Andrew, maybe we can start off by you telling us a little bit more about what it is that you do.

Thoracic surgeons operate on the chest, and the majority of our patients tend to be lung cancer patients, but we take care of patients with both malignant and benign conditions within the chest.
The majority of our practice.
Lung cancer seems to be pretty prevalent. Is that still the case?
Yes, this is still the case due to smoking history.
And it is the number one cause of death by cancer in the United States.
And it is the second most common highest incidence of cancer for both men and women.
And when you think about that, often on this show, we talk about all kinds of different modalities that people use to treat cancer, whether it’s surgery or whether it’s chemotherapy or whether it’s radiation.
How many patients actually, or what proportion of lung cancer patients actually are treated with surgery? Is that the majority, or is that a pretty low number compared to the total number of patients who are diagnosed each year?
The number of patients who are eligible for surgery is not the majority, however, as we detect more and more lung cancer through lung cancer screening, more patients are identified earlier in the disease process and thus are eligible for surgery as a treatment.
As a surgeon, I guess I am a little bit biased, but I often think that when patients are eligible for surgery, it’s often a good thing because we’re often treating people for curative intent. Is that right?

Yes, and that’s the same for lung cancer as well. Surgery for lung cancer typically is most helpful for patients who are in their early stage of lung cancer. And so historically talk a little bit about how lung cancer was managed surgically. Sure, lung cancer had been managed with what’s called a thoracotomy. And a thoracotomy is a large incision on the side of the chest, usually about 6 inches or so long and through that skin incision the access is in between the ribs and those are spread open in order to access the lung and the lung cancer to remove the tumor. And so tell us more. I mean, it sounds like that’s a pretty big operation. You’re in the hospital and somebody is making this large cut in your chest and spreading ribs and taking out part of your lung.
0:04:12.69 –> 0:04:14.51 What does that feel like or look like from a patient perspective?
0:04:14.51 –> 0:04:16.539 How long are you in hospital?
0:04:16.54 –> 0:04:18.466 Does that mean that you’re on a breathing tube?
0:04:18.47 –> 0:04:20.075 Does that mean that you’re in ICU?
0:04:20.075 –> 0:04:21.359 Give us more of a sense of what that looks like.
0:04:21.36 –> 0:04:23.6 Sure, so overtime up till modern day when patients require thoracotomy incision for their lung cancer the hospital stay is usually between three to five days. And patients are usually in a step down unit for monitoring their vital signs and the majority of the hospital stay is making sure their pain is well controlled so that they can deep breathe well and cough well and recover after such a big operation.
0:05:00.517 –> 0:05:13.824 But I understand that now, just like many surgeries we think that used to be done with a big cut as well. Where now it can be done with 3 little holes and some cameras.
0:05:13.824 –> 0:05:17.586 What many people in the lay public call little telescopes where the gallbladder can be removed through tiny incisions.
0:05:17.586 –> 0:05:20.23 What many people in the lay call little telescopes.
0:05:20.23 –> 0:05:26.228 Where now it can be done with 3 little holes and some cameras.
0:05:26.228 –> 0:05:30.208 Has lung cancer surgery progressed to that point?
Yes, absolutely, so that’s minimally invasive lung surgery starting in about the 90s, there was the progress in terms of minimally invasive instrumentation. Just as you had mentioned for Gallbladder surgery, these laparoscopic instruments were modified for the chest, and so what that looks like today is usually a camera and it’s usually about a 5 millimeter or less than half an inch in diameter that gets projected onto a typical HD screen in the OR through one incision and there are three other small incisions, again, usually quite small, about a centimeter and through these total of four incisions we use that technique to remove lung cancer, where previously we had done a thoracotomy. So it sounds like that would potentially be much easier on patients, much less pain. So what does that picture look like? I mean, do patients go home sooner? It doesn’t sound like you’d need to spread ribs and those kinds of things, so pain is a contrasting picture to what that looks like as
opposed to a thoracotomy.
