WEBVTT

NOTE duration: "01:26:37.940"

NOTE Confidence: 0.97662437

00:00:00.160 --> 00:00:01.199 Alright. Well, great. Thank you

NOTE Confidence: 0.97662437

00:00:01.199 --> 00:00:02.560 so much everybody for joining.

NOTE Confidence: 0.97662437

00:00:02.560 --> 00:00:03.919 We're really all excited to

NOTE Confidence: 0.97662437

00:00:03.919 --> 00:00:05.779 be here. So happy official

NOTE Confidence: 0.9555427

00:00:06.080 --> 00:00:07.520 NET Awareness Day. It is

NOTE Confidence: 0.9555427

00:00:07.520 --> 00:00:09.039 actually on November tenth, which

NOTE Confidence: 0.9555427

00:00:09.039 --> 00:00:10.320 is why we picked this

NOTE Confidence: 0.9555427

00:00:10.320 --> 00:00:10.820 evening.

NOTE Confidence: 0.9858612

00:00:11.280 --> 00:00:12.320 Our goals tonight are to

NOTE Confidence: 0.9858612

00:00:12.320 --> 00:00:14.080 highlight awareness and diagnosis and

NOTE Confidence: 0.9858612

00:00:14.080 --> 00:00:16.335 treatment for patients with neuroendocrine

NOTE Confidence: 0.9858612

00:00:16.395 --> 00:00:16.895 tumors.

NOTE Confidence: 0.99573857

00:00:17.515 --> 00:00:18.235 So I have an,

NOTE Confidence: 0.99866104

00:00:18.875 --> 00:00:20.655 wonderful panel of colleagues.

NOTE Confidence: 0.96596134

00:00:21.275 --> 00:00:22.635 So I, my name is

NOTE Confidence: 0.96596134

00:00:22.635 --> 00:00:24.555 Pam Coons. I'm a professor

NOTE Confidence: 0.96596134

00:00:24.555 --> 00:00:26.255 of medicine and medical oncology.

NOTE Confidence: 0.96596134

00:00:26.395 --> 00:00:27.755 I direct the center for

NOTE Confidence: 0.96596134

00:00:27.755 --> 00:00:29.675 GI cancers at Yale Cancer

NOTE Confidence: 0.96596134

00:00:29.675 --> 00:00:31.455 Center and Smilow Cancer Hospital,

NOTE Confidence: 0.96596134

00:00:31.650 --> 00:00:32.690 and I co lead the

NOTE Confidence: 0.96596134

00:00:32.690 --> 00:00:34.150 neuroendocrine tumor program.

NOTE Confidence: 0.93649894

00:00:34.530 --> 00:00:36.370 Doctor David Klimstra is a

NOTE Confidence: 0.93649894

00:00:36.370 --> 00:00:38.070 professor professor of pathology,

NOTE Confidence: 0.9983196

00:00:38.850 --> 00:00:39.809 and he will be speaking

NOTE Confidence: 0.9983196

00:00:39.809 --> 00:00:40.710 about understanding,

NOTE Confidence: 0.9994824

00:00:42.210 --> 00:00:42.950 your pathology.

NOTE Confidence: 0.9305835

00:00:43.570 --> 00:00:45.170 Doctor George Al Fakhri is

NOTE Confidence: 0.9305835

00:00:45.170 --> 00:00:46.784 a professor of radiology and

NOTE Confidence: 0.9305835

00:00:46.784 --> 00:00:48.705 biomedical engineering. He directs the

NOTE Confidence: 0.9305835

00:00:48.705 --> 00:00:49.665 pet center, and we'll talk

NOTE Confidence: 0.9305835

00:00:49.665 --> 00:00:51.045 about pet scans tonight.

NOTE Confidence: 0.9730797

00:00:51.425 --> 00:00:53.585 And doctor John Kuntzmann is

NOTE Confidence: 0.9730797

00:00:53.585 --> 00:00:55.265 an assistant professor of surgery

NOTE Confidence: 0.9730797

00:00:55.265 --> 00:00:56.785 and surgical oncology, and we'll

NOTE Confidence: 0.9730797

00:00:56.785 --> 00:00:58.465 talk about surgical approaches to

NOTE Confidence: 0.9730797

00:00:58.465 --> 00:00:59.425 NETs. And then we will

NOTE Confidence: 0.9730797

00:00:59.425 --> 00:01:01.040 finish up with a thirty

NOTE Confidence: 0.9730797

00:01:01.040 --> 00:01:02.260 minute q and a.

NOTE Confidence: 0.99656713

00:01:03.760 --> 00:01:04.260 Alright.

NOTE Confidence: 0.98644507

00:01:05.360 --> 00:01:07.360 So as of twenty twenty

NOTE Confidence: 0.98644507

00:01:07.360 --> 00:01:09.140 one, the state of Connecticut

NOTE Confidence: 0.9997578

00:01:09.680 --> 00:01:11.459 recognizes November tenth

NOTE Confidence: 0.9652041

00:01:12.000 --> 00:01:14.755 as NET Cancer Awareness Day.

NOTE Confidence: 0.99488324

00:01:15.215 --> 00:01:16.675 So thank you to governor

NOTE Confidence: 0.99385524

00:01:17.055 --> 00:01:19.055 Lamont and to a number

NOTE Confidence: 0.99385524

00:01:19.055 --> 00:01:19.535 of,

NOTE Confidence: 0.9936759

00:01:19.935 --> 00:01:20.435 NET

NOTE Confidence: 0.9987285

00:01:20.815 --> 00:01:21.875 advocacy organizations

NOTE Confidence: 0.9665408

00:01:22.175 --> 00:01:23.535 for really advocating for this,

NOTE Confidence: 0.9665408

00:01:23.535 --> 00:01:25.555 and so most states acknowledge

NOTE Confidence: 0.9665408

00:01:25.694 --> 00:01:26.435 this day.

NOTE Confidence: 0.9996234

00:01:27.649 --> 00:01:28.609 So I will talk a

NOTE Confidence: 0.9996234

00:01:28.609 --> 00:01:29.909 little bit about neuroendocrine

NOTE Confidence: 0.9991122

00:01:30.289 --> 00:01:30.789 neoplasms

NOTE Confidence: 0.9245282

00:01:31.250 --> 00:01:33.109 one zero one, and neoplasms

NOTE Confidence: 0.9245282

00:01:33.250 --> 00:01:33.750 encompasses

NOTE Confidence: 0.99175996

00:01:34.530 --> 00:01:36.929 neuroendocrine tumors and the higher

NOTE Confidence: 0.99175996

00:01:36.929 --> 00:01:38.609 grade neuroendocrine carcinomas, and I

NOTE Confidence: 0.99175996

00:01:38.609 --> 00:01:40.130 will talk briefly about some

NOTE Confidence: 0.99175996

00:01:40.130 --> 00:01:41.750 medical management tips.

NOTE Confidence: 0.9918812

00:01:43.795 --> 00:01:45.495 So I love just acknowledging

NOTE Confidence: 0.9918812

00:01:45.795 --> 00:01:47.795 some history here, and some

NOTE Confidence: 0.9918812

00:01:47.795 --> 00:01:48.855 of you may be familiar

NOTE Confidence: 0.9918812

00:01:48.915 --> 00:01:50.455 with the term carcinoid.

NOTE Confidence: 0.9869647

00:01:51.075 --> 00:01:52.195 It was coined by a

NOTE Confidence: 0.9869647

00:01:52.195 --> 00:01:54.435 German pathologist in the early

NOTE Confidence: 0.9869647

00:01:54.435 --> 00:01:55.335 nineteen hundreds

NOTE Confidence: 0.9956113

00:01:55.790 --> 00:01:56.610 to describe,

NOTE Confidence: 0.9846458

00:01:57.630 --> 00:01:59.310 neuroendocrine tumors, and it meant

NOTE Confidence: 0.9846458

00:01:59.310 --> 00:02:00.290 cancer like.

NOTE Confidence: 0.98179597

00:02:00.670 --> 00:02:02.830 Neuroendocrine neoplasms can actually start

NOTE Confidence: 0.98179597

00:02:02.830 --> 00:02:04.830 throughout the body. That's called

NOTE Confidence: 0.98179597

00:02:04.830 --> 00:02:06.350 the primary site where it

NOTE Confidence: 0.98179597

00:02:06.350 --> 00:02:06.850 starts.

NOTE Confidence: 0.99706143

00:02:07.310 --> 00:02:07.810 And

NOTE Confidence: 0.86230797

00:02:08.415 --> 00:02:10.195 neuroendocrine neoplasms are derived

NOTE Confidence: 0.9391074

00:02:10.735 --> 00:02:12.115 from neuroendocrine cells,

NOTE Confidence: 0.9983771

00:02:12.575 --> 00:02:13.695 in the gut and in

NOTE Confidence: 0.9983771

00:02:13.695 --> 00:02:16.275 other places. Most grow slower

NOTE Confidence: 0.9983771

00:02:16.415 --> 00:02:17.475 than their adenocarcinoma

NOTE Confidence: 0.9932261

00:02:18.014 --> 00:02:19.155 counterparts. Adenocarcinomas

NOTE Confidence: 0.99112755

00:02:19.535 --> 00:02:21.000 are often a more common

NOTE Confidence: 0.99112755

00:02:21.000 --> 00:02:22.680 cancer type. Think of run

NOTE Confidence: 0.99112755

00:02:22.680 --> 00:02:23.960 of the mill colon cancer,

NOTE Confidence: 0.99112755

00:02:23.960 --> 00:02:24.700 for example.

NOTE Confidence: 0.93662477

00:02:25.080 --> 00:02:26.940 And another really key characteristic

NOTE Confidence: 0.93662477

00:02:27.080 --> 00:02:28.680 that I suspect doctor Alfaquer

NOTE Confidence: 0.93662477

00:02:28.680 --> 00:02:29.639 will get into is that

NOTE Confidence: 0.93662477

00:02:29.639 --> 00:02:30.139 somatostatin

NOTE Confidence: 0.69604707

00:02:30.440 --> 00:02:30.940 receptors,

NOTE Confidence: 0.9212056

00:02:31.320 --> 00:02:32.380 or like a target,

NOTE Confidence: 0.9951569

00:02:32.680 --> 00:02:34.200 are usually present on the

NOTE Confidence: 0.9951569

00:02:34.200 --> 00:02:36.495 cell surface of neuroendocrine neoplasms.

NOTE Confidence: 0.99913883

00:02:38.415 --> 00:02:38.915 So

NOTE Confidence: 0.99180204

00:02:39.694 --> 00:02:41.614 NNs are really not that

NOTE Confidence: 0.99180204

00:02:41.614 --> 00:02:42.735 rare. They used to be

NOTE Confidence: 0.99180204

00:02:42.735 --> 00:02:43.715 considered rare.

NOTE Confidence: 0.99431

00:02:44.415 --> 00:02:46.034 They are low in incidence,

NOTE Confidence: 0.99431

00:02:46.174 --> 00:02:47.694 meaning the number diagnosed per

NOTE Confidence: 0.99431

00:02:47.694 --> 00:02:48.495 year, but you can see

NOTE Confidence: 0.99431

00:02:48.495 --> 00:02:50.674 we're nearing about ten per

NOTE Confidence: 0.99431

00:02:50.735 --> 00:02:52.210 hundred thousand persons

NOTE Confidence: 0.9724101

00:02:52.510 --> 00:02:53.550 in the US. That's the

NOTE Confidence: 0.9724101

00:02:53.550 --> 00:02:54.450 yellow line,

NOTE Confidence: 0.9839176

00:02:55.310 --> 00:02:57.550 compared to overall cancers, which

NOTE Confidence: 0.9839176

00:02:57.550 --> 00:02:58.510 is the blue line, which

NOTE Confidence: 0.9839176

00:02:58.510 --> 00:02:59.570 has really stabilized,

NOTE Confidence: 0.98693746

00:03:00.350 --> 00:03:01.630 over the last many years.

NOTE Confidence: 0.98693746

00:03:01.630 --> 00:03:03.470 But neuroendocrine neoplasms are increasing.

NOTE Confidence: 0.98693746

00:03:03.470 --> 00:03:04.750 We're getting better at diagnosing

NOTE Confidence: 0.98693746

00:03:04.750 --> 00:03:05.175 them.

NOTE Confidence: 0.9977763

00:03:05.895 --> 00:03:07.514 But there is probably a

NOTE Confidence: 0.90660447

00:03:07.815 --> 00:03:09.175 a truth to this line

NOTE Confidence: 0.90660447

00:03:09.175 --> 00:03:11.035 indicating that perhaps their environmental

NOTE Confidence: 0.9644706

00:03:11.575 --> 00:03:13.095 environmental reasons or other causes

NOTE Confidence: 0.9644706

00:03:13.095 --> 00:03:14.555 of this increased incidence.

NOTE Confidence: 0.78943795

00:03:16.215 --> 00:03:17.195 NENS are

NOTE Confidence: 0.98708594

00:03:17.760 --> 00:03:20.180 more prevalent than previously appreciated.

NOTE Confidence: 0.98708594

00:03:20.240 --> 00:03:21.680 Prevalence is the number of

NOTE Confidence: 0.98708594

00:03:21.680 --> 00:03:23.520 patients alive at any given

NOTE Confidence: 0.98708594

00:03:23.520 --> 00:03:24.020 time,

NOTE Confidence: 0.98605996

00:03:24.400 --> 00:03:26.260 and the prevalence of neuroendocrine

NOTE Confidence: 0.98605996

00:03:26.400 --> 00:03:26.900 neoplasms

NOTE Confidence: 0.9974729

00:03:27.440 --> 00:03:29.360 is about equal or slightly

NOTE Confidence: 0.9974729

00:03:29.360 --> 00:03:30.639 higher than that of stomach

NOTE Confidence: 0.9974729

00:03:30.639 --> 00:03:32.180 and pancreas cancer combined.

NOTE Confidence: 0.9784853

00:03:33.794 --> 00:03:35.495 There are several key characteristics.

NOTE Confidence: 0.9784853

00:03:35.635 --> 00:03:36.595 I'm not gonna go into

NOTE Confidence: 0.9784853

00:03:36.595 --> 00:03:37.795 details on all of these,

NOTE Confidence: 0.9784853

00:03:37.795 --> 00:03:39.394 but I talk to when

NOTE Confidence: 0.9784853

00:03:39.394 --> 00:03:40.675 I meet with patients, I

NOTE Confidence: 0.9784853

00:03:40.675 --> 00:03:41.655 talk about these

NOTE Confidence: 0.99769956

00:03:41.955 --> 00:03:43.795 categories or ways that we

NOTE Confidence: 0.99769956

00:03:43.795 --> 00:03:44.295 describe

NOTE Confidence: 0.92171896

00:03:44.595 --> 00:03:45.655 neuroendocrine tumors,

NOTE Confidence: 0.96660155

00:03:46.190 --> 00:03:47.150 whether or not they secrete

NOTE Confidence: 0.96660155

00:03:47.150 --> 00:03:48.590 a hormone that's called functional

NOTE Confidence: 0.96660155

00:03:48.590 --> 00:03:49.090 status,

NOTE Confidence: 0.97753155

00:03:49.390 --> 00:03:50.770 where the cancer starts,

NOTE Confidence: 0.9855424

00:03:51.150 --> 00:03:52.670 that's the primary site, what's

NOTE Confidence: 0.9855424

00:03:52.670 --> 00:03:54.510 the stage, that means where

NOTE Confidence: 0.9855424

00:03:54.510 --> 00:03:55.550 in your body is the

NOTE Confidence: 0.9855424

00:03:55.550 --> 00:03:56.050 cancer,

NOTE Confidence: 0.98859847

00:03:56.670 --> 00:03:58.445 the volume of disease, is

NOTE Confidence: 0.98859847

00:03:58.445 --> 00:03:59.805 it low volume or high

NOTE Confidence: 0.98859847

00:03:59.805 --> 00:04:00.305 volume,

NOTE Confidence: 0.999234

00:04:00.845 --> 00:04:01.805 whether or not you have

NOTE Confidence: 0.999234

00:04:01.805 --> 00:04:03.485 a somatostatin receptor on the

NOTE Confidence: 0.999234

00:04:03.485 --> 00:04:04.785 surface of the cell,

NOTE Confidence: 0.99870473

00:04:05.245 --> 00:04:06.625 the grade of the tumor,

NOTE Confidence: 0.9826524

00:04:07.085 --> 00:04:08.145 degree of differentiation.

NOTE Confidence: 0.9742081

00:04:08.925 --> 00:04:10.285 We're starting to look more

NOTE Confidence: 0.9742081

00:04:10.285 --> 00:04:11.265 and more at genetics,

NOTE Confidence: 0.98599285

00:04:11.565 --> 00:04:13.580 so genetics passed from parent

NOTE Confidence: 0.98599285

00:04:13.580 --> 00:04:15.280 to child and also genetics

NOTE Confidence: 0.98599285

00:04:15.340 --> 00:04:16.560 of the tumor itself.

NOTE Confidence: 0.9895467

00:04:17.419 --> 00:04:18.779 We know that sex and

NOTE Confidence: 0.9895467

00:04:18.779 --> 00:04:20.860 racial differences can occur. And

NOTE Confidence: 0.9895467

00:04:20.860 --> 00:04:22.380 then our environment in which

NOTE Confidence: 0.9895467

00:04:22.380 --> 00:04:23.980 we live can also impact

NOTE Confidence: 0.9895467

00:04:23.980 --> 00:04:25.745 both our diagnosis, but also

NOTE Confidence: 0.9895467

00:04:25.745 --> 00:04:26.544 the type of care we

NOTE Confidence: 0.9895467

00:04:26.544 --> 00:04:27.665 give. Those are called social

NOTE Confidence: 0.9895467

00:04:27.665 --> 00:04:28.885 determinants of health.

NOTE Confidence: 0.9642731

00:04:31.345 --> 00:04:32.544 So the primary side I

NOTE Confidence: 0.9642731

00:04:32.544 --> 00:04:34.145 mentioned already is where the

NOTE Confidence: 0.9642731

00:04:34.145 --> 00:04:35.904 cancer starts. The small intestine

NOTE Confidence: 0.9642731

00:04:35.904 --> 00:04:37.025 is by far the most

NOTE Confidence: 0.9642731

00:04:37.025 --> 00:04:37.525 common,

NOTE Confidence: 0.94307923

00:04:37.960 --> 00:04:39.319 followed by the lung and

NOTE Confidence: 0.94307923

00:04:39.319 --> 00:04:40.759 then the pancreas and then

NOTE Confidence: 0.94307923

00:04:40.759 --> 00:04:41.259 other.

NOTE Confidence: 0.9972982

00:04:41.720 --> 00:04:43.180 And if a cancer spreads,

NOTE Confidence: 0.9972982

00:04:43.400 --> 00:04:45.479 it retains the properties of

NOTE Confidence: 0.9972982

00:04:45.479 --> 00:04:46.699 that primary site.

NOTE Confidence: 0.97933906

00:04:47.000 --> 00:04:47.960 So, for example, if a

NOTE Confidence: 0.97933906

00:04:47.960 --> 00:04:49.879 neuroendocrine tumor spreads to the

NOTE Confidence: 0.97933906

00:04:49.879 --> 00:04:51.720 liver, it doesn't become liver

NOTE Confidence: 0.97933906

00:04:51.720 --> 00:04:53.055 cancer. It is still, for

NOTE Confidence: 0.97933906

00:04:53.055 --> 00:04:55.714 example, a pancreatic neuroendocrine tumor

NOTE Confidence: 0.97933906

00:04:55.775 --> 00:04:56.995 that spread to the liver.

NOTE Confidence: 0.98413396

00:04:57.535 --> 00:04:58.735 We used to be lumpers,

NOTE Confidence: 0.98413396

00:04:58.735 --> 00:04:59.775 but we are really now

NOTE Confidence: 0.98413396

00:04:59.775 --> 00:05:00.835 splitters, meaning

NOTE Confidence: 0.9352668

00:05:01.295 --> 00:05:03.615 that NENS of different primary

NOTE Confidence: 0.9352668

00:05:03.615 --> 00:05:05.875 sites really have different incidence

NOTE Confidence: 0.9352668

00:05:05.935 --> 00:05:07.430 rates, different biology,

NOTE Confidence: 0.99702775

00:05:08.050 --> 00:05:09.650 they respond differently to treatment,

NOTE Confidence: 0.99702775

00:05:09.650 --> 00:05:11.410 and they're often now studied

NOTE Confidence: 0.99702775

00:05:11.410 --> 00:05:12.390 in different trials.

NOTE Confidence: 0.99798393

00:05:14.930 --> 00:05:16.130 So this is a very

NOTE Confidence: 0.99798393

00:05:16.130 --> 00:05:17.730 detailed example of something that

NOTE Confidence: 0.99798393

00:05:17.730 --> 00:05:19.270 we call the AJCC

NOTE Confidence: 0.9264827

00:05:19.890 --> 00:05:21.410 or American Joint Committee on

NOTE Confidence: 0.9264827

00:05:21.410 --> 00:05:22.545 Cancer staging.

