

WEBVTT

NOTE duration:"00:38:58.2420000"

NOTE language:en-us

NOTE Confidence: 0.918576955795288

00:00:00.030 --> 00:00:06.590 Just just leave the screen leave yourself some room so you can actually see the screen, and then.

NOTE Confidence: 0.901733934879303

00:00:07.680 --> 00:00:29.540 Let me see here O what I thought we would do is we're going to go over a couple of cases and will hopefully get the tumor board is not seen these cases will see will test them to see if they're right if they come up with the right answer or not.

NOTE Confidence: 0.927610814571381

00:00:30.330 --> 00:01:00.340 But I think it'll give an idea of what we go through what our discussions are like what our decisionmaking is like so the first patient is a 58 year old male who has been smoking for 20 years and has a 30 pack year, smoking history. During that time had a cough and underwent a chest X Ray that showed an abnormality.

NOTE Confidence: 0.843189001083374

00:01:00.340 --> 00:01:25.190 And then add this see T Scan Zero Doctor Amy Rabinowitz, who is a truly a remarkable radiologist. She is an amazing asset that we have at this hospital Amy? What do you think about this? Yeah, yeah?

NOTE Confidence: 0.854186952114105

00:01:28.330 --> 00:01:58.820 Before I start Lynn Dr to know his last slide less some other chess radiologists, but that's an old slide. We now have 8 dedicated thoracic chest radiologists here in our section. Some of the ones that were on their ones retired in one is no longer here. But we have 8 fantastic people in our section who are specifically trained in all. We do is look at the lungs look at the chest. Every day, 24 hours a day 7 days a week basically so.

NOTE Confidence: 0.810721933841705

00:01:58.820 --> 00:02:08.650 So looking at it a lot you got pretty good at it, but anyway, so here in the chiva pointer to show them.

NOTE Confidence: 0.75155109167099

00:02:10.550 --> 00:02:15.940 I could probably point will that work. Sorry.

NOTE Confidence: 0.711499810218811

00:02:16.490 --> 00:02:21.620 Or down if you could point so right here, so these.

NOTE Confidence: 0.784075438976288

00:02:22.130 --> 00:02:28.390 This is the lower part of sorry there, we go.

NOTE Confidence: 0.903920114040375

00:02:30.070 --> 00:03:02.560 This is the lower part of the chest. So this white thing that we're seeing here in this white thing here. These are the diaphragms OK, so these great things here with white dots and them. These are the most inferior part of your lungs your lung bases and hear this big white dot here. This doesn't belong here. This is not a blood vessel. So it looks like I don't have a measuring tool here. But maybe a 2 centimeter? What we would call it a well circumscribed lung nodule and nodule this size and someone who smokes.

NOTE Confidence: 0.900390982627869

00:03:02.560 --> 00:03:28.950 Based on chassity you know, we would call this an indeterminate lung nodule. Sometimes people have lung nodules that are the size that end up being benign lesions or nodules from infection. But in somebody who's a smoker who's not sick in the hospital. Ann this is incidentally picked up a good percentage of these will end up being neoplastic nodule potentially lung cancer.

NOTE Confidence: 0.881627678871155

00:03:29.570 --> 00:03:42.690 Excellent so this patient had a pet scan and the pet scan, which is a radioactive sugar did have some activity in that nodule.

NOTE Confidence: 0.862727105617523

00:03:44.300 --> 00:04:16.200 A little bit little bit and this is the scan a gram. It's a little bit different way of looking at it and there was no other uptake anywhere else. So Kevin the patient wanted to know should we biopsy. This is this a biopsy rible thing and is that a good idea, so the we do image guided targeted biopsy is so the image in guidance. Technology has been has gotten advance so, so much.

NOTE Confidence: 0.893802106380463

00:04:16.200 --> 00:04:48.620 In the last many years now, so the A lot about these are the masses that there are deep inside under either city ultrasound or the even pass city guided we can actually take a tissue sample out of this pretty accessible. Ian the pretty safely, but also the technology has been advanced enough such that the now that issue not only quality but also quantities have gotten much improved over the years, so those allow, or not only the adequate diagnosis.

NOTE Confidence: 0.824604034423828

00:04:48.620 --> 00:05:14.780 Oh, but also the lot of different the markers that are necessary for the lot of treatments options that we have so sorry. Kevin Kim is our director of Interventional. Paul Menology Interventional radiology and fire sees things using a needle through the skin doctor Homer is our pathologist.

