Welcome to Yale Cancer Answers, with your host, Doctor Anees Chagpar.

Yale Cancer Answers features the latest information on cancer care by welcoming oncologists and specialists who are on the forefront of the battle to fight cancer. This week, it’s a conversation about radiotherapy for lung cancer with Doctor Henry Park.

Dr. Park is an assistant professor of therapeutic radiology at the Yale School of Medicine, where Doctor Chagpar is a professor of surgical oncology.

Henry, maybe we can start off by telling us a little bit more about yourself and what you do. I’d be happy to, so I grew up in Jersey and first came to Yale as a college student about 18 years ago. I stayed at Yale for medical school and moved to Boston for two years. And then I focused on public health and I received an MPH in public health at Harvard.

Then I stayed there for my medical internship and
returned to Yale about eight years ago and after my radiation oncology residency I joined the faculty about four years ago. So as a radiation oncologist, I specialize in helping patients who have a cancer diagnosis to figure out if radiation therapy is the right choice for them. I focus primarily on treating patients with lung cancer as well as those with head and neck cancer, and I see patients in New Haven and Waterford and help to manage their care throughout the course of their radiation therapy and really work with the surgeons and the medical oncologists together as a team to try to figure out what are the best recommendations that we can give for each individual patient. Henry, let’s talk a little bit more about lung cancer and how it’s treated. I mean, for many of our listeners there may be questions about how exactly we decide whether a patient should be treated with surgery or with chemotherapy, or with radiotherapy, or with a combination of all three or two of the three. Tell us more about how those decisions are made.
It’s a very complex discussion we have often with the patients as well as each of us from the surgeons and the medical oncologists, as well as the radiation oncologists. We meet once a week at a lung tumor board which is every Monday and we get together and discuss any situations that might be challenging for us to decide what the right combination or treatment is. The overarching goal though is to be individualized with how we make recommendations and to make sure that we’re meeting the goals of the patient as well. So we want to really focus on that. Primarily, radiation is specifically a non-invasive and invisible way of treating many kinds of cancers and for lung cancer specifically it is very useful in multiple different kinds of contexts. And it really depends a lot on the stage of disease as well as the patients status, health status and goals. So for example, for stage one lung cancer, when the disease is very localized,
we really often choose between surgery and radiation therapy for a patient to try to figure out how best to cure their cancer. So we’ve found overtime that this technique called SBRT or stereotactic body radiation therapy serves as an excellent alternative to surgery in certain patients. We use a high dose of radiation per session. Over just three to five treatments using this very precise technique in order to target these small localized lung tumors and then to try to eliminate them completely. But for more locally advanced disease, we had to make the decision about whether or not we need to use chemotherapy with radiation together. Often we will need lower doses of radiation each day and spread out over multiple weeks of daily treatment in order to be able to treat larger volumes of disease, especially when the disease has spread to the lymph nodes, we still do this with a curative intent most of the time but sometimes we decide that there’s some situations where chemotherapy first is helpful,
followed by surgery. Other times we do chemo-radiation, meaning chemotherapy and radiation therapy together, and other times, chemo and radiation followed by surgery, so there really are multiple options that depending on exactly where the tumor is and how it’s spread and what we think each patient can tolerate in terms of the treatment, we often have to make those recommendations and discuss those options with each patient. Getting back to where you started with early stage lung cancer, stage one, when you said well, we need to make the decision about using SBRT versus surgery, it sounds to me like many patients may opt for SBRT if these two are equivalent. Here you have radiation therapy which is non invasive, painless. Three to five days I believe you said versus surgery, which is clearly invasive. Often will result in a hospital stay and so are these really equivalent or is one superior?