Sure, so when patients undergo this type of surgery called VATS or video assisted thoracoscopic surgery because of the smaller incisions, patients do have less pain. They do recover in the hospital and at home much more easily, and their quality of life and a return to work is sooner as well. They do recover in the hospital and at home much more easily, and their quality of life and a return to work is sooner as well. From a variety of studies that have been done overtime this has shown to be the case compared to open thoracotomy cases and so, whereas thoracotomy patients spend about three to four days in hospital, in a step down, what happens to patients who are treated with VATS usually does result in a reduction of the hospital stay from one to two days, depending on various other factors. But the reduction in the hospital stay is usually from reduction in pain. If we take a step back and we think about it from the health care system, Is a procedure cheaper than the other? I mean, I can see that you know thoracotomies likely have increased costs due to increased length of stay, but on the other hand there's
capital equipment and technology that adds up to cost as well. Have people looked at differences between vats and thoracotomy in terms of cost? Yes, there have been several studies and the general conclusion from these is that because of reduced hospital stay, the minimally invasive approach, is less costly. But as you were saying, the hospital of course has to invest in the capital upfront, and this is also similar to another minimally invasive instrument, the robotic approach. Again, there is investment upfront on the hospital and the health system, but overtime there is reduced cost. For patients, when patients are looking at paying out of pocket for these procedures, or if they have a particular percentage copays and those kinds of things, is there a difference in terms of patient cost as well? I actually do not have a good idea on the cost from the patient standpoint. I do believe that as the healthcare
system has savings on this that it would get passed on to the patient, but I don’t know. Yeah one would certainly imagine so and VATS procedures now have become fairly widely accepted, right? So most insurances should cover VATS procedures just as they would thoracotomies? Yes, absolutely. All insurance companies do cover VATS the minimally invasive approach compared to thoracotomy. So are there any reasons why a particular patient may not opt for a VATS procedure versus a thoracotomy, are there patients that you would kind of lean more towards doing things as we would say old school. As you can imagine for the minimally invasive approach that requires instrumentation that is small in order to fit through these small incisions that we use, and so VATS is used for relatively straightforward lung cancer operations. For operations that are more complicated, for example, larger tumor or if the patient has received chemotherapy
and or radiation where there is more scarring due to those treatments that does make it more difficult. It’s not totally unreasonable, but it is certainly easier on the surgeon to do the operation through a thoracotomy for those scenarios.

And does it take special kind of training to be able to do vats procedures, or are most lung cancer surgeons pretty adept at both? In today’s thoracic surgery practices, almost all, at least in the United States, almost all thoracic surgeons have been trained in vats. In addition to the traditional thoracotomy approach, and so most hospitals then have this technology that patients would be able to avail themselves of. It’s not like you have to go to some place special to get that. Exactly most hospitals would have this. The instrumentation for minimally invasive vats, yes. We are going to take a very short break.
0:13:14.9 –> 0:13:17.582 Please stay tuned to learn more
about surgical management of thoracic malignancies.
0:13:22.63 –> 0:13:25.702 Support for Yale Cancer Answers comes from AstraZeneca, working
to eliminate cancer as a cause of death.
0:13:35.36 –> 0:13:37.415 the most common cancer in
0:13:39.06 –> 0:13:41.13 approximately 3000 women will be
diagnosed with breast cancer this year,
0:13:41.13 –> 0:13:43.58 but thanks to earlier detection,
0:13:43.58 –> 0:13:45.63 there are more options for patients to
fight breast cancer than ever before.
0:13:45.63 –> 0:13:47.69 and novel therapies,
0:13:47.69 –> 0:13:50.539 there are more options for patients to
fight breast cancer than ever before.
0:13:50.539 –> 0:13:53.03 Women should schedule a baseline
mammogram beginning at age 40 or earlier if they have risk factors
0:13:53.03 –> 0:14:01.66 associated with breast cancer.
0:14:01.66 –> 0:14:03.595 Digital breast tomosynthesis or
3D mammography is transforming
breast screening by significantly
0:14:05.143 –> 0:14:07.078 reducing unnecessary procedures while
picking up more cancers and eliminating
some of the fear and anxiety
0:14:16.2 –> 0:14:18.12 More information is available
at yalecancercenter.org.
We are discussing the surgical management of thoracic malignancies, so Andrew right before the break we were talking a lot about how historically lung cancer had been taken out with thoracotomies, which are large cuts people needed to stay in hospital several days in a step down unit and how really things have evolved towards VATS or video assisted thoracic surgery, where you can use kind of small incisions, reducing pain, reducing length of stay and you had mentioned before the break that there’s yet another technology in terms of robotic surgery.

