So welcome everyone,
my name is Doctor Pamela Koons
and I am a GI medical oncologist.
I am the director of the Center for
Gastrointestinal Cancers at Yale Cancer
Center and Smilow Cancer Hospital.
This is our kickoff for
our spring CME series.
For the Center for GI cancers we are
starting tonight on neuroendocrine tumors
and I will be your host on Thursday,
April 21st.
We will have a CME on rectal cancer
We will have a CME on gastric cancers hosted by Doctor Jill Lacy.

So this evening I have the pleasure of hosting and moderating this talk on neuroendocrine tumors.

I will be giving a brief overview of Nets 101 and then we’ll help moderate the Q&A.

I'm joined by Doctor Miriam, a boy and an assistant professor of radiology and nuclear medicine, and she will be speaking about the role of molecular imaging and theranostics in care of patients with...
Nets and doctor Saj Khan and associate professor of surgery and surgical. Allergy and Section chief of Hepato Pancreato, biliary and mixed tumors will be joining us this evening and talking about the surgical management of pancreas and small foulness. So I will just go ahead and get started, so I'm just for our audience. Each of our talks will be about 20 minutes. Please feel free to put questions in the chat or Q&A throughout. We will try to respond with a typed response throughout, but we will also have time at the end.
NOTE Confidence: 0.92255316
00:01:38.759 --> 00:01:42.288 for a through Q&amp;A and you can ask them.

NOTE Confidence: 0.92255316
00:01:42.290 --> 00:01:44.818 These are my disclosures, so I’m going to talk briefly about the

NOTE Confidence: 0.92255316
00:01:44.820 --> 00:01:47.196 epidemiology and nomenclature of Nets.

NOTE Confidence: 0.92255316
00:01:48.990 --> 00:01:51.355 Talk about characteristics that I think really impact treatment selection

NOTE Confidence: 0.92255316
00:01:53.792 --> 00:01:56.048 for patients and then talk about

NOTE Confidence: 0.92255316
00:01:56.048 --> 00:02:00.805 treatment for hormone and tumor control.

NOTE Confidence: 0.92255316
00:02:00.805 --> 00:02:02.415 I usually like starting with a little

NOTE Confidence: 0.92255316
00:02:02.415 --> 00:02:04.640 bit of history so neuroendocrine

NOTE Confidence: 0.92255316
00:02:04.640 --> 00:02:07.570 tumors and the description of

NOTE Confidence: 0.92255316
00:02:07.570 --> 00:02:09.628 Nets goes back to the late 1800s,

NOTE Confidence: 0.92255316
00:02:09.628 --> 00:02:10.900 and it was really in the early 1900s that.

NOTE Confidence: 0.92255316
00:02:10.900 --> 00:02:13.990 Doctor Urban door for a German

NOTE Confidence: 0.92255316
00:02:13.990 --> 00:02:16.718 pathologist coined the term carcinoid.
00:02:16.720 --> 00:02:18.904 It meant cancer like and he described

00:02:18.904 --> 00:02:21.475 and felt that there were five key

00:02:21.475 --> 00:02:23.039 characteristics that they were.

00:02:23.040 --> 00:02:26.262 These tumors were small and multifocal

00:02:26.262 --> 00:02:28.410 had undifferentiated cellular formations,

00:02:28.410 --> 00:02:30.058 had well defined borders,

00:02:30.058 --> 00:02:31.294 no metastatic potential,

00:02:31.300 --> 00:02:33.376 and were slow growing and harmless,

00:02:33.380 --> 00:02:36.230 and though he contributed really important

00:02:36.230 --> 00:02:38.760 early knowledge about this disease,

00:02:38.760 --> 00:02:41.294 we now know that many of these

00:02:41.300 --> 00:02:43.020 characteristics are not true.

00:02:43.020 --> 00:02:45.600 And I think the term carcinoid

00:02:45.681 --> 00:02:47.240 and cancer like, unfortunately,

00:02:47.240 --> 00:02:50.520 really slowed the field in terms of our

00:02:50.530 --> 00:02:53.494 And I think the term carcinoid

00:02:53.494 --> 00:02:55.509 and cancer like, unfortunately,
00:02:50.520 --> 00:02:52.920 recognition that these are in fact cancers.
NOTE Confidence: 0.92255316
00:02:52.920 --> 00:02:55.278 The term carcinoid is really fallen
NOTE Confidence: 0.92255316
00:02:55.278 --> 00:02:58.276 out of favor and instead we are
NOTE Confidence: 0.92255316
00:02:58.276 --> 00:03:00.546 using the term neuroendocrine tumor
NOTE Confidence: 0.92255316
00:03:00.546 --> 00:03:03.199 and then by which primary site.
NOTE Confidence: 0.92255316
00:03:03.200 --> 00:03:06.360 So we have seen an explosion of advances,
NOTE Confidence: 0.92255316
00:03:06.360 --> 00:03:08.548 both therapeutics and diagnostics
NOTE Confidence: 0.92255316
00:03:08.548 --> 00:03:10.189 really since 2011.
NOTE Confidence: 0.92255316
00:03:10.190 --> 00:03:12.731 So in the 1980s we had strept
NOTE Confidence: 0.92255316
00:03:12.731 --> 00:03:15.339 Zosyn and Ivy alkylating agent,
NOTE Confidence: 0.92255316
00:03:15.340 --> 00:03:17.780 and octreotide that was initially
NOTE Confidence: 0.92255316
00:03:17.780 --> 00:03:20.199 approved for hormone control,
NOTE Confidence: 0.92255316
00:03:20.200 --> 00:03:22.748 and then since 2011 we have had
NOTE Confidence: 0.92255316
00:03:22.748 --> 00:03:25.958 therapeutic advances in the areas
NOTE Confidence: 0.92255316
00:03:25.958 --> 00:03:29.516 of biologics of everolimus and snib
NOTE Confidence: 0.92255316
00:03:29.516 --> 00:03:31.960 somatostatin analogs of lanreotide
00:03:31.960 --> 00:03:33.586 to look just at for carcinoid.
00:03:33.590 --> 00:03:36.670 Syndrome, Ludo date in 2018.
00:03:36.670 --> 00:03:39.316 We'll talk about some of the.
00:03:39.320 --> 00:03:41.552 Other systemic agents and then also
00:03:41.552 --> 00:03:43.919 some of the imaging agents that
00:03:43.919 --> 00:03:45.944 are listed above the timeline.
00:03:45.950 --> 00:03:49.182 I like also sort of nailing down the
00:03:49.182 --> 00:03:52.665 point that Nets are really not that rare,
00:03:52.670 --> 00:03:54.428 so they are rare by incidents,
00:03:54.430 --> 00:03:57.196 so incidents being the number of
00:03:57.196 --> 00:03:59.793 patients diagnosed per year and for
00:03:59.793 --> 00:04:02.497 this is based on a large Sears study
00:04:02.575 --> 00:04:04.969 conducted in 2017 and the incidence
00:04:04.969 --> 00:04:07.646 rate for Nets is about 7 per 100,000
00:04:07.646 --> 00:04:10.214 and this is in the yellow line on the
figure compared to the blue line, which is the incidence of all malignant neoplasms which has remained relatively stable. However, the prevalence of neuroendocrine tumors is actually the second highest prevalent GI malignancy. It exceeds stomach and pancreatic adenocarcinoma combined, and that’s likely because this is a more indolent disease and patients live for many years more commonly with the low grade neuroendocrine tumors. Nets are epithelial neoplasms derived from neuroendocrine cells throughout the body,
most commonly found in the GI tract, but also in the lungs and other sites, and most grow slowly in comparison with their adenocarcinoma counterparts. The majority are sporadic and the minority are associated with familial syndromes such as Von Hippel, Lindau and Neurofibromatosis. Pathognomonic for this disease is the fact that somatostatin receptors are present on the cell surface in about 80 to 90%. This is typically with somatostatin.
00:05:14.384 --> 00:05:15.770 receptor type 2.

NOTE Confidence: 0.905978501333333

00:05:15.770 --> 00:05:17.464 The diagnostic work up and I will

NOTE Confidence: 0.905978501333333

00:05:17.464 --> 00:05:19.544 say if you take away one thing from

NOTE Confidence: 0.905978501333333

00:05:19.544 --> 00:05:21.213 this is that the cross sectional

NOTE Confidence: 0.905978501333333

00:05:21.213 --> 00:05:23.446 imaging is really the mainstay of how

NOTE Confidence: 0.905978501333333

00:05:23.446 --> 00:05:25.874 we monitor the patients with Nets.

NOTE Confidence: 0.905978501333333

00:05:25.874 --> 00:05:28.550 Either a multiphasic CT and that

NOTE Confidence: 0.905978501333333

00:05:28.550 --> 00:05:30.826 arterial phase is critical if

NOTE Confidence: 0.905978501333333

00:05:30.826 --> 00:05:33.580 you’re ordering a CT scan or an

NOTE Confidence: 0.905978501333333

00:05:33.580 --> 00:05:34.546 MRI somatostatin receptor.

NOTE Confidence: 0.905978501333333

00:05:34.546 --> 00:05:36.724 Imaging is important but is not

NOTE Confidence: 0.905978501333333

00:05:36.724 --> 00:05:38.546 the primary modality with which

NOTE Confidence: 0.905978501333333

00:05:38.546 --> 00:05:39.930 we image these patients.

NOTE Confidence: 0.905978501333333

00:05:39.930 --> 00:05:41.946 These are done commonly at time of

NOTE Confidence: 0.905978501333333

00:05:41.946 --> 00:05:43.540 diagnosis and for patients with

NOTE Confidence: 0.905978501333333

00:05:43.540 --> 00:05:45.538 metastatic disease we may do them.
Annually or every two years, somatostatin receptor imaging is now used with gallium 68, dotatate PET or copper 64, and I'm going to actually. This will be a little bit of a teaser. I'm going to let doctor a boy and talk more about somatostatin receptor based imaging. The tissue diagnosis we like to know the primary site if we can identify it and four key data elements are important when you’re looking at a pathology report. The WHO grade Ki 67 mitotic index.
Degree of differentiation.