NOTE Confidence: 0.9969617

00:05:23.165 --> 00:05:25.025 And staging helps us determine,

NOTE Confidence: 0.98839206

00:05:25.964 --> 00:05:27.185 in three different categories,

NOTE Confidence: 0.9961392

00:05:27.485 --> 00:05:27.985 tumor,

NOTE Confidence: 0.971556

00:05:28.365 --> 00:05:29.665 lymph node, and metastasis,

NOTE Confidence: 0.991945

00:05:30.605 --> 00:05:32.365 how the cancer is involved

NOTE Confidence: 0.991945

00:05:32.365 --> 00:05:33.425 in each of these,

NOTE Confidence: 0.9955473

00:05:33.885 --> 00:05:34.385 categories.

NOTE Confidence: 0.98851526

00:05:34.925 --> 00:05:35.805 And I'm not gonna go

NOTE Confidence: 0.98851526

00:05:35.805 --> 00:05:36.845 into the details, but I

NOTE Confidence: 0.98851526

00:05:36.845 --> 00:05:37.825 wanted to just

NOTE Confidence: 0.96420926

00:05:38.389 --> 00:05:39.509 teach you that that's how

NOTE Confidence: 0.96420926

00:05:39.509 --> 00:05:40.870 we as physicians really think

NOTE Confidence: 0.96420926

00:05:40.870 --> 00:05:41.990 about this. So t refers

NOTE Confidence: 0.96420926

00:05:41.990 --> 00:05:43.349 to the primary tumor. It

NOTE Confidence: 0.96420926

00:05:43.349 --> 00:05:44.970 involves depth of invasion,

NOTE Confidence: 0.96827364

00:05:45.430 --> 00:05:46.810 the size of the tumor,

NOTE Confidence: 0.93133926

00:05:47.430 --> 00:05:49.349 n refers to regional lymph

NOTE Confidence: 0.93133926

00:05:49.349 --> 00:05:50.870 nodes, whether they're present or

NOTE Confidence: 0.93133926

00:05:50.870 --> 00:05:52.169 absent and sometimes

NOTE Confidence: 0.9906582

00:05:52.504 --> 00:05:54.025 is defined by the number

NOTE Confidence: 0.9906582

00:05:54.025 --> 00:05:55.004 of lymph nodes.

NOTE Confidence: 0.9862539

00:05:55.464 --> 00:05:57.224 And then m refers to

NOTE Confidence: 0.9862539

00:05:57.224 --> 00:05:57.724 distant

NOTE Confidence: 0.8479219

00:05:58.025 --> 00:05:58.525 metastasis,

NOTE Confidence: 0.9782642

00:05:59.384 --> 00:06:00.745 again, whether it's present or

NOTE Confidence: 0.9782642

00:06:00.745 --> 00:06:02.025 absent, and there are some

NOTE Confidence: 0.9782642

00:06:02.025 --> 00:06:02.525 nuances.

NOTE Confidence: 0.8717662

00:06:02.985 --> 00:06:04.044 And then we combine

NOTE Confidence: 0.95955557

00:06:04.880 --> 00:06:06.160 that those t, n, and

NOTE Confidence: 0.95955557

00:06:06.160 --> 00:06:07.279 m to come up with

NOTE Confidence: 0.95955557

00:06:07.279 --> 00:06:09.760 an overall stage, which you

NOTE Confidence: 0.95955557

00:06:09.760 --> 00:06:10.880 can see kind of in

NOTE Confidence: 0.95955557

00:06:10.880 --> 00:06:12.720 this top right Cornell table

NOTE Confidence: 0.95955557

00:06:12.720 --> 00:06:13.220 two,

NOTE Confidence: 0.99933267

00:06:13.760 --> 00:06:14.880 allows us to come up

NOTE Confidence: 0.99933267

00:06:14.880 --> 00:06:16.260 with that combined stage.

NOTE Confidence: 0.9717574

00:06:18.375 --> 00:06:19.654 I'm gonna really let doctor

NOTE Confidence: 0.9717574

00:06:19.654 --> 00:06:21.275 Klimster go into the details

NOTE Confidence: 0.9717574

00:06:21.335 --> 00:06:23.034 of understanding your pathology,

NOTE Confidence: 0.9969969

00:06:23.495 --> 00:06:24.694 but suffice it to say

NOTE Confidence: 0.9969969

00:06:24.694 --> 00:06:26.315 that this has really evolved

NOTE Confidence: 0.9969969

00:06:26.455 --> 00:06:27.815 over the last thirty or

NOTE Confidence: 0.9969969

00:06:27.815 --> 00:06:29.835 forty years. We think about

NOTE Confidence: 0.9974822

00:06:30.790 --> 00:06:31.290 differentiation,

NOTE Confidence: 0.9925565

00:06:31.750 --> 00:06:32.630 which is really what the

NOTE Confidence: 0.9925565

00:06:32.630 --> 00:06:33.750 cells look like under the

NOTE Confidence: 0.9925565

00:06:33.750 --> 00:06:34.250 microscope,

NOTE Confidence: 0.97453976

00:06:34.870 --> 00:06:36.070 grade, which is how rapid

NOTE Confidence: 0.97453976

00:06:36.070 --> 00:06:37.190 they are they are dividing.

NOTE Confidence: 0.97453976

00:06:37.190 --> 00:06:37.990 And there are a number

NOTE Confidence: 0.97453976

00:06:37.990 --> 00:06:39.850 of features that help pathologists

NOTE Confidence: 0.9240774

00:06:40.790 --> 00:06:42.310 determine this, and then that

NOTE Confidence: 0.9240774

00:06:42.310 --> 00:06:43.050 in turn

NOTE Confidence: 0.97903085

00:06:43.555 --> 00:06:44.375 helps oncologists,

NOTE Confidence: 0.9431355

00:06:45.154 --> 00:06:46.995 both medical oncologists like myself

NOTE Confidence: 0.9431355

00:06:46.995 --> 00:06:48.214 and surgical oncologists,

NOTE Confidence: 0.9992336

00:06:48.835 --> 00:06:50.914 tailor the treatment based on

NOTE Confidence: 0.9992336

00:06:50.914 --> 00:06:52.375 a number of these characteristics.

NOTE Confidence: 0.9829797

00:06:53.074 --> 00:06:54.115 A key takeaway, and I

NOTE Confidence: 0.9829797

00:06:54.115 --> 00:06:55.875 would imagine that doctor Klimster

NOTE Confidence: 0.9829797

00:06:55.875 --> 00:06:56.935 will touch on this,

NOTE Confidence: 0.9975812

00:06:57.839 --> 00:07:00.100 an expert pathology review is

NOTE Confidence: 0.9975812

00:07:00.160 --> 00:07:01.520 just as important as getting

NOTE Confidence: 0.9975812

00:07:01.520 --> 00:07:03.060 an expert medical oncologist

NOTE Confidence: 0.9548355

00:07:03.360 --> 00:07:04.180 or expert,

NOTE Confidence: 0.9670958

00:07:05.200 --> 00:07:07.300 surgical oncologist or even radiologist.

NOTE Confidence: 0.9670958

00:07:07.520 --> 00:07:08.800 So really having people who

NOTE Confidence: 0.9670958

00:07:08.800 --> 00:07:10.640 are familiar with these cancers

NOTE Confidence: 0.9670958

00:07:10.640 --> 00:07:11.300 is critical.

NOTE Confidence: 0.9903986

00:07:12.785 --> 00:07:14.545 Understanding your pet. So we

NOTE Confidence: 0.9903986

00:07:14.545 --> 00:07:15.845 talked a little bit about

NOTE Confidence: 0.9895735

00:07:16.465 --> 00:07:17.765 stage and determining

NOTE Confidence: 0.98216873

00:07:18.145 --> 00:07:20.545 extent of disease. So DOTA

NOTE Confidence: 0.98216873

00:07:20.545 --> 00:07:22.065 PET scans are really one

NOTE Confidence: 0.98216873

00:07:22.065 --> 00:07:23.585 of our best tools to

NOTE Confidence: 0.98216873

00:07:23.585 --> 00:07:25.825 help determine extent and volume

NOTE Confidence: 0.98216873

00:07:25.825 --> 00:07:26.485 of disease.

NOTE Confidence: 0.95132905

00:07:27.420 --> 00:07:28.620 Again, I know doctor El

NOTE Confidence: 0.95132905

00:07:28.620 --> 00:07:29.740 Fakher will go over this,

NOTE Confidence: 0.95132905

00:07:29.740 --> 00:07:30.460 but just to give you

NOTE Confidence: 0.95132905

00:07:30.460 --> 00:07:31.180 a little bit of a

NOTE Confidence: 0.95132905

00:07:31.180 --> 00:07:33.040 teaser, you can see really

NOTE Confidence: 0.95132905

00:07:33.100 --> 00:07:33.840 big differences,

NOTE Confidence: 0.9482658

00:07:34.860 --> 00:07:36.620 in these three different DODA

NOTE Confidence: 0.9482658

00:07:36.620 --> 00:07:38.460 PET scans. This first one

NOTE Confidence: 0.9482658

00:07:38.460 --> 00:07:39.360 is localized.

NOTE Confidence: 0.9974478

00:07:40.385 --> 00:07:42.165 The middle one is metastatic

NOTE Confidence: 0.9974478

00:07:42.465 --> 00:07:42.965 with

NOTE Confidence: 0.9181716

00:07:43.265 --> 00:07:45.745 high volume large liver lesions.

NOTE Confidence: 0.9181716

00:07:45.745 --> 00:07:46.805 It's liver predominant.

NOTE Confidence: 0.9774134

00:07:47.425 --> 00:07:48.465 And then on the far

NOTE Confidence: 0.9774134

00:07:48.465 --> 00:07:50.245 right, the patient has metastatic

NOTE Confidence: 0.9774134

00:07:50.465 --> 00:07:51.905 disease, but it is lower

NOTE Confidence: 0.9774134

00:07:51.905 --> 00:07:52.405 volume,

NOTE Confidence: 0.9926768

00:07:52.785 --> 00:07:54.405 but lots of little scattered

NOTE Confidence: 0.9926768

00:07:54.545 --> 00:07:55.365 bone metastases.

NOTE Confidence: 0.9246956

00:07:56.320 --> 00:07:56.980 So pets

NOTE Confidence: 0.9932005

00:07:57.520 --> 00:07:59.600 give us incredible resolution and

NOTE Confidence: 0.9932005

00:07:59.600 --> 00:08:01.120 really, again, help us tailor

NOTE Confidence: 0.9932005

00:08:01.120 --> 00:08:01.620 treatments.

NOTE Confidence: 0.92299724

00:08:03.200 --> 00:08:04.720 Doctor Kunstman will touch on

NOTE Confidence: 0.92299724

00:08:04.720 --> 00:08:05.220 surgery.

NOTE Confidence: 0.9904951

00:08:05.840 --> 00:08:07.380 Really, one of our first

NOTE Confidence: 0.9904951

00:08:07.440 --> 00:08:09.755 steps in tailoring a treatment

NOTE Confidence: 0.9904951

00:08:09.755 --> 00:08:11.035 for a patient is asking

NOTE Confidence: 0.9904951

00:08:11.035 --> 00:08:13.135 this question, is surgery feasible?

NOTE Confidence: 0.97521484

00:08:13.755 --> 00:08:14.794 The answer is yes for

NOTE Confidence: 0.97521484

00:08:14.794 --> 00:08:17.215 several situations. If it's localized,

NOTE Confidence: 0.96775126

00:08:17.835 --> 00:08:19.695 we can often offer curative

NOTE Confidence: 0.96775126

00:08:19.755 --> 00:08:21.275 intense surgery to remove the

NOTE Confidence: 0.96775126

00:08:21.275 --> 00:08:23.375 primary tumor. If it's metastatic

NOTE Confidence: 0.96775126

00:08:23.675 --> 00:08:25.370 and patients have symptoms from

NOTE Confidence: 0.96775126

00:08:25.370 --> 00:08:26.650 their primary tumor like a

NOTE Confidence: 0.96775126

00:08:26.650 --> 00:08:27.150 blockage,

NOTE Confidence: 0.98907536

00:08:27.610 --> 00:08:29.050 we sometimes will still remove

NOTE Confidence: 0.98907536

00:08:29.050 --> 00:08:30.190 that primary tumor.

NOTE Confidence: 0.9833975

00:08:30.650 --> 00:08:31.550 And if metastatic

NOTE Confidence: 0.96183485

00:08:32.010 --> 00:08:33.210 with low grade or low

NOTE Confidence: 0.96183485

00:08:33.210 --> 00:08:35.210 tumor burden, we sometimes even

NOTE Confidence: 0.96183485

00:08:35.210 --> 00:08:35.950 can offer

NOTE Confidence: 0.9769341

00:08:36.650 --> 00:08:37.929 surgical removal of some of

NOTE Confidence: 0.9769341

00:08:37.929 --> 00:08:39.605 those metastatic sites, which we

NOTE Confidence: 0.9769341

00:08:39.605 --> 00:08:40.345 call a cytoreductive

NOTE Confidence: 0.97228277

00:08:40.884 --> 00:08:41.384 surgery.

NOTE Confidence: 0.9690675

00:08:43.204 --> 00:08:44.725 If the answer to is

NOTE Confidence: 0.9690675

00:08:44.725 --> 00:08:46.804 surgery feasible and no, that

NOTE Confidence: 0.9690675

00:08:46.804 --> 00:08:48.565 often will happen for patients

NOTE Confidence: 0.9690675

00:08:48.565 --> 00:08:50.024 who have high tumor burden

NOTE Confidence: 0.9690675

00:08:50.324 --> 00:08:51.785 or if it's high grade

NOTE Confidence: 0.98971367

00:08:52.370 --> 00:08:53.490 or just if a patient

NOTE Confidence: 0.98971367

00:08:53.490 --> 00:08:54.690 is not a good surgical

NOTE Confidence: 0.98971367

00:08:54.690 --> 00:08:55.890 candidate, and then we will

NOTE Confidence: 0.98971367

00:08:55.890 --> 00:08:57.670 think about doing systemic treatments.

NOTE Confidence: 0.99256575

00:08:59.250 --> 00:09:01.809 So systemic treatments fall into

NOTE Confidence: 0.99256575

00:09:01.809 --> 00:09:03.570 kind of the the, realm

NOTE Confidence: 0.99256575

00:09:03.570 --> 00:09:04.950 of a medical oncologist,

NOTE Confidence: 0.986171

00:09:05.745 --> 00:09:07.745 and they fall into five

NOTE Confidence: 0.986171

00:09:07.745 --> 00:09:09.125 main treatment categories.

NOTE Confidence: 0.7737967

00:09:09.665 --> 00:09:10.965 Somatocyan analogs,

NOTE Confidence: 0.99603444

00:09:11.425 --> 00:09:12.385 many of you have heard

NOTE Confidence: 0.99603444

00:09:12.385 --> 00:09:14.405 of these monthly hormone injections.

NOTE Confidence: 0.99603444

00:09:14.465 --> 00:09:15.285 They're not

NOTE Confidence: 0.9905824

00:09:15.745 --> 00:09:16.705 they don't have anything to

NOTE Confidence: 0.9905824

00:09:16.705 --> 00:09:17.665 do with male or female

NOTE Confidence: 0.9905824

00:09:17.665 --> 00:09:19.045 hormones, but involve

NOTE Confidence: 0.9561373

00:09:19.649 --> 00:09:21.990 hormones that are related to

NOTE Confidence: 0.9561373

00:09:22.050 --> 00:09:23.509 net tumor growth.

NOTE Confidence: 0.9812373

00:09:24.050 --> 00:09:26.149 So octreotide and lanreotide

NOTE Confidence: 0.9987233

00:09:26.610 --> 00:09:27.429 are two examples.

NOTE Confidence: 0.93807614

00:09:28.690 --> 00:09:30.610 There are targeted therapies such

NOTE Confidence: 0.93807614

00:09:30.610 --> 00:09:31.350 as everolimus

NOTE Confidence: 0.9605006

00:09:31.730 --> 00:09:32.709 and sunitinib,

NOTE Confidence: 0.9792967

00:09:33.304 --> 00:09:34.425 and we actually have a

NOTE Confidence: 0.9792967

00:09:34.425 --> 00:09:35.964 a new one called cabozantinib

NOTE Confidence: 0.9902366

00:09:36.584 --> 00:09:38.125 that was just FDA approved.

NOTE Confidence: 0.99523365

00:09:38.745 --> 00:09:40.505 These target very specific tumor

NOTE Confidence: 0.99523365

00:09:40.505 --> 00:09:42.524 growth pathways for neuroendocrine neoplasms.

NOTE Confidence: 0.982148

00:09:43.144 --> 00:09:44.605 There's true chemotherapy,

NOTE Confidence: 0.99963427

00:09:46.200 --> 00:09:47.320 and there's a range of

NOTE Confidence: 0.99963427

00:09:47.320 --> 00:09:48.940 different chemotherapy options.

NOTE Confidence: 0.9990692

00:09:49.399 --> 00:09:50.700 There is immunotherapy

NOTE Confidence: 0.93166083

00:09:51.320 --> 00:09:53.080 generally only reserved for patients

NOTE Confidence: 0.93166083

00:09:53.080 --> 00:09:55.580 with higher grade poorly differentiated

NOTE Confidence: 0.93166083

00:09:55.640 --> 00:09:56.140 neuroendocrine

NOTE Confidence: 0.85712034

00:09:56.839 --> 00:09:57.339 carcinomas.

NOTE Confidence: 0.9964164

00:09:58.040 --> 00:09:59.160 And I'm happy to answer

NOTE Confidence: 0.9964164

00:09:59.160 --> 00:10:00.279 some questions on that in

NOTE Confidence: 0.9964164

00:10:00.279 --> 00:10:01.605 the q and a. And

NOTE Confidence: 0.9964164

00:10:01.605 --> 00:10:02.405 then one of our,

NOTE Confidence: 0.95745796

00:10:02.965 --> 00:10:04.645 newest, maybe not even that

NOTE Confidence: 0.95745796

00:10:04.645 --> 00:10:06.405 new, FDA approved in twenty

NOTE Confidence: 0.95745796

00:10:06.405 --> 00:10:08.665 eighteen, but newer category,

NOTE Confidence: 0.9810678

00:10:09.285 --> 00:10:10.565 of treatments is something called

NOTE Confidence: 0.9810678

00:10:10.565 --> 00:10:12.804 radioligand therapy. And this is

NOTE Confidence: 0.9810678

00:10:12.885 --> 00:10:14.825 really takes advantage of knowing

NOTE Confidence: 0.9810678

00:10:14.885 --> 00:10:16.105 that we have that somatostatin

NOTE Confidence: 0.9810678

00:10:16.325 --> 00:10:17.550 receptor on the cell surface

NOTE Confidence: 0.9810678

00:10:17.550 --> 00:10:19.230 from the pet, and we

NOTE Confidence: 0.9810678

00:10:19.230 --> 00:10:20.530 target a therapy

NOTE Confidence: 0.9988677

00:10:21.070 --> 00:10:21.890 to that,

NOTE Confidence: 0.85098517

00:10:22.590 --> 00:10:24.290 that receptor or that target,

NOTE Confidence: 0.98174393

00:10:24.750 --> 00:10:26.050 that is a radioisotope,

NOTE Confidence: 0.965312

00:10:26.510 --> 00:10:27.950 in this case, lutetium one

NOTE Confidence: 0.965312

00:10:27.950 --> 00:10:29.330 seventy seven, but we have

NOTE Confidence: 0.965312

00:10:29.545 --> 00:10:31.545 several clinical trials looking at,

NOTE Confidence: 0.965312

00:10:31.865 --> 00:10:32.765 a new radioisotopes.

NOTE Confidence: 0.85871714

00:10:34.985 --> 00:10:36.665 So systemic treatments, just as

NOTE Confidence: 0.85871714

00:10:36.665 --> 00:10:38.105 I was saying earlier, we

NOTE Confidence: 0.85871714

00:10:38.105 --> 00:10:38.605 are

NOTE Confidence: 0.94756734

00:10:38.905 --> 00:10:40.765 splitters now and think about

NOTE Confidence: 0.94756734

00:10:40.825 --> 00:10:43.100 pancreatic nets differently than small

NOTE Confidence: 0.94756734

00:10:43.100 --> 00:10:44.559 bowel nets. So our systemic

NOTE Confidence: 0.94756734

00:10:44.700 --> 00:10:45.920 treatments differ

NOTE Confidence: 0.98615867

00:10:46.460 --> 00:10:48.300 by primary site. So it's

NOTE Confidence: 0.98615867

00:10:48.300 --> 00:10:49.740 important for us to try

NOTE Confidence: 0.98615867

00:10:49.740 --> 00:10:50.940 our best to figure out

NOTE Confidence: 0.98615867

00:10:50.940 --> 00:10:53.200 where your tumor originates.