NOTE Confidence: 0.93259209394455

00:05:15.310 --> 00:05:24.630 Rob what would you what do you think about your potential to diagnose something like this based on a needle biopsy you think that that would be helpful in this setting or not.

NOTE Confidence: 0.859098076820374

00:05:25.520 --> 00:05:43.620 So first of all I want to say that the biopsies that are obtained at Yale are amazing. Actually, the icy so one of the things we see here is we see patients referred for have been biopsied elsewhere. So we see biopsies from really every hospital in the state and we see biopsies had been tainted GAIL and.

NOTE Confidence: 0.905093550682068

00:05:44.280 --> 00:06:15.280 You know when you see a biopsy you have a piece of tissue and you could imagine if you saw a photograph of a relative of yours and you saw them their whole face you would recognize him pretty well. You just see their ear. It might be a little harder to recognize exactly what you see. And so when you see a small piece of tissue as opposed to an adequate piece of tissue is trying to understand who exactly it is, but you only have part of the air. Or maybe a little bit of the nose to go by. You have to use a lot of imagination, whereas it. Yeah, we are much more likely to see the entire.

NOTE Confidence: 0.886548221111298

00:06:15.280 --> 00:06:39.840 The entire face uhm I would say that for a lesion like this. This will lesion. My guess is that this lesion will be probably accurately diagnose the vast majority of time. There are certainly are times when we have a discussion about do they actually have the appropriate material. But I would think at least like this? Which is a very round very regularly should everything is pretty clean would be likely to be diagnosable on a biopsy.

NOTE Confidence: 0.895913660526276

00:06:40.460 --> 00:07:11.040 So this may be surprising, but we would almost never biopsy this and the reason is if we biopsy it in its cancer well. We're going to take it out. If we buy up scene. It's not cancer because of what Rob was saying there's a chance that we hit the part of it. That didn't have the cancer in it, because cancers can be a mixture of scar tissue inflammation. Even sometimes infection and so the way I describe it is.

NOTE Confidence: 0.888067185878754

00:07:11.040 --> 00:07:41.900 Taking biopsies like taking part of a book needle takes words surgery takes out the whole book and sometimes a few words tells you what you need to know, but sometimes it doesn't tell you the whole story. So if we stick a needle in this and it says no cancer. There's a 20% chance that there's still cancer in that and when I tell patience is if somebody told you that there's a snake in your shoes and there's a 20% chance. It's poisonous you're

getting rid of the shoes so at least in Ohio. You would be getting rid of issued only 2 people do here in Connecticut.

NOTE Confidence: 0.871752381324768

00:07:41.900 --> 00:08:04.020 So as a part of the management. This would be somebody where we would take him to the operating room and we would take this out and based on frozen section. We would send it to Rob and Rob would tell us is this cancer or no cancer and so Rob your team said this was a neuroendocrine tumor.

NOTE Confidence: 0.893334269523621

00:08:05.970 --> 00:08:37.800 So that would be a right so the issue, there would be so we're getting this some really were getting deeper little deep in the weeds here, but it's just the point is that even though we talk about tumors in the lung. It's the key concept is that there are different types of tumors right there's some things that are formed lesions like that is. Dan says completely benign you take it out. Nothing is going to happen. You're done. There's some tumors would you take it out and we're worried about you, you know we think you need follow up this is really something bad could happen.

NOTE Confidence: 0.894513785839081

00:08:37.800 --> 00:09:09.110 Maybe not today, but at some point, it could there's other tumors where it's like you know. Maybe it will. Maybe it won't. But the chances are relatively low, and so my job is basically to tell them. Where on that spectrum is this looks really bad. This looks like. So so this isn't so bad or don't worry about it. This is all good so if I if I saw something like that which was nice round in regular and he said. No random grid and given the fact that the PET scan was pretty weak. That was not exactly I blindingly thing is probably going to be one of the lower grade.

NOTE Confidence: 0.894758820533752

00:09:09.110 --> 00:09:42.380 Tumors, which is should be out. But if it's out you're probably going to be OK. So Interestingly enough that we took it out and there was a lymph node that was positive and this is actually small cell interesting that's unexpected so Amy? Why would that surprise you based on the image. Ng is that a normal cancer of the lung. There are small cell and non small cell and they behave very differently. They look differently under the microscope and they behave very differently.