We'll talk about that in a moment.

And then tumor markers or hormones are important for this disease,

but I will say that tumor markers such as chromogranin or neuron specific enolase or pancreas statin often fluctuate and may not actually track with what's happening radiographically.

The field has swung away from using these and I often don't use chroma granite a now because really the gold standard is the imaging.

Hormones, however, such as serotonin or 24 hour urine 5 hiaa.
00:06:54.000 --> 00:06:56.219 which is a byproduct or a metabolite of serotonin.

00:06:56.860 --> 00:07:00.486 Those can be useful and should be tracked overtime.

00:07:01.530 --> 00:07:05.193 So I find that there are really six key characteristics that impact treatment hormone status stage and burden of disease grade and differentiation. Pace of growth, primary site and somatostatin receptor status.

00:07:16.070 --> 00:07:17.967 I'll spend just a moment on each of these just to really set the stage in terms of how we talk about and think about these.
So a functional neuroendocrine tumor is defined as a patient who has symptoms from a measurable hormone that’s in either the urine or the blood. Carcinoid syndrome is a classic example of that. 10% of patients with small intestine Nets have carcinoid syndrome, and it’s due to production of peptides and am means such as serotonin or five hiaa, and it can cause Flushing Venus telangiectasis as shown in this picture on the left diarrhea. Bronchospasm, valvular fibrosis, and hypotension.
This is also a picture of a of the pulmonary and tricuspid valves that are very fibrotic. Pancreatic neuroendocrine tumors can also secrete hormones in about 40% of patients, most commonly insulin, followed by gastrin, glucagon and vaso intestinal polypeptide, and the symptoms are really defined by the hormones secreted and nonfunctional. Nets are defined as patients who are asymptomatic or have symptoms that are not from hormone access.

So stage and grade. I think this is I really try to
describe this to patients 'cause I think for patients in particular this can be very confusing. So to this audience however, stage is very familiar term. What's interesting is that the AJC staging criteria have only included Nets since 2010. This is a really nice picture here of a localized pancreatic net, which will show in the video and a metastatic pancreatic net with high degree of liver burden. As you can see here, grade is really what the cells look like under the microscope.
Low grade is slower, growing higher grade is faster growing. We really base this on the Ki67 in mitotic index. The 2019 digestive WHO classification is the most recent. I’m next to the Red Arrow is a. New change that was made to this so we have well differentiated. Net grade 1/2 and three and poorly differentiated nurkin carcinoma. grade 3 and that’s divided into small cell and large cell. When I didn’t put on this slide is kind of the breakdown of the
Ki 67 in mitotic index, but really the take away from this is that clinically we treat the grade one and two well differentiated Nets very similarly. This well differentiated grade 3 net is a relatively new category. I think that we have to treat based on the individual patients biology bulk of disease. The poorly differentiated nedycon carcinomas are treated very differently. That will not be the primary topic of. Kind of the subsequent slides on treatment. Typically those patients are typically treated with platinum at openside.
So pace of growth, something I was getting to really does inform our treatment selection. We may need a patient with a metastatic low grade net who has very stable disease or slow progression, or may have more rapid progression. Some of those patients may not need treatment initially. Observation may be appropriate, whereas others may have high burden of disease or symptoms from tumor. bulk and they may need treatment. I know this is a GI focused talk,
but Nets can happen in almost any organ in the small intestine. Most commonly that is one of the most common sites we see commonly in the ilium, but we will also see pancreatic Nets and other Nets in the GI tract, and many clinical trials and treatments are really tailored based on primary site. Therefore, FDA approvals are sometimes limited specifically to primary sites. One example of that is synonym for pancreatic Nets. We now know that somatostatin receptor status is critical both for diagnosis and therapy.
Again, I’m going to let Doctor boy and go into this. This is an interesting picture just to show an octreoscan which has now really completely been replaced by gallium dotate. This is the same patient image with an octreoscan and a gallium 68 dotate pet, and you can see that the resolution is far superior with the pet based imaging. So now we’re going to launch in the next sort of the final half of my presentation on general treatment categories for nuts. I will go into some of the specifics just so that you have access to this.
If you choose to watch this again,

so we have 4 main categories,

somatostatin analogs, peptide receptor,

radionuclide therapy, biologics,

and cytotoxic chemotherapy,

I am going to really focus my conversation or presentation tonight on antitumor treatments.

So not a statin.

Analogs were really initially developed for a hormone control and remain as the primary tool that we use for hormone control,

but I’m not going to go into just for sake of time.

Details on hormone control tonight,
and theranostics again, I'm going to just use this to talk about some of the therapies. Dr Abovyan will go into this as well, but in terms of my cartoon here, imagine you have a patient in population. Do they have a receptor on the surface of their cells? We do in fact have that. So with the gallium 68 or copper 64 pets, we select out those patients using that imaging, and then we in fact have a targeted therapy that goes to that target.
So that’s theranostics Dr. Boy and will focus on that.

When I described this to patients, I used the lock and key description or analogy. I think that helps them understand why we use somatostatin analogs, why we use the Dota Tate imaging, so think of the somatostatin receptor as the lock, the key is the peptide, and then there’s a reporting unit. So for somatostatin analogs, we actually have two trials that demonstrated antitumor effect. The Pro MID study demonstrated the
effect of octreotide versus placebo, and the clarinet study demonstrated the effectiveness of lanreotide versus placebo. Both had a primary endpoint of progression and that the clarinet study was progression free survival and they both should have benefit over placebo octreotide. Is not formally does not have a formal FDA label for antitumor effect. It is primarily in hormone control, but it is. These two agents are often used interchangeably.
Landry Tide was FDA approved in 2014 as an antitumor agent.

I’d like to put this up because I get asked this a lot. So how do we think about dosing for tumor control? Octreotide LARC is usually used at the 30 milligram I am monthly dose and lanreotide at 120 milligrams deep. Subq. There is no need to overlap with short acting unless it’s a functional tumor. I think there was data years ago that we needed to do a test dose to test for allergy. That’s not generally needed in practice and there is little data to support the routine use. Above standard dose of somatostatin
analogue for tumor control.

The side effects include nausea, diarrhea, cholelithiasis, and hyperglycemia.

I'm going to go through these quickly. I have them just kind of as placeholders, but Doctor Brian will talk about these, but we've had incredible advances in the diagnostics for NETs as well and there is a very handy paper and I have this here just as a reference on the appropriate use criteria for somatostatin receptor PET imaging and new under consumers. That's a great reference. And then in the therapy is something that also Doctor Boy and will discuss and
specifically around the Netter one phase,
three clinical trial.
So I’ll mention it just in passing
that this was a study I had the
time I was at Stanford.
It’s a randomized study that really
set the stage for using their Gnostics
and specifically alluded it,
and that’s it.
Was a positive study.
I will give.
I will give that punchline away
for Doctor O’Brien.
But moving on to some of the
other systemic therapies,
Everolimus is approved for pancreatic and non functional GI and lung Nets. This is an inventory inhibitor. There were sister studies Radiant three and Radiant four and. Both of them showed a progression free survival benefit in these patient populations, and they were both approved. So for pancreatic net in 2011 and for GI and lung Nets in 2016. And tyrosine kinase inhibitors also have a role in neuroendocrine tumors. Sonett nib was approved on the
basis of this randomized study in patients with well differentiated advanced pancreatic Nets.
So that’s the one that I said we don’t yet have a tyrosine kinase inhibitor approved for small bowel Nets. This was also approved on the basis of a PFS benefit. You’ll notice that most neuroendocrine tumor clinical trials have progression free survival as a primary endpoint, and that’s because OS. Is an impractical endpoint given that patients tend to receive many subsequent therapies after these clinical trials and it be given.
the indolence of the disease, it would be too difficult, practically speaking, to use overall survival.

So this was approved in 2011. Sir Afatinib is not yet FDA approved. It is under FDA review. At present, this was on the basis of two large studies conducted in China and then a phase one. Two study that has been conducted in the United States in a more traditionally Western population. But this was positive in both.
pancreatic and extra pancreatic Nets.

And is, I suspect that at some point this spring or summer, we will have a decision from the FDA. I'd like to mention a study on chemotherapy that I had the opportunity to lead for pancreatic Nets, so this was a study of temozolomide versus capecitabine intimas Olumide for grade one or two metastatic pancreatic Nets. This was a study that ultimately demonstrated that Caped M was superior to temozolomide alone and median progression. Free survival was about 23 months for the combination versus 14 months. For Thomas Olumide at the time.
00:18:06.392 --> 00:18:08.020 of the initial analysis,

00:18:08.020 --> 00:18:10.799 it appeared as if there was an overall survival benefit.

00:18:10.799 --> 00:18:12.650 Stay tuned.

00:18:12.650 --> 00:18:13.538 We have the final analysis submitted to ASCO for an updated analysis.

00:18:13.538 --> 00:18:16.202 I think one of the key takeaways of this is that we see a higher response rate than we've seen really for any of the other therapies.

00:18:16.202 --> 00:18:19.918 somatostatin analogues, mtor inhibitors, tyrosine kinase inhibitors all have a you know 5% or less objective response rate.

00:18:19.920 --> 00:18:21.691 for patients with pancreatic Nets I did not go into that.

00:18:21.691 --> 00:18:23.984 but somatostatin analogues, mtor inhibitors, tyrosine kinase inhibitors all have a you know 5% or less objective response rate.

00:18:23.984 --> 00:18:25.840 So for patients with pancreatic Nets

00:18:25.840 --> 00:18:27.760 for any of the other therapies.