NOTE Confidence: 0.99895906

00:10:53.980 --> 00:10:55.360 There are still some situations

NOTE Confidence: 0.98302686

00:10:55.955 --> 00:10:57.875 that arise where we can't

NOTE Confidence: 0.98302686

00:10:57.875 --> 00:10:58.995 figure that out, and there

NOTE Confidence: 0.98302686

00:10:58.995 --> 00:11:00.195 are some treatments that actually

NOTE Confidence: 0.98302686

00:11:00.195 --> 00:11:01.554 can apply to several different

NOTE Confidence: 0.98302686

00:11:01.554 --> 00:11:02.535 primary sites.

NOTE Confidence: 0.9156903

00:11:02.995 --> 00:11:04.995 But often for starters, for

NOTE Confidence: 0.9156903

00:11:04.995 --> 00:11:06.775 a lower grade neuroendocrine neoplasm,

NOTE Confidence: 0.9156903

00:11:06.835 --> 00:11:07.975 we will use

NOTE Confidence: 0.98926073

00:11:08.434 --> 00:11:09.735 observation if it's

NOTE Confidence: 0.98669523

00:11:10.230 --> 00:11:11.750 slow growing and patients are

NOTE Confidence: 0.98669523

00:11:11.750 --> 00:11:12.250 asymptomatic

NOTE Confidence: 0.90675753

00:11:12.630 --> 00:11:14.570 or consider octreotide or lamreotide.

NOTE Confidence: 0.9831479

00:11:15.110 --> 00:11:16.790 For pancreatic NETs, we have

NOTE Confidence: 0.9831479

00:11:16.790 --> 00:11:18.550 several options, including some of

NOTE Confidence: 0.9831479

00:11:18.550 --> 00:11:19.690 those ones I mentioned.

NOTE Confidence: 0.9728672

00:11:20.230 --> 00:11:21.589 For small bowel NET, there

NOTE Confidence: 0.9728672

00:11:21.589 --> 00:11:22.950 are actually fewer options. And

NOTE Confidence: 0.9728672

00:11:22.950 --> 00:11:24.790 for pancreatic NETs, chemotherapy does

NOTE Confidence: 0.9728672

00:11:24.790 --> 00:11:26.205 not work as well for

NOTE Confidence: 0.9728672

00:11:26.205 --> 00:11:27.745 small bowel neuroendocrine tumors.

NOTE Confidence: 0.9849072

00:11:28.445 --> 00:11:29.565 And I wanna just highlight

NOTE Confidence: 0.9849072

00:11:29.565 --> 00:11:31.565 that the NCCN or the

NOTE Confidence: 0.9849072

00:11:31.565 --> 00:11:34.205 National Comprehensive Cancer Network puts

NOTE Confidence: 0.9849072

00:11:34.205 --> 00:11:35.805 out guidelines for physicians, but

NOTE Confidence: 0.9849072

00:11:35.805 --> 00:11:37.425 there's also a patient

NOTE Confidence: 0.97692925

00:11:37.885 --> 00:11:39.565 portal that is very helpful

NOTE Confidence: 0.97692925

00:11:39.565 --> 00:11:41.720 and and describes these algorithms

NOTE Confidence: 0.97692925

00:11:41.860 --> 00:11:43.059 that we rely on as

NOTE Confidence: 0.97692925

00:11:43.059 --> 00:11:43.559 doctors,

NOTE Confidence: 0.98330426

00:11:44.179 --> 00:11:45.540 and puts them into lay

NOTE Confidence: 0.98330426

00:11:45.540 --> 00:11:46.040 terms.

NOTE Confidence: 0.93063605

00:11:47.140 --> 00:11:48.340 They are specific for each

NOTE Confidence: 0.93063605

00:11:48.340 --> 00:11:49.240 primary site.

NOTE Confidence: 0.99661946

00:11:50.820 --> 00:11:52.660 Really critical to thinking about

NOTE Confidence: 0.99661946

00:11:52.660 --> 00:11:54.580 systemic treatments and really moving

NOTE Confidence: 0.99661946

00:11:54.580 --> 00:11:55.559 the needle forward

NOTE Confidence: 0.9884846

00:11:55.995 --> 00:11:57.615 is thinking about clinical trials.

NOTE Confidence: 0.9884846

00:11:57.755 --> 00:11:59.535 We have several clinical trials

NOTE Confidence: 0.9884846

00:11:59.755 --> 00:12:01.855 for neuroendocrine tumors and neuroendocrine

NOTE Confidence: 0.9884846

00:12:01.915 --> 00:12:02.415 carcinomas.

NOTE Confidence: 0.94770396

00:12:03.035 --> 00:12:04.315 At Yale at present, I

NOTE Confidence: 0.94770396

00:12:04.315 --> 00:12:05.695 wanna just mention a few.

NOTE Confidence: 0.94770396

00:12:05.755 --> 00:12:07.035 So this first one in

NOTE Confidence: 0.94770396

00:12:07.035 --> 00:12:08.475 the table is for patients

NOTE Confidence: 0.94770396

00:12:08.475 --> 00:12:10.315 who've had a pancreatic net

NOTE Confidence: 0.94770396

00:12:10.315 --> 00:12:10.815 removed.

NOTE Confidence: 0.9952417

00:12:11.350 --> 00:12:12.809 And we're asking the question,

NOTE Confidence: 0.9952417

00:12:13.030 --> 00:12:15.050 does four months of capecitabine

NOTE Confidence: 0.9952417

00:12:15.350 --> 00:12:15.850 temozolomide

NOTE Confidence: 0.996335

00:12:16.230 --> 00:12:16.730 chemotherapy

NOTE Confidence: 0.9937765

00:12:17.110 --> 00:12:18.390 help reduce that risk of

NOTE Confidence: 0.9937765

00:12:18.390 --> 00:12:18.890 recurrence?

NOTE Confidence: 0.99519175

00:12:20.390 --> 00:12:21.770 This second row,

NOTE Confidence: 0.97793573

00:12:22.230 --> 00:12:23.750 is a new trial looking

NOTE Confidence: 0.97793573

00:12:23.750 --> 00:12:26.005 at lutetium dotatate. That's the

NOTE Confidence: 0.97793573

00:12:26.005 --> 00:12:26.505 radioligand

NOTE Confidence: 0.9891377

00:12:26.885 --> 00:12:28.644 therapy kind of earlier in

NOTE Confidence: 0.9891377

00:12:28.644 --> 00:12:29.764 the disease course. So this

NOTE Confidence: 0.9891377

00:12:29.764 --> 00:12:31.225 is a first line treatment

NOTE Confidence: 0.9891377

00:12:31.524 --> 00:12:33.125 for patients with grade one

NOTE Confidence: 0.9891377

00:12:33.125 --> 00:12:34.105 and grade two

NOTE Confidence: 0.91692495

00:12:34.804 --> 00:12:36.345 GI neuroendocrine tumors.

NOTE Confidence: 0.99481237

00:12:37.285 --> 00:12:38.245 We also have a new

NOTE Confidence: 0.99481237

00:12:38.245 --> 00:12:39.620 trial that's just opened looking

NOTE Confidence: 0.99481237

00:12:39.620 --> 00:12:41.460 at symptom control. I mentioned

NOTE Confidence: 0.99481237

00:12:41.460 --> 00:12:41.960 that,

NOTE Confidence: 0.95577663

00:12:42.580 --> 00:12:44.020 some patients with NETs, about

NOTE Confidence: 0.95577663

00:12:44.020 --> 00:12:45.380 thirty to forty percent, may

NOTE Confidence: 0.95577663

00:12:45.380 --> 00:12:46.360 secrete hormones,

NOTE Confidence: 0.99699306

00:12:46.820 --> 00:12:48.100 and there is a new

NOTE Confidence: 0.99699306

00:12:48.100 --> 00:12:49.559 oral form of octreotide

NOTE Confidence: 0.9163946

00:12:50.340 --> 00:12:51.240 called paltucitine,

NOTE Confidence: 0.99875283

00:12:51.620 --> 00:12:52.740 and we are looking at

NOTE Confidence: 0.99875283

00:12:52.740 --> 00:12:54.280 that for carcinoid syndrome.

NOTE Confidence: 0.99635726

00:12:55.955 --> 00:12:57.735 And then for neuroendocrine carcinoma,

NOTE Confidence: 0.99635726

00:12:57.875 --> 00:12:59.335 we have two trials.

NOTE Confidence: 0.9994798

00:13:00.115 --> 00:13:01.315 One is looking at the

NOTE Confidence: 0.9994798

00:13:01.315 --> 00:13:01.815 combination

NOTE Confidence: 0.9985932

00:13:02.275 --> 00:13:03.095 of chemotherapy

NOTE Confidence: 0.95360446

00:13:03.554 --> 00:13:04.375 and immunotherapy.

NOTE Confidence: 0.974605

00:13:04.915 --> 00:13:05.815 That's atezolizumab.

NOTE Confidence: 0.986619

00:13:07.040 --> 00:13:08.959 And then a new kind

NOTE Confidence: 0.986619

00:13:08.959 --> 00:13:10.559 of earlier phase trial that's

NOTE Confidence: 0.986619

00:13:10.559 --> 00:13:12.000 looking at a very exciting

NOTE Confidence: 0.986619

00:13:12.000 --> 00:13:13.459 new target called

NOTE Confidence: 0.7559947

00:13:13.760 --> 00:13:14.740 DLL three.

NOTE Confidence: 0.9433335

00:13:15.279 --> 00:13:16.980 And this is, paluntamid,

NOTE Confidence: 0.98789376

00:13:17.360 --> 00:13:18.660 which is a new drug

NOTE Confidence: 0.98789376

00:13:18.720 --> 00:13:19.540 that's being

NOTE Confidence: 0.99615127

00:13:19.895 --> 00:13:21.735 studied both alone and with

NOTE Confidence: 0.99615127

00:13:21.735 --> 00:13:22.235 chemotherapy.

NOTE Confidence: 0.99950075

00:13:24.135 --> 00:13:25.275 So I really

NOTE Confidence: 0.9888596

00:13:25.975 --> 00:13:27.895 like talking about the advances

NOTE Confidence: 0.9888596

00:13:27.895 --> 00:13:28.855 that we've made. As you

NOTE Confidence: 0.9888596

00:13:28.855 --> 00:13:30.054 can see, all these advances

NOTE Confidence: 0.9888596

00:13:30.054 --> 00:13:31.175 are clustered on the right

NOTE Confidence: 0.9888596

00:13:31.175 --> 00:13:32.554 side since twenty eleven,

NOTE Confidence: 0.9994508

00:13:33.015 --> 00:13:33.975 and I think that these

NOTE Confidence: 0.9994508

00:13:33.975 --> 00:13:35.115 advances really

NOTE Confidence: 0.996327

00:13:35.630 --> 00:13:37.070 make me hopeful for the

NOTE Confidence: 0.996327

00:13:37.070 --> 00:13:39.230 future of, this field. I

NOTE Confidence: 0.996327

00:13:39.230 --> 00:13:40.429 think they impart hope to

NOTE Confidence: 0.996327

00:13:40.429 --> 00:13:40.929 patients.

NOTE Confidence: 0.98298407

00:13:41.470 --> 00:13:42.590 I think we're doing lots

NOTE Confidence: 0.98298407

00:13:42.590 --> 00:13:44.029 of exciting work in clinical

NOTE Confidence: 0.98298407

00:13:44.029 --> 00:13:45.390 trials, and hopefully, we'll have

NOTE Confidence: 0.98298407

00:13:45.390 --> 00:13:47.309 some new treatments available in

NOTE Confidence: 0.98298407

00:13:47.309 --> 00:13:48.529 the next couple of years.

NOTE Confidence: 0.96221066

00:13:49.950 --> 00:13:50.850 I think also

NOTE Confidence: 0.99558944

00:13:51.285 --> 00:13:53.045 as patients and caregivers, it's

NOTE Confidence: 0.99558944

00:13:53.045 --> 00:13:54.485 important to arm yourself with

NOTE Confidence: 0.99558944

00:13:54.485 --> 00:13:55.605 information. This is just an

NOTE Confidence: 0.99558944

00:13:55.605 --> 00:13:56.644 example from,

NOTE Confidence: 0.8883996

00:13:57.045 --> 00:13:57.545 LACNets

NOTE Confidence: 0.9567461

00:13:58.404 --> 00:13:59.925 and, which is a patient

NOTE Confidence: 0.9567461

00:13:59.925 --> 00:14:01.125 advocacy group, and they have

NOTE Confidence: 0.9567461

00:14:01.125 --> 00:14:02.345 something called NETVitals,

NOTE Confidence: 0.9801676

00:14:03.045 --> 00:14:04.804 which is a wonderful tool

NOTE Confidence: 0.9801676

00:14:04.804 --> 00:14:06.264 to help you learn what

NOTE Confidence: 0.9801676

00:14:06.410 --> 00:14:08.030 questions to ask your doctors.

NOTE Confidence: 0.9950886

00:14:09.290 --> 00:14:10.670 So a few parting thoughts.

NOTE Confidence: 0.960283

00:14:11.370 --> 00:14:13.050 So primary site matters for

NOTE Confidence: 0.960283

00:14:13.050 --> 00:14:13.950 treatment selection.

NOTE Confidence: 0.9858376

00:14:14.570 --> 00:14:16.410 Stage indicates where the cancer

NOTE Confidence: 0.9858376

00:14:16.410 --> 00:14:18.890 is located, and grade refers

NOTE Confidence: 0.9858376

00:14:18.890 --> 00:14:20.330 to biology or degree of

NOTE Confidence: 0.9858376

00:14:20.330 --> 00:14:20.830 aggressiveness.

NOTE Confidence: 0.98287153

00:14:21.865 --> 00:14:24.285 Again, we've made several incredible

NOTE Confidence: 0.98287153

00:14:24.425 --> 00:14:25.464 advances in the last ten

NOTE Confidence: 0.98287153

00:14:25.464 --> 00:14:26.745 years in terms of treatment

NOTE Confidence: 0.98287153

00:14:26.745 --> 00:14:28.045 and in terms of imaging,

NOTE Confidence: 0.9975001

00:14:28.505 --> 00:14:29.944 and clinical trials are really

NOTE Confidence: 0.9975001

00:14:29.944 --> 00:14:31.464 critical to make some progress

NOTE Confidence: 0.9975001

00:14:31.464 --> 00:14:33.084 in, in the field.

NOTE Confidence: 0.9986337

00:14:34.180 --> 00:14:36.020 And so I will stop

NOTE Confidence: 0.9986337

00:14:36.020 --> 00:14:36.840 share here.

NOTE Confidence: 0.9885637

00:14:37.300 --> 00:14:39.060 I am going to pass

NOTE Confidence: 0.9885637

00:14:39.060 --> 00:14:40.680 the baton to doctor Klimstra,

NOTE Confidence: 0.99781895

00:14:41.220 --> 00:14:41.960 who will

NOTE Confidence: 0.97292405

00:14:42.660 --> 00:14:44.580 will go next. And, actually,

NOTE Confidence: 0.97292405

00:14:44.580 --> 00:14:45.860 what I forgot, I what

NOTE Confidence: 0.97292405

00:14:45.860 --> 00:14:46.580 I do need to do

NOTE Confidence: 0.97292405

00:14:46.580 --> 00:14:47.800 is I will be playing,

NOTE Confidence: 0.9750539

00:14:48.435 --> 00:14:49.095 a video.

NOTE Confidence: 0.95842826

00:14:49.475 --> 00:14:51.075 Doctor Klimstra is on, but

NOTE Confidence: 0.95842826

00:14:51.075 --> 00:14:52.055 we have prerecorded

NOTE Confidence: 0.95710975

00:14:52.355 --> 00:14:53.175 his video.

NOTE Confidence: 0.99966455

00:14:53.555 --> 00:14:54.675 So bear with me for

NOTE Confidence: 0.99966455

00:14:54.675 --> 00:14:55.495 just a moment.

NOTE Confidence: 0.8539355

00:15:02.279 --> 00:15:02.779 Okay.

NOTE Confidence: 0.9187587

00:15:04.040 --> 00:15:05.480 Here at Yale. And I'm

NOTE Confidence: 0.9187587

00:15:05.480 --> 00:15:06.839 very happy to share

NOTE Confidence: 0.9533959

00:15:07.399 --> 00:15:08.440 I'll start that from the

NOTE Confidence: 0.9533959

00:15:08.440 --> 00:15:08.940 beginning.

NOTE Confidence: 0.88754505

00:15:09.720 --> 00:15:11.399 Good evening. I'm David Klimster.

NOTE Confidence: 0.88754505

00:15:11.399 --> 00:15:12.620 I'm a a pathologist,

NOTE Confidence: 0.97031283

00:15:13.160 --> 00:15:14.654 here at Yale. And I'm

NOTE Confidence: 0.97031283

00:15:14.654 --> 00:15:16.195 very happy to share,

NOTE Confidence: 0.9840253

00:15:16.735 --> 00:15:18.815 some information about understanding the

NOTE Confidence: 0.9840253

00:15:18.815 --> 00:15:20.995 pathology of neuroendocrine tumors.

NOTE Confidence: 0.89100087

00:15:21.935 --> 00:15:23.695 But first, a few words

NOTE Confidence: 0.89100087

00:15:23.695 --> 00:15:24.515 about pathologists.

NOTE Confidence: 0.99841857

00:15:25.695 --> 00:15:28.380 Pathologists are physicians that don't

NOTE Confidence: 0.99841857

00:15:28.440 --> 00:15:30.120 directly interact with patients,

NOTE Confidence: 0.93844163

00:15:30.520 --> 00:15:32.380 most of the time unlike,

NOTE Confidence: 0.9077139

00:15:33.720 --> 00:15:34.220 gastroenterologists

NOTE Confidence: 0.9139628

00:15:34.840 --> 00:15:35.340 or

NOTE Confidence: 0.9775208

00:15:35.720 --> 00:15:37.340 an oncologist or a surgeon.

NOTE Confidence: 0.9486438

00:15:38.040 --> 00:15:40.620 They're essentially behind the scenes,

NOTE Confidence: 0.9980101

00:15:41.160 --> 00:15:41.660 and

NOTE Confidence: 0.94960463

00:15:43.675 --> 00:15:44.795 I sort of think of

NOTE Confidence: 0.94960463

00:15:44.795 --> 00:15:46.394 them as being behind the

NOTE Confidence: 0.94960463

00:15:46.394 --> 00:15:47.995 curtain. If you remember The

NOTE Confidence: 0.94960463

00:15:47.995 --> 00:15:49.675 Wizard of Oz and the

NOTE Confidence: 0.94960463

00:15:49.675 --> 00:15:51.295 little dog opens the curtain,

NOTE Confidence: 0.9792503

00:15:51.755 --> 00:15:54.014 and, there's a a statement,

NOTE Confidence: 0.9792503

00:15:54.075 --> 00:15:55.355 pay no attention to the

NOTE Confidence: 0.9792503

00:15:55.355 --> 00:15:56.654 man behind the curtain.

NOTE Confidence: 0.9725908

00:15:57.675 --> 00:15:59.650 Well, pathologists are often behind

NOTE Confidence: 0.9725908

00:15:59.650 --> 00:16:00.530 the curtain, but I think

NOTE Confidence: 0.9725908

00:16:00.530 --> 00:16:01.650 we should pay attention to

NOTE Confidence: 0.9725908

00:16:01.650 --> 00:16:03.030 the man behind the curtain

NOTE Confidence: 0.9725908

00:16:03.330 --> 00:16:05.090 or perhaps the woman behind

NOTE Confidence: 0.9725908

00:16:05.090 --> 00:16:07.250 the curtain because pathologists have

NOTE Confidence: 0.9725908

00:16:07.250 --> 00:16:09.490 a lot, to contribute to

NOTE Confidence: 0.9725908

00:16:09.490 --> 00:16:11.670 the knowledge about, your disease.

NOTE Confidence: 0.99911076

00:16:13.225 --> 00:16:14.365 So what is pathology?

NOTE Confidence: 0.96600056

00:16:15.144 --> 00:16:16.904 If you Google it, this

NOTE Confidence: 0.96600056

00:16:16.904 --> 00:16:18.264 is the definition that pops

NOTE Confidence: 0.96600056

00:16:18.264 --> 00:16:20.504 up. Everything is AI these

NOTE Confidence: 0.96600056

00:16:20.504 --> 00:16:22.024 days, and it says pathology

NOTE Confidence: 0.96600056

00:16:22.024 --> 00:16:23.225 is the medical science that

NOTE Confidence: 0.96600056

00:16:23.225 --> 00:16:25.464 studies the causes, mechanisms, and

NOTE Confidence: 0.96600056

00:16:25.464 --> 00:16:26.605 effects of disease.