NOTE Confidence: 0.904147505760193

00:09:42.380 --> 00:10:12.410 Is that a common picture for small cell? No. It's not and sometimes we do see things at imaging that don't really don't really correspond with what the pathologist is seeing or maybe? What's going on clinically and that's why our multidisciplinary tumor boards are are invaluable because we all discuss and say, Well, you know could it be this and kind of come for the most part or most times come to a consensus, but not not everyone.

NOTE Confidence: 0.909064292907715

00:10:12.440 --> 00:10:44.390 Not every patient reads the book and his you know has follows the typical classic when when you get to the chapter on lung cancer what it should look like so usually when we see lung cancer. There different types of lung cancers. There different cell types. We can guess based on image Ng? What cell type, it might be, but Doctor Homer. Here, the pathologist is the one that's really seeing the cells. We don't have. We don't quite yet. Maybe in the future. Our cat scanners don't have microscope so we can't see the actual cells.

NOTE Confidence: 0.917295634746552

00:10:44.390 --> 00:11:13.940 We're just trained to to find the disease described the disease. An oops sorry and did you change that to figure out most likely? What the disease is going to be, but small cell lung cancer in general presents with very large lymph nodes in the media. Steinem, a lot of times. We don't even see the primary tumor in the lung, but they're usually centralny central meaning located in the center of the chest kind of.

NOTE Confidence: 0.894200086593628

00:11:14.600 --> 00:11:28.740 You know, kind of in near where the heart is near where the pulmonary arteries are when we see lung nodules that are peripherally located the majority of those are going to be non small cell lung cancers or we would say adenocarcinomas.

NOTE Confidence: 0.907670974731445

00:11:29.560 --> 00:11:59.940 It does point out the fact that even though the clinical features the radiology are very helpful in most of the time the end of the day. You know the pathologist's the one who actually decide what the final diagnosis is so even though to me and I think to most of us would not have guessed that that would have been a small cell, the final microscopic diagnosis is in fact, the final diagnosis and that's really the way things actually wind up that's a great point. So we usually treat things as if they are very dangerous cancers and hopefully are pleasantly surprised.

NOTE Confidence: 0.896475791931152

00:11:59.940 --> 00:12:29.950 That, they're not just so that we don't under react or to disrupt things or so. A common question is there was a lymph node metastasis and we didn't see it on this pet scan. How could that be the pet scan was only done a week before an the pet scan. It's a radioactive sugar and so things that you sugar give off a signal but it only is as bright as the number of cells that are giving off the signal so the way I describe it is. It's kind of like looking for people wearing pink shirts in a football stadium.

NOTE Confidence: 0.902272999286652

00:12:29.950 --> 00:13:01.080 It can be there, but there's not a lot of am sitting

together they don't stand out so a pet scan even though you have a pet scan. It's our best way to look for cancer that spread but it misses things that's smaller than say the size of a small great, so I think that's important, so Rick Wilson, is one of our superstar medical oncologists. He's a surgery is a scientist and a medical Oncologist and he knows a lot about small cell, he knows more about small cell than anybody up here.

NOTE Confidence: 0.864546716213226

00:13:01.080 --> 00:13:11.860 Uh so he's the only medical oncologist up here. What do you think about this? Is this somebody you'd give chemotherapy too? Are there any trials or anything?

NOTE Confidence: 0.926094174385071

00:13:14.020 --> 00:13:26.430 What are your thoughts so I think as we've heard already this is sort of an unusual presentation for a small cell lung cancer small cell lung cancer is a type of.

NOTE Confidence: 0.93958854675293

00:13:26.940 --> 00:13:45.690 Lung cancer that actually tends to spread fairly early in presentation, meaning that most of the time when we meet someone who has a diagnosis of a small cell lung cancer. We are usually can already see evidence of it in other places as well, just because it tends to spread.

NOTE Confidence: 0.929884195327759

00:13:46.300 --> 00:14:19.100 Fairly early in the course of its development. This is an unusual situation where from the imaging studies. We didn't see any evidence of this being in another location. But as we heard in a nearby lymph node. There was some evidence of involvement of the small cell cancer in that note as well. Even though you couldn't see that on the scan so in a situation like this, you know that tumor has now been removed by surgery, but because we know that a small cell lung cancer is one that tends to spread.

NOTE Confidence: 0.928682923316956

00:14:19.100 --> 00:14:52.720 Early would be concerned that there could be additional cancer cells. Perhaps too small to see on scans, but could be in another location and so this is a situation where I think we would be considering additional therapy. Small cell lung cancers tend to be very sensitive to chemotherapies into radiation. And so this is a situation where even though really the only thing that had been seen on the scans has now been removed.