00:18:27.760 --> 00:18:29.158 I did not go into that,
who need objective tumor shrinkage, these are actually very good therapies to think about. So let’s wrap this up. I think I have. Two slides left. So how do we really think about sequencing that these treatments? It’s very confusing. We’re actually in a fortunate place now of having a number of therapies, but it gets very difficult to know what order in which we should use them, so this is adapted from Nancy CN guidelines, so I would say commonly a first line treatment is either observation.
or octreotide or lanreotide, but where it gets very confusing as thinking about second line therapies. So I have a handy table to help you think about that, and I’ve put them in. Order of how I generally will think about using them. I often will consider using PRT or Ludo tape or lutathera as the as it’s also called in the second line setting. It has a modest response rate of about 18% along PFS and is well tolerated and we do have to take care if patients GFR is less than 30.
We are developing more experience with them.

The chemotherapy tamela mining capecitabine has the highest response rate.

And should be considered for patients with pancreatic Nets who need an objective response.

It does have higher adverse events for older patients.

I will sometimes consider temozolomide alone.

Forever Elemin in both have very low response rates,

the PFS is about a year best for low volume disease,

but I find that the adverse event profile is tough for both of these.

Everyone ever really miss in
particular is good for insulinoma because it can cause hyperglycemia, but it’s tough and can cause pneumonitis and the hyperglycemia can be difficult for patients with uncontrolled diabetes. So takeaways I hope you’ve learned that Nets are not that rare. They are deserving of high quality basic, translational and clinical research efforts. We’ve had incredible advances in the last 10 years. PRT is really a game changer and I expect the next decade of...
clinical trials to be looking at better patient selection, minimizing toxicities and increasing efficacy and multidisciplinary care and team science is really key for this disease so I am going to stop share. I think I’m close to time. I am going to pass the baton to Doctor Abovyan and then Doctor Boyd if you can then pass that baton when you’re done to Doctor Khan and then we will do a Q and a great. Thank you doctor Kuntz. This was fantastic.

Sam my screen.

So I’m going to talk about the role of molecular imaging,
and there are Gnostics in the care of patients with neural neoplasms I’m in. I’m at Yale Department of Radiology and I am in a nuclear medicine and new radiology sections. For disclosures, I have a research collaboration with vistage imaging and I do clinical trials with Blue Earth diagnostics. We’re going to start a little bit with standard imaging, CT, and MRI, but we’re not going to focus on this imaging modalities because they’re pretty well understood in the community and just kind of going over the basics of it. For carcinoid tumors, we can do very

39
nice chest imaging with CT of the chest.

We can do contrast and noncontrast imaging, and here is an example of a lung carcinoid lesion.

For pancreatic neuroendocrine tumors we can do CT imaging. Enhance CT imaging, but we can also do MRI and here you see actually a patient with pancreatic tail or entropy neoplasm that is heterogeneous solid and partially cystic sometimes difficult to evaluate.

We can also do MRI imaging with abdominal MRI. You can do it with contrast
and without contrast, you can evaluate in this particular patient static liver lesions within the. This MRI pretty well and this actually is same patient that progressed in development has to season the liver. But we want to also start imaging beyond standard anatomical imaging with molecular imaging and with standard and understandable imaging we can see a lot of the basics of actually delineate the borders of the tumor and where they’re located, but it’s really hard to say what is
the characteristics of the tumor, so we're very good at defining the anatomy and the location and the extent of the disease and location of disease. But not so much in terms of is the same neuroendocrine tumor. If you just look at the lover? Or is this something else? What's really nice is that you can actually use targeted imaging to describe the receptors on the surface of tumors, without having to do a biopsy. And this is an example of a gallium dotatate PET,
which I’ll describe this little alphabet. So soup in the next few slides, but what it allows you to do is to visualize semantics. Some of some analog binding to a somatostatin receptor, and being able to see it light up on this Cam.

I’m so glad Doctor Kunz mentioned that tree a scam that used to be the standard way of trying to see some exciting receptor receptor expression on tumors. And as you can see, these are not very good images.
and they’re very hard to see. And it’s very difficult to tell where the tumor is, and this actually is the same patient I showed you earlier. With pancreatic tail tumor, and you can barely see where this illusion is, and this is a planar imaging, and if we did SPECT, we could localize it to the left upper quadrant, but it would be very difficult to localize it to the pancreas very well. Also, if there were smaller lesions, we wouldn’t be able to see it.
And here’s an example of a trio scan being lined up right next to door dotate scan gallium.

And you can see how many lesions are being missed.

An actress can that can be clearly seen on the pet C team.

But going to the dough depart a lot of folks ask me Doda what, what is this Doda and the alphabet soup of gallium dotatate gallium dooda talk.

But there’s actually a very nice logic to it.
because then you will never question what these are. So first, let’s talk about labeling in chemistry. When you’re thinking about PET radionuclides such as gallium and copper, which are used for imaging and PET, you cannot just attack, give them to the patient, they’re actually toxic, so you need to keep them in the cage, and this is a doda cage, so you would kill 8 gallium 68 in this doda cage, and what’s really nice about this cage. It has a couple of. Four different arms and to these arms you
can actually attach your targeting molecule, so in this case it’s actually a tight analog Tate, so you attach this peptide to the doda and you have your radionuclide chelated inside of the Doda. So there’s a very logical name to this. This value attach it through the ARM gallium Doda date. Very simple, right? So now that you understand. This kind of logic it it becomes very easy to understand how we mean these scans and with the labeling you can actually really be able to see this.
So this is a gallium dotate PET CT in a patient with multiple metastases. Some medicine receptor positive liver metastases and you can actually see that there is also a period where did metastasis in the lymph node that's outside of the liver and here you have kidneys and bladder. So it really helps you evaluate the patients in terms of the appropriate use criteria. I’m so glad Doctor Kunz had a full slide on this in terms of evaluating. Not all patients need to be getting gallium daughter take pets and there's there. We're still truly evaluating exactly where
and when we should be doing these scans, but there's several indications that should be done. That are appropriate and some of the most indicative are the initial staging after histologic diagnosis of neuroendocrine tumor and localization of primary tumor. This skin is so sensitive form for lesions, so you'll be able to see it and then the other very common. Very important point is selection of patients for some meta stat.
and receptive targeted therapy
Later now what’s really nice about this

therapy and this is where it’s really revolutionary in medicine is that you can use this method to image your tumor,

so you have your radionuclide.

all you have to do is to pop this one out and pop lutetium 177 in so you keep.

A molecule the same.

You keep the targeting the same but.
therapeutic for neuroendocrine tumors.
So this would be called very logically.
I know you’re thinking about this.
Lu teach to Doda tape. Very simple.
So we imaged with gallium dotatate and we treat it with lutetium.
So you know this drop whatever we imaged. That’s exactly where the treatment went.
Now we don’t just have to do lutetium, we can also use other radionuclides such as alpha emitters and here at Yale we’re now approved to
00:30:06.079 --> 00:30:08.342 start doing this and it’s very
NOTE Confidence: 0.767840264
00:30:08.342 --> 00:30:10.222 exciting new development to start
NOTE Confidence: 0.767840264
00:30:10.292 --> 00:30:12.497 doing these therapies in patients.
NOTE Confidence: 0.767840264
00:30:12.500 --> 00:30:16.496 So how do these alpha and beta emitters work?
NOTE Confidence: 0.767840264
00:30:16.500 --> 00:30:20.307 Well for lutetium and this is an image from.
NOTE Confidence: 0.7648798
00:30:22.880 --> 00:30:27.245 AAA a website where basically describes
NOTE Confidence: 0.7648798
00:30:27.245 --> 00:30:30.860 the mechanism of luthera and you
NOTE Confidence: 0.7648798
00:30:30.860 --> 00:30:33.620 administer the drug intravenously.
NOTE Confidence: 0.7648798
00:30:33.620 --> 00:30:36.560 The drug gets taken up into the
NOTE Confidence: 0.7648798
00:30:36.560 --> 00:30:37.820 neuroendocrine tumor sides.
NOTE Confidence: 0.7648798
00:30:37.820 --> 00:30:39.992 The drug binds to the receptors
NOTE Confidence: 0.7648798
00:30:39.992 --> 00:30:42.365 on the tumor sides and gets
NOTE Confidence: 0.7648798
00:30:42.365 --> 00:30:44.485 internalized inside of the cell.
NOTE Confidence: 0.7648798
00:30:44.490 --> 00:30:47.725 Through endocytosis and the radionuclide
NOTE Confidence: 0.7648798
00:30:47.725 --> 00:30:50.960 emits its particles beta particles,
NOTE Confidence: 0.7648798
00:30:50.960 --> 00:30:55.656 or if using that actinium type of therapy.
Luther, it’s really the beta particles because it’s lutetium 177 and that can cause DNA damage. And once you have DNA damage you can that can lead to tumor cell death. And that’s and that’s the main mechanism. So to just kind of overview this again in terms of image guided therapy, you can select patients for whether they are eligible for this kind of therapy with your imaging agent, gallium dotatate. And you can see if the patient expresses this amount of statin receptors in the body, and in this particular patient
there are multiple metastatic lesion
Molecule, then you bring the patient in and
And that is basically the same
except it has the radionuclide
that causes DNA damage.
Image trace that you can see on camera
and you can basically
see exactly where lutetium dotatate went.
Now it’s not as crisp
and beautiful as pet CT,
but you can actually see where this therapy went.
And you can actually start doing those symmetry.
These images so this kind of technology allows selection of right patient and providing the right drug for the patient and in neuroendocrine tumors that has really changed how we change how we treat patients.
So the indications for lutetium dotatate.
So these are the GI neuroendocrine tumors and they have to be well differentiated.
G1 and G2 tumors.
We need to confirm some metastatic
receptor expression and that can be done with gallium dotatate PET CT.