it’s hard to say for sure. We have not yet been successful as a specialty, either surgery or radiation oncology, at comparing head-to-head in a randomized trial to be sure of that answer about exactly which patients are best for surgery and which are best for radiation. We do know that when you compare those who have received surgery and those who had radiation therapy, that those who have received surgery often have better outcomes than those who had radiation therapy, but we don’t know if that’s because patients who get radiation therapy may not always be candidates for surgery, or may not be fitted for surgery either. So that’s why we don’t know for sure about that. Typically, if patients can get surgery, and if the surgeons believe that they can take the tumor out without causing too much of a functional deficit, meaning that your lung function can handle our surgery and that you as a patient can handle the
surgery and recover well from it
if it is expected that can happen,
then our gold standard still is surgery.
At this point, however,
we believe that radiation,
especially for those who are not
good surgical candidates, meaning
that surgery would likely lead to
a major issue with their quality
of life going forward
and that recovery may be too
much for a patient,
then we believe that radiation,
especially this SBRT technique,
does achieve very good outcomes.
We’re still working on trying to
complete a clinical trial to try to
compare surgery and radiation therapy
for those who are eligible for either one,
but it is has been hard to get enough patients
on this clinical trial to answer
the question fully so far.
The clinical trial is
currently open and enrolling at the VA.
There have been other clinical trials
that did not have enough
patients to answer the question fully,
but when they combine the results
of those studies they found among
the patients that did
receive SBRT who were
also eligible for surgery otherwise but did receive SBRT, did have very good outcomes and seemed to be just as good as surgery in those small number of patients, but we don’t have enough patients yet on one of these randomized trials to know for sure if radiation is truly a fully adequate alternative to surgery, for those who can get surgery. I know on this show I’m often standing on a soapbox talking about clinical trials. But if these two modalities truly are equivalent, the only way that we’re going to in practice offer SBRT to all patients is if we have the clinical trial data that compares head-to-head and demonstrates that they’re equivalent. And the signal so far is that based on combining results of trials that didn’t meet their accrual target, it looks like these two are equivalent. But it would really be a tremendous advance to avoid surgery in patients we could offering them SBRT. Am I correct in assuming that SBRT has fewer side effects than surgery long term? Are there side effects to the SBRT as well that cause patients difficulties in breathing or reduced lung capacity and so on
and so forth that they should be concerned about? There are in the short term, we believe that SBRT T has fewer side effects, so often for patients who may be older or have more other medical issues or who may not be able to withstand the recovery very well from surgery in the short term, we feel confident that SBRT T has fewer side effects in that short term. However, as time goes by, I think the other issue here is long term follow up and long term survival as well as side effects. The side effects do accumulate overtime and the more we learn about SBRT T which has been in widespread practice for only about 15 years or so, not as long as surgery has been around, so we don’t have as much long term data as a surgery does. But we know in that three to five year period that as you go further along in that period, close follow up is really required because we need to see how the side effects accumulate. And sometimes they don’t present themselves for a couple of years or a few years afterwards.
So we do want to watch closely for that, because there can be side effects, especially with lung function. Overall in the lung function, as inflammation occurs and eventually scarring as part of the healing process is that ultimately, we may see that the pulmonary function may decline more gradually over time compared to surgery, where the decline tends to be a little on the sooner side, so that’s why it’s really nuanced and subtle. There are some differences there, but both of them have their risks and side effects, and that’s why we encourage our patients to meet both the surgeons and the radiation oncologists who have stage one disease to really determine what exactly is expected for each individual patient. The other thing about radiation, just as it is for surgery, is it depends on where exactly within the lung the tumor is arising from. So if it’s right in the middle of the lung, far away from other...
organs, then the side effects may be less, however, if the tumor is closer to the esophagus or the airways, or to the ribs, you might see other side effects that are beyond the lung themselves. So for example, if we get treatment very close to the esophagus, we might expect that we'll see some more difficulty with swallowing or painful swallowing, heartburn, things like that, if it's too close to the airways, we might see some bleeding, more cough. If it's too close to the ribs or the chest wall or the back, sometimes we'll see some pain that can arise even a couple of years afterwards, so it's not a benign treatment completely, but the side effects generally are well tolerated for most patients.