NOTE Confidence: 0.934569716453552

00:14:52.720 --> 00:14:58.880 I think we'd be concerned that there are additional cancer cells there and that additional therapy might be indicated.

NOTE Confidence: 0.797365486621857

00:14:59.800 --> 00:15:00.650 Great.

NOTE Confidence: 0.802207052707672

00:15:02.130 --> 00:15:07.530 Yeah something like that.

NOTE Confidence: 0.762188315391541

00:15:08.090 --> 00:15:12.130 Pet scan for this specific mutations there, only shows.

NOTE Confidence: 0.898512244224548

00:15:13.160 --> 00:15:43.310 So it would show that cancer for that mutation anywhere in the bottom you can make it so that when you're talking about a test their sensitivity and specificity so sensitivity is it finding everything that there is to find specificity is it correctly, saying what it is so if you have a really sensitive test. You never miss anything but you pick up a lot of things that actually aren't anything if you have a really specific test then you are you?

NOTE Confidence: 0.901186585426331

00:15:43.310 --> 00:16:03.230 Only find the cancers the lung cancers, but you miss a lot of them zero. There are that's a great question there. These metabolic test so this is a radioactive sugar. There are more and more tests that are based on specific things that cells are using and so there's.

NOTE Confidence: 0.916106760501862

00:16:03.820 --> 00:16:38.830 There's a dodo datscan that is very specific for a specific type of cancer. There so the field is moving in that general direction. But I think that it's still at a point where you're sacrificing. It's very specific, but not as sensitive if that makes sense. But we do a lot of work here on blood tests and one of the radiation oncologists. Part of the research. We do with him, his names. Abhi Patel looks at actually little fragments of DNA that are floating around in the bloodstream of cancer patients so if you imagine how sensitive that is.

NOTE Confidence: 0.844318151473999

00:16:38.830 --> 00:16:40.720 You literally have?

NOTE Confidence: 0.892391324043274

00:16:41.460 --> 00:16:58.670 This a kazillion cells that are breaking and dying and shedding DNA and one cancer cells DNA can be teased out of that. Haystack of other fragments using these advanced technologies that doctor Patel is innovative.

NOTE Confidence: 0.873995780944824

00:17:00.780 --> 00:17:01.570 All right.

NOTE Confidence: 0.91176962852478

00:17:03.120 --> 00:17:33.390 So the next case. This is a 78 year old female significant smoker who had a cough and got a chest X Ray and was found to have this lesion, which is lighting up on the pet scan, which is that bright area there. There were no there is no evidence of lymph nodes, but we need diagnosis of this because we got a brain scan.

NOTE Confidence: 0.945666790008545

00:17:33.390 --> 00:17:40.150 An Unfortunately there were 2 areas in the brain that were showing abnormalities.

NOTE Confidence: 0.902279317378998

00:17:40.700 --> 00:18:11.770 Aaron do this errands, one of our Interventional Pulmonologist, who does a lot of our staging for us and what do you think about this? How would you prioritize? What would you go after and how would you get a diagnosis certainly so as Doctor Buffa said I'm one of the interventional pulmonary doctors, which means I'm a pulmonologist by training, but, I specialize in doing pulmonary procedures, so one of the things that I do our procedures called bronchoscopies or?

NOTE Confidence: 0.909000277519226

00:18:11.770 --> 00:18:41.780 Ebase uhm and so when we think about diagnosing and then subsequently managing patients with potentially lung cancer. We think about doing A to obtain a tissue sample. We think about doing a biopsy that is at first. The least invasive thing to do that will provide us. Some most information about staging so doctor. Tanui talked to us a bit about staging in terms of lung cancer and many of you are also probably familiar with them.

NOTE Confidence: 0.898378551006317

00:18:41.860 --> 00:19:16.870 So, in this case, the patient has lesions in the brain that look consistent with potentially metastatic disease. Uhm and so we would classify this person. If we assume that these are positive as a stage 4 disease. Obviously, there are challenges to buy up seeing a brain right so we then assume that this potentially is a foci of metastatic disease and turn to the lung to try to biopsy. The lung and a non invasive way so this lesion would be very amenable to doing a uh a biopsy.