We're still allowed to use octreoscan and sometimes we will use it if insurance will deny that the pet city, but you really want to do this with a pet CT. We also evaluate bone marrow function, renal function, and liver function. Yes, and this is the point where nuclear medicine physicians are starting to become partners with oncologists and surgeons in treatment of these patients. Because we no longer just read the images were actually evaluated. Whether the patient is eligible
00:33:27.915 --> 00:33:29.940 for the study and we evaluate,
00:33:29.940 --> 00:33:32.580 follow up, and we do those symmetry.
00:33:32.580 --> 00:33:35.744 And this is of patient oriented,
00:33:35.744 --> 00:33:38.704 patient facing role for nuclear
00:33:38.704 --> 00:33:42.336 medicine physicians and radiologists.
00:33:42.336 --> 00:33:43.559 Now.
00:33:43.560 --> 00:33:46.254 Even though the letter one has
00:33:46.254 --> 00:33:48.050 established the parameters for
00:33:48.133 --> 00:33:50.664 treatment of patients with Sarah,
00:33:50.664 --> 00:33:53.120 but we are still,
00:33:53.120 --> 00:33:55.796 we’re still figuring out the exact
00:33:55.796 --> 00:33:58.072 guidelines for which patients will
00:33:58.072 --> 00:33:59.846 benefit most, and they’re still.
00:33:59.846 --> 00:34:01.718 There’s a lot of active research
00:34:01.718 --> 00:34:03.020 going on in this field,
and it’s very exciting to be part of this field as we’re expanding beyond the netter one. Trial indications. But you’re probably thinking, well, what about FDG? GS News and pretty much every other oncological indication. How about your endocrine tumors? Well, a lot of the well differentiated G1 on your endocrine tumors are actually not hypermetabolic, so we there’s really no no role for our DG in the well differentiated once, the well differentiated once, and there is the spectrum that the tumors will express.
A lot of this medicine receptor and will not have as much.

Hypermetabolic activity, but the higher grade tumors.

Then you’re in different parts.

Sonoma is Angie 3 tumors.

They will have hypermetabolic activity and there’s still a lot of Gray area in between them as well, because sometimes they look the lower grade tumors will also have hypermetabolic activity, but in nuclear medicine we have this idea that there’s dedifferentiation that happens.
So this is a patient with a well differentiated neuron, different tumor. With multiple somatostatin receptor avid lesions and this is a patient that had dedifferentiation that neural different from which the tumor is now hypermetabolic, or it can actually expect express sounds of medicine receptors, but not as many. So the exact point where we would treat these patients, particularly the ones that have FDG uptake.
Is still not fully evaluated, but hypermetabolic activity within these tumors is seen as a poor prognostic marker.

So in terms of PRT treatment, the details for this treatment is we do right now.

Standard dose of 200 millicuries every eight weeks and we do 8 cycles.

During the therapy we do an amino acid infusion for renal protection and we provide antiemetics for nausea and patients usually will continue somatostatin and lock therapy at this during PRT treatment now.
None of you are thinking well. What if?

How do we treat a patient?

Every single patient with the same dose?

And you’re thinking right, the whole field of theranostics right now and treatment is moving towards personalized symmetry and that is becoming a big talking point with Society of nuclear medicine and molecular imaging and major initiatives.

And the reason is there, nastix agents are becoming more and more available for different cancers in prostate cancer will have a
new theranostic agent that’s very likely to be FDA approved next month. And with that targeted therapy, you want to think about it in a couple different ways and just in terms of global way with their Gnostics, you can image the targets such as location of the tumors and that way you can provide targeted therapy in terms of location of the tumor, because you can see where the drug is and then you can just exchange the radionuclide and target that therapy. You can also think of targeted therapy in another way where you target as
particular step in the mechanism of.

Therapy, and that is targeting a specific pathway step.

So for FDA approved radiopharmaceuticals there’s really been an explosion in the recent years.

So it we really kind of started with a cold see lemon cooling for prostate cancer and gallium dotatate was approved when you’re entering tumors in 2016 and then was followed by a cold see lemon cooling for prostate cancer and gallium dotatate was approved when you’re entering tumors in 2016 and then was followed by Gallium Delta talk and the difference between Tate and talk is in the peptide portion of the targeting agent.

And in there they work pretty much the same in terms of ability to
detect some metastatic receptors.

We also now have a copper 64 labeled DOTATATE and.

The therapy for lutetium builder did was.

He has also been FDA approved for quite a while now and it was basically approved based on the meter one trial,

which showed improved progression free survival in these patients and I really appreciate Doctor Koontz going over.

For this so for future directions we have to evaluate PRT efficacy and higher grade neuroendocrine neoplasms.

We're also working on personalized symmetry, so providing the right dose to the
patient and hopefully see better outcomes in patients, and we need to evaluate indications for re-treatment of patients. So after they completed the four cycles of therapy, what are the indications for repeat? Treatment another cycle of therapy and also of the alpha therapeutics. And another thing that we're working on here at Yale is personalized tumor directed analysis with basically doing volumetric assessment of the different metastases and generating growth curves for each individual lesion in the volumetric form and following.
Physical growth parks and figuring out which lesions are growing and needs targeted therapy through different ways and which ones are not so, so. In conclusion, cross sectional imaging with CT and MRI can diagnose and follow in your Endocrine meal Plaza. And it’s they’re really excellent ways to do imaging for these patients, but. And molecular imaging of somatostatin receptor expression allows for better molecular characterization of new rendering. Gallium Dotatate pet is very sensitive
for detection of metastatic lesions

and allows to evaluate whether patient

dotatate therapy is established

and allows to treat some medicine

and receptor tumors expressing

Staten receptor expressing neuron doctrine,

neoplasms, and it allows us to

visualize the location of the therapy

and many advances for personalized

therapy are being evaluated right now,

so stay tuned to this field 'cause

it’s really changing how we’re

managing their endocrine schermers.

I really want to thank you for your time
and pass the Bhutan to doctor Sajid Khan.

You’re on mute. Doctor Khan.

OK, OK, I think I’m unmuted now.

I’m is that right?

OK, yes, OK, alright.

Thank you Doctor rebellion that

was just an outstanding talk.

I learned a lot from that talk and I’m sure

other people in the audience learned a lot.

And Doctor Kunz talk was also at standing.

So, uh, you know, so I’m going to

spend the next 20 minutes talking to

you from a slightly different perspective,

and one that will include the surgical

management of neuroendocrine tumors.
And since just the surgical management of neuroendocrine tumors is a large topic in and of itself, I'll focus specifically on pancreas and small bowel, and I'd love to ask any questions towards the end. First time I have no disclosures.

Looking at it from the end where they looked at. Recall based study of the incidence of neuroendocrine tumors over the course of time.
and this is kind of the punch line.

One of the points that Romans made is neuroendocrine tumors are not necessarily a rare anymore because the incidence of these is rising and this includes the focus of this talk, which will include pancreas and small bowel.

Under consumers and in green over here, there’s been a very steady and then more recently, a steeper rise in the incidence of pancreas.

Under consumers and in green over here, a small bowel or under consumers.