NOTE Confidence: 0.97350186

00:16:27.200 --> 00:16:29.279 It involves examining tissues, fluids,

NOTE Confidence: 0.97350186

00:16:29.279 --> 00:16:30.880 and organs to identify and

NOTE Confidence: 0.97350186

00:16:30.880 --> 00:16:33.460 understand the underlying underlying causes

NOTE Confidence: 0.97350186

00:16:33.600 --> 00:16:34.980 causes of illness.

NOTE Confidence: 0.9584035

00:16:36.400 --> 00:16:37.920 Typically, we do this using

NOTE Confidence: 0.9584035

00:16:37.920 --> 00:16:38.580 a microscope,

NOTE Confidence: 0.8803797

00:16:39.200 --> 00:16:40.100 looking at,

NOTE Confidence: 0.9752047

00:16:40.615 --> 00:16:42.215 glass slides of of tissue,

NOTE Confidence: 0.9752047

00:16:42.215 --> 00:16:44.695 but increasingly, we're using genetic

NOTE Confidence: 0.9752047

00:16:44.695 --> 00:16:46.315 sequencing and other more advanced

NOTE Confidence: 0.99951905

00:16:46.695 --> 00:16:47.195 technologies.

NOTE Confidence: 0.9908172

00:16:48.375 --> 00:16:50.295 In practical terms, what does

NOTE Confidence: 0.9908172

00:16:50.295 --> 00:16:52.315 pathology provide for the patient?

NOTE Confidence: 0.9892648

00:16:52.850 --> 00:16:55.190 Well, pathology establishes the diagnosis

NOTE Confidence: 0.99350846

00:16:55.890 --> 00:16:57.430 of a neuroendocrine tumor.

NOTE Confidence: 0.9994912

00:16:57.730 --> 00:16:59.750 It can help identify where

NOTE Confidence: 0.95938456

00:17:00.290 --> 00:17:01.810 the tumor originated if it's

NOTE Confidence: 0.95938456

00:17:01.810 --> 00:17:02.950 not, immediately,

NOTE Confidence: 0.8252684

00:17:03.890 --> 00:17:04.390 parent.

NOTE Confidence: 0.99842066

00:17:05.345 --> 00:17:07.045 We can assess the adequacy

NOTE Confidence: 0.99842066

00:17:07.265 --> 00:17:08.785 of a surgical procedure to

NOTE Confidence: 0.99842066

00:17:08.785 --> 00:17:11.105 remove a neuroendocrine tumor. We

NOTE Confidence: 0.99842066

00:17:11.105 --> 00:17:12.385 can also look at factors

NOTE Confidence: 0.99842066

00:17:12.385 --> 00:17:14.145 that predict how aggressive a

NOTE Confidence: 0.99842066

00:17:14.145 --> 00:17:15.665 particular tumor is likely to

NOTE Confidence: 0.99842066

00:17:15.665 --> 00:17:16.165 be.

NOTE Confidence: 0.9867267

00:17:17.130 --> 00:17:18.890 We study factors that predict

NOTE Confidence: 0.9867267

00:17:18.890 --> 00:17:21.050 responses to treatment. These are

NOTE Confidence: 0.9867267

00:17:21.050 --> 00:17:22.270 known as biomarkers,

NOTE Confidence: 0.9985024

00:17:22.650 --> 00:17:24.090 and we can even analyze

NOTE Confidence: 0.9985024

00:17:24.090 --> 00:17:24.750 the risk,

NOTE Confidence: 0.9983511

00:17:25.130 --> 00:17:26.670 for hereditary disease.

NOTE Confidence: 0.99809855

00:17:28.570 --> 00:17:29.530 So if we think about

NOTE Confidence: 0.99809855

00:17:29.530 --> 00:17:30.670 neuroendocrine tumors,

NOTE Confidence: 0.9506855

00:17:31.435 --> 00:17:32.895 just some general principles,

NOTE Confidence: 0.9556908

00:17:33.275 --> 00:17:35.435 and neuroendocrine cells are cells

NOTE Confidence: 0.9556908

00:17:35.435 --> 00:17:37.115 that produce various types of

NOTE Confidence: 0.9556908

00:17:37.115 --> 00:17:37.615 hormones,

NOTE Confidence: 0.9577014

00:17:38.155 --> 00:17:40.315 and they're distributed throughout most

NOTE Confidence: 0.9577014

00:17:40.315 --> 00:17:42.175 organs in the body. Essentially,

NOTE Confidence: 0.9577014

00:17:42.315 --> 00:17:44.494 everywhere, there are neuroendocrine cells,

NOTE Confidence: 0.95326144

00:17:44.880 --> 00:17:46.880 and therefore, neuroendocrine tumors can

NOTE Confidence: 0.95326144

00:17:46.880 --> 00:17:47.380 arise

NOTE Confidence: 0.9961097

00:17:47.840 --> 00:17:48.900 in these

NOTE Confidence: 0.9780679

00:17:49.200 --> 00:17:50.980 various organs throughout the body.

NOTE Confidence: 0.96031666

00:17:52.240 --> 00:17:53.460 And we call them neuroendocrine

NOTE Confidence: 0.96031666

00:17:53.600 --> 00:17:54.800 tumors or NETs.

NOTE Confidence: 0.9988893

00:17:55.359 --> 00:17:57.300 This is a relatively recent

NOTE Confidence: 0.9997144

00:17:57.840 --> 00:17:58.340 standardization

NOTE Confidence: 0.9990085

00:17:59.494 --> 00:18:00.635 of of the nomenclature.

NOTE Confidence: 0.97621906

00:18:01.815 --> 00:18:03.095 In the past, they were

NOTE Confidence: 0.97621906

00:18:03.095 --> 00:18:05.115 often called carcinoid tumors.

NOTE Confidence: 0.9811959

00:18:06.135 --> 00:18:07.915 And in the lung, even

NOTE Confidence: 0.9811959

00:18:07.975 --> 00:18:09.494 now, that term is is

NOTE Confidence: 0.9811959

00:18:09.494 --> 00:18:10.935 commonly used. So it's important

NOTE Confidence: 0.9811959

00:18:10.935 --> 00:18:12.615 to know that NET and

NOTE Confidence: 0.9811959

00:18:12.615 --> 00:18:14.555 carcinoid tumor are synonymous.

NOTE Confidence: 0.9598529

00:18:16.670 --> 00:18:18.609 Now in the spectrum of

NOTE Confidence: 0.9598529

00:18:18.670 --> 00:18:20.510 of cancers, and NETs are

NOTE Confidence: 0.9598529

00:18:20.510 --> 00:18:21.970 regarded to be cancer,

NOTE Confidence: 0.9208417

00:18:22.910 --> 00:18:23.410 malignant,

NOTE Confidence: 0.9881695

00:18:25.310 --> 00:18:27.150 neuroendocrine tumors are considered well

NOTE Confidence: 0.9881695

00:18:27.150 --> 00:18:27.650 differentiated.

NOTE Confidence: 0.97040194

00:18:28.475 --> 00:18:29.755 Now what exactly does that

NOTE Confidence: 0.97040194

00:18:29.755 --> 00:18:30.255 mean?

NOTE Confidence: 0.99889445

00:18:30.635 --> 00:18:31.535 Well, differentiation

NOTE Confidence: 0.9969017

00:18:32.155 --> 00:18:33.435 has to do with how

NOTE Confidence: 0.9969017

00:18:33.435 --> 00:18:35.195 closely a tumor resembles its

NOTE Confidence: 0.9969017

00:18:35.195 --> 00:18:36.095 normal counterpart.

NOTE Confidence: 0.96361554

00:18:36.635 --> 00:18:37.835 So for instance, if we

NOTE Confidence: 0.96361554

00:18:37.835 --> 00:18:38.635 look at a piece of

NOTE Confidence: 0.96361554

00:18:38.635 --> 00:18:39.935 pancreas and there's

NOTE Confidence: 0.93449694

00:18:40.395 --> 00:18:41.915 an organ called the islet

NOTE Confidence: 0.93449694

00:18:41.915 --> 00:18:42.980 of Langerhans

NOTE Confidence: 0.9704904

00:18:43.280 --> 00:18:45.619 composed of normal pancreatic neuroendocrine

NOTE Confidence: 0.9704904

00:18:45.760 --> 00:18:46.260 cells.

NOTE Confidence: 0.9966552

00:18:46.800 --> 00:18:47.679 And if we look at

NOTE Confidence: 0.9966552

00:18:47.679 --> 00:18:49.600 a pancreatic neuroendocrine tumor, you

NOTE Confidence: 0.9966552

00:18:49.600 --> 00:18:51.280 can see that the tumor

NOTE Confidence: 0.9966552

00:18:51.280 --> 00:18:53.059 cells look very similar

NOTE Confidence: 0.99950576

00:18:53.359 --> 00:18:54.740 to their normal counterparts.

NOTE Confidence: 0.9994952

00:18:55.280 --> 00:18:56.480 This is what's known as

NOTE Confidence: 0.9994952

00:18:56.480 --> 00:18:57.220 well differentiated.

NOTE Confidence: 0.9265307

00:18:59.085 --> 00:18:59.585 In,

NOTE Confidence: 0.9963693

00:19:01.085 --> 00:19:03.005 clinical terms, this equates to

NOTE Confidence: 0.9963693

00:19:03.005 --> 00:19:05.425 a relatively slow growing tumor,

NOTE Confidence: 0.9963693

00:19:05.725 --> 00:19:06.845 which is which is good

NOTE Confidence: 0.9963693

00:19:06.845 --> 00:19:08.145 news. It means that neuroendocrine

NOTE Confidence: 0.9963693

00:19:08.205 --> 00:19:09.505 tumors are not as aggressive

NOTE Confidence: 0.99962157

00:19:09.965 --> 00:19:11.425 as other types of malignancy.

NOTE Confidence: 0.9990177

00:19:13.429 --> 00:19:14.570 That being said,

NOTE Confidence: 0.96515244

00:19:15.030 --> 00:19:16.390 some neuroendocrine tumors are more

NOTE Confidence: 0.96515244

00:19:16.390 --> 00:19:18.250 aggressive than others and predicting,

NOTE Confidence: 0.99128914

00:19:18.869 --> 00:19:20.070 which ones are likely to

NOTE Confidence: 0.99128914

00:19:20.070 --> 00:19:21.109 be more aggressive is an

NOTE Confidence: 0.99128914

00:19:21.109 --> 00:19:21.609 important,

NOTE Confidence: 0.9993577

00:19:22.390 --> 00:19:23.369 role for pathology.

NOTE Confidence: 0.99173546

00:19:24.710 --> 00:19:26.070 It's also important to remember

NOTE Confidence: 0.99173546

00:19:26.070 --> 00:19:27.590 that the proper treatment depends

NOTE Confidence: 0.99173546

00:19:27.590 --> 00:19:28.630 on quite a number of

NOTE Confidence: 0.99173546

00:19:28.630 --> 00:19:29.655 different factors.

NOTE Confidence: 0.97887427

00:19:30.035 --> 00:19:31.415 Depends on where the neuroendocrine

NOTE Confidence: 0.97887427

00:19:31.475 --> 00:19:32.375 tumor originated,

NOTE Confidence: 0.9849138

00:19:32.915 --> 00:19:34.675 how aggressive it is. In

NOTE Confidence: 0.9849138

00:19:34.675 --> 00:19:36.355 other words, is it a

NOTE Confidence: 0.9849138

00:19:36.355 --> 00:19:36.855 relatively,

NOTE Confidence: 0.9988385

00:19:38.515 --> 00:19:39.015 slow

NOTE Confidence: 0.7465024

00:19:39.395 --> 00:19:40.455 benign behaving

NOTE Confidence: 0.9636855

00:19:40.755 --> 00:19:42.275 neuroendocrine tumor, or is it

NOTE Confidence: 0.9636855

00:19:42.275 --> 00:19:42.855 a more

NOTE Confidence: 0.98478484

00:19:43.520 --> 00:19:44.020 aggressive,

NOTE Confidence: 0.96753925

00:19:45.919 --> 00:19:46.980 malignant behaving

NOTE Confidence: 0.9871466

00:19:47.359 --> 00:19:48.419 neuroendocrine tumor?

NOTE Confidence: 0.96606666

00:19:48.880 --> 00:19:50.480 Also, how advanced it is?

NOTE Confidence: 0.96606666

00:19:50.480 --> 00:19:51.380 Is it still

NOTE Confidence: 0.9631783

00:19:51.840 --> 00:19:53.600 localized within the organ where

NOTE Confidence: 0.9631783

00:19:53.600 --> 00:19:55.119 it originated, or has it

NOTE Confidence: 0.9631783

00:19:55.119 --> 00:19:55.619 spread?

NOTE Confidence: 0.9941198

00:19:56.434 --> 00:19:58.775 And furthermore, what genetic abnormalities

NOTE Confidence: 0.9941198

00:19:58.915 --> 00:20:00.294 it has can be important

NOTE Confidence: 0.957706

00:20:00.595 --> 00:20:01.734 to help direct treatment.

NOTE Confidence: 0.9951926

00:20:04.035 --> 00:20:05.955 Now neuroendocrine tumors have been

NOTE Confidence: 0.9951926

00:20:05.955 --> 00:20:06.455 increasing

NOTE Confidence: 0.9661471

00:20:06.755 --> 00:20:08.674 over the past decades, and,

NOTE Confidence: 0.8624592

00:20:09.075 --> 00:20:10.035 you can see this as

NOTE Confidence: 0.8624592

00:20:10.035 --> 00:20:10.615 a comparison

NOTE Confidence: 0.9755309

00:20:11.149 --> 00:20:12.590 that shows the top line

NOTE Confidence: 0.9755309

00:20:12.590 --> 00:20:14.590 for all malignant neoplasms is

NOTE Confidence: 0.9755309

00:20:14.590 --> 00:20:15.809 relatively flat,

NOTE Confidence: 0.99504316

00:20:16.190 --> 00:20:17.789 whereas the red line for

NOTE Confidence: 0.99504316

00:20:17.789 --> 00:20:18.929 neuroendocrine tumors

NOTE Confidence: 0.98665553

00:20:19.230 --> 00:20:20.450 has been increasing,

NOTE Confidence: 0.98738915

00:20:21.470 --> 00:20:22.669 year to year, which means

NOTE Confidence: 0.98738915

00:20:22.669 --> 00:20:24.109 that they're becoming much more

NOTE Confidence: 0.98738915

00:20:24.109 --> 00:20:24.609 prevalent

NOTE Confidence: 0.99961275

00:20:25.575 --> 00:20:27.015 and important for us to

NOTE Confidence: 0.99961275

00:20:27.015 --> 00:20:27.515 recognize.

NOTE Confidence: 0.9930644

00:20:28.695 --> 00:20:30.315 So how do we establish

NOTE Confidence: 0.8158398

00:20:30.615 --> 00:20:32.054 a diagnosis of an organoid

NOTE Confidence: 0.8158398

00:20:32.054 --> 00:20:32.554 tumor?

NOTE Confidence: 0.9885591

00:20:33.575 --> 00:20:34.535 First of all, there has

NOTE Confidence: 0.9885591

00:20:34.535 --> 00:20:36.234 to be some suspicion either

NOTE Confidence: 0.9777181

00:20:36.535 --> 00:20:38.215 from some symptoms the patient

NOTE Confidence: 0.9777181

00:20:38.215 --> 00:20:39.115 may be experiencing

NOTE Confidence: 0.9468449

00:20:39.415 --> 00:20:40.470 or from some,

NOTE Confidence: 0.99347323

00:20:41.429 --> 00:20:43.049 finding on an imaging study.

NOTE Confidence: 0.97791815

00:20:43.590 --> 00:20:44.490 And then typically,

NOTE Confidence: 0.9617944

00:20:45.030 --> 00:20:45.850 we try to,

NOTE Confidence: 0.99886495

00:20:46.630 --> 00:20:48.070 obtain a piece of tissue

NOTE Confidence: 0.99886495

00:20:48.070 --> 00:20:49.590 to make the diagnosis through

NOTE Confidence: 0.99886495

00:20:49.590 --> 00:20:50.090 endoscopy

NOTE Confidence: 0.9428415

00:20:50.789 --> 00:20:51.770 or through interventional

NOTE Confidence: 0.9256123

00:20:52.309 --> 00:20:54.250 radiology using a needle,

NOTE Confidence: 0.95632976

00:20:54.950 --> 00:20:56.409 or even through surgery.

NOTE Confidence: 0.95385814

00:20:57.244 --> 00:20:58.125 And all of these,

NOTE Confidence: 0.99085045

00:20:58.445 --> 00:21:00.384 procedures give rise to,

NOTE Confidence: 0.99150425

00:21:01.005 --> 00:21:02.544 a biopsy or a tissue

NOTE Confidence: 0.99150425

00:21:02.605 --> 00:21:04.125 sample, which is then sent

NOTE Confidence: 0.99150425

00:21:04.125 --> 00:21:05.505 to the pathology laboratory.

NOTE Confidence: 0.97906846

00:21:06.365 --> 00:21:07.424 We make this,

NOTE Confidence: 0.96032083

00:21:07.884 --> 00:21:09.965 tissue into glass slides that

NOTE Confidence: 0.96032083

00:21:09.965 --> 00:21:11.005 are stained so we can

NOTE Confidence: 0.96032083

00:21:11.005 --> 00:21:12.280 look at them with a

NOTE Confidence: 0.96032083

00:21:12.280 --> 00:21:12.780 microscope.

NOTE Confidence: 0.99872637

00:21:13.480 --> 00:21:14.440 And this is what we

NOTE Confidence: 0.99872637

00:21:14.440 --> 00:21:14.940 see.

NOTE Confidence: 0.9553466

00:21:15.960 --> 00:21:18.140 These these are neuroendocrine tumors

NOTE Confidence: 0.9553466

00:21:18.280 --> 00:21:19.960 viewed through microscope. So this

NOTE Confidence: 0.9553466

00:21:19.960 --> 00:21:21.580 is the histology of neuroendocrine

NOTE Confidence: 0.9553466

00:21:21.640 --> 00:21:22.140 tumors.

NOTE Confidence: 0.9858535

00:21:22.760 --> 00:21:23.800 The image on the left

NOTE Confidence: 0.9858535

00:21:23.800 --> 00:21:25.715 is from the small intestine.

NOTE Confidence: 0.999127

00:21:26.175 --> 00:21:26.895 The one on the right

NOTE Confidence: 0.999127

00:21:26.895 --> 00:21:27.955 is from the pancreas.

NOTE Confidence: 0.99825066

00:21:28.335 --> 00:21:29.135 And if you look at

NOTE Confidence: 0.99825066

00:21:29.135 --> 00:21:30.175 this, you can see a

NOTE Confidence: 0.99825066

00:21:30.175 --> 00:21:32.415 number of different cellular structures

NOTE Confidence: 0.99825066

00:21:32.415 --> 00:21:33.695 that we pay attention to.

NOTE Confidence: 0.99825066

00:21:33.695 --> 00:21:35.315 You can see the cells

NOTE Confidence: 0.9609127

00:21:35.615 --> 00:21:37.859 have cytoplasm, which is stained

NOTE Confidence: 0.9609127

00:21:37.859 --> 00:21:40.119 pink. They have nuclei, which

NOTE Confidence: 0.9609127

00:21:40.260 --> 00:21:41.320 are stained purple.

NOTE Confidence: 0.99848014

00:21:42.580 --> 00:21:44.260 They also have, in this

NOTE Confidence: 0.99848014

00:21:44.260 --> 00:21:44.740 case,

NOTE Confidence: 0.9974144

00:21:45.300 --> 00:21:46.760 these dark pink

NOTE Confidence: 0.94288284

00:21:47.060 --> 00:21:48.920 hormone granules, which are recognizable.

NOTE Confidence: 0.9995365

00:21:49.380 --> 00:21:50.580 And all of these features

NOTE Confidence: 0.9995365

00:21:50.580 --> 00:21:51.720 are very characteristic

NOTE Confidence: 0.9986986

00:21:52.465 --> 00:21:52.965 pathologically

NOTE Confidence: 0.98730433

00:21:53.505 --> 00:21:54.625 when we look at them

NOTE Confidence: 0.98730433

00:21:54.625 --> 00:21:55.445 in the microscope.

NOTE Confidence: 0.934172

00:21:56.625 --> 00:21:58.305 Some of the nuclei have,

NOTE Confidence: 0.934172

00:21:58.625 --> 00:22:00.485 this very coarse pattern,

NOTE Confidence: 0.98004425

00:22:01.905 --> 00:22:03.105 in them, which is known

NOTE Confidence: 0.98004425

00:22:03.105 --> 00:22:04.625 as salt and pepper chromatin.

NOTE Confidence: 0.98004425

00:22:04.625 --> 00:22:05.585 You can imagine if you

NOTE Confidence: 0.98004425

00:22:05.585 --> 00:22:06.865 were to combine salt and

NOTE Confidence: 0.98004425

00:22:06.865 --> 00:22:08.460 pepper together, you would have

NOTE Confidence: 0.98004425

00:22:08.460 --> 00:22:09.679 a similar appearance.