NOTE Confidence: 0.919282674789429

00:19:16.870 --> 00:19:48.990 Be a bronchoscopy, which is a procedure that's an outpatient procedure patients are put under anesthesia and we use a long skinny Camera that goes into the mouth and down into the airway to find this lesion. The advantage of doing it. This way as opposed to a technique that doctor Kim described before going through the skin is even though the pet scan here potentially didn't show any lymph nodes lighting up as Doctor Bath fitter talked about the pet scans, not 100%.

NOTE Confidence: 0.922492921352386



00:19:48.990 --> 00:20:13.620 Accurate and so there is the potential that this malignancy that we know is potentially spread to the brain may be present. In some of the lymph nodes of the chest and in order to think about the most comprehensive way to treat this cancer, we would sample both this lesion. An all of the lymph nodes in the chest at the same time to determine if any of the lymph nodes were involved.

NOTE Confidence: 0.919584512710571

00:20:14.430 --> 00:20:47.640 Great so this is Stage 4 cancer that is a cancer that all through medical school along time ago for me. That was that was not a curable cancer and I would say that the we have made great progress at the beginning identifying cancer and great progress in Stage 4 and I think Scott Guettinger, going to talk about chemotherapy innovations for Stage 4. But Roy Decker is one of our radiation oncologist, he's not only an active.

NOTE Confidence: 0.896528005599976

00:20:47.640 --> 00:21:09.180 Active clinician, he leads some clinical trials in this subset where I can you tell us what is new and exciting in this? This entity of limited spread cancer so along with Dan in my training we were taught that when cancer had spread beyond the initial site.

NOTE Confidence: 0.915347337722778

00:21:09.850 --> 00:21:41.560 It was really no longer appropriate to think about you know, aggressive and potentially curative therapy. What we've learned is that there are some patients who have really very limited sites of disease, so at this patients are good example. Their primary tumors in the lung. They have 2 small spots in the brain and according to them. That's all they have So what we've learned over the last several years is that treating these patients aggressively with surgery or radiation or Ablation Interventional E can improve their survival compared to just.

NOTE Confidence: 0.907680213451386

00:21:41.560 --> 00:21:51.250 Doing chemotherapy now we do think that chemotherapy are immune therapy is still critically important in their care. It's so we're just adding on local therapy to be aggressive.

NOTE Confidence: 0.905448853969574

00:21:51.760 --> 00:22:22.130 For those of you who are not familiar with radiation. You know, so we deliver X Rays that are not fundamentally different than the X Rays, you get during a see T scan. They're just higher. NRG they're very carefully focused and aimed very precisely at the tumors. We want to treat and you know in this patient with these small brain tumors one of the things that we would consider is using radio surgery. It's a single day treatment where we can treat these small tumors with really submillimeter accuracy.

NOTE Confidence: 0.901307463645935

00:22:22.130 --> 00:22:41.820 I'm sparing the brain around a man. Honestly, we have an outstanding chance of controlling them. So you know our new paradigm in our group is to talk about these cases and think about how we can you know how we can add local therapies such as surgery radiation ablation into their care?

NOTE Confidence: 0.742794334888458

00:22:43.450 --> 00:22:45.150 Great.

NOTE Confidence: 0.900596976280212

00:22:46.000 --> 00:23:16.710 So the last case, I wanted to talk about is a 50 year old gentleman wear heavy smoker who developed a cough. You're seeing a pattern here got a chest X Ray and was found to have this nodule. The there are some irregular borders. It looks not dissimilar to a I don't know if you want to highlight the nodule and comment on its friendliness or lack thereof.

NOTE Confidence: 0.905903577804565

00:23:16.710 --> 00:23:50.660 So when we see nodules are spots in the lungs when we describe them. One of the things we want to look at carefully and describe also are its margins and unlike the first case that we saw. That was a nice sharply. The one that had the nodule in the left lower lobe. It was nice and perfectly round and you could take a pencil and trace its margins. This one is in perfectly round. This has little tentacles or little spicules coming off of it. And while again just like the first case that ended up being a lung cancer.

NOTE Confidence: 0.906274259090424

00:23:50.660 --> 00:24:18.900 Um when we have nodules that are more irregularly shaped that's going to raise our suspicion or based on image Ng. That's going to have a much higher likelihood of being a lung cancer rather than the smoothly smoothly. Marginated Nodules, but again just like the first case, the nice sharply. Marginated ones can be cancer, too. But this is a much more. This is a more worrisome appearance when margins are irregular or speculated.