2 and that’ll be the focus of this talk.
00:43:42.480 --> 00:43:43.792 the audience know that.
NOTE Confidence: 0.942148555714286
00:43:43.800 --> 00:43:46.474 Many of our patients are getting scans.
NOTE Confidence: 0.942148555714286
00:43:46.480 --> 00:43:48.452 A cross sectional imaging,
NOTE Confidence: 0.942148555714286
00:43:48.452 --> 00:43:50.917 and they’re often incidental findings.
NOTE Confidence: 0.942148555714286
00:43:50.920 --> 00:43:52.830 And oftentimes these are how
NOTE Confidence: 0.942148555714286
00:43:52.830 --> 00:43:54.358 neuroendocrine tumors are discovered
NOTE Confidence: 0.942148555714286
00:43:54.358 --> 00:43:56.716 as our other kinds of tumors as well,
NOTE Confidence: 0.942148555714286
00:43:56.720 --> 00:44:02.910 and I’m sure that’s driving the higher
NOTE Confidence: 0.942148555714286
00:44:02.910 --> 00:44:04.960 incidence that we’re seeing over time.
NOTE Confidence: 0.942148555714286
00:44:04.960 --> 00:44:07.010 So the interesting thing about
NOTE Confidence: 0.942148555714286
00:44:07.010 --> 00:44:09.510 neuroendocrine tumors is that the
NOTE Confidence: 0.942148555714286
00:44:09.510 --> 00:44:10.158 survival for neuroendocrine tumors is,
NOTE Confidence: 0.942148555714286
00:44:10.158 --> 00:44:12.102 generally speaking,
NOTE Confidence: 0.942148555714286
00:44:12.102 --> 00:44:13.588 favorable when we and the focus
NOTE Confidence: 0.942148555714286
00:44:13.590 --> 00:44:15.678 again will be on pancreas.
NOTE Confidence: 0.942148555714286
00:44:15.678 --> 00:44:16.818 Neuroendocrine tumors and small
bowel neuroendocrine tumors and the survival is dependent on grade, and we’re not going to talk too much about grade three grade 4 door under consumers and much of what we see are grade one and grade tuna under consumers and the survival. Is is usually favorable and that leads to. That the perspective of how these new entrants should be managed and you know, and you know I’m going to give you my perspective as a surgical oncologist. And I think we all have our own perspectives on things. And as a surgical oncologist at
00:44:53.360 --> 00:44:55.165 longer progression free survivals,
NOTE Confidence: 0.942148555714286
00:44:55.165 --> 00:44:57.240 the longer survivals impact how?
NOTE Confidence: 0.942148555714286
00:44:57.240 --> 00:44:58.360 What kind of surgical management
NOTE Confidence: 0.942148555714286
00:44:58.360 --> 00:44:59.480 we offer to our patients.
NOTE Confidence: 0.88028361
00:45:01.550 --> 00:45:03.510 So for the talk, we’ll break it up
NOTE Confidence: 0.88028361
00:45:03.510 --> 00:45:05.309 into the remainder of the talk.
NOTE Confidence: 0.88028361
00:45:05.310 --> 00:45:08.397 Will break it up into three different.
NOTE Confidence: 0.88028361
00:45:08.400 --> 00:45:10.248 Sessions one will be the pink
NOTE Confidence: 0.88028361
00:45:10.248 --> 00:45:11.172 richner endocrine tumors,
NOTE Confidence: 0.88028361
00:45:11.180 --> 00:45:12.920 which I’ll talk about first.
NOTE Confidence: 0.88028361
00:45:12.920 --> 00:45:14.564 I’ll follow that with the small
NOTE Confidence: 0.88028361
00:45:14.564 --> 00:45:16.260 bowel and are under consumers.
NOTE Confidence: 0.88028361
00:45:16.260 --> 00:45:19.212 And lastly, we talk about metastatic
NOTE Confidence: 0.88028361
00:45:19.212 --> 00:45:21.180 neuroendocrine tumors as well.
NOTE Confidence: 0.88028361
00:45:21.180 --> 00:45:23.260 These are common surgical scenarios
NOTE Confidence: 0.88028361
00:45:23.260 --> 00:45:26.425 that maybe some of your patients
NOTE Confidence: 0.88028361
00:45:26.425 --> 00:45:29.170 have experienced and and hopefully
NOTE Confidence: 0.88028361
00:45:29.261 --> 00:45:31.826 this will provide some types.
NOTE Confidence: 0.88028361
00:45:31.830 --> 00:45:34.596 So in regards to the pancreas
NOTE Confidence: 0.88028361
00:45:34.596 --> 00:45:35.518 narender consumers.
NOTE Confidence: 0.88028361
00:45:35.520 --> 00:45:36.264 So you know,
NOTE Confidence: 0.88028361
00:45:36.264 --> 00:45:37.752 I think in order to understand
NOTE Confidence: 0.88028361
00:45:37.752 --> 00:45:39.517 if someone needs an operation,
NOTE Confidence: 0.88028361
00:45:39.520 --> 00:45:41.122 one needs to just understand the
NOTE Confidence: 0.88028361
00:45:41.122 --> 00:45:42.540 basics of the neuroendocrine tumors.
NOTE Confidence: 0.88028361
00:45:42.540 --> 00:45:44.043 And you know these are some of the points
NOTE Confidence: 0.88028361
00:45:44.043 --> 00:45:45.667 that are important to a surgical oncologist.
NOTE Confidence: 0.88028361
00:45:45.670 --> 00:45:47.830 When we see patients who think
NOTE Confidence: 0.88028361
00:45:47.830 --> 00:45:48.910 christner under consumers.
NOTE Confidence: 0.88028361
00:45:48.910 --> 00:45:50.584 I'm I'm very interested in tumor
NOTE Confidence: 0.88028361
00:45:50.584 --> 00:45:52.628 biology and I could tell that to
NOTE Confidence: 0.88028361
00:45:52.628 --> 00:45:54.368 rebooting is also from her very
NOTE Confidence: 0.88028361
00:45:54.368 --> 00:45:55.894 elaborate talk and pink Krishna
NOTE Confidence: 0.88028361
00:45:55.894 --> 00:45:57.664 render from rumors arise from the
NOTE Confidence: 0.88028361
00:45:57.670 --> 00:45:59.550 endocrine cells of the pancreas,
NOTE Confidence: 0.88028361
00:45:59.550 --> 00:46:03.270 which are important to understand
NOTE Confidence: 0.88028361
00:46:03.270 --> 00:46:06.312 and they account for 3% of
NOTE Confidence: 0.88028361
00:46:06.312 --> 00:46:07.938 pancreas tumors altogether.
NOTE Confidence: 0.88028361
00:46:07.938 --> 00:46:10.106 So still pancreatic ductal
NOTE Confidence: 0.88028361
00:46:10.106 --> 00:46:12.135 adenocarcinomas and other kinds
NOTE Confidence: 0.88028361
00:46:12.135 --> 00:46:14.679 of tumors comprise majority but 3%
NOTE Confidence: 0.88028361
00:46:14.679 --> 00:46:16.574 of pink christner under consumers
NOTE Confidence: 0.88028361
00:46:16.574 --> 00:46:18.700 are comprised of by peanuts.
NOTE Confidence: 0.88028361
00:46:18.700 --> 00:46:21.549 The median age at diagnosis is 60
NOTE Confidence: 0.88028361
00:46:21.549 --> 00:46:24.435 years and the survival is longer
NOTE Confidence: 0.88028361
00:46:24.435 --> 00:46:26.415 than that anchors adenocarcinoma,
NOTE Confidence: 0.88028361
00:46:26.420 --> 00:46:27.935 so that’s very important point
NOTE Confidence: 0.88028361
00:46:27.935 --> 00:46:30.018 to understand is as all of us
NOTE Confidence: 0.88028361
00:46:30.018 --> 00:46:31.030 in the audience have.
NOTE Confidence: 0.88028361
00:46:31.030 --> 00:46:32.880 I’m sure I can understand,
NOTE Confidence: 0.88028361
00:46:32.880 --> 00:46:34.724 and they’re obviously people.
NOTE Confidence: 0.88028361
00:46:34.724 --> 00:46:37.490 Some celebrities over the years that
NOTE Confidence: 0.88028361
00:46:37.561 --> 00:46:39.134 we have observed that have been
NOTE Confidence: 0.88028361
00:46:39.134 --> 00:46:40.760 diagnosed with these kinds of tumors.
NOTE Confidence: 0.88028361
00:46:40.760 --> 00:46:41.980 Both adenocarcinoma.
NOTE Confidence: 0.88028361
00:46:41.980 --> 00:46:45.030 I think Christina render consumers.
NOTE Confidence: 0.88028361
00:46:45.030 --> 00:46:47.070 The note status is very important,
NOTE Confidence: 0.88028361
00:46:47.070 --> 00:46:49.685 so patients with node negative
NOTE Confidence: 0.88028361
00:46:49.685 --> 00:46:50.600 peanuts tend to
NOTE Confidence: 0.672960371666667
00:46:50.610 --> 00:46:52.590 have them. Sorry to interrupt you,
NOTE Confidence: 0.672960371666667
00:46:52.590 --> 00:46:56.944 your slide is not projecting it maybe.
NOTE Confidence: 0.672960371666667
00:46:56.950 --> 00:46:58.680 Yep, there you go. Perfect, thanks.
NOTE Confidence: 0.918569646666667
00:46:58.690 --> 00:46:59.760 Thank you.
00:47:00.720 --> 00:47:02.796 Sorry, so the survival is very
NOTE Confidence: 0.91856964666667
00:47:02.796 --> 00:47:05.100 important based on the nodal status.
NOTE Confidence: 0.91856964666667
00:47:05.100 --> 00:47:08.614 So patients with no negative peanuts have
NOTE Confidence: 0.91856964666667
00:47:08.614 --> 00:47:12.206 a very favorable survival at 136 months.
NOTE Confidence: 0.91856964666667
00:47:12.206 --> 00:47:14.821 The addition of noteworthy metastasis
NOTE Confidence: 0.91856964666667
00:47:14.821 --> 00:47:17.867 to lymph nodes decreases at survival
NOTE Confidence: 0.91856964666667
00:47:17.867 --> 00:47:20.646 to 77 months and one patient
NOTE Confidence: 0.91856964666667
00:47:20.646 --> 00:47:22.494 present with distant metastases.
NOTE Confidence: 0.91856964666667
00:47:22.500 --> 00:47:25.780 This survival is 24 months and
NOTE Confidence: 0.91856964666667
00:47:25.780 --> 00:47:28.230 you know that’s important to
NOTE Confidence: 0.91856964666667
00:47:28.230 --> 00:47:30.356 understand because 60% of patients
NOTE Confidence: 0.91856964666667
00:47:30.356 --> 00:47:32.266 do present with distant metastases.
NOTE Confidence: 0.91856964666667
00:47:32.270 --> 00:47:34.094 And I think that plays into
NOTE Confidence: 0.91856964666667
00:47:34.094 --> 00:47:35.310 the decision making process.
NOTE Confidence: 0.91856964666667
00:47:35.310 --> 00:47:37.718 So for how to treat the patient
NOTE Confidence: 0.91856964666667
00:47:37.718 --> 00:47:39.642 to optimally and as doctor Kunz
had mentioned during her talk, majority of cases are sporadic and some are familiar. Pink Reisner under consumers are nonfunctioning tumors and and by this what I mean is that nonfunctioning tumors do not produce clinical symptoms, even though the tumors can’t still produce hormones, but they don’t produce enough hormones that cause clinical symptoms. The nonfunctioning tumors, now in the updated literature, revealed account for about
00:48:12.700 --> 00:48:13.652 75% of these tumors.
NOTE Confidence: 0.7983114075
00:48:13.652 --> 00:48:15.394 I think some of this has to do with
NOTE Confidence: 0.7983114075
00:48:15.394 --> 00:48:16.604 these smaller new render consumers,
NOTE Confidence: 0.7983114075
00:48:16.610 --> 00:48:17.104 the child.
NOTE Confidence: 0.7983114075
00:48:17.104 --> 00:48:19.114 Talk a little bit about that are
NOTE Confidence: 0.7983114075
00:48:19.114 --> 00:48:21.049 diagnosed more and more frequently
NOTE Confidence: 0.7983114075
00:48:21.049 --> 00:48:23.638 in that number has increased over
NOTE Confidence: 0.7983114075
00:48:23.638 --> 00:48:25.574 overtime and then functioning tumors,
NOTE Confidence: 0.7983114075
00:48:25.574 --> 00:48:27.446 so functioning tumors are tumors
NOTE Confidence: 0.7983114075
00:48:27.446 --> 00:48:29.376 that have hormone hypersecretion that
NOTE Confidence: 0.7983114075
00:48:29.376 --> 00:48:31.800 does lead to clinical manifestation.
NOTE Confidence: 0.7983114075
00:48:31.800 --> 00:48:33.906 The six types are listed here,
NOTE Confidence: 0.7983114075
00:48:33.910 --> 00:48:35.390 which are insulinomas most
NOTE Confidence: 0.7983114075
00:48:35.390 --> 00:48:37.240 commonly that we see Glucagon,
NOTE Confidence: 0.7983114075
00:48:37.240 --> 00:48:37.708 omas,
NOTE Confidence: 0.7983114075
00:48:37.708 --> 00:48:38.644 gastrinomas VIP,
omas Mathis adenomas and others

as well functioning tumors tend to have better survival than nonfunctioning tumors and part of this.