NOTE Confidence: 0.99954003

00:22:09.980 --> 00:22:11.440 And this is so typical

NOTE Confidence: 0.9759055

00:22:11.740 --> 00:22:13.040 of neuroendocrine tumors.

NOTE Confidence: 0.967602

00:22:13.660 --> 00:22:15.100 And the other feature is

NOTE Confidence: 0.967602

00:22:15.100 --> 00:22:16.220 the fact that they the

NOTE Confidence: 0.967602

00:22:16.220 --> 00:22:17.500 cells tend to be arranged

NOTE Confidence: 0.967602

00:22:17.500 --> 00:22:18.240 in nests.

NOTE Confidence: 0.95265263

00:22:19.100 --> 00:22:20.460 So all of these findings

NOTE Confidence: 0.95265263

00:22:20.460 --> 00:22:21.260 when we look through a

NOTE Confidence: 0.95265263

00:22:21.260 --> 00:22:23.600 microscope are able to suggest

NOTE Confidence: 0.95265263

00:22:23.660 --> 00:22:24.434 that we're dealing with a

NOTE Confidence: 0.95265263

00:22:24.434 --> 00:22:25.794 neuroendocrine tumor, but how do

NOTE Confidence: 0.95265263

00:22:25.794 --> 00:22:27.174 we confirm the diagnosis?

NOTE Confidence: 0.9510665

00:22:28.674 --> 00:22:30.855 Well, there's the characteristic microscopic

NOTE Confidence: 0.9510665

00:22:31.075 --> 00:22:32.835 appearance, which by itself can

NOTE Confidence: 0.9510665

00:22:32.835 --> 00:22:34.294 be very, very suggestive.

NOTE Confidence: 0.98138547

00:22:34.994 --> 00:22:36.755 But there's also techniques to

NOTE Confidence: 0.98138547

00:22:36.755 --> 00:22:37.255 demonstrate,

NOTE Confidence: 0.9995758

00:22:38.460 --> 00:22:39.920 even more specifically

NOTE Confidence: 0.9493311

00:22:40.380 --> 00:22:42.320 that the cells we're seeing

NOTE Confidence: 0.78538543

00:22:42.700 --> 00:22:44.220 are represented in our endocrine

NOTE Confidence: 0.78538543

00:22:44.220 --> 00:22:44.720 tumor.

NOTE Confidence: 0.98691654

00:22:45.420 --> 00:22:46.460 It turns out that there

NOTE Confidence: 0.98691654

00:22:46.460 --> 00:22:48.000 are very specific proteins,

NOTE Confidence: 0.9980039

00:22:49.100 --> 00:22:50.160 that are characteristic

NOTE Confidence: 0.9514669

00:22:50.540 --> 00:22:52.855 of of all or most

NOTE Confidence: 0.9514669

00:22:52.855 --> 00:22:54.075 neuroendocrine cells,

NOTE Confidence: 0.9992715

00:22:54.375 --> 00:22:55.915 and we can actually detect

NOTE Confidence: 0.9992715

00:22:56.054 --> 00:22:56.955 these proteins.

NOTE Confidence: 0.9985884

00:22:57.494 --> 00:22:58.554 How do we do this?

NOTE Confidence: 0.9979566

00:22:58.855 --> 00:23:00.715 A procedure known as immunohistochemistry.

NOTE Confidence: 0.997125

00:23:02.775 --> 00:23:04.554 It's not actually that complicated.

NOTE Confidence: 0.9503891

00:23:05.789 --> 00:23:07.730 It it involves using antibodies,

NOTE Confidence: 0.99977213

00:23:08.350 --> 00:23:08.850 which

NOTE Confidence: 0.95834446

00:23:09.309 --> 00:23:11.730 recognize very specifically these proteins.

NOTE Confidence: 0.9987835

00:23:12.509 --> 00:23:13.409 And the antibodies

NOTE Confidence: 0.99942255

00:23:14.190 --> 00:23:15.970 are tagged with a colored

NOTE Confidence: 0.7367966

00:23:16.350 --> 00:23:16.850 product.

NOTE Confidence: 0.96689165

00:23:17.804 --> 00:23:19.504 In most cases, a brown,

NOTE Confidence: 0.9902024

00:23:20.205 --> 00:23:21.725 color that we can see

NOTE Confidence: 0.9902024

00:23:21.725 --> 00:23:22.625 through the microscope.

NOTE Confidence: 0.99959266

00:23:23.484 --> 00:23:24.945 So if we have a

NOTE Confidence: 0.99959266

00:23:25.004 --> 00:23:26.304 piece of a biopsy,

NOTE Confidence: 0.99068266

00:23:27.164 --> 00:23:28.784 we can apply these antibodies

NOTE Confidence: 0.99068266

00:23:29.004 --> 00:23:30.125 to it. And if the

NOTE Confidence: 0.99068266

00:23:30.125 --> 00:23:30.625 proteins

NOTE Confidence: 0.9987562

00:23:31.500 --> 00:23:33.200 that are characteristic of neuroendocrine

NOTE Confidence: 0.9987562

00:23:33.420 --> 00:23:35.100 cells and neuroendocrine tumors are

NOTE Confidence: 0.9987562

00:23:35.100 --> 00:23:35.600 present,

NOTE Confidence: 0.9746287

00:23:35.900 --> 00:23:37.119 they will stain brown

NOTE Confidence: 0.9009203

00:23:37.500 --> 00:23:38.240 like this.

NOTE Confidence: 0.97677445

00:23:38.540 --> 00:23:40.220 And these are two of

NOTE Confidence: 0.97677445

00:23:40.220 --> 00:23:42.300 those proteins, chromogran a and

NOTE Confidence: 0.97677445

00:23:42.300 --> 00:23:42.800 synaptophysin.

NOTE Confidence: 0.9994768

00:23:43.625 --> 00:23:45.405 And by applying this technique,

NOTE Confidence: 0.9809425

00:23:45.785 --> 00:23:47.385 we're able to verify that

NOTE Confidence: 0.9809425

00:23:47.385 --> 00:23:48.744 the tumor we see that

NOTE Confidence: 0.9809425

00:23:48.744 --> 00:23:50.665 has a microscopic appearance of

NOTE Confidence: 0.9809425

00:23:50.665 --> 00:23:51.885 a neuroendocrine tumor,

NOTE Confidence: 0.993199

00:23:52.185 --> 00:23:53.785 in fact, has the proteins

NOTE Confidence: 0.993199

00:23:53.785 --> 00:23:54.525 we expect

NOTE Confidence: 0.9849122

00:23:54.825 --> 00:23:56.125 to find in a neuroendocrine

NOTE Confidence: 0.9849122

00:23:56.265 --> 00:23:56.765 tumor.

NOTE Confidence: 0.9996031

00:23:57.780 --> 00:23:58.520 This is a

NOTE Confidence: 0.99769306

00:23:58.980 --> 00:24:00.740 very standard technique applied in

NOTE Confidence: 0.99769306

00:24:00.740 --> 00:24:02.280 pathology for many different,

NOTE Confidence: 0.98608476

00:24:02.740 --> 00:24:04.420 tumor types and many different

NOTE Confidence: 0.98608476

00:24:04.420 --> 00:24:04.920 applications.

NOTE Confidence: 0.9287827

00:24:06.660 --> 00:24:08.340 Another example is that we

NOTE Confidence: 0.9287827

00:24:08.340 --> 00:24:08.840 can,

NOTE Confidence: 0.9976408

00:24:09.700 --> 00:24:11.300 try to identify the site

NOTE Confidence: 0.9976408

00:24:11.300 --> 00:24:11.960 of origin

NOTE Confidence: 0.98622924

00:24:12.494 --> 00:24:13.935 of a neuroendocrine tumor if

NOTE Confidence: 0.98622924

00:24:13.935 --> 00:24:14.915 it has spread

NOTE Confidence: 0.9804461

00:24:15.295 --> 00:24:16.655 to a distant organ like

NOTE Confidence: 0.9804461

00:24:16.655 --> 00:24:18.175 the liver, and it's not

NOTE Confidence: 0.9804461

00:24:18.175 --> 00:24:19.635 clear where it's coming from.

NOTE Confidence: 0.9804461

00:24:19.775 --> 00:24:21.135 And these, this is the

NOTE Confidence: 0.9804461

00:24:21.135 --> 00:24:22.255 list I showed you before

NOTE Confidence: 0.9804461

00:24:22.255 --> 00:24:23.395 of all of the different,

NOTE Confidence: 0.99929535

00:24:23.775 --> 00:24:24.915 neuroendocrine tumors

NOTE Confidence: 0.977409

00:24:25.750 --> 00:24:27.270 that can occur. And it

NOTE Confidence: 0.977409

00:24:27.270 --> 00:24:28.650 turns out that we have

NOTE Confidence: 0.977409

00:24:28.710 --> 00:24:29.210 antibodies

NOTE Confidence: 0.92130494

00:24:29.830 --> 00:24:30.650 that stain,

NOTE Confidence: 0.9964499

00:24:31.669 --> 00:24:33.270 each of these different tumor

NOTE Confidence: 0.9964499

00:24:33.270 --> 00:24:34.570 types very specifically.

NOTE Confidence: 0.92662144

00:24:35.190 --> 00:24:36.789 So for instance, we have,

NOTE Confidence: 0.88348275

00:24:37.190 --> 00:24:38.730 specific formal markers

NOTE Confidence: 0.9917285

00:24:39.109 --> 00:24:40.645 that can be used to,

NOTE Confidence: 0.951723

00:24:41.205 --> 00:24:43.625 identify tumors from some locations,

NOTE Confidence: 0.9990149

00:24:44.085 --> 00:24:45.205 and we actually have other

NOTE Confidence: 0.9990149

00:24:45.205 --> 00:24:45.705 markers

NOTE Confidence: 0.98833466

00:24:46.325 --> 00:24:48.805 for, different, proteins that are

NOTE Confidence: 0.98833466

00:24:48.805 --> 00:24:50.805 specific to other sites. And

NOTE Confidence: 0.98833466

00:24:50.805 --> 00:24:52.244 so by using these stains,

NOTE Confidence: 0.98833466

00:24:52.244 --> 00:24:53.705 we're able to characterize,

NOTE Confidence: 0.9993341

00:24:55.070 --> 00:24:57.010 the origin of many neuroendocrine

NOTE Confidence: 0.9993341

00:24:57.230 --> 00:24:57.730 tumors.

NOTE Confidence: 0.99706584

00:24:59.630 --> 00:25:01.630 What about assessing neuroendocrine tumors

NOTE Confidence: 0.99706584

00:25:01.630 --> 00:25:02.450 after surgery?

NOTE Confidence: 0.9806912

00:25:03.150 --> 00:25:04.590 If you're having surgery for

NOTE Confidence: 0.9806912

00:25:04.590 --> 00:25:06.109 neuroendocrine tumor, the hope is

NOTE Confidence: 0.9806912

00:25:06.109 --> 00:25:07.490 that you have removed it.

NOTE Confidence: 0.9964909

00:25:08.035 --> 00:25:08.915 And one of the roles

NOTE Confidence: 0.9964909

00:25:08.915 --> 00:25:10.595 of pathology is to look

NOTE Confidence: 0.9964909

00:25:10.595 --> 00:25:11.255 at that,

NOTE Confidence: 0.9507785

00:25:11.875 --> 00:25:13.635 specimen and determine whether or

NOTE Confidence: 0.9507785

00:25:13.635 --> 00:25:15.315 not the tumor has been

NOTE Confidence: 0.9507785

00:25:15.315 --> 00:25:16.295 completely removed.

NOTE Confidence: 0.9487769

00:25:17.155 --> 00:25:18.515 This is Moll's looking at

NOTE Confidence: 0.9487769

00:25:18.515 --> 00:25:19.890 the margins or the edges

NOTE Confidence: 0.9487769

00:25:20.290 --> 00:25:21.430 of the tissue.

NOTE Confidence: 0.97943884

00:25:21.810 --> 00:25:23.090 And if the tumor has

NOTE Confidence: 0.97943884

00:25:23.090 --> 00:25:24.290 been completely removed, there should

NOTE Confidence: 0.97943884

00:25:24.290 --> 00:25:25.650 be normal tissue at the

NOTE Confidence: 0.97943884

00:25:25.650 --> 00:25:26.150 edges.

NOTE Confidence: 0.9976204

00:25:27.090 --> 00:25:28.210 On the other hand, if

NOTE Confidence: 0.9976204

00:25:28.210 --> 00:25:29.590 the tumor has been incompletely

NOTE Confidence: 0.9976204

00:25:29.810 --> 00:25:31.190 removed, it may extend

NOTE Confidence: 0.99639696

00:25:31.730 --> 00:25:33.615 to the tissue edge. And

NOTE Confidence: 0.99639696

00:25:33.615 --> 00:25:34.815 by seeing that, we can

NOTE Confidence: 0.99639696

00:25:34.815 --> 00:25:36.515 recognize that the resection

NOTE Confidence: 0.9995205

00:25:36.975 --> 00:25:38.175 of the tumor has not

NOTE Confidence: 0.9995205

00:25:38.175 --> 00:25:38.915 been complete.

NOTE Confidence: 0.98555607

00:25:40.415 --> 00:25:41.695 Another thing that we do

NOTE Confidence: 0.98555607

00:25:41.695 --> 00:25:42.195 with,

NOTE Confidence: 0.93604386

00:25:43.455 --> 00:25:45.875 surgical specimen is look at

NOTE Confidence: 0.9739707

00:25:46.260 --> 00:25:47.320 evidence of spread.

NOTE Confidence: 0.9686575

00:25:47.940 --> 00:25:49.940 Has the neuroendocrine tumor spread

NOTE Confidence: 0.9686575

00:25:49.940 --> 00:25:51.800 from its primary site to,

NOTE Confidence: 0.9636574

00:25:52.260 --> 00:25:54.280 distant sites or lymph nodes?

NOTE Confidence: 0.9359142

00:25:54.740 --> 00:25:56.180 And typically, lymph nodes are

NOTE Confidence: 0.9359142

00:25:56.180 --> 00:25:56.680 removed

NOTE Confidence: 0.9167472

00:25:57.060 --> 00:25:58.280 at the time of surgery

NOTE Confidence: 0.9167472

00:25:58.420 --> 00:26:00.340 and sometimes also biopsies of

NOTE Confidence: 0.9167472

00:26:00.340 --> 00:26:01.800 distant sites will be

NOTE Confidence: 0.9988988

00:26:02.155 --> 00:26:04.175 provided for us to assess

NOTE Confidence: 0.99607724

00:26:04.555 --> 00:26:05.855 the extent of disease.

NOTE Confidence: 0.9892615

00:26:07.835 --> 00:26:08.875 So how do we predict

NOTE Confidence: 0.9892615

00:26:08.875 --> 00:26:11.055 the aggressiveness of neuroendocrine tumors?

NOTE Confidence: 0.98001325

00:26:12.155 --> 00:26:13.195 Well, the first is what

NOTE Confidence: 0.98001325

00:26:13.195 --> 00:26:14.155 I just said. We look

NOTE Confidence: 0.98001325

00:26:14.155 --> 00:26:15.275 at the stage. In other

NOTE Confidence: 0.98001325

00:26:15.275 --> 00:26:16.734 words, the extent of tumor.

NOTE Confidence: 0.98001325

00:26:17.029 --> 00:26:18.149 How big is it? How

NOTE Confidence: 0.98001325

00:26:18.149 --> 00:26:19.590 deeply invasive is it as

NOTE Confidence: 0.98001325

00:26:19.590 --> 00:26:20.789 it spread to lymph nodes

NOTE Confidence: 0.98001325

00:26:20.789 --> 00:26:22.549 or distant sites? And each

NOTE Confidence: 0.98001325

00:26:22.549 --> 00:26:24.090 of these different parameters

NOTE Confidence: 0.9976041

00:26:24.710 --> 00:26:27.029 correlates with increasing aggressiveness as

NOTE Confidence: 0.9976041

00:26:27.029 --> 00:26:28.710 it moves from the local

NOTE Confidence: 0.9976041

00:26:28.710 --> 00:26:30.250 organ into other,

NOTE Confidence: 0.9728478

00:26:30.630 --> 00:26:31.609 distant sites.

NOTE Confidence: 0.9806491

00:26:32.615 --> 00:26:34.695 But another very important parameter

NOTE Confidence: 0.9806491

00:26:34.695 --> 00:26:36.475 is to establish the grade.

NOTE Confidence: 0.94640285

00:26:36.935 --> 00:26:38.535 And what the grade refers

NOTE Confidence: 0.94640285

00:26:38.535 --> 00:26:40.475 to is the inherent aggressiveness

NOTE Confidence: 0.9995164

00:26:41.175 --> 00:26:41.994 of the tumor.

NOTE Confidence: 0.9936632

00:26:42.295 --> 00:26:43.675 Is this a bland

NOTE Confidence: 0.927071

00:26:43.975 --> 00:26:45.494 mild tumor, or is this

NOTE Confidence: 0.927071

00:26:45.494 --> 00:26:46.475 a real bully?

NOTE Confidence: 0.9854698

00:26:46.859 --> 00:26:47.820 And we have a way

NOTE Confidence: 0.9854698

00:26:47.820 --> 00:26:49.520 of measuring that.

NOTE Confidence: 0.9966187

00:26:50.140 --> 00:26:51.660 And it's actually based on

NOTE Confidence: 0.9966187

00:26:51.660 --> 00:26:52.540 the growth rate of the

NOTE Confidence: 0.9966187

00:26:52.540 --> 00:26:54.059 tumor, which makes sense. The

NOTE Confidence: 0.9966187

00:26:54.059 --> 00:26:55.980 faster it's growing, the more

NOTE Confidence: 0.9966187

00:26:55.980 --> 00:26:57.119 aggressive it is.

NOTE Confidence: 0.9996035

00:26:58.059 --> 00:26:59.179 So how do we measure

NOTE Confidence: 0.9996035

00:26:59.179 --> 00:27:00.160 the growth rate?

NOTE Confidence: 0.9335035

00:27:00.855 --> 00:27:01.815 Well, for a tumor to

NOTE Confidence: 0.9335035

00:27:01.815 --> 00:27:03.994 grow, the cells must divide.

NOTE Confidence: 0.9335035

00:27:04.054 --> 00:27:05.335 They go through the process

NOTE Confidence: 0.9335035

00:27:05.335 --> 00:27:07.275 of mitosis where one cell

NOTE Confidence: 0.9991066

00:27:07.815 --> 00:27:08.315 replicates

NOTE Confidence: 0.9912667

00:27:08.615 --> 00:27:10.215 its DNA and then splits

NOTE Confidence: 0.9912667

00:27:10.215 --> 00:27:11.275 into two cells.

NOTE Confidence: 0.9963916

00:27:11.895 --> 00:27:13.515 And this process of mitosis

NOTE Confidence: 0.99906945

00:27:13.975 --> 00:27:15.275 is visible microscopically.

NOTE Confidence: 0.9576973

00:27:15.815 --> 00:27:16.850 So So if you look

NOTE Confidence: 0.9576973

00:27:16.850 --> 00:27:18.230 at cells, you can see

NOTE Confidence: 0.91373265

00:27:18.610 --> 00:27:19.010 the,

NOTE Confidence: 0.99495465

00:27:20.130 --> 00:27:21.670 condensation of the chromatin,

NOTE Confidence: 0.94957066

00:27:22.450 --> 00:27:24.070 in the or the chromosomes,

NOTE Confidence: 0.94957066

00:27:24.130 --> 00:27:24.930 I should say, in the

NOTE Confidence: 0.94957066

00:27:24.930 --> 00:27:26.450 middle of the cell. And

NOTE Confidence: 0.94957066

00:27:26.450 --> 00:27:28.930 this these mitotic figures as

NOTE Confidence: 0.94957066

00:27:28.930 --> 00:27:30.205 they're known can be found

NOTE Confidence: 0.94957066

00:27:30.205 --> 00:27:30.705 within,

NOTE Confidence: 0.99543697

00:27:31.565 --> 00:27:33.025 neuroendocrine tumor samples.

NOTE Confidence: 0.97054017

00:27:33.965 --> 00:27:35.005 And so by looking at

NOTE Confidence: 0.97054017

00:27:35.005 --> 00:27:36.545 the histology of the neuroendocrine

NOTE Confidence: 0.97054017

00:27:36.685 --> 00:27:37.744 tumor with a microscope,

NOTE Confidence: 0.9737735

00:27:38.205 --> 00:27:39.744 we can find these mitotic

NOTE Confidence: 0.9737735

00:27:39.805 --> 00:27:41.165 figures and we can quantify

NOTE Confidence: 0.9737735

00:27:41.165 --> 00:27:43.244 them. And they're typically expressed

NOTE Confidence: 0.9737735

00:27:43.244 --> 00:27:45.185 as the number of mitoses

NOTE Confidence: 0.96610475

00:27:45.880 --> 00:27:46.760 in a certain,

NOTE Confidence: 0.9910394

00:27:47.240 --> 00:27:48.919 area of the tumor. Two

NOTE Confidence: 0.9910394

00:27:48.919 --> 00:27:50.619 square millimeters is typical.