And what about long term side effects? I realized that you said that SBRT is relatively new in the past 15 years or so, but with other cancers treated with radiation, people are often told about the possibility of secondary
malignancies and worry about that, especially with scarring that takes place and so on.

Is that something that patients should be worried about in lung cancer treated with SBRT as well? It is something we counsel our patients about and we don’t know for sure if radiation really leads to, in the lung at least, if it really leads to significantly increased risk of other lung cancers down the road. Because often when patients get one lung cancer, it doesn’t matter what kind of treatment they get, they are often more prone to other lung cancers that we watch very closely for. So if something comes back in an area that was previously radiated, we may not know if that was because of the radiation, or because it would have happened anyway, but we do see that sometimes where lung tumors do come up, both in the areas where there was a previous radiation as well as other areas of the lung or in the body that really had nothing to do with the radiation so it is hard to know for sure. But it’s something that we
0:13:58.79 –> 0:14:00.42 counsel our patients about, 
0:14:00.474 –> 0:14:01.994 that theoretical risk that 
0:14:01.994 –> 0:14:04.175 radiation can lead to a second 
0:14:04.175 –> 0:14:05.975 malignancy many years down the road, 
0:14:05.98 –> 0:14:08.017 but it seems to be less of 
0:14:08.017 –> 0:14:09.84 a problem for lung cancer 
0:14:09.84 –> 0:14:11.485 then it is for other kinds of 
0:14:15.238 –> 0:14:17.655 We're going to take a short 
0:14:17.655 –> 0:14:19.929 break for a medical minute and 
0:14:19.929 –> 0:14:22.479 then come back and talk more 
0:14:22.479 –> 0:14:24.709 about radiotherapy for lung cancer 
0:14:26.17 –> 0:14:28.36 Funding for Yale Cancer Answers 
0:14:28.429 –> 0:14:30.579 comes from Smilow Cancer Hospital, 
0:14:30.579 –> 0:14:32.729 promoting sun safety and 
0:14:32.802 –> 0:14:34.872 skin cancer screening in honor of 
0:14:34.872 –> 0:14:37.03 UV Safety Month. For information and 
0:14:37.03 –> 0:14:39.725 to learn if you should be screened, 
0:14:39.73 –> 0:14:40.5 visit yalecancercenter.org/screening. 
0:14:42.6 –> 0:14:44.296 The American Cancer Society 
0:14:44.296 –> 0:14:46.416 estimates that nearly 150,000 people 
0:14:46.416 –> 0:14:49.073 in the US will be diagnosed with 
0:14:49.073 –> 0:14:50.96 colorectal cancer this year alone. 
0:14:50.96 –> 0:14:52.885 When detected early colorectal cancer 
0:14:52.885 –> 0:14:55.34 is easily treated and highly curable, 
0:14:55.34 –> 0:14:58.193 and men and women over the age of 45 
0:14:58.193 –> 0:15:00.055 should have regular colonoscopies 
0:15:00.055 –> 0:15:02.5 to screen for the disease. 
0:15:02.5 –> 0:15:04.092 Patients with colorectal cancer 
0:15:04.092 –> 0:15:06.48 have more hope than ever before,
thanks to increased access to advanced therapies and specialized care. Clinical trials are currently underway at federally Designated comprehensive cancer centers such as Yale Cancer Center and at Smilow Cancer Hospital to test innovative new treatments for colorectal cancer tumor gene analysis has helped improve management of colorectal cancer by identifying the patients most likely to benefit from chemotherapy and newer targeted agents, resulting in more patient specific treatment. More information is available at yalecancercenter.org. You’re listening to Connecticut Public Radio. Welcome back to Yale Cancer Answers. This is doctor Anees Chagpar and I’m joined tonight by my guest Doctor Henry Park. We’re talking about radiotherapy for lung cancer and right before the break we were talking about the use of radiation therapy and specifically SBRT for the management of stage one or early stage lung cancer. So Henry, you were mentioning that radiation also may play a role in more advanced cancers that are locally advanced and not metastatic.
But one of the questions that often comes up is, sometimes we use chemotherapy alone and sometimes we use chemotherapy plus radiation combined at the same time. How do we make those decisions? So that’s a very good question. We do that based on seeing exactly where the disease has spread. So if it has gone to the lymph nodes that are still in the chest, or if it’s a very advanced tumor in the lung that seems to be invading other structures in the chest, then that’s often where we consider this to be locally advanced but not metastatic, meaning that it has not spread to other organs throughout the body like the brain or the liver or other areas. So in that case we still do approach this with the intent to cure, so we use some kind of combination typically of chemotherapy with radiation. Or some kind of combination of chemo with surgery, with or without radiation, so for those patients it really depends on the similar features that we look for in early stage lung cancer.
Given how much the patient can tolerate and what they’re willing to tolerate, as well as the amount of disease that needs to be treated. The surgeons will weigh in about how much lung would have to be removed in order to do the adequate surgery and we will weigh in about how much the normal organs nearby will receive. The surgeons say it’s resectable. Having you decide then whether