NOTE Confidence: 0.921102523803711

00:24:19.660 --> 00:24:53.730 So we got a pet scan and there's some up taking it. I didn't show you all of the images, but one of the curious things is when we got the pet scan you also get a see T scan and it had changed a little bit and it had gotten just a little bit smaller. It was very subtle thing. There was about a month in between normally a cancer a garden variety cancer should increase by 25% in its diameter in about 3 months, so if it's an inch it will go to an inch and a quarter that's just kind of a ballpark of how things grow.

NOTE Confidence: 0.920968651771545

00:24:53.730 --> 00:25:11.940 So if something is discovered in you if you March, it back if it's big enough to be seen on a see T scan. It's probably been in you

for a couple of years on average, but Polly. This is something that got a little bit smaller? What are some other things this could be?

NOTE Confidence: 0.930703222751617

00:25:13.240 --> 00:25:48.250 So uhm the differential for lung nodules and we look at these all the time. There's 3 big categories. One is infectious and that could be a current active infection or it could be an infection that you had when you were younger and didn't even realize some people are exposed to tuberculosis and don't realize but even an ammonia or something that you had along the way could leave scars. The other big category that we look at for pulmonary. Nodules are the inflammatory diseases, so if you have any of the kind of arthritis type things or vasculitis.

NOTE Confidence: 0.915205597877502

00:25:48.250 --> 00:26:20.260 It's just like they leave nodes kind of most people come see them on their extremities. But you can also get them in your lung and then the 3rd big category that we've been talking about are malignant season. These could be primary lung cancer. They could be a cancer from somewhere else that went to your lung so this is a patient where we would have them come in and do a really thorough history about any you know in infectious history that they had. They grow up in a place where there was a lot of tuberculosis or a lot of fungal infections.

NOTE Confidence: 0.939239084720612

00:26:20.260 --> 00:26:28.840 We would just do a really thorough history about their other comorbidities and then perhaps they have another malignancy or something else that's concerning.

NOTE Confidence: 0.906135857105255

00:26:29.690 --> 00:27:00.440 So we took this patient to the operating room and which is our normal. We don't go right to the lung cancer operation. So the lung cancer operation. Normally, the lung is separated into lobes. There's 3 on the right to on the left 4 slices of an orange. They are individually wrapped but stuck together. We don't do the lobectomy lung cancer operation for most patients is to remove the lobe. We start with taking just a piece of the lobe letting doctor Homer and his team look at it.

NOTE Confidence: 0.88979971408844

00:27:00.440 --> 00:27:32.250 And sure enough, this was not a cancer. It was inflammation. And so that it was a very small minimally invasive surgery and we did not move forward to lobe. We just one last thought Poly. You did mention that there are knowing a patient's prior cancer history. 'cause cancer in the lung can either start in the lung or come to the lung from somewhere else. Frank dead or back is in the audience. If you don't. If you don't know. Frank he's a literal giant he's not a tall man, but he's a.

NOTE Confidence: 0.917335271835327

00:27:32.250 --> 00:28:04.040 Figuratively, a giant in the field of lung cancer. He's been quoted in every major newspaper has published in every major Journal. He's truly a rock star in lung cancer Frank? How do you put together somebody has a history of another cancer and then pops up in your clinic with a new lung nodule. How do you figure that out and what are sort of some baseline risks that you know? Is it a new lung cancer or is it their old cancer that's showing up in the lungs.

NOTE Confidence: 0.851568698883057

00:28:05.090 --> 00:28:09.240 Well, I think you have to consider a lot of different things.

NOTE Confidence: 0.904930233955383

00:28:11.460 --> 00:28:42.490 I think it's always a you know a judgment call where you factor in a lot of different aspects. So one aspect is what type of cancer did they have before you know there are skin cancers that are really not aggressive and not likely to ever show up anywhere else and pretty low grade and you know if that's what you're dealing with that's very different than if you're dealing with a more aggressive cancer.

NOTE Confidence: 0.931912243366241

00:28:42.490 --> 00:29:10.730 I think another thing is when they had their previous cancer was at a very early stage cancer that has a very low risk of ever showing up again or was that you know a higher stage colon cancer or whatever where you say you know risks are going to be fairly high something's going to show up again. I think another thing is the time period if its been along time since the previous cancer. It's getting to be pretty unlikely. This is related.

NOTE Confidence: 0.928484916687012

00:29:11.330 --> 00:29:19.210 And then there are imaging characteristics so if it's something that's come from somewhere else and gone to the lung it tends to look.