NOTE Confidence: 0.9647454

00:27:52.119 --> 00:27:54.140 Another technique we can use

NOTE Confidence: 0.9647454

00:27:54.359 --> 00:27:56.299 to assess the growth rate

NOTE Confidence: 0.9647454

00:27:56.359 --> 00:27:57.500 or the cell divisions

NOTE Confidence: 0.927607

00:27:58.039 --> 00:27:59.260 is again by immunohistochemistry.

NOTE Confidence: 0.96418554

00:28:00.664 --> 00:28:02.205 And there's a protein called

NOTE Confidence: 0.9665605

00:28:02.664 --> 00:28:04.025 k I sixty seven or

NOTE Confidence: 0.9665605

00:28:04.025 --> 00:28:05.164 k sixty seven,

NOTE Confidence: 0.99780643

00:28:05.625 --> 00:28:07.484 which is expressed in cells

NOTE Confidence: 0.99780643

00:28:07.544 --> 00:28:08.365 that are,

NOTE Confidence: 0.99360216

00:28:09.225 --> 00:28:10.744 that are growing and and

NOTE Confidence: 0.99360216

00:28:10.744 --> 00:28:11.304 and and,

NOTE Confidence: 0.9868279

00:28:12.345 --> 00:28:13.804 reproducing their DNA.

NOTE Confidence: 0.9890326

00:28:14.530 --> 00:28:16.290 And it results in brown

NOTE Confidence: 0.9890326

00:28:16.290 --> 00:28:17.670 staining of the nuclei.

NOTE Confidence: 0.9993306

00:28:18.210 --> 00:28:19.490 And the more brown staining

NOTE Confidence: 0.9993306

00:28:19.490 --> 00:28:20.230 you have,

NOTE Confidence: 0.99869186

00:28:20.530 --> 00:28:22.050 the more rapidly growing the

NOTE Confidence: 0.99869186

00:28:22.050 --> 00:28:22.869 tumor is.

NOTE Confidence: 0.9366297

00:28:23.410 --> 00:28:25.030 We express this as the

NOTE Confidence: 0.9366297

00:28:25.330 --> 00:28:26.869 p sixty seven index

NOTE Confidence: 0.97910297

00:28:27.330 --> 00:28:28.850 or the percentage of tumor

NOTE Confidence: 0.97910297

00:28:28.850 --> 00:28:31.054 cells that show brown staining.

NOTE Confidence: 0.99535257

00:28:32.475 --> 00:28:33.595 And it turns out that

NOTE Confidence: 0.99535257

00:28:33.595 --> 00:28:35.355 the World Health Organization has

NOTE Confidence: 0.99535257

00:28:35.355 --> 00:28:37.275 established a grading system for

NOTE Confidence: 0.99535257

00:28:37.275 --> 00:28:38.415 neuroendocrine tumors

NOTE Confidence: 0.99677926

00:28:38.794 --> 00:28:40.715 that is based on both

NOTE Confidence: 0.99677926

00:28:40.715 --> 00:28:42.235 the mitotic rate that I

NOTE Confidence: 0.99677926

00:28:42.235 --> 00:28:42.735 mentioned

NOTE Confidence: 0.96485233

00:28:43.035 --> 00:28:44.395 and the p sixty seven

NOTE Confidence: 0.96485233

00:28:44.395 --> 00:28:44.895 index.

NOTE Confidence: 0.99123573

00:28:45.270 --> 00:28:46.390 And you can see that

NOTE Confidence: 0.99123573

00:28:46.390 --> 00:28:48.570 as the, rates of proliferation,

NOTE Confidence: 0.99583316

00:28:49.510 --> 00:28:50.790 growth of the cells go

NOTE Confidence: 0.99583316

00:28:50.790 --> 00:28:52.390 up, the grade goes up

NOTE Confidence: 0.99583316

00:28:52.390 --> 00:28:52.890 correspondingly.

NOTE Confidence: 0.9368159

00:28:55.750 --> 00:28:57.430 Here's a a comparison of

NOTE Confidence: 0.9368159

00:28:57.430 --> 00:28:59.210 the key sixty seven staining

NOTE Confidence: 0.98850566

00:28:59.554 --> 00:29:00.595 for a low grade or

NOTE Confidence: 0.98850566

00:29:00.595 --> 00:29:01.335 g one

NOTE Confidence: 0.88436687

00:29:01.635 --> 00:29:02.135 net,

NOTE Confidence: 0.97716343

00:29:02.595 --> 00:29:04.115 an intermediate grade or g

NOTE Confidence: 0.97716343

00:29:04.115 --> 00:29:04.855 two net,

NOTE Confidence: 0.9893715

00:29:05.235 --> 00:29:06.355 and a high grade or

NOTE Confidence: 0.9893715

00:29:06.355 --> 00:29:08.215 grade three g three net.

NOTE Confidence: 0.9893715

00:29:08.355 --> 00:29:09.235 And you can see the

NOTE Confidence: 0.9893715

00:29:09.235 --> 00:29:10.914 dramatic change in the number

NOTE Confidence: 0.9893715

00:29:10.914 --> 00:29:12.595 of the nuclei that are

NOTE Confidence: 0.9893715

00:29:12.595 --> 00:29:14.210 staining brown. And this is

NOTE Confidence: 0.9893715

00:29:14.210 --> 00:29:15.790 a very commonly used technique

NOTE Confidence: 0.9252982

00:29:16.330 --> 00:29:17.770 to establish the grade of

NOTE Confidence: 0.9252982

00:29:17.770 --> 00:29:18.830 neuroendocrine tumors.

NOTE Confidence: 0.99671835

00:29:20.810 --> 00:29:21.770 It turns out that the

NOTE Confidence: 0.99671835

00:29:21.770 --> 00:29:23.930 grade correlates very well with

NOTE Confidence: 0.99671835

00:29:23.930 --> 00:29:25.450 clinical outcome. So if we

NOTE Confidence: 0.99671835

00:29:25.450 --> 00:29:26.115 look at,

NOTE Confidence: 0.96258706

00:29:26.515 --> 00:29:27.875 for instance, this study of

NOTE Confidence: 0.96258706

00:29:27.875 --> 00:29:30.375 patients who have metastatic neuroendocrine

NOTE Confidence: 0.96258706

00:29:30.515 --> 00:29:32.035 tumors, those that have spread

NOTE Confidence: 0.96258706

00:29:32.035 --> 00:29:33.095 to distant organs,

NOTE Confidence: 0.9938292

00:29:33.554 --> 00:29:34.515 the ones that are low

NOTE Confidence: 0.9938292

00:29:34.515 --> 00:29:36.115 grade still have a very

NOTE Confidence: 0.9938292

00:29:36.115 --> 00:29:38.035 good survival. The top line

NOTE Confidence: 0.9938292

00:29:38.035 --> 00:29:38.850 shows that,

NOTE Confidence: 0.99745846

00:29:39.650 --> 00:29:41.250 nearly ninety percent of those

NOTE Confidence: 0.99745846

00:29:41.250 --> 00:29:42.770 patients are still alive after

NOTE Confidence: 0.99745846

00:29:42.770 --> 00:29:43.590 five years.

NOTE Confidence: 0.9855011

00:29:43.890 --> 00:29:44.929 But as you get into

NOTE Confidence: 0.9855011

00:29:44.929 --> 00:29:46.870 intermediate grade, the green line,

NOTE Confidence: 0.95399773

00:29:47.250 --> 00:29:49.270 or high grade, the orange,

NOTE Confidence: 0.99769306

00:29:50.130 --> 00:29:51.490 line, you can see that

NOTE Confidence: 0.99769306

00:29:51.490 --> 00:29:53.030 that survival declines

NOTE Confidence: 0.99743253

00:29:53.845 --> 00:29:55.365 from fifty percent to very

NOTE Confidence: 0.99743253

00:29:55.365 --> 00:29:55.865 low,

NOTE Confidence: 0.9934016

00:29:56.485 --> 00:29:58.005 over the course of of

NOTE Confidence: 0.9934016

00:29:58.005 --> 00:29:59.845 five years. And so grading,

NOTE Confidence: 0.9934016

00:29:59.845 --> 00:30:01.044 it turns out, is a

NOTE Confidence: 0.9934016

00:30:01.044 --> 00:30:01.865 very essential,

NOTE Confidence: 0.9899864

00:30:03.205 --> 00:30:03.705 pathologic

NOTE Confidence: 0.99938107

00:30:04.005 --> 00:30:05.865 parameter that we have to

NOTE Confidence: 0.99938107

00:30:05.924 --> 00:30:06.424 assess.

NOTE Confidence: 0.9729769

00:30:08.740 --> 00:30:10.020 I mentioned before that we're

NOTE Confidence: 0.9729769

00:30:10.020 --> 00:30:11.779 also doing genetic sequencing of

NOTE Confidence: 0.9729769

00:30:11.779 --> 00:30:13.539 neuroendocrine tumors, and this is,

NOTE Confidence: 0.8683155

00:30:14.500 --> 00:30:16.039 again, a a fundamental

NOTE Confidence: 0.9692333

00:30:16.340 --> 00:30:17.640 aspect of the pathology.

NOTE Confidence: 0.99923897

00:30:18.419 --> 00:30:19.559 How is this useful?

NOTE Confidence: 0.99053705

00:30:20.764 --> 00:30:22.625 Well, it can help verify

NOTE Confidence: 0.99053705

00:30:22.684 --> 00:30:24.125 the diagnosis. There are certain

NOTE Confidence: 0.99053705

00:30:24.125 --> 00:30:26.065 mutations that are highly characteristic

NOTE Confidence: 0.97669303

00:30:26.684 --> 00:30:28.205 of neuroendocrine tumors. And so

NOTE Confidence: 0.97669303

00:30:28.205 --> 00:30:29.585 if we find those mutations

NOTE Confidence: 0.97669303

00:30:29.725 --> 00:30:31.264 by sequencing the tumor's

NOTE Confidence: 0.9989701

00:30:31.565 --> 00:30:32.065 DNA,

NOTE Confidence: 0.9957318

00:30:32.524 --> 00:30:33.965 it can help support the

NOTE Confidence: 0.9957318

00:30:33.965 --> 00:30:35.985 diagnosis of neuroendocrine tumor.

NOTE Confidence: 0.9994206

00:30:37.120 --> 00:30:38.400 It can also predict the

NOTE Confidence: 0.9994206

00:30:38.400 --> 00:30:38.900 outcome.

NOTE Confidence: 0.9875067

00:30:39.520 --> 00:30:40.960 Some of these mutations are

NOTE Confidence: 0.9875067

00:30:40.960 --> 00:30:42.640 associated with the prognosis, and

NOTE Confidence: 0.9875067

00:30:42.640 --> 00:30:44.260 so finding a certain mutation

NOTE Confidence: 0.9933289

00:30:44.800 --> 00:30:45.300 may

NOTE Confidence: 0.99725056

00:30:45.760 --> 00:30:47.200 tell you that this tumor

NOTE Confidence: 0.99725056

00:30:47.200 --> 00:30:48.240 is likely to be more

NOTE Confidence: 0.99725056

00:30:48.240 --> 00:30:49.300 aggressive than

NOTE Confidence: 0.84831166

00:30:49.679 --> 00:30:51.300 another neuroendocrine tumor.

NOTE Confidence: 0.944319

00:30:52.985 --> 00:30:54.445 Probably the most exciting

NOTE Confidence: 0.9510104

00:30:55.065 --> 00:30:56.125 feature of,

NOTE Confidence: 0.99685466

00:30:56.585 --> 00:30:58.424 sequencing the the tumor DNA

NOTE Confidence: 0.99685466

00:30:58.424 --> 00:30:59.965 is to identify mutations

NOTE Confidence: 0.9992692

00:31:00.585 --> 00:31:02.365 that we have drugs for.

NOTE Confidence: 0.94771516

00:31:02.745 --> 00:31:03.865 So some of the,

NOTE Confidence: 0.9896842

00:31:04.720 --> 00:31:06.399 treatments you may be offered

NOTE Confidence: 0.9896842

00:31:06.399 --> 00:31:07.620 for neuroendocrine tumors,

NOTE Confidence: 0.9223734

00:31:08.880 --> 00:31:10.980 acts by targeting specific

NOTE Confidence: 0.6629585

00:31:11.519 --> 00:31:12.019 mutations.

NOTE Confidence: 0.9918608

00:31:12.480 --> 00:31:13.759 And we can find those

NOTE Confidence: 0.9918608

00:31:13.759 --> 00:31:15.519 mutations that will predict that

NOTE Confidence: 0.9918608

00:31:15.519 --> 00:31:16.799 that drug will work in

NOTE Confidence: 0.9918608

00:31:16.799 --> 00:31:18.285 that given tumor. And this

NOTE Confidence: 0.9918608

00:31:18.285 --> 00:31:19.645 is what's known as precision

NOTE Confidence: 0.9918608

00:31:19.645 --> 00:31:21.185 medicine, a very exciting,

NOTE Confidence: 0.96712387

00:31:22.045 --> 00:31:24.305 current way of managing patients.

NOTE Confidence: 0.9673109

00:31:25.805 --> 00:31:27.245 And finally, if we look

NOTE Confidence: 0.9673109

00:31:27.245 --> 00:31:28.945 at not the tumor DNA,

NOTE Confidence: 0.96995306

00:31:29.405 --> 00:31:31.825 but the normal germline DNA,

NOTE Confidence: 0.98802763

00:31:32.480 --> 00:31:33.300 we can identify

NOTE Confidence: 0.99713486

00:31:34.000 --> 00:31:35.040 if there's a risk of

NOTE Confidence: 0.99713486

00:31:35.040 --> 00:31:36.260 hereditary disease.

NOTE Confidence: 0.9549985

00:31:36.800 --> 00:31:38.100 And this is very important

NOTE Confidence: 0.9549985

00:31:38.160 --> 00:31:40.160 because if the answer is

NOTE Confidence: 0.9549985

00:31:40.160 --> 00:31:41.780 arising because of a hereditary

NOTE Confidence: 0.9549985

00:31:41.920 --> 00:31:43.440 mutation, it means other members

NOTE Confidence: 0.9549985

00:31:43.440 --> 00:31:45.120 of the family are also

NOTE Confidence: 0.9549985

00:31:45.120 --> 00:31:45.780 at risk.

NOTE Confidence: 0.96842015

00:31:46.240 --> 00:31:47.460 And just for example,

NOTE Confidence: 0.99539864

00:31:48.585 --> 00:31:50.505 in pancreatic neuroendocrine tumors, there's

NOTE Confidence: 0.99539864

00:31:50.505 --> 00:31:52.445 a whole list of hereditary

NOTE Confidence: 0.99755615

00:31:52.825 --> 00:31:53.325 associations.

NOTE Confidence: 0.9887024

00:31:53.945 --> 00:31:54.585 These are,

NOTE Confidence: 0.9781637

00:31:54.985 --> 00:31:55.965 inherited diseases

NOTE Confidence: 0.9936767

00:31:56.345 --> 00:31:57.885 that give rise to neuroendocrine

NOTE Confidence: 0.9936767

00:31:58.105 --> 00:31:58.605 tumors.

NOTE Confidence: 0.9881609

00:31:59.145 --> 00:32:00.985 And by sequencing the the,

NOTE Confidence: 0.9698547

00:32:01.544 --> 00:32:03.885 germline DNA, the normal DNA,

NOTE Confidence: 0.9901907

00:32:04.370 --> 00:32:06.150 we're able to recognize these

NOTE Confidence: 0.9901907

00:32:06.210 --> 00:32:06.950 to help,

NOTE Confidence: 0.9902571

00:32:07.490 --> 00:32:09.170 identify patients with a family

NOTE Confidence: 0.9902571

00:32:09.170 --> 00:32:09.670 risk.

NOTE Confidence: 0.97746253

00:32:10.290 --> 00:32:11.650 Up to sixteen percent of

NOTE Confidence: 0.97746253

00:32:11.650 --> 00:32:13.830 patients with pancreatic neuroendocrine tumors

NOTE Confidence: 0.97746253

00:32:13.890 --> 00:32:16.230 have a hereditary cancer predisposition

NOTE Confidence: 0.9750232

00:32:16.610 --> 00:32:17.810 mutation, and so this is

NOTE Confidence: 0.9750232

00:32:17.810 --> 00:32:18.630 very important.

NOTE Confidence: 0.9978086

00:32:21.615 --> 00:32:22.755 So just to summarize,

NOTE Confidence: 0.964787

00:32:23.615 --> 00:32:24.115 pathologists

NOTE Confidence: 0.9973595

00:32:25.215 --> 00:32:26.175 provide some of the most

NOTE Confidence: 0.9973595

00:32:26.175 --> 00:32:28.175 vital information to establish the

NOTE Confidence: 0.9973595

00:32:28.175 --> 00:32:28.675 diagnosis,

NOTE Confidence: 0.9994617

00:32:28.975 --> 00:32:30.035 predict the clinical

NOTE Confidence: 0.98178774

00:32:30.495 --> 00:32:32.895 behavior, and predict response to

NOTE Confidence: 0.98178774

00:32:32.895 --> 00:32:33.955 specific treatments.

NOTE Confidence: 0.9965553

00:32:35.010 --> 00:32:36.210 But it's important to remember

NOTE Confidence: 0.9965553

00:32:36.210 --> 00:32:38.150 that pathology is an interpretive

NOTE Confidence: 0.9965553

00:32:38.290 --> 00:32:38.790 discipline.

NOTE Confidence: 0.99934417

00:32:40.050 --> 00:32:40.870 Some aspects

NOTE Confidence: 0.9526211

00:32:41.250 --> 00:32:42.070 are subjective,

NOTE Confidence: 0.99764186

00:32:42.690 --> 00:32:44.310 and this is the interpretation

NOTE Confidence: 0.99764186

00:32:44.450 --> 00:32:45.750 of an individual pathologist.

NOTE Confidence: 0.9629632

00:32:46.530 --> 00:32:48.130 So this little cartoon, which

NOTE Confidence: 0.9629632

00:32:48.130 --> 00:32:50.265 I've shamelessly stolen off the

NOTE Confidence: 0.9629632

00:32:50.265 --> 00:32:52.765 Internet says, good. You've got

NOTE Confidence: 0.9629632

00:32:52.904 --> 00:32:54.284 the pathology report.

NOTE Confidence: 0.9984538

00:32:54.745 --> 00:32:56.205 What did the lab say?

NOTE Confidence: 0.9979779

00:32:57.065 --> 00:32:58.365 And the response is

NOTE Confidence: 0.9208652

00:32:58.745 --> 00:32:59.625 as though it was a

NOTE Confidence: 0.9208652

00:32:59.625 --> 00:33:00.445 dog wolf

NOTE Confidence: 0.9974542

00:33:01.110 --> 00:33:03.190 because the lab isn't saying

NOTE Confidence: 0.9974542

00:33:03.190 --> 00:33:05.110 anything. It's the pathologist who

NOTE Confidence: 0.9974542

00:33:05.110 --> 00:33:05.930 wrote the report

NOTE Confidence: 0.9930135

00:33:06.390 --> 00:33:07.930 that is conveying the information.

NOTE Confidence: 0.9930135

00:33:08.230 --> 00:33:09.190 And so you have to

NOTE Confidence: 0.9930135

00:33:09.190 --> 00:33:10.950 understand that just as any

NOTE Confidence: 0.9930135

00:33:10.950 --> 00:33:12.570 other physician gives an opinion,

NOTE Confidence: 0.9930135

00:33:12.790 --> 00:33:14.070 the pathologist is giving an

NOTE Confidence: 0.9930135

00:33:14.070 --> 00:33:15.210 opinion on the pathology.