Probably is patient present symptom with symptomatology earlier than non functioning tumors and that might lead to a better survival ultimately because it was diagnosed or earlier on in the process.

So when a surgical oncologist, if you come to Yale Surgical and I see one of the Yale surgical oncologists you know there are certain things that we think are
Important to guide our principles of surgical management of patients for assessing a patient. For that and our goals for surgery are the first is to maximize local control, so I think that’s a very important point for not just bankers neuroendocrine tumors, but in general for other types of neuroendocrine tumors as well. Another goal is to increase quality of life and sometimes that even non-functioning tumors can have an adverse effect on the individuals quality of life. So surgery can improve, increase funds, quality of life progression.
Free survival is an important point as well too given the behavior of these tumors a lot of times we focus on progression free survival and not as much as overall survival. So progression free survival is very important for this kind of tumor. Generally speaking we aim for R0 resection margins and that’s something we strive for for many. Kinds of search conchology operations and that just simply means microscopically and grossly negative. We’ll talk a little bit more about. There’s some different that’s
not always the case, but that’s for some of the metastatic tumors. But we are usually striving for an artist or section and the other final goal is we try to alleviate clinical symptoms, and this is very important for those with the functioning or underprint tumors. And and with the source of the hormone, hypersecretion is removed. It can substantially alleviate ones in the completely. Address it altogether. And we also, you know, with our surgeries and a lot of these pancreas cases can be major.
00:50:39.922 --> 00:50:40.978 operations and us.

00:50:40.978 --> 00:50:44.070 But we do try to limit our short

00:50:44.070 --> 00:50:45.982 term morbidity and the long term

00:50:45.982 --> 00:50:47.780 morbidity as well too in the few.

00:50:47.780 --> 00:50:49.780 See one of the surgical oncologists at Yale.

00:50:49.780 --> 00:50:51.736 We our role is taking this

00:50:51.736 --> 00:50:52.388 into consideration.

00:50:54.800 --> 00:50:57.635 So, so I’m gonna give you some

00:50:57.635 --> 00:50:59.202 specific surgical scenarios here

00:50:59.202 --> 00:51:01.897 that may be of some use and you know

00:51:01.897 --> 00:51:03.931 one scenario includes a patient that

00:51:03.931 --> 00:51:06.298 presents the localized non metastatic

00:51:06.298 --> 00:51:07.774 pancreas neuroendocrine tumor.

00:51:07.780 --> 00:51:08.683 And generally speaking,

00:51:08.683 --> 00:51:11.438 we respect the for the resection is feasible.
The meeting survival in the literature is 7.1 years, but the important thing to understand, and is that about half the patients do recur at two almost three years. So recurrence free survival is important to consider here as well, so so many patients to recur. Another common scenario are these small pink trees that are under 15 years, so these are pink creature under consumers that when we say that there are small, we’re thinking 1.5 to 2 centimeters in the depends on which studies you’re looking at. There’s a good study out of
00:51:48.174 --> 00:51:48.990 the University of Chicago.

00:51:48.990 --> 00:51:51.426 There's another good study out of Massachusetts General and then that's where this number of less than two centimeters or 1.5 to 2 centimeters comes up, because given the behavior of neuroendocrine pancreas, sometimes surgery is not necessary for these patients, but I would recommend careful observation and you know each patient is an individual and we need to evaluate every patient should be evaluated individually and but oftentimes patients with
smaller tumors can be observed, you know, and I just want to make a quick comment about that. And that being said, you know if there’s a young patient that’s diagnosed with, for example, 1.8 centimeter neuroendocrine tumor that’s in. Yeah, in her late 20s or so, you know one can make a reasonable argument that with a longer life term expectancy, maybe that might not be the person we tried. Decide to observe with the small neuron consumer and we do survey these patients.
And if there are changes to their cross sectional imaging, which is an important point for neuroendocrine tumors, we will consider them per section.

Another scenario that sometimes comes up is a locally advanced and metastatic on fund, resectable. Patient in that kind of a scenario, you know, sometimes we consider palliative surgery with some of the options listed here, and that’s sometimes a scenario and then limited liver metastases. We’re going to talk at the last.
third of this talk a little bit more

NOTE Confidence: 0.83844109

about metastatic disease and in some

NOTE Confidence: 0.83844109

patients with limited liver metastases.

NOTE Confidence: 0.83844109

Will will use an asynchronous approach where the primary tumors are addressed

NOTE Confidence: 0.83844109

and the liver tumors is addressed,

NOTE Confidence: 0.83844109

or we considered a surgery in a staged.

NOTE Confidence: 0.83844109

So for all of these sections I'm just figured I'd share some patient examples for you to try to put it

NOTE Confidence: 0.867011257692308

So for all of these sections I'm just figured I'd share some patient examples for you to try to put it

NOTE Confidence: 0.867011257692308

I just figured I'd share some patient examples for you to try to put it

NOTE Confidence: 0.867011257692308

examples for you to try to put it

NOTE Confidence: 0.867011257692308

examples for you to try to put it

NOTE Confidence: 0.867011257692308

examples for you to try to put it

NOTE Confidence: 0.867011257692308

into some perspective and the

NOTE Confidence: 0.867011257692308

into some perspective and the

NOTE Confidence: 0.867011257692308

into some perspective and the

NOTE Confidence: 0.867011257692308

into some perspective and the

NOTE Confidence: 0.867011257692308

into some perspective and the

NOTE Confidence: 0.867011257692308

first patient I'd like to present is

NOTE Confidence: 0.867011257692308

an 80 year old male who presented

NOTE Confidence: 0.867011257692308

an 80 year old male who presented

NOTE Confidence: 0.867011257692308

an 80 year old male who presented

NOTE Confidence: 0.867011257692308

an 80 year old male who presented

NOTE Confidence: 0.867011257692308

what's called the Whipple's triad,
which we’ve heard about, and for Pinkerton are under consumers, what we teach our residents is, you know, if you’re ones considering a functional. Increased our hundred tumor work up starts with the biochemical workup and this patient did have a biochemical work up, which indeed was consistent with insulinoma. After the biochemical work up, then we preceded with the localization studies to identify where this tumor is located and in this patient. Here, this is the frontal images and it shows.
I don’t think my arrow is projecting here, but there’s a hyper enhancing mass in the head of the pancreas which is seen. And that is sometimes the look of how a neuron tumor shows up on cross sectional imaging, and we performed a pancreaticoduodenectomy with an extended lymphadenectomy on this patient specimen seen on the right, and interestingly, immediately the patient’s hypoglycemic episodes were completely resolved and provided this gentleman with many years of custom free life.

Next, I’d like to transition to small bowel neuroendocrine tumors.
And these are tumors that are submucosal neoplasms which primarily arise from the jejunum and the ileum. And there they do have neuroendocrine differentiation, just like some of these other tumors that we're talking about today. They have an ability to secrete functional hormones and a means they are the most common tumor of the small bowel with malignant potential. Which is interesting because this is shifted because when I was in intern almost 20 years ago now we used to not look at small bowel neuronal tumors as
the most common small bowel tumors.

We would think more of adenocarcinoma and then more often even benign tumors. But interestingly, now neuroendocrine small bowel tumors are the most common. Small bowel tumor with Fullington potential. Nearly a third of these tumors arise relatively close to the ileocecal valve, and that the reason that’s important is our operative decision making takes that into consideration. Many patients present with multifocal disease that’s also very important. When I talk about surgical approaches, and about 35% of patients
present with distant metastases, so surgical resection is a preferred frontline treatment for these patients. The reasons for that are:

1. It can improve survival.
2. It can reduce the risk for developing metastatic disease.
3. It can alleviate symptoms and
4. It can prevent or delay the onset of symptom development.

And that’s important as we talk a little bit more here.
that some of your patients may present with into the hospital. And 11 scenario is in east symptomatic patient that the patient presents with asymptomatic disease with the primary tumor without distant metastases. So even though these patients present with asymptomatic disease, in retrospect, many of them will have some symptomatology. And they won’t know about it until after they’ve had their surgery. But that symptomatology may have prompted their imaging in the 1st place and the cross sectional imaging Dr Booing can speak to this better than I can,
but oftentimes it shows something such as a mesenteric or small bowel mass, which is hyper enhancing. Speculated or calcified, and interestingly in the operating room, you know, the speculation is something we really appreciate because these tumors in the OR or the mesenteric mass in the OR tend to be fixed, as opposed to something that some freely movable, which is the case with some of the benign small bowel tumors.
and even small biologists.

Another scenario is an asymptomatic primary tumor with distant metastasis.

I’m going to talk a little bit about that.

In the last scenario, because I think that’s going to be an important thing to go over.

And symptomatically. You know, sometimes these neuroendocrine tumors present with the bowel obstruction, abdominal pain, bleeding, and the so-called carcinoid syndrome as well.