NOTE Confidence: 0.89477550983429

00:29:19.890 --> 00:29:26.630 Fairly round, most of the time, but tends to be in the lower lobes and not the upper lobes. You know there are a number of.

NOTE Confidence: 0.934671938419342

00:29:27.480 --> 00:29:38.040 Things based on their history, the type of cancer. They had a number of things based on the imaging that you know really dramatically. I think influences your?

NOTE Confidence: 0.936115622520447

00:29:38.680 --> 00:29:58.120 Your estimation of the probability that this is a new primary lung cancer versus something related to a previous cancer that they might have had and so usually you can put it together in a way where you can make a pretty good judgment call pretty accurate. Judgement call on what it is.

NOTE Confidence: 0.822301805019379

00:29:59.450 --> 00:30:11.930 Well before I dismiss this panel does anybody have any questions for them, yeah.

NOTE Confidence: 0.8964803814888

00:30:12.700 --> 00:30:43.970 Arena absolutely so artificial intelligence, so using computer algorithms to go through series of images to try to identify so we're AI is really showing promise is we if you screen somebody for lung cancer. 25% of the nodules that are identified are not are not 25% of people have a nodule 99% of them are not cancer.

NOTE Confidence: 0.913509428501129

00:30:43.990 --> 00:31:14.560 So how do you determine is a given nodule cancer or not so AI is really gaining momentum in that space that's something that we're working on here, but it's being worked on in several institutions. It there are nuances that AI has an advantage. To they can look at things. There's things that AI can consider that we don't consider you know the size of the spike in relation to the size of a rib or something that you just wouldn't think to.

NOTE Confidence: 0.925025522708893

00:31:14.560 --> 00:31:31.330 Make that comparison, but there are nuances to the history to the progression overtime that only a radiologist is going to be able to tease together so I think it's got tremendous promise as a complement to radiology not as a replacement.

NOTE Confidence: 0.852904915809631

00:31:32.200 --> 00:32:07.110 We're using it here and we find that pulled it out more experimentally. But when we're looking at studies in different parts of the body. So I know in the emergency room when people come in looking for friendly plugging ahead. So we have a system that looks for that an will alert sorry well alert the radiologist. You know if we have a long list of cases to read a study will pop up with like a red flag and they'll go and look at that and see you know is the computer right? Is there something or super urgent on this study that I need to let the clinician know about right away.

NOTE Confidence: 0.890150189399719

00:32:07.190 --> 00:32:25.060 So I don't know how I think it's been performing very well with the brain bleeds in the lungs or in the chest arena. We've been

we have this set up to look for blood clots in the lung so pulmonary emboli and just you know over the past? Maybe.

NOTE Confidence: 0.909479141235352

00:32:25.660 --> 00:32:58.230 4 to 6 months, we have it kind of installed on our computer systems where we read the studies. an A lot of times it's correct a lot of times it picks up things that aren't in it has a lot of false positives. So it's not it's not perfect, but we always look at you know what its flagging and sometimes we completely agree. Other times, were like no that's you know it's pointing to a vein. It's not a blood clot in an orderly or it's pointing to an airway. That's filled with a little mucus or secretions, so it's not perfect, but it's definitely.

NOTE Confidence: 0.906931459903717

00:32:58.230 --> 00:33:29.720 Nice to have like the extra set of eyes and to flag cases for us to look at them more quickly if there actually is an urgent find it so I would just add a comment to that. I think sometimes AI is oversimplified and oversold so certainly we can use computer technology in a lot of ways. An we are working. You know, there's all kinds of things going on to develop that and to use that and.

NOTE Confidence: 0.922406196594238

00:33:29.720 --> 00:33:45.850 And I fully support that on the other hand, you gotta remember what AI is doing is it's saying OK. I'm looking at. You know 10,000 patients and looking at their scans and I'm coming up with a prediction based on an average of 10,000.

NOTE Confidence: 0.926807999610901

00:33:46.730 --> 00:34:03.520 OK, that's fine now if you want to be treated as an average of 10,000, then all you need is a I but, I think for most people. It's I don't want to be an average 10,000. I want you to take whatever you can learn from 10,000, but then I want you to apply it.

NOTE Confidence: 0.916030585765839

00:34:04.140 --> 00:34:15.670 To me as an individual. I want you to take into account sort of other factors. An see how well does that actually apply to me and I think that that.