NOTE Confidence: 0.99758273

00:33:16.405 --> 00:33:17.925 Now many aspects of it

NOTE Confidence: 0.99758273

00:33:17.925 --> 00:33:18.425 are

NOTE Confidence: 0.9957934

00:33:18.885 --> 00:33:20.085 quite black and white, and

NOTE Confidence: 0.9957934

00:33:20.085 --> 00:33:21.125 you should be able to

NOTE Confidence: 0.9957934

00:33:21.125 --> 00:33:21.625 obtain,

NOTE Confidence: 0.9804103

00:33:23.045 --> 00:33:25.385 the definitive diagnosis, the results

NOTE Confidence: 0.99361616

00:33:25.765 --> 00:33:26.745 of any immunohistochemistry,

NOTE Confidence: 0.9945295

00:33:28.085 --> 00:33:29.125 the site of origin of

NOTE Confidence: 0.9945295

00:33:29.125 --> 00:33:30.745 the cancer, the stage,

NOTE Confidence: 0.994136

00:33:31.300 --> 00:33:32.600 the grade of the cancer,

NOTE Confidence: 0.9696652

00:33:33.140 --> 00:33:34.500 and the results of any

NOTE Confidence: 0.9696652

00:33:34.500 --> 00:33:36.420 genomics or biomarker studies. All

NOTE Confidence: 0.9696652

00:33:36.420 --> 00:33:37.000 of these

NOTE Confidence: 0.9732318

00:33:37.300 --> 00:33:38.580 should be conveyed within a

NOTE Confidence: 0.9732318

00:33:38.580 --> 00:33:39.940 pathology report, and you should

NOTE Confidence: 0.9732318

00:33:39.940 --> 00:33:41.000 look for this information

NOTE Confidence: 0.9900295

00:33:41.460 --> 00:33:42.920 if you see a pathology

NOTE Confidence: 0.9900295

00:33:43.060 --> 00:33:43.960 report on

NOTE Confidence: 0.96466947

00:33:44.305 --> 00:33:45.985 a neuroendocrine tumor or really

NOTE Confidence: 0.96466947

00:33:45.985 --> 00:33:47.505 any kind of of of

NOTE Confidence: 0.96466947

00:33:47.505 --> 00:33:48.005 cancer.

NOTE Confidence: 0.9878664

00:33:49.025 --> 00:33:49.905 And if there are any

NOTE Confidence: 0.9878664

00:33:49.905 --> 00:33:51.505 doubts about the pathology, the

NOTE Confidence: 0.9878664

00:33:51.505 --> 00:33:52.005 physician,

NOTE Confidence: 0.96239436

00:33:53.105 --> 00:33:54.625 treating you is is a

NOTE Confidence: 0.96239436

00:33:54.625 --> 00:33:56.145 little uncertain or you have

NOTE Confidence: 0.96239436

00:33:56.145 --> 00:33:56.645 concerns,

NOTE Confidence: 0.9980891

00:33:57.100 --> 00:33:58.379 it's always possible to get

NOTE Confidence: 0.9980891

00:33:58.379 --> 00:34:00.220 a second opinion. Pathology cases

NOTE Confidence: 0.9980891

00:34:00.220 --> 00:34:01.039 can be sent

NOTE Confidence: 0.97774607

00:34:01.340 --> 00:34:02.879 to experts in their endocrine

NOTE Confidence: 0.97774607

00:34:03.100 --> 00:34:04.000 tumor pathology,

NOTE Confidence: 0.99921626

00:34:04.620 --> 00:34:06.220 to ensure that everything is

NOTE Confidence: 0.99921626

00:34:06.220 --> 00:34:07.200 is done correctly.

NOTE Confidence: 0.9872828

00:34:08.460 --> 00:34:09.339 So with that, I hope

NOTE Confidence: 0.9872828

00:34:09.339 --> 00:34:10.755 you've learned a little bit

NOTE Confidence: 0.9872828

00:34:10.755 --> 00:34:11.234 about,

NOTE Confidence: 0.9617031

00:34:11.714 --> 00:34:13.394 what pathologists do in the

NOTE Confidence: 0.9617031

00:34:13.394 --> 00:34:14.934 care of patients with neuroendocrine

NOTE Confidence: 0.9617031

00:34:14.994 --> 00:34:15.494 tumors,

NOTE Confidence: 0.98452526

00:34:15.875 --> 00:34:17.474 and, I'll be happy to

NOTE Confidence: 0.98452526

00:34:17.474 --> 00:34:18.994 participate in the discussion in

NOTE Confidence: 0.98452526

00:34:18.994 --> 00:34:19.894 a little while.

NOTE Confidence: 0.9993954

00:34:20.194 --> 00:34:21.654 Thanks so much for listening.

NOTE Confidence: 0.99497986

00:34:27.730 --> 00:34:29.489 Wonderful. So doctor Klimster will

NOTE Confidence: 0.99497986

00:34:29.489 --> 00:34:30.850 be available for for the

NOTE Confidence: 0.99497986

00:34:30.850 --> 00:34:31.750 q and a.

NOTE Confidence: 0.96817726

00:34:32.370 --> 00:34:33.810 I'll just remind everybody that

NOTE Confidence: 0.96817726

00:34:33.810 --> 00:34:34.690 the q and a will

NOTE Confidence: 0.96817726

00:34:34.690 --> 00:34:35.969 be done through the q

NOTE Confidence: 0.96817726

00:34:35.969 --> 00:34:37.410 and a webinar tool. You're

NOTE Confidence: 0.96817726

00:34:37.410 --> 00:34:38.805 welcome to start putting things

NOTE Confidence: 0.96817726

00:34:38.805 --> 00:34:40.165 in if you had questions

NOTE Confidence: 0.96817726

00:34:40.165 --> 00:34:41.525 either from my presentation or

NOTE Confidence: 0.96817726

00:34:41.525 --> 00:34:43.385 doctor Klimstra's, and we can

NOTE Confidence: 0.96817726

00:34:43.445 --> 00:34:44.645 start answering some of those,

NOTE Confidence: 0.96817726

00:34:44.645 --> 00:34:45.765 but also can take those

NOTE Confidence: 0.96817726

00:34:45.765 --> 00:34:47.605 questions live. So doctor El

NOTE Confidence: 0.96817726

00:34:47.605 --> 00:34:48.885 Fakhri, I will pass to

NOTE Confidence: 0.96817726

00:34:48.885 --> 00:34:49.385 you.

NOTE Confidence: 0.9965752

00:34:54.560 --> 00:34:55.219 Thank you,

NOTE Confidence: 0.8072751

00:34:56.080 --> 00:34:57.060 doctor Kunz.

NOTE Confidence: 0.9353659

00:34:57.920 --> 00:34:58.820 Hello, everyone.

NOTE Confidence: 0.9783025

00:34:59.760 --> 00:35:01.280 It's a pleasure to join

NOTE Confidence: 0.9783025

00:35:01.280 --> 00:35:02.719 you here. I joined Yale

NOTE Confidence: 0.9783025

00:35:02.719 --> 00:35:03.940 only two years ago,

NOTE Confidence: 0.9071966

00:35:04.255 --> 00:35:05.535 and I lead there the

NOTE Confidence: 0.9071966

00:35:05.535 --> 00:35:07.455 Yale Biomedical Aging Institute and

NOTE Confidence: 0.9071966

00:35:07.455 --> 00:35:08.594 the Yale Pet Center.

NOTE Confidence: 0.96246064

00:35:09.215 --> 00:35:10.895 And, what we're gonna talk

NOTE Confidence: 0.96246064

00:35:10.895 --> 00:35:13.474 about is understanding your pet.

NOTE Confidence: 0.96246064

00:35:13.695 --> 00:35:14.815 And your pet in this

NOTE Confidence: 0.96246064

00:35:14.815 --> 00:35:16.335 case, I'm sure you all

NOTE Confidence: 0.96246064

00:35:16.335 --> 00:35:17.555 know by now that's positron

NOTE Confidence: 0.96246064

00:35:17.614 --> 00:35:19.315 emission tomography. That's not,

NOTE Confidence: 0.99844766

00:35:20.060 --> 00:35:21.520 your pet at home.

NOTE Confidence: 0.9896167

00:35:22.060 --> 00:35:23.440 So how does,

NOTE Confidence: 0.9956714

00:35:24.620 --> 00:35:26.480 positron emission tomography work?

NOTE Confidence: 0.97030616

00:35:27.260 --> 00:35:28.380 If you've had a pet

NOTE Confidence: 0.97030616

00:35:28.380 --> 00:35:29.580 or if you googled one,

NOTE Confidence: 0.97030616

00:35:29.580 --> 00:35:30.780 you'll see that, usually, we

NOTE Confidence: 0.97030616

00:35:30.780 --> 00:35:32.780 will inject you with a

NOTE Confidence: 0.97030616

00:35:32.780 --> 00:35:33.760 radio tracer,

NOTE Confidence: 0.9972376

00:35:34.535 --> 00:35:36.055 and that radio tracer goes

NOTE Confidence: 0.9972376

00:35:36.055 --> 00:35:37.195 everywhere in your body.

NOTE Confidence: 0.9893231

00:35:38.295 --> 00:35:39.575 And then it's gonna be

NOTE Confidence: 0.9893231

00:35:39.575 --> 00:35:40.935 a radioactive material that is

NOTE Confidence: 0.9893231

00:35:40.935 --> 00:35:41.995 gonna be emitting,

NOTE Confidence: 0.97004455

00:35:43.495 --> 00:35:45.895 some, positrons. These positrons will

NOTE Confidence: 0.97004455

00:35:45.895 --> 00:35:46.395 annihilate,

NOTE Confidence: 0.9768218

00:35:47.094 --> 00:35:47.594 and,

NOTE Confidence: 0.9460551

00:35:47.895 --> 00:35:49.594 we will have photons detected.

NOTE Confidence: 0.9460551

00:35:49.655 --> 00:35:51.390 So you have something like

NOTE Confidence: 0.9460551

00:35:51.390 --> 00:35:52.770 this where you have some

NOTE Confidence: 0.8792752

00:35:53.150 --> 00:35:54.829 relations inside the body, two

NOTE Confidence: 0.8792752

00:35:54.829 --> 00:35:55.809 photons detected,

NOTE Confidence: 0.99744564

00:35:56.190 --> 00:35:57.309 and that tells us where

NOTE Confidence: 0.99744564

00:35:57.309 --> 00:35:58.050 that happened.

NOTE Confidence: 0.99593544

00:35:59.069 --> 00:36:01.010 Then we will have literally

NOTE Confidence: 0.99593544

00:36:01.150 --> 00:36:02.510 millions of these that we

NOTE Confidence: 0.99593544

00:36:02.510 --> 00:36:03.250 will be

NOTE Confidence: 0.9949028

00:36:04.065 --> 00:36:05.605 mapping back to where,

NOTE Confidence: 0.9685658

00:36:06.464 --> 00:36:08.325 they were originated from.

NOTE Confidence: 0.9853106

00:36:08.704 --> 00:36:09.744 And that will give us

NOTE Confidence: 0.9853106

00:36:09.744 --> 00:36:10.964 a map of,

NOTE Confidence: 0.94531

00:36:11.344 --> 00:36:11.844 what,

NOTE Confidence: 0.9754059

00:36:12.305 --> 00:36:13.844 the PET scan looks like.

NOTE Confidence: 0.9754059

00:36:14.065 --> 00:36:15.585 And these are the kind

NOTE Confidence: 0.9754059

00:36:15.585 --> 00:36:16.864 of typical PET scans you

NOTE Confidence: 0.9754059

00:36:16.864 --> 00:36:17.525 would see,

NOTE Confidence: 0.98160315

00:36:18.230 --> 00:36:18.630 with,

NOTE Confidence: 0.92798805

00:36:19.109 --> 00:36:20.549 if you're coming for the

NOTE Confidence: 0.92798805

00:36:20.549 --> 00:36:22.329 suspicion of a neuroendocrine tumor.

NOTE Confidence: 0.9713813

00:36:22.710 --> 00:36:23.670 We're gonna talk a little

NOTE Confidence: 0.9713813

00:36:23.670 --> 00:36:25.609 bit later about what DOTATATE

NOTE Confidence: 0.9713813

00:36:25.670 --> 00:36:27.270 PET is. But, just to

NOTE Confidence: 0.9713813

00:36:27.270 --> 00:36:28.630 give you a sense, we'll

NOTE Confidence: 0.9713813

00:36:28.630 --> 00:36:30.630 see things that are very

NOTE Confidence: 0.9713813

00:36:30.630 --> 00:36:32.630 abnormal. Here, this is disease

NOTE Confidence: 0.9713813

00:36:32.630 --> 00:36:33.290 or tumors.

NOTE Confidence: 0.96723515

00:36:33.645 --> 00:36:34.525 There are also a lot

NOTE Confidence: 0.96723515

00:36:34.525 --> 00:36:35.725 of normal things we'll see,

NOTE Confidence: 0.96723515

00:36:35.725 --> 00:36:37.085 like the kidneys or the

NOTE Confidence: 0.96723515

00:36:37.085 --> 00:36:38.465 bladder or physiological,

NOTE Confidence: 0.75198746

00:36:39.725 --> 00:36:40.225 GI,

NOTE Confidence: 0.9430417

00:36:41.245 --> 00:36:43.105 or GU, you know, intestinal,

NOTE Confidence: 0.98079634

00:36:43.645 --> 00:36:45.425 uptake gastrointestinal uptake.

NOTE Confidence: 0.94932634

00:36:45.725 --> 00:36:47.025 We'll see also the pituitary

NOTE Confidence: 0.94932634

00:36:47.165 --> 00:36:48.710 gland. It tends to light

NOTE Confidence: 0.94932634

00:36:48.710 --> 00:36:50.549 up on data tape. So

NOTE Confidence: 0.94932634

00:36:50.549 --> 00:36:52.150 what our job is, is

NOTE Confidence: 0.94932634

00:36:52.150 --> 00:36:53.510 to when we're doing the

NOTE Confidence: 0.94932634

00:36:53.510 --> 00:36:55.349 imaging is to parse out

NOTE Confidence: 0.94932634

00:36:55.349 --> 00:36:56.790 what is normal uptake and

NOTE Confidence: 0.94932634

00:36:56.790 --> 00:36:58.150 what is abnormal because the

NOTE Confidence: 0.94932634

00:36:58.150 --> 00:36:59.690 abnormal is what we are,

NOTE Confidence: 0.99084693

00:37:00.230 --> 00:37:01.670 looking for, what we're interested

NOTE Confidence: 0.99084693

00:37:01.670 --> 00:37:02.170 in.

NOTE Confidence: 0.933886

00:37:02.715 --> 00:37:03.915 Not that the normal is

NOTE Confidence: 0.933886

00:37:03.915 --> 00:37:05.355 not important, but what we're

NOTE Confidence: 0.933886

00:37:05.355 --> 00:37:06.655 looking for is the abnormal.

NOTE Confidence: 0.9358821

00:37:07.195 --> 00:37:07.695 So,

NOTE Confidence: 0.99747175

00:37:09.275 --> 00:37:10.495 how does that work?

NOTE Confidence: 0.9278244

00:37:11.035 --> 00:37:12.975 Doctor Kunz mentioned this earlier.

NOTE Confidence: 0.9278244

00:37:13.035 --> 00:37:14.315 What we are looking at

NOTE Confidence: 0.9278244

00:37:14.315 --> 00:37:14.815 here

NOTE Confidence: 0.8062944

00:37:15.195 --> 00:37:15.595 is,

NOTE Confidence: 0.99878895

00:37:17.180 --> 00:37:18.799 something that is very specific

NOTE Confidence: 0.99878895

00:37:18.859 --> 00:37:19.760 in neuroendocrine

NOTE Confidence: 0.78927386

00:37:20.619 --> 00:37:21.119 tumors,

NOTE Confidence: 0.9844286

00:37:21.819 --> 00:37:23.440 which is that they express,

NOTE Confidence: 0.98043424

00:37:25.180 --> 00:37:26.859 especially, you know, as we

NOTE Confidence: 0.98043424

00:37:26.859 --> 00:37:28.400 go for high grade tumors,

NOTE Confidence: 0.9125924

00:37:28.859 --> 00:37:29.760 they will express,

NOTE Confidence: 0.92604816

00:37:31.185 --> 00:37:33.025 levels of a receptor called

NOTE Confidence: 0.92604816

00:37:33.025 --> 00:37:33.605 the somatostatin

NOTE Confidence: 0.98379683

00:37:33.985 --> 00:37:34.485 receptor.

NOTE Confidence: 0.88801056

00:37:34.864 --> 00:37:36.305 For those who like, were

NOTE Confidence: 0.88801056

00:37:36.305 --> 00:37:37.605 buffs of biochemistry,

NOTE Confidence: 0.9724616

00:37:37.905 --> 00:37:38.965 that's what the somatostatin

NOTE Confidence: 0.99342537

00:37:39.985 --> 00:37:41.205 receptor looks like.

NOTE Confidence: 0.9603543

00:37:41.745 --> 00:37:43.585 And this is very tempting

NOTE Confidence: 0.9603543

00:37:43.585 --> 00:37:45.160 for us in pet because

NOTE Confidence: 0.9603543

00:37:45.160 --> 00:37:46.120 if we know what a

NOTE Confidence: 0.9603543

00:37:46.120 --> 00:37:47.020 structure is,

NOTE Confidence: 0.98903453

00:37:47.400 --> 00:37:48.700 we could make up

NOTE Confidence: 0.99302137

00:37:49.160 --> 00:37:50.920 something like a GPS that

NOTE Confidence: 0.99302137

00:37:50.920 --> 00:37:52.540 will hone on that somatostatin

NOTE Confidence: 0.7548553

00:37:52.920 --> 00:37:53.420 receptor,

NOTE Confidence: 0.98685724

00:37:53.960 --> 00:37:55.340 and that will be emitting

NOTE Confidence: 0.9997599

00:37:55.880 --> 00:37:57.100 back to the scanner

NOTE Confidence: 0.96352255

00:37:57.425 --> 00:37:58.705 where it is. And that's

NOTE Confidence: 0.96352255

00:37:58.705 --> 00:37:59.665 exactly what we do in

NOTE Confidence: 0.96352255

00:37:59.665 --> 00:38:00.565 a PET scan,

NOTE Confidence: 0.9988869

00:38:01.265 --> 00:38:01.765 of

NOTE Confidence: 0.78144836

00:38:02.145 --> 00:38:02.724 a neuroendocrine

NOTE Confidence: 0.99436754

00:38:03.105 --> 00:38:04.705 tumor. We have injected a

NOTE Confidence: 0.99436754

00:38:04.705 --> 00:38:06.065 compound that is binding to

NOTE Confidence: 0.99436754

00:38:06.065 --> 00:38:07.445 the somatostatin receptor.

NOTE Confidence: 0.94116753

00:38:08.224 --> 00:38:10.305 That compound is, and the

NOTE Confidence: 0.94116753

00:38:10.305 --> 00:38:11.425 binding, I'm not gonna bore

NOTE Confidence: 0.94116753

00:38:11.425 --> 00:38:12.510 you in the details, but

NOTE Confidence: 0.94116753

00:38:12.590 --> 00:38:13.710 usually, we do some chelation

NOTE Confidence: 0.94116753

00:38:13.790 --> 00:38:15.410 some form of chelation where,

NOTE Confidence: 0.88408756

00:38:15.710 --> 00:38:17.550 we have an emitter that's

NOTE Confidence: 0.88408756

00:38:17.550 --> 00:38:18.050 usually,

NOTE Confidence: 0.7630682

00:38:19.790 --> 00:38:21.710 either a spec emitter like

NOTE Confidence: 0.7630682

00:38:21.710 --> 00:38:23.710 NDM or a gallium for

NOTE Confidence: 0.7630682

00:38:23.710 --> 00:38:24.450 PET or

NOTE Confidence: 0.950575

00:38:25.005 --> 00:38:25.964 later, we're gonna see a

NOTE Confidence: 0.950575

00:38:25.964 --> 00:38:26.844 little later what we're gonna

NOTE Confidence: 0.950575

00:38:26.844 --> 00:38:27.565 do with this when we

NOTE Confidence: 0.950575

00:38:27.565 --> 00:38:28.924 do treatment with Leticia because

NOTE Confidence: 0.950575

00:38:28.924 --> 00:38:29.805 we're gonna treat with the

NOTE Confidence: 0.950575

00:38:29.805 --> 00:38:31.085 same thing. But for now,

NOTE Confidence: 0.950575

00:38:31.085 --> 00:38:32.704 let's concentrate on the,

NOTE Confidence: 0.99700016

00:38:33.645 --> 00:38:34.625 imaging side.

NOTE Confidence: 0.9897848

00:38:35.325 --> 00:38:35.825 That

NOTE Confidence: 0.98217756

00:38:36.125 --> 00:38:38.430 that molecule now is bound

NOTE Confidence: 0.98217756

00:38:38.430 --> 00:38:40.030 to that tumor, and it's

NOTE Confidence: 0.98217756

00:38:40.030 --> 00:38:41.469 telling us, here's where I

NOTE Confidence: 0.98217756

00:38:41.469 --> 00:38:41.969 am.