An approach that is important is expectations for our patients suffer.
Patient knows what to expect in a non-emergent setting prior to undergoing a surgical and conchological section. It goes along way for their satisfaction down the road. That’s something that our group at Yale uses. So we talked to our patients ahead of surgery and one thing that we talked to our patients about is sometimes that because of the multifocality of these tumors, larger areas of small bowel need to be respected. Lead to increased frequency of their bowels of bowel movements.
We also consider perceptibility.

A lot of it comes down to the mesenteric artery and the vein superior mesenteric.

That’s something we strongly consider for respectability for these guys into tumors, and indirectly or small bowel resection with a lymphadenectomy. Sometimes it involves resection of a mesenteric mass, which is how a patient may present, and in the operating room.

It’s very important to palpate for synchronous tumors, so open operations are preferred.
and I just want to spend just a minute talking about that as well too. So we do a lot of laparoscopic and minimally invasive surgery at Yale. A lot of our operations are done in that manner, and the way I look at laparoscopy and minimally invasive surgeries is that it should be a tool to provide a good oncologic operation. It shouldn't not be the other way around, meaning someone should not get a minimally invasive surgery just for the sake of getting minimally invasive surgery,
but so so for the way we approach these are we usually will do them.

Laparoscopic Lee roulette, metastases and sometimes we could make a very small incision and eviscerate the tumor and palpate the entire small bowel to make sure that they’re synchronous. Tumors are are not missed, which sometimes is the case with true laparoscopic operations.

For these small bell, any tease we value for distant metastases and sometimes consider a cholecystectomy and a lot of that. Ends up being a conversation with the
surgical oncologist and medical oncologist,

and about this patient may be a candidate for lanreotide in the future which can predispose to the development of gallstones. Uhm?

So so a few scenarios.

So patient presents with an incidental finding on cross sectional imaging.

You know our suggestions are the patient should be evaluated by a surgical oncologist per section the patient presents, with an isolated mesenteric mass or small bowel mass, and the reasons we consider surgery
are again, it could be diagnostic.

Sometimes these tumors are not always new render consumers,

but they usually are when we look at it with our radiologists,

so it's something to consider.

The operation is potentially curative and this is very important.

It can avoid future symptoms of bowel obstruction,

bleeding or ischaemia,

which sometimes happens in these small bells are under primary.

Tumors are left alone,
so that's an important point to mention and we do see that sometime with the patient that had an arrangement in which was being observed and so the patient can present with some symptoms down the road. And of course it can avoid reduced risk. Another scenario is an asymptomatic primary with distant metastasis, and again this can be. This would suggest to be evaluated by a surgical oncologist and and the reasons for surgery in order.
to avoid future complications and metastasis and discomfort. This kind of an approach can still provide a profession free survival advantage. And then, if patients. Sometimes patients present symptomatically and impatient that’s presenting symptomatically should probably just get to the operating room and be seen by a general surgeon in the local hospital. Because sometimes these patients you know don’t have room to be transferred, and they and acute ballot traction should just usually be managed locally and the reasons for this.
Of course the obvious alleviates her symptoms. That it can be diagnosed and be potentially cured. And a patient example here is an asymptomatic patient with an asymptomatic small bell NET. This is a 59 year old male who presented with a 4.2 centimeter hyper enhancing mesenteric mass on CT for abdominal pain, which resolved by the time we evaluated him and then this picture shows a CAT scan with a hyper In Sync 4.2 centimeter mass, which we ended up taking to the OR and resecting which is
showing all the way in the right.
And we did an en bloc small bowel
resection with the mesenteric mass
and the surgical pathology
revealed multifocal tumors.
Node positive disease without metastasis,
and it was a grade one tear.
And finally,
I'll end this session by submitting
metastatic here under consumers.
So again,
some perspective on things from
a surgeon's perspective that so
the reason we find this important
is because the third patient,
present with cysteine metastasis
in the liver, happens to be the most common site of metastasis. Metastasis is important because it negatively affects revival as, and that's the case with all cancers, and there's a increased risk of death compared to an individual that has localized disease. Clinical presentation can include hormonal symptoms, and that's more often the case for small bowel and any tease. This could be diarrhea,
wheezing and flushing, and sometimes the patients could have valves are right sided valvular disease which can lead to heart failure. Increase your under. Consumers are important. They’re at their often nonfunctional in cases of metastasis. The goal for the arguments supporting surgery for metastatic any teas are the first in the important thing is to control the tumor burden and by respecting ones metastatic neuroendocrine tumors. The progression free survival improves the patients as a whole and you know
The literature can show five-year overall five-year survival up to 74%. That's overall survival, but the important thing to understand is there's a high risk of recurrence. Despite that kind of an approach, even though I'm talking about five-year old roll survival, so even though I'm talking about 74% the recurrence rate is nearly 80%. It could prevent or delay the effective symptom control, particularly for functioning tumors. It could prevent or delay the
sequelae of carcinoid syndromes.

It can improve one’s performance status and pain, and this is the case more for nonfunctioning tumors and the number has shifted us to the number of the percent of tumor that we’d like to site, or reducing individual. And there was a time where we used to think more along the lines of 90% but more recent literature has suggested that that number might be closer to 70%. Reduction of the tumor burden, and it’s important if one can have this kind of cytoreduction,
and we usually try to remove the primary tumor in the regional disease in this 70% number that I mentioned. But even if one does not have their primary tumor that’s identified. One can still consider a cytoreductive surgery if greater than 70% of the disease burden that’s clinically present can be addressed. And extrahepatic disease is not a contraindication to the surgical site or reduction. The tools that we use in surgical oncology for Cytoreduction, and I’m focusing a little bit more.
on the liver because I'm very biased towards the liver and, uh, I like operating the liver and then this ends up being the most one of the most common sites for the most common cited medicine disease. For any tease, we often will try to do what's called prank while sparing resections, because, as I mentioned before, many of these patients were occur and they can have a longer survival, and they can recur in the liver, so we try to do prank whispering resections. Impossible understanding that. Well, if there's another recurrence down the road,
it can allow the patient for a second liver operation or liver directed therapy down the road. But sometimes we do need to perform major head protect me as given the distribution of the testis is sometimes we consider a microwave ablation where we put a probe into the center of the tumor or sometimes our interventional radiology colleagues who are very adept at doing that can do that as well too. And if they can do it in the last invasive fashion, that’s always. Investing for the patient and surgical
site or rejection should be attempted when it’s anatomically feasible and it can be performed with a low morbidity.

So I’ll end with a patient example, and this is a 62 year old male who, when I had seen him, was five years after the status posted, dissipated protect me for nonfunctioning tankers or under consumer one of his smile. Medical oncologists was surveying him and identified enlarge. This doesn’t show everything, but this is a patient that had three tumors when we had seen him.
one in the left lateral liver,

one in the left medial liver,

and then one in the right liver.

And then we went ahead and we actually needed to do a major liver section for the left side, and apparently sparing resection on the right side to clear all of the disease.

And we did a cholecystectomy in this case as well too, and the pathology revealed for neuroendocrine tumors, which were identified in the liver, which were well differentiated.

So the surgical manager of papers at
small bowel neuroendocrine tumors,

the incidence is rising.

Section of primary neuroendocrine tumors.

This clinical benefit and we’ve shown that,

and I’ve shown that the pancreas for

under consumers those non functioning,

functioning and for small V al

any teas and finally surgical

Any tease has clinical benefit at

greater than 70% of the tumor burden. 

Any tease has clinical benefit at 

greater than 70% of the tumor burden. 

Which percentage.

OK, thank you for your time.

Thank you to doctors appointment and con.

Those were both great presentations,

so I think what we’ll try to do is
tackle some of the questions that have come through the chat and I also have some questions for the two of you and we can have a conversation. So one of the first questions that came through is I think this was in reference and Doctor Boy was in reference and Doctor Boy and maybe I’ll direct this to you. Is can the Ludo dictate treatment? and particularly if the cancer load is low, that’s I think aspirational,
What are the goals of treatment and in what setting do we typically use it? Yeah, this is a really great question now. The indications for which PRT is being used for right now is for well differentiated tumors, and when we do the therapy majority of the tumors actually do not decrease in size, but it does slow their growth, so there’s significant improvement in progression. Free survival. So no, this is not a cure, but it does improve symptoms and improve survival. In patients. So that’s for the lutetium. We still have a lot of other therapies in in
the pipeline that we’re still evaluating, but the goal is not cure. The goal is extension of life and improvement of symptoms. Thank you, there was another question that I think perhaps Doctor Khan can answer. So and I think you addressed this a little bit in the course of your presentation such so is it possible that we maybe can’t find the primary, but we do see metastatic disease. You touched on that a little bit in the course of your surgical indications, but maybe you can address that some. Yes, yeah, so that’s not an uncommon scenario.
Back spoons, and that’s very good question.

And you know it is all worth it to look for the primary tumor and do a thorough exhaustive look for the primary tumor. However, the primary tumor cannot be found.

There is benefit towards some. If a patient has a resectable metastatic disease, which could be said or reduced to over 70%, and the morbidity is not very high.

Uh, I would still recommend consideration for surgical cytoreduction because of the improvement in professional free survival. And I’ll just comment this.

You know, entity of unknown primaries is
certainly something that we come across, although I will say I think that’s less in the era of gallium 68 PET scans. I think we are often identifying the primary a little bit more easily with better imaging so, but we do still see that I have a couple of questions actually there. I think there is one more in the Q&A from the audience, so this is something. Maybe I’ll tackle first, but would welcome comments from my partners. Here, so some cancers, even lung adenocarcinomas,
had endocrine secretion.

How can we treat that?