Tell us more about that? The Intuitive company produced a robotic technology in the 2000s, that’s what is commonly known today as the DaVinci robot, so that is another minimally invasive tool that thoracic surgeons can use to surgically treat lung cancer.
you know robots doing your surgery –> 0:15:52:388
for some might seem really high tech –> 0:15:56:03
and really innovative and for others, –> 0:15:58:61
might seem really kind of frightening –> 0:16:01:76
because you kind of like the idea –> 0:16:04:918
of a human actually being there –> 0:16:07:475
to manage your cancer. –> 0:16:09:695
So how exactly does this robot –> 0:16:13:21
or robotic surgery work? –> 0:16:15:214
Is it really like there’s –> 0:16:17:719
a small little robot –> 0:16:20:06
that goes in there and does your surgery –> 0:16:24:132
during robotic lung cancer cases? –> 0:16:26:909
We have the robot arms at the –> 0:16:30:473
patients table and a few feet away –> 0:16:34:017
the surgeon sits at a console –> 0:16:36:879
during robotic lung cancer cases? –> 0:16:36:99
where they view the images from –> 0:16:40:428
the robotic camera and they use –> 0:16:43:822
an instrumentation to remove the –> 0:16:46:577
robotic arms that way so the surgeon –> 0:16:50:084
is certainly in the room next to –> 0:16:53:293
the patient with the robotic arms –> 0:16:56:101
at the patient doing the –> 0:16:59:45
actual work inside the chest. So –> 0:17:02:37
the important key is that the surgeon –> 0:17:05:534
is really the brain operating –> 0:17:08:521
the robot and the robot’s arms. –> 0:17:11:593
These robots are not –> 0:17:14:056
operating independently of –> 0:17:15:898
a surgeon who is there, is –> 0:17:19:3
that right?
Absolutely, the robot is not autonomous. The robot in each and every movement is directed by the surgeon. So why is this any different then where you’re still working with instruments. Looking at an image on a screen, both are certainly minimally invasive approaches with the robotic technology. Formed through four small incisions, each are between 8 to 12 millimeters in size and there is an additional incision. A small incision that’s made for the assistant at the bedside to assist during the operation as well. So both certainly do result in less pain in the postoperative period then and open thoracotomy, the main advantages for the robotic approach is number 1, the improved visualization because of the robotic camera and the technology that went into developing that it does give you a 3 dimensional view of the surgical field. Sort of like you were actually inside the chest looking at these structures and doing the surgery that way. In addition to that,
It’s certainly more ergonomic as well, and if it’s easier on the surgeon, that certainly helps the operation go well and for the patients that have a better outcome. So you know I can appreciate that the camera is a little bit better. The arms are a little bit better in terms of their ergonomics and potentially the degree to which they are flexible in moving in various directions, which can make the operation easier to perform. But there must be added cost to this whole system over VATS which as you mentioned, is pretty universally available. Certainly the robotic system has a greater capital costs for the hospital for the health system. And in addition to the actual tools, the actual robot and the consoles there does need additional training on the side of the staff as well. For example, a person at the bedside being another surgeon or resident physician assistant to assist and in addition to that person, of course, the nursing staff in the room to help set up the robotic instrumentation for the
operation and not to mention in scenarios where an acute issue needs to be dealt with, the whole team needs to be aware of how to maneuver things so that they could be dealt with without the robot, and so there are many things that are required for a surgeon to perform robotic thoracic surgery as part of their practice. One of the ideas behind the technology is also to allow surgeons who have perhaps not trained in vats to be able to perform a minimally invasive approach a lot easier. As both the vats approach and the robotic approach do have learning curves associated with them, the learning curve from open thoracotomy to robotic approach is an easier minimally invasive approach to learn. And so from the patient’s standpoint, if you compare vats to robotic surgery, is there any difference in terms of length of stay or pain, or return to work? There have been and continue to be studies looking at this. And other factors as well. For example, the length of stay there is a trend towards decrease length of stay. There is a trend towards decrease pain, but so far nothing that is
statistically significant.
The other factor to consider is from a cancer operation. If any of these minimally invasive approaches are similar or different than the traditional approach in terms of cancer survival and so far do not have a difference between them or with the traditional approach in terms of cancer survivorship. And is robotic surgery covered by all insurance the way vats is and would be the cost to the patient and or to the hospital system be the same. Most insurance companies do recognize robotic surgery and it is covered. I don’t know the specifics of how the comparison between a robotic approach versus a vats approach in terms of the final cost to the patient. So how do you make the decision between whether to offer patients a VATS procedure versus a robotic procedure? I think the main thing is from the surgeon experience and training standpoint. I think when patients are seeing a thoracic surgeon and discussing surgical options, mostly, a surgeon has trained and is comfortable with the vats approach and then
0:24:24.513 –> 0:24:27.72 I think that is appropriate of course.