In early stage lung cancer, you talked a little bit about deciding between surgery and radiation, and I think we get the concept that both surgery and radiation therapy are local modalities designed to treat lung cancer in the lung itself. So one question that comes up is, if my cancer is resectable, say I’ve got locally advanced lung cancer, I’m going to get chemotherapy. The surgeons say it’s resectable.
to add more radiation therapy or whether to leave it with the surgery alone. Often we decide that we don’t add more radiation therapy afterwards or we don’t add radiation therapy at all. It’s a conversation with the surgeon about whether or not they think they can resect this tumor after the chemotherapy. Sometimes they may prefer to have chemo and radiation together before surgery, or they may prefer to have the chemotherapy alone before surgery. We used to do more radiation therapy after surgery. But like you mentioned before, there’s been a recent clinical trial this past year that showed that for those patients who had certain types of lymph nodes or in certain locations, that adding radiation therapy after surgery may not be as necessary as we once thought. And so far the five year survival numbers have just been released as well for stage three disease and are at least 10% higher than we’ve ever seen in really any clinical trial. Either involving surgery or not involving surgery.
I can't emphasize enough how important these clinical trials are to really moving the field forward. Are all patients eligible for immunotherapy given that data? Or do we look for certain biomarkers to decide whether or not they would be candidates for that? Most patients are eligible for it after chemotherapy and radiation if they have stage three disease, we may not always give it afterwards. Depending on their response to the chemotherapy and radiation, so we’d require before receiving that we have another scan that shows that there’s not new disease elsewhere already starting. We’d also want to be sure that patients have tolerated the chemotherapy and radiation well enough to start the immune therapy, and there’s other biomarkers like PDL1 that are very helpful in determining how likely the patient is to respond to immunotherapy as well. Right now we still do offer it even for those who do not have the PDL1 marker. But it may not be as helpful in those patients as it is for those who have a high PD L1 expression.
Given those data than the fact that we offer immunotherapy regardless of PDL1 status and the fact that the clinical trials have demonstrated that chemo, radiation therapy followed by immune therapy without surgery offers tremendous survival benefits, do we ever offer surgery to stage three patients anymore? We still do. I think there's certain circumstances still where we don’t know what the role is yet of surgery with immunotherapy and if we still get good outcomes from let's say, chemo with surgery afterwards, or chemo and radiation, then surgery and we’d save the immunotherapy, which didn’t really exist during the time of the surgical trials, then you know, could we still get good outcomes from that? We believe we may be able to. We still don’t have that clinical trial data yet to prove that yet. But as we move forward, there’s other trials that are currently being considered right now about combining immunotherapy with surgery as well. And even in the earlier stage setting that’s
I think becoming more and more studied seeing if that is going to be helpful and as the months and even as the days and weeks go by, new data comes out all the time from clinical trials that changed the way we think about the best way of treating stage three lung cancer. And so when we were talking about stage one and even locally advanced up to stage three lung cancer, you used the term curative intent and can you explain to our listeners what you mean by curative intent and what the alternative is? The concept there is that we are hoping to eliminate the tumor so that it does not grow and come back at any point in the patients life. Are we always successful at that? No, but we would approach it with the intention of doing that, and that’s supposed to palliative intent where the goal is to help with alleviate symptoms that may come up. For example, if the disease has already spread outside of the chest, we may be approaching the disease in that capacity in terms of the treatments that we may offer.
However, in the past five to 10 years, there’s a lot of wiggle room in between where we may not necessarily believe we will completely eradicate the tumor with any combination of therapies, but that we believe we can extend survival and extend Disease Control for years afterwards, and we’re often successful at doing that and that’s often an important goal for a lot of patients is to live as long as possible and to turn their cancer into more of a chronic disease. And I think we’re seeing that more and more with the advent of immunotherapy. Better combinations with surgery and chemotherapy and radiation therapy, as well as targeted therapy that specifically targets certain mutations, especially in lung cancer, that can often, even if they are not specifically curative, they may give patients multiple years of extra life and time before they require other kinds of therapies. So when you say that, I mean you’re referring to stage four or metastatic patients in whom can still have many years of good quality of life. Tell us more about the use of radiation therapy in those circumstances?
because we’re seeing such improved outcomes from our excellent systemic therapies, meaning the chemotherapies and immune therapies and also targeted therapies. Radiation has an increasing role as well. In stage four patients, we used to be limited to alleviating symptoms, which radiation is very effective in doing over a very low dose and a short period of time. However, with this SBRT technique that we’ve been using for stage one lung cancer, we often use this in the metastatic setting especially for those who have disease called oligometastatic disease and what this means is that only a few spots, maybe one or three or even five spots, may be present outside of the lung and if we can use either surgery or radiation, some kind of local therapy to address those areas after systemic therapy, has worked well for a patient, then we may be able to really extend their time without needing systemic therapy and having good disease control so it’s something that we’re seeing improved survival from clinical trials recently. When you add radiation or surgery
In very selected populations, meaning those who responded well to their systemic therapy and who have a limited number and treatable areas where we can use surgery or radiation, these patients have been able to live longer than they would have otherwise.