I didn’t personally spend a lot of time talking about how we treat hormone control, but I think for certainly for many patients with neuroendocrine related hormones secretion we the mainstay is really using somatostatin analogs. First they were approved on the basis of controlling hormones, specifically carcinoid syndrome, which is diarrhea and flushing. They are also indicated in some other forms of hormones secretion, including gastrinomas and others. But we also try to PSI to reduce or
01:12:44.040 --> 01:12:46.932 kind of reduce the bulk of the tumor,
01:12:46.932 --> 01:12:48.816 either through surgery as Doctor Khan
01:12:48.816 --> 01:12:51.559 indicated or other systemic treatments
01:12:51.560 --> 01:12:54.710 So cytotoxic chemotherapy can do that.
01:12:54.710 --> 01:12:56.492 Doctor Khan, I think, spoke about
01:12:56.492 --> 01:12:58.880 some of the like oblited procedures.
01:13:00.903 --> 01:13:03.019 We often we didn’t talk tonight a
01:13:03.020 --> 01:13:05.642 but I think that when patients
01:13:05.642 --> 01:13:07.136 have secretion of hormones,
01:13:07.136 --> 01:13:08.544 we really it’s tricky.
01:13:08.550 --> 01:13:10.632 Because we need to think about
01:13:10.632 --> 01:13:12.448 both managing the hormones and
So doctor,
can you have any other comments on that?
Yeah, I know, I think those are why you
know if if if an individual has a patient.
If a provider has a patient with,
neuroendocrine tumor general,
but in this specific scenario
it’s good to have them evaluate
in a multidisciplinary fashion.
Because surgery.
I’m not saying everyone needs surgery
and sometimes systemic options are
much more effective at controlling
these symptoms than surgical options.
And and I think that’s why you
know an active discussion by a
multidisciplinary tumor board. Is it very beneficial for the patient, but you know if one is able to control you, know a high burden of disease like I threw the number of 70% out there. That’s for surgical literature. But I don’t know if this is true or not, but perhaps that would be true for non-surgical approaches as well. And I think if we’re able to address the source of where the hormones are being separated from, we could probably really provide some good clinical abilities to our patients.
Right, right now I agree.

Good doctor Brian.

I have a question that comes up almost in many of my patient interactions and also when I’m teaching trainees this actually just came up yesterday.

How do we interpret SUV on Gallium 68 pet? Should we pay attention to it? Is it different than how we think about FDG pet?

Oh yeah, that’s a great question. It’s a we can give a whole lecture tracer uptake, so I would I would think too. I do recommend to, so it’s a.

It’s a general unit of Tracer
update that’s generalized to patient body weight.

But the the big issue?

Hope we lost Doctor Abovyan there for a moment. So hopefully she will be back.

Related to the tax, there will be a doctor boy and we lost you for just a minute. Maybe you can repeat the last portion of that.

Oh sorry, I was having Internet connectivity issues so so in terms of that SUV is it’s a it’s a way to measure tracer uptake normalized to patient body weight.

And it is a semi quantitative that measure.
There's a whole field of quantitative PET that requires very complex mathematical modeling. And here at EO, under the guidance of Doctor Rich Carson, their leader leaders, they go pet center in quantitative PET imaging and we're still trying to figure out how to apply to clinical practice because it's not used in clinical practice. But as UV is kind of a poor man's approach to try to quantitate so it's a semi-quantitative measure, but I would really focus on looking at the CVS within a specific tracer. So if you're going to compare...
NOTE Confidence: 0.81383524444445
01:16:10.582 --> 01:16:11.857 SUV values only,
NOTE Confidence: 0.81383524444445
NOTE Confidence: 0.81383524444445
01:16:14.780 --> 01:16:16.530 Don’t compare them between gallium
NOTE Confidence: 0.81383524444445
01:16:16.530 --> 01:16:19.304 dotate and don’t talk or gallium dotate,
NOTE Confidence: 0.81383524444445
01:16:19.304 --> 01:16:21.136 and if you’re so,
NOTE Confidence: 0.81383524444445
01:16:21.140 --> 01:16:22.958 if you have a patient that’s
NOTE Confidence: 0.81383524444445
01:16:22.958 --> 01:16:24.480 being imaged with MTG pad,
NOTE Confidence: 0.81383524444445
01:16:24.480 --> 01:16:27.980 then you can compare the SUV values.
NOTE Confidence: 0.81383524444445
01:16:27.980 --> 01:16:30.330 But if you’re patient change
NOTE Confidence: 0.81383524444445
01:16:30.330 --> 01:16:32.200 significantly so supposedly lost a
NOTE Confidence: 0.81383524444445
01:16:32.200 --> 01:16:34.800 lot of weight in between the scans,
NOTE Confidence: 0.81383524444445
01:16:34.800 --> 01:16:37.488 then you have to be really careful
NOTE Confidence: 0.81383524444445
01:16:37.490 --> 01:16:39.795 and usually in nuclear medicine
NOTE Confidence: 0.81383524444445
01:16:39.795 --> 01:16:42.100 when we do the reports,
NOTE Confidence: 0.81383524444445
01:16:42.100 --> 01:16:43.655 we do mention the numbers
NOTE Confidence: 0.81383524444445
’cause everybody wants some.

Connotation, but we do try to use language as well because it’s it’s a semi quantitative analysis.

Thank you, yeah that’s helpful.

Doctor Khan I have a question that comes up a lot in tumor board.

You know, I think I’d love to hear from you of.

Are there situations or notable situations where you’re like?

Gosh, I really wish I saw this patient earlier, like when?

When should medical oncologists or surgeons in the community be thinking about surgery?
When should it be on their radar? I'd say specifically for metastatic disease. OK, you know. Maybe I can also answer one about non metastatic disease. Some you know. I think if one identifies a hypervascular mesenteric mass, I would consider sending it to one of the surgical oncology, or at least one of the general surgeon to evaluate for it, because you know, every so often we do see a patient that
01:17:47.942 --> 01:17:50.557 has had this followed a cross sectional
NOTE Confidence: 0.842575879166667
01:17:50.557 --> 01:17:52.651 imaging and then presents with you
NOTE Confidence: 0.842575879166667
01:17:52.651 --> 01:17:55.014 know some sort of a problem with the.
NOTE Confidence: 0.842575879166667
01:17:55.020 --> 01:17:56.680 Primary small bowel related issue.
NOTE Confidence: 0.842575879166667
01:17:56.680 --> 01:17:59.040 Whether it’s this kimia infarct
NOTE Confidence: 0.842575879166667
01:17:59.040 --> 01:18:00.714 or balance truction and then it
NOTE Confidence: 0.842575879166667
01:18:00.714 --> 01:18:02.840 becomes more of an emerging problem.
NOTE Confidence: 0.842575879166667
01:18:02.840 --> 01:18:04.478 And it’s something that I probably
NOTE Confidence: 0.842575879166667
01:18:04.478 --> 01:18:06.644 could be less of a bigger operation
NOTE Confidence: 0.842575879166667
01:18:06.644 --> 01:18:08.660 for metastatic disease as well too.
NOTE Confidence: 0.842575879166667
01:18:08.660 --> 01:18:09.718 So actually,
NOTE Confidence: 0.842575879166667
01:18:09.718 --> 01:18:13.421 the last patient I presented was being
NOTE Confidence: 0.842575879166667
01:18:13.421 --> 01:18:16.536 followed for awhile because the the
NOTE Confidence: 0.842575879166667
01:18:16.536 --> 01:18:19.605 tumors were were visible and I had
NOTE Confidence: 0.842575879166667
01:18:19.605 --> 01:18:22.090 given a talk on liver metastasis about.
NOTE Confidence: 0.842575879166667
01:18:22.090 --> 01:18:24.136 You know around that time and

134
then the individual who. Caring for that patient was didn’t realize that surgical options and options for that patient, so I think if a patient is known to have a neuroendocrine tumor and perhaps present was the liver metastases, I think it’s worth it for that patient to be seen by GI medical oncologist or surgical oncologist. Because I do think that we can provide a good progression free survival benefit for most patients in that kind of a scenario. If with a good multidisciplinary approach.
Great thank you and doctor Brian.

Maybe I’ll ask you one one more and sort of.

I’d say a really exciting direction and something you and I are partnering on is really thinking about a theranostics program.

Can you speak to how you think the field is changing and how we are likely to see the development of theranostics programs?

Sort of in multiple locations, but maybe the value of that.

What that means and and sort of how nuclear medicine docs are going to be. Providing direct patient care.

Oh, thank you. Yes, this is a very exciting field and
I just came back from Society of Nuclear Medicine and Molecular Imaging Therapeutics conference where we met for several days and talked about how different sites across USA are starting the theranostics centers and their layout plans and how they’re going to be treating the patients. We are now going back to senior patients. We’re now really practicing together with radiation oncology as well and with oncologists and surgeons and really practicing together.
we’re really practicing together as a team in terms of taking care of patients.

There’s sites where patient is being seen by their GI oncologist and followed up by a visit with nuclear medicine Doc to discuss PRRT and the specifics of radiation based therapy radionuclide. Therapy and that really helps patients in terms of understanding what they’re going to be undergoing and their side effects and the risks. The nuclear medicine physicians are following up on the patients and are involved in in the care.

So another thing that’s really helpful is that we’re starting to combine
chemotherapy with radionuclide therapy and trials and trying to see how we can improve the efficacy of these therapies. And the only way to do it is to work together. So it’s a really exciting team based approach that’s happening across the country and it’s really gonna change radiology and how we care for our patients. Not very exciting, I think. Lots of opportunities for asking for really excellent patient care and I think you know one thing we can speak to is really
the importance of multidisciplinary care for the care of these patients. I think the intent was to have three different disciplines represented on this panel tonight and I think we all certainly work together and caring for our patients with Nets. So I think what we can do is I don’t see other. I don’t know if Doctor Boyd or Doctor Khan you had any other burning questions for each other or anything that has come up. If not, I really want to thank the two of you. Certainly for your time and and excellent presentations,
I want to thank our audience for their time and listing tonight. This has been recorded so we will make this available to the Community and stay tuned for our future GCM E series in April and May. We will promote those and hope that some of you will listen again. So thank you and have a wonderful evening.