0:24:27.72 –> 0:24:30.42 And if they are more comfortable
0:24:30.42 –> 0:24:33.214 and have trained in the robotic
0:24:33.214 –> 0:24:36.378 approach then that is fine as well.
0:24:36.38 –> 0:24:39.019 I think the main thing for
0:24:39.019 –> 0:24:42.61 patients to be aware of is that the
0:24:42.61 –> 0:24:44.985 thoracic surgeon have some experience
0:24:45.074 –> 0:24:47.779 in a minimally invasive approach,
0:24:47.78 –> 0:24:50.17 whether it’s vats or robotic.
0:24:50.17 –> 0:24:54.506 So that their length of stay is less,
0:24:54.51 –> 0:24:56.682 their pain is less.
0:24:56.682 –> 0:24:59.94 Their return to work is sooner,
0:24:59.94 –> 0:25:03.156 and there are also less complications
0:25:03.156 –> 0:25:05.932 after surgery compared to the
0:25:05.932 –> 0:25:08.627 traditional open approach as well.
0:25:10.57 –> 0:25:13.006 Do all hospitals have robotic
0:25:13.006 –> 0:25:15.863 surgery or when we
0:25:15.863 –> 0:25:19.1 were talking about VATS you had kind of
0:25:19.1 –> 0:25:21.938 mentioned that this is pretty ubiquitous.
0:25:21.94 –> 0:25:24.892 Most people have trained in vats and
0:25:24.892 –> 0:25:28.468 so it would be something that would be
0:25:28.468 –> 0:25:31.619 very amenable no matter where you were.
0:25:31.62 –> 0:25:34.038 It doesn’t sound like that’s necessarily
0:25:34.038 –> 0:25:36.25 the case for robotic surgery.
0:25:36.67 –> 0:25:39.256 Is that right?
0:25:39.256 –> 0:25:41.65 Not all hospital systems have the Davinci
0:25:41.65 –> 0:25:44.655 technology this is something
0:25:44.655 –> 0:25:48.325 that is becoming more common and
0:25:48.325 –> 0:25:51.14 my understanding from a financial
0:25:51.14 –> 0:25:54.026 standpoint is that the company
0:25:54.026 –> 0:25:57.764 does work with the hospital in the
health system to come up with a suitable plan so that they can offer the robotic technology to their patients and to save on the cost. And that cost savings, hopefully does get passed on to the patient as well, and you had talked about kind of deciding between vats versus robotic surgery you really mentioned that it had to do primarily with the surgeons comfort. If surgeons are comfortable with both techniques and have been trained in both, are there particular patient characteristics that would lean you more one way or another?

Yeah, for the robotic approach the instruments tend to be longer and sturdier than the vats instruments and so for patients for example, who might be morbidly obese it would be easier for the surgeon to do the surgery robotically versus by vats. And there are other scenarios from a tumor standpoint as well. With the robotic approach, the ability to do very fine detailed dissection and surgery is enhanced compared to the vats.
0:27:39.345 –> 0:27:43.515 approach due to the improved camera,
0:27:43.52 –> 0:27:47.786 improved ergonomics and the ability
0:27:47.79 –> 0:27:50.225 for the robotic instrumentation to
0:27:50.225 –> 0:27:52.66 have greater degrees of freedom
0:27:52.735 –> 0:27:54.58 with the instrumentation,
0:27:54.58 –> 0:27:58.748 so for those types of tumors as well,
0:27:58.75 –> 0:28:01.17 those are
0:28:01.17 –> 0:28:05.226 better performed with robotic versus vats.
0:28:05.87 –> 0:28:08.12 Doctor Andrew Dhanasopon is an
0:28:08.12 –> 0:28:09.62 assistant professor of thoracic
0:28:09.681 –> 0:28:12.04 surgery at the Yale School of Medicine.
0:28:12.04 –> 0:28:13.496 If you have questions,
0:28:13.496 –> 0:28:14.952 the address is canceranswers@yale.edu
0:28:14.952 –> 0:28:16.963 and past editions of the program
0:28:16.963 –> 0:28:18.799 are available in audio and written
0:28:20.39 –> 0:28:22.79 We hope you’ll join us next week to
0:28:22.79 –> 0:28:25.136 learn more about the fight against