radiation works on a variety of different cell types24:13 into mp3 file <http://yalecancercenter.org/podcast/sept2610-cancer-answers-wilson.mp3> because if we can better understand the mechanisms through which it works, we can be much more specific in its application for certain types of diseases and patients with certain types of problems. Some of our clinical physicians are also doing laboratory research, some of the physicians are doing clinical research, running clinical trials for example, and seeing patients and offering clinical trials to them and then we have other scientists in the department who do not see patients at all, but are working in the fundamental radiobiology laboratories, and we also have a fairly large group of PhD physicists who are doing research in those areas in terms of developing the technology of radiation delivery, imaging, and dosimetric evaluation, so we have really got a triple pronged approach, clinical care, basic research in radiobiology, and research in physics and we all work together. Foss I think it is really important for everybody to know that that whole conglomeration of people comprises a fairly large portion of the Cancer Center. Typically we think mostly about the clinical oncologist and the surgeons, but certainly your group is doing some real cutting-edge work and there are lots of folks involved in that work. Wilson A lot of folks involved and we have a very successful radiobiology program, which is not only

large in terms of the number of faculty and staff, but it is one of the leading centers in the United States in terms of garnering NIH funding. Foss Lynn, another hat that you wear among your many hats is as the Residency Training Program Director for Radiation Oncology. Can you tell us a little bit about that program? Wilson We obviously train physicians in radiation oncology, all of them have graduated from an accredited medical school. As I mentioned earlier, the training is a total of five years, there is a one year internship which is generally done in internal medicine and then folks come to our department following that for specific training in the field of radiation oncology which will subsequently lead to them taking their board examination and being board certified in the specialty. The training program is relatively large, starting next year will be up to 11 trainees at any one given time, so we take approximately three trainees per year and our program is a very popular one, I think because of the amount of quality that we offer, the education is good, we are a large department as we have touched upon, so there is a lot of access for the trainees to research projects and a lot of different clinical excellence from our large faculty group. It has become a very very competitive field and we receive approximately 200 applications a year for three positions. It's extremely competitive, it was not that competitive many years ago, but it is something that has really been popularized over the last 10 years or so, and I think that is probably because of a lot of the advances in technology. Much of the field was the same in terms of what is involved with interacting with patients and oncology and using the radiation devices, but the technology in our field and our ability to accurately deliver treatment very safely has exploded in the last decade so the field has become very popular. 27:30 into mp3 file <http://yalecancercenter.org/podcast/sept2610-cancer-answers-wilson.mp3> Foss And one of the major focuses of your particular work here at Yale is the treatment of patients with cutaneous T-cell lymphoma. We have collaborated certainly over the years in that area and Yale is one of a very small number of centers that delivers total skin electron beam radiation, is it less than 10 centers in the United States, Lynn, that does it the way we do it? Wilson Probably less than ten do enough of it to really feel very comfortable offering it to patients on a daily basis and it is one of the most complicated treatments that we do in radiation oncology and the reason for that is because we use six different fields to treat the patient's entire body and each of those fields is actually divided into two, an upper part of the body and a lower part of the body, so we have those 12 fields and then we have some supplemental fields that treat the area between the legs and the bottoms of the feet, top of the head actually gets treated as part of the original 12 fields. We have got all of these fields, and to some extent there are areas of the fields that overlap with each other, but that is actually by design and is the way we want it to work, but there is a lot of calibration involved. Patients can get side effects from the treatment and so that is important, and you and I have a lot of expertise in this, but physicians who are attempting to do total skin electron beam therapy at a center where there is not much experience, I spend a fair amount of time taking phone calls, trying to help these physicians with their cases because they are not familiar sometimes with the diseases and the treatment can be very very

complicated, so it works extremely well and smoothly when it is done right at a center with experience and we have quite a bit of experience. There are other centers in the United States with a lot of experience but total skin electron beam therapy, when you asked earlier, is radiation therapy accessible for patients, that is something that there are probably certainly less than 20 centers in the United States that have enough experience to claim true expertise. Dr. Lynn Wilson is a Professor of Therapeutic Radiology and an expert in the use of radiation to treat lung cancers and cutaneous lymphomas. He is also the new host of Yale Cancer Center Answers. If you have questions or would like to share your comments, visit yalecancercenter.org where you can also subscribe to our pod cast and find written transcripts of past programs. I am Bruce Barber and you are listening to the WNPR Health Forum on the Connecticut Public Broadcasting Network.