NOTE Confidence: 0.938484311103821

00:34:16.420 --> 00:34:39.960 Individualized judgment still ends up being a physician judgment. Now we need to build the AI tools. So they can enhance that ability to individualize that to people but we have to keep in mind that we have to keep that and sometimes I get the feeling that this field of AI is sort of moving the.

NOTE Confidence: 0.944078862667084

00:34:40.880 --> 00:34:48.450 I don't know the industry in the tech people and so forth are sort of moving, it into a sphere where it doesn't necessarily.

NOTE Confidence: 0.924061179161072

00:34:49.620 --> 00:34:57.590 Help enhance our clinical judgment at sort of thought more of to replace it and I don't really see that as being.

NOTE Confidence: 0.931653082370758

00:34:58.130 --> 00:35:19.210 Really, where we want to end up so I think that it's exciting. There's a lot going on. I think we still have a lot to learn about how to make that really be most useful in the individualized patient care, which is really the fundamental aspect of Medison. You know that's really what happens.

NOTE Confidence: 0.881194055080414

00:35:19.750 --> 00:35:50.960 I just wanted to make one other comment about metastatic disease, which is that pathology is also not always but frequently useful intruders helping decide so while getting a biopsy might be. You might get a negative result that is not very helpful might not show the tumor. But I see that percentage of the time pathologies actually also very helpful, deciding whether something is primary, the longer that's a critical point. So there are definitely times when we biopsy, we use biopsies to rule in or prove that something.

NOTE Confidence: 0.890526652336121

00:35:50.960 --> 00:35:57.120 Is something we don't use biopsies to prove that something isn't something to subtle?

NOTE Confidence: 0.855851709842682

00:35:57.620 --> 00:36:01.190 Semantics, but did you have a question?

NOTE Confidence: 0.876750349998474

00:36:08.870 --> 00:36:31.070 So one in Seven lung cancers happens in somebody who's never been a smoker. Frank I don't need the there do you know have a sense of what the trajectory? Is is the prevalence of non smoking cancer on the rise? I don't know that I've heard that but Frank would know.

NOTE Confidence: 0.924253225326538

00:36:32.320 --> 00:36:57.740 Well, I think it's you know, I think it's on the rise. But the other thing is that I think we need to take a I don't know more sophisticated approach so there was actually just a study that was published from Korea, where they they did a pretty fancy kind of genetic analysis and they had a lot of epidemiologic data about exposure to smoking and so forth and there are certain.

NOTE Confidence: 0.935836911201477

00:36:58.280 --> 00:37:05.020 Genetic patterns of mutations and things that are you know just very characteristic of people that smoked.

NOTE Confidence: 0.940703749656677

00:37:05.530 --> 00:37:19.410 An then there are others that are not an they actually found that there was a I don't remember the exact percentage now. But there is a pretty sizeable chunk of the people who do have a history of smoking.

NOTE Confidence: 0.921543300151825

00:37:20.450 --> 00:37:27.350 But their cancers don't seem to fit that pattern or cancer seem to fit the pattern of people that are non smokers.

NOTE Confidence: 0.913612484931946

00:37:27.960 --> 00:38:00.350 They don't seem to have that characteristic mutational lots of different mutations and mutational signature smokers. So I actually think that you know, we've had accrued view of just saying well. Did you ever smoke in your life and you know OK, you quit 30 years ago? Well, we're still going to count that as smoking, but I think we've counted a lot of cancers as being tobacco related. Maybe not a lot, but a portion at least of cancers as being tobacco related that are.

NOTE Confidence: 0.914631307125092

00:38:00.350 --> 00:38:30.360 Probably not tobacco related and I guess the other thing I would say is that as I over my career of sort of looked at cancers. You you see that it's not all, one thing. It's not all just you know it's a lung cancer and they're all the same you see that you know the ground glass. Opacity's it's a different beast. Yes, they're lung cancers. But they behave differently. They seem to have a different cause they seem to be a just a different disease an?

NOTE Confidence: 0.930106461048126

00:38:30.360 --> 00:38:31.810 You know, I think we need to.

NOTE Confidence: 0.901378333568573

00:38:32.740 --> 00:38:58.240 Taken a fresh look. I think at how we interpret that and I think that some of the genetic analysis that we're able to do I think is allowing us to be able to do that. In a better way. Frank is literally published a paper entitled Shades of Gray so he's written just about everything. So I want to thank the panel. Emily are you going to come up for the next so Haley.