We talked a lot in this show so far about clinical trials and historically people have always thought that clinical trials were only for patients who had no other option, patients who had stage four disease. But it sounds like that clearly is not the case and that there are clinical trials that are offered across various different stages to allow patients to get the best therapies. What clinical trials are currently ongoing that you’re most excited about? We have a lot of clinical trials ongoing right now at yield in lung cancer, but specific to radiation we actually have three right now for stage one disease, so exactly the opposite of what we had been used to seeing for clinical trials, and that they’re really often used like you’re saying for patients as a sort of a last resort.
It’s really the opposite for us, where we’re trying to approach this to improve the standard of care even more at all stages of disease. So for example, stage one lung cancer, we do have two clinical trials one that’s currently active and one that is about to open fairly soon that look at the idea of SBRT with immune therapy for stage one disease. So half the patients will get the standard of care, radiation therapy, and half the patients will also get immune therapy as well. And that’s our way of studying to see if will get even better outcomes with SBRT and with immune therapy and try to prevent recurrences that happened elsewhere in the body, so I’m very excited about those studies, and I also have a study of my own as well that looks at a clinical trial that’s looking at a fewer number of sessions of SBRT for those tumors that are a little closer to the middle of the chest and trying to make it more convenient and for patients they only come in three times instead
of five times for tumors that are closer to the middle of the chest.

Henry Park is an assistant professor of therapeutic radiology at the Yale School of Medicine.

If you have questions, the address is canceranswers@yale.edu and past editions of the program are available in audio and written form at YaleCancerCenter.org.

We hope you’ll join us next week to learn more about the fight against cancer here on Connecticut Public Radio.

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