NOTE Confidence: 0.83810675

00:38:42.750 --> 00:38:43.250 And,

NOTE Confidence: 0.9896808

00:38:43.550 --> 00:38:45.070 that is very helpful because

NOTE Confidence: 0.9896808

00:38:45.070 --> 00:38:46.430 that will tell us something

NOTE Confidence: 0.9896808

00:38:46.430 --> 00:38:47.650 that is very specific

NOTE Confidence: 0.8287506

00:38:48.349 --> 00:38:49.329 about neuroacrine

NOTE Confidence: 0.9402782

00:38:49.630 --> 00:38:50.130 tumors

NOTE Confidence: 0.96674365

00:38:50.430 --> 00:38:52.109 that is not something that

NOTE Confidence: 0.96674365

00:38:52.109 --> 00:38:53.650 will be shared with other

NOTE Confidence: 0.91532797

00:38:54.405 --> 00:38:55.765 uptake or tumors. So for

NOTE Confidence: 0.91532797

00:38:55.765 --> 00:38:56.265 example,

NOTE Confidence: 0.9639536

00:38:56.645 --> 00:38:57.605 you may have had in

NOTE Confidence: 0.9639536

00:38:57.605 --> 00:38:59.125 the past another form of

NOTE Confidence: 0.9639536

00:38:59.125 --> 00:39:01.305 PET scans called FDG, fluoridoxyglucose.

NOTE Confidence: 0.96640015

00:39:02.485 --> 00:39:03.925 That's by far the most

NOTE Confidence: 0.96640015

00:39:03.925 --> 00:39:05.364 widespread that we will do.

NOTE Confidence: 0.96640015

00:39:05.364 --> 00:39:06.645 Ninety five percent of all

NOTE Confidence: 0.96640015

00:39:06.645 --> 00:39:07.900 scans we do are FGG

NOTE Confidence: 0.96640015

00:39:07.900 --> 00:39:09.660 scans. Well, that doesn't work

NOTE Confidence: 0.96640015

00:39:09.660 --> 00:39:11.900 very well in neuroendocrine tumors.

NOTE Confidence: 0.96640015

00:39:11.900 --> 00:39:13.420 I'm showing you here an

NOTE Confidence: 0.96640015

00:39:13.420 --> 00:39:13.920 example

NOTE Confidence: 0.79623

00:39:14.860 --> 00:39:15.360 where,

NOTE Confidence: 0.9608519

00:39:15.820 --> 00:39:17.200 on the FDG PET,

NOTE Confidence: 0.96847594

00:39:17.820 --> 00:39:19.180 there is no there's nothing

NOTE Confidence: 0.96847594

00:39:19.180 --> 00:39:21.094 abnormal here. Whereas you can

NOTE Confidence: 0.96847594

00:39:21.094 --> 00:39:22.454 see, you don't need to

NOTE Confidence: 0.96847594

00:39:22.454 --> 00:39:23.734 be really a radiologist to

NOTE Confidence: 0.96847594

00:39:23.734 --> 00:39:24.934 know that this is abnormal.

NOTE Confidence: 0.96847594

00:39:24.934 --> 00:39:26.535 There's clearly an abnormal uptake

NOTE Confidence: 0.96847594

00:39:26.535 --> 00:39:27.035 here,

NOTE Confidence: 0.9478385

00:39:27.335 --> 00:39:28.375 that is related to the

NOTE Confidence: 0.9478385

00:39:28.375 --> 00:39:28.875 somnostatin

NOTE Confidence: 0.9246504

00:39:29.255 --> 00:39:30.714 receptor. So that,

NOTE Confidence: 0.89416546

00:39:32.454 --> 00:39:34.234 that side of the imaging,

NOTE Confidence: 0.89416546

00:39:34.454 --> 00:39:35.515 looking at the

NOTE Confidence: 0.6973142

00:39:36.670 --> 00:39:37.950 so to stand receptor is

NOTE Confidence: 0.6973142

00:39:37.950 --> 00:39:39.090 incredibly important

NOTE Confidence: 0.87344956

00:39:39.469 --> 00:39:39.969 because

NOTE Confidence: 0.9596212

00:39:40.510 --> 00:39:42.110 it's gonna tell us what

NOTE Confidence: 0.9596212

00:39:42.190 --> 00:39:43.550 is the tumor avid? If

NOTE Confidence: 0.9596212

00:39:43.550 --> 00:39:44.590 it the tumor is avid,

NOTE Confidence: 0.9596212

00:39:44.590 --> 00:39:45.710 that's a good thing. Because

NOTE Confidence: 0.9596212

00:39:45.710 --> 00:39:47.070 when we're gonna hit it

NOTE Confidence: 0.9596212

00:39:47.070 --> 00:39:48.590 later with a beta emitter

NOTE Confidence: 0.9596212

00:39:48.590 --> 00:39:50.350 for therapy, well, we'll be

NOTE Confidence: 0.9596212

00:39:50.350 --> 00:39:51.390 able to do some damage,

NOTE Confidence: 0.9596212

00:39:51.390 --> 00:39:52.404 which is what we wanna

NOTE Confidence: 0.9596212

00:39:52.404 --> 00:39:52.904 do.

NOTE Confidence: 0.936701

00:39:53.684 --> 00:39:55.384 There have been several trials,

NOTE Confidence: 0.94016254

00:39:56.644 --> 00:39:58.565 many led by, doctor Kunz

NOTE Confidence: 0.94016254

00:39:58.565 --> 00:40:00.005 who's here. The netter one

NOTE Confidence: 0.94016254

00:40:00.005 --> 00:40:01.125 trial was the one that

NOTE Confidence: 0.94016254

00:40:01.125 --> 00:40:02.184 led to the approval

NOTE Confidence: 0.9685297

00:40:02.565 --> 00:40:04.244 of lutetium dotatate. We're gonna

NOTE Confidence: 0.9685297

00:40:04.244 --> 00:40:05.630 talk a lot more about

NOTE Confidence: 0.9685297

00:40:05.630 --> 00:40:06.770 this in the next slide.

NOTE Confidence: 0.9061401

00:40:07.550 --> 00:40:08.930 The netter two trial

NOTE Confidence: 0.9854383

00:40:09.310 --> 00:40:11.150 expanded the use from a

NOTE Confidence: 0.9854383

00:40:11.150 --> 00:40:12.050 second line

NOTE Confidence: 0.9490577

00:40:12.350 --> 00:40:13.469 of therapy that was in

NOTE Confidence: 0.9490577

00:40:13.469 --> 00:40:14.670 netter one to a first

NOTE Confidence: 0.9490577

00:40:14.670 --> 00:40:15.710 line of treatment for the

NOTE Confidence: 0.9490577

00:40:15.710 --> 00:40:16.690 high grade disease.

NOTE Confidence: 0.94339675

00:40:17.070 --> 00:40:18.590 And the netter three trial,

NOTE Confidence: 0.94339675

00:40:18.590 --> 00:40:20.165 which is kind of about

NOTE Confidence: 0.94339675

00:40:20.165 --> 00:40:21.445 to start, and doctor Kunz

NOTE Confidence: 0.94339675

00:40:21.445 --> 00:40:23.364 is one of the, two

NOTE Confidence: 0.94339675

00:40:23.364 --> 00:40:24.405 chairs of that,

NOTE Confidence: 0.8754221

00:40:24.885 --> 00:40:26.585 trial. She's leading that trial.

NOTE Confidence: 0.9564715

00:40:27.045 --> 00:40:28.085 Is for low and now

NOTE Confidence: 0.9564715

00:40:28.085 --> 00:40:29.445 we're moving to low grade

NOTE Confidence: 0.9564715

00:40:29.445 --> 00:40:29.945 disease.

NOTE Confidence: 0.88435364

00:40:31.205 --> 00:40:31.605 And,

NOTE Confidence: 0.97185075

00:40:32.725 --> 00:40:33.945 so you see we're going

NOTE Confidence: 0.9954994

00:40:34.390 --> 00:40:35.690 further and further upstream

NOTE Confidence: 0.9996248

00:40:35.989 --> 00:40:36.650 from the

NOTE Confidence: 0.7506567

00:40:37.270 --> 00:40:38.250 second line,

NOTE Confidence: 0.8777315

00:40:40.150 --> 00:40:41.989 high grade, first top line,

NOTE Confidence: 0.8777315

00:40:41.989 --> 00:40:43.670 high grade, and now lower

NOTE Confidence: 0.8777315

00:40:43.670 --> 00:40:44.170 grade.

NOTE Confidence: 0.9978108

00:40:44.790 --> 00:40:45.910 So what are we doing

NOTE Confidence: 0.9978108

00:40:45.910 --> 00:40:46.410 there?

NOTE Confidence: 0.991834

00:40:46.790 --> 00:40:48.550 Until now, we talked about

NOTE Confidence: 0.991834

00:40:48.550 --> 00:40:49.050 the

NOTE Confidence: 0.90972775

00:40:49.775 --> 00:40:50.975 pet side of things where

NOTE Confidence: 0.90972775

00:40:50.975 --> 00:40:52.275 we image the patient.

NOTE Confidence: 0.95173866

00:40:53.055 --> 00:40:54.575 But the same way here,

NOTE Confidence: 0.95173866

00:40:54.575 --> 00:40:55.315 we chelated,

NOTE Confidence: 0.9849908

00:40:58.655 --> 00:41:00.114 a gallium or an indium

NOTE Confidence: 0.9849908

00:41:00.175 --> 00:41:00.835 to image.

NOTE Confidence: 0.9858104

00:41:01.135 --> 00:41:02.335 Instead of that, we could

NOTE Confidence: 0.9858104

00:41:02.335 --> 00:41:03.395 chelate a lutetium.

NOTE Confidence: 0.9308432

00:41:04.640 --> 00:41:06.020 And now we get ourselves

NOTE Confidence: 0.96829444

00:41:06.480 --> 00:41:07.760 a beta emitter that can

NOTE Confidence: 0.96829444

00:41:07.760 --> 00:41:09.300 do some serious damage,

NOTE Confidence: 0.9668056

00:41:09.600 --> 00:41:11.520 whatever it's gonna be. And

NOTE Confidence: 0.9668056

00:41:11.520 --> 00:41:12.960 if this molecule were to

NOTE Confidence: 0.9668056

00:41:12.960 --> 00:41:14.500 go only through the somatostatin

NOTE Confidence: 0.96114564

00:41:14.800 --> 00:41:15.300 receptors

NOTE Confidence: 0.9580837

00:41:16.575 --> 00:41:18.255 and nowhere else, you know

NOTE Confidence: 0.9580837

00:41:18.255 --> 00:41:19.375 that's not true because I've

NOTE Confidence: 0.9580837

00:41:19.375 --> 00:41:20.415 showed you that some goes

NOTE Confidence: 0.9580837

00:41:20.415 --> 00:41:21.295 to the bladder and we're

NOTE Confidence: 0.9580837

00:41:21.295 --> 00:41:22.175 gonna come back to that

NOTE Confidence: 0.9580837

00:41:22.175 --> 00:41:22.974 and some goes to the

NOTE Confidence: 0.9580837

00:41:22.974 --> 00:41:23.855 kidney. So we have to

NOTE Confidence: 0.9580837

00:41:23.855 --> 00:41:25.055 be careful with the organs,

NOTE Confidence: 0.9580837

00:41:25.055 --> 00:41:26.255 normal organs, which we call

NOTE Confidence: 0.9580837

00:41:26.255 --> 00:41:27.695 at risk. But if we

NOTE Confidence: 0.9580837

00:41:27.695 --> 00:41:28.655 have a lot of that

NOTE Confidence: 0.9580837

00:41:28.655 --> 00:41:30.175 going to the disease, like

NOTE Confidence: 0.9580837

00:41:30.175 --> 00:41:30.675 here,

NOTE Confidence: 0.94945186

00:41:31.040 --> 00:41:32.239 and if we're gonna inflict

NOTE Confidence: 0.94945186

00:41:32.239 --> 00:41:33.839 some serious damage with lutetium

NOTE Confidence: 0.94945186

00:41:33.839 --> 00:41:34.900 one seventy seven,

NOTE Confidence: 0.9905666

00:41:35.200 --> 00:41:36.739 we got ourselves a treatment.

NOTE Confidence: 0.9905666

00:41:36.960 --> 00:41:38.000 And not only we got

NOTE Confidence: 0.9905666

00:41:38.000 --> 00:41:39.440 ourselves a treatment, but we

NOTE Confidence: 0.9905666

00:41:39.440 --> 00:41:41.040 got ourselves a treatment where

NOTE Confidence: 0.9905666

00:41:41.040 --> 00:41:42.239 we can see what we

NOTE Confidence: 0.9905666

00:41:42.239 --> 00:41:42.739 treat

NOTE Confidence: 0.9780926

00:41:43.255 --> 00:41:44.535 and we treat what we

NOTE Confidence: 0.9780926

00:41:44.535 --> 00:41:46.135 see, which is something that

NOTE Confidence: 0.9780926

00:41:46.135 --> 00:41:47.974 is incredibly important. That's a

NOTE Confidence: 0.9780926

00:41:47.974 --> 00:41:49.015 that's a first that has

NOTE Confidence: 0.9780926

00:41:49.015 --> 00:41:50.375 been only so a few

NOTE Confidence: 0.9780926

00:41:50.375 --> 00:41:51.734 years that we have. The

NOTE Confidence: 0.9780926

00:41:51.734 --> 00:41:52.855 only treatment we had in

NOTE Confidence: 0.9780926

00:41:52.855 --> 00:41:54.614 that space was iodine, and

NOTE Confidence: 0.9780926

00:41:54.614 --> 00:41:55.835 that was since the forties

NOTE Confidence: 0.8662653

00:41:56.340 --> 00:41:56.740 for,

NOTE Confidence: 0.9220383

00:41:57.140 --> 00:41:58.820 thyroid cancer. We haven't had

NOTE Confidence: 0.9220383

00:41:58.820 --> 00:42:00.600 anything since iodine.

NOTE Confidence: 0.77152884

00:42:01.220 --> 00:42:01.720 So,

NOTE Confidence: 0.68824464

00:42:02.100 --> 00:42:03.080 and cell hurts.

NOTE Confidence: 0.991656

00:42:03.460 --> 00:42:04.980 So now we are we

NOTE Confidence: 0.991656

00:42:04.980 --> 00:42:06.420 have two of these, one

NOTE Confidence: 0.991656

00:42:06.420 --> 00:42:07.620 for prostate and one for

NOTE Confidence: 0.991656

00:42:07.620 --> 00:42:10.280 neuroendocrine tumor. And unlike chemotherapies

NOTE Confidence: 0.9502654

00:42:10.660 --> 00:42:11.400 where you

NOTE Confidence: 0.9695244

00:42:11.805 --> 00:42:13.885 basically treat blind, you're bombing

NOTE Confidence: 0.9695244

00:42:13.885 --> 00:42:14.385 everything.

NOTE Confidence: 0.94418055

00:42:15.005 --> 00:42:16.364 Here, we see where we're

NOTE Confidence: 0.94418055

00:42:16.364 --> 00:42:17.645 going. We see where our

NOTE Confidence: 0.94418055

00:42:17.645 --> 00:42:19.105 agents are killing tumors,

NOTE Confidence: 0.99702704

00:42:19.405 --> 00:42:20.444 and we can image them

NOTE Confidence: 0.99702704

00:42:20.444 --> 00:42:21.885 afterwards to see if there's

NOTE Confidence: 0.99702704

00:42:21.885 --> 00:42:23.265 still a lot of the

NOTE Confidence: 0.99702704

00:42:23.405 --> 00:42:24.925 tumor or not so much

NOTE Confidence: 0.99702704

00:42:24.925 --> 00:42:25.744 that is left.

NOTE Confidence: 0.8629143

00:42:26.130 --> 00:42:26.869 So theranostics

NOTE Confidence: 0.97322214

00:42:27.170 --> 00:42:28.769 is this combination where we're

NOTE Confidence: 0.97322214

00:42:28.769 --> 00:42:29.589 gonna do,

NOTE Confidence: 0.94741523

00:42:29.969 --> 00:42:31.510 at the same time diagnosis

NOTE Confidence: 0.8173891

00:42:32.130 --> 00:42:33.589 with PET, respect,

NOTE Confidence: 0.90714645

00:42:33.890 --> 00:42:35.089 and then therapy with a

NOTE Confidence: 0.90714645

00:42:35.089 --> 00:42:36.609 beta emitter or later we'll

NOTE Confidence: 0.90714645

00:42:36.609 --> 00:42:37.750 see with an alpha.

NOTE Confidence: 0.9609481

00:42:38.735 --> 00:42:40.575 And, you know, while the

NOTE Confidence: 0.9609481

00:42:40.575 --> 00:42:43.075 antibody drug conjugate deliver chemotoxins,

NOTE Confidence: 0.93818074

00:42:43.695 --> 00:42:45.155 here we're gonna be delivering

NOTE Confidence: 0.9715651

00:42:45.535 --> 00:42:47.535 ionization energy to tumor cells

NOTE Confidence: 0.9715651

00:42:47.535 --> 00:42:48.575 to break the DNA and

NOTE Confidence: 0.9715651

00:42:48.575 --> 00:42:49.715 just kill them off.

NOTE Confidence: 0.98841304

00:42:50.175 --> 00:42:51.614 And then we reduce with

NOTE Confidence: 0.98841304

00:42:51.614 --> 00:42:53.075 that the off target radiation

NOTE Confidence: 0.98841304

00:42:53.135 --> 00:42:53.489 effect

NOTE Confidence: 0.99251604

00:42:54.369 --> 00:42:54.770 because,

NOTE Confidence: 0.96957713

00:42:55.330 --> 00:42:57.410 we're killing where the tumor

NOTE Confidence: 0.96957713

00:42:57.410 --> 00:42:58.930 or where the molecule went,

NOTE Confidence: 0.96957713

00:42:58.930 --> 00:43:00.290 and we're not killing anywhere

NOTE Confidence: 0.96957713

00:43:00.290 --> 00:43:01.570 else. So the toxicity is

NOTE Confidence: 0.96957713

00:43:01.570 --> 00:43:02.930 gonna be a lot less

NOTE Confidence: 0.96957713

00:43:02.930 --> 00:43:03.430 than

NOTE Confidence: 0.84499055

00:43:03.890 --> 00:43:05.110 if we're not selective.

NOTE Confidence: 0.9424435

00:43:06.494 --> 00:43:07.714 Since the first radiopharmaceutical

NOTE Confidence: 0.99619347

00:43:08.015 --> 00:43:09.395 drug has been approved,

NOTE Confidence: 0.9106852

00:43:09.855 --> 00:43:11.535 there's now FDA approval, as

NOTE Confidence: 0.9106852

00:43:11.535 --> 00:43:13.234 doctor Kunz mentioned, for these.

NOTE Confidence: 0.8756029

00:43:13.614 --> 00:43:14.914 And the radiopharmaceutical

NOTE Confidence: 0.9564344

00:43:15.375 --> 00:43:16.734 are gaining recognition as a

NOTE Confidence: 0.9564344

00:43:16.734 --> 00:43:18.575 viable target. So, you know,

NOTE Confidence: 0.9564344

00:43:18.575 --> 00:43:19.614 this is something that we

NOTE Confidence: 0.9564344

00:43:19.614 --> 00:43:20.994 are very excited about.

NOTE Confidence: 0.9962392

00:43:22.550 --> 00:43:23.050 Alright.

NOTE Confidence: 0.9887813

00:43:23.350 --> 00:43:25.270 Now all this is good

NOTE Confidence: 0.9887813

00:43:25.270 --> 00:43:25.930 and great.

NOTE Confidence: 0.99917483

00:43:26.390 --> 00:43:27.690 We could stop here.

NOTE Confidence: 0.9986712

00:43:28.469 --> 00:43:28.969 Unfortunately

NOTE Confidence: 0.7976348

00:43:29.510 --> 00:43:30.730 well, or fortunately,

NOTE Confidence: 0.94309425

00:43:31.430 --> 00:43:33.050 each patient is unique.

NOTE Confidence: 0.96644443

00:43:33.670 --> 00:43:35.110 Each cycle in the treatment

NOTE Confidence: 0.96644443

00:43:35.110 --> 00:43:36.630 is unique, and each lesion

NOTE Confidence: 0.96644443

00:43:36.630 --> 00:43:36.950 is unique.

NOTE Confidence: 0.96568155

00:43:38.685 --> 00:43:39.725 What I mean by that

NOTE Confidence: 0.96568155

00:43:39.725 --> 00:43:41.405 is every patient will have

NOTE Confidence: 0.96568155

00:43:41.405 --> 00:43:43.005 a unique tumor burden and

NOTE Confidence: 0.96568155

00:43:43.005 --> 00:43:43.505 distribution,

NOTE Confidence: 0.9728786

00:43:45.085 --> 00:43:46.445 and that is gonna be

NOTE Confidence: 0.9728786

00:43:46.445 --> 00:43:47.345 also changing

NOTE Confidence: 0.96249366

00:43:48.125 --> 00:43:49.105 at every cycle.

NOTE Confidence: 0.9918502

00:43:49.405 --> 00:43:50.610 Think of it this way.

NOTE Confidence: 0.9918502

00:43:50.690 --> 00:43:52.290 If this didn't change from

NOTE Confidence: 0.9918502

00:43:52.290 --> 00:43:53.270 cycle to cycle,

NOTE Confidence: 0.97143877

00:43:53.570 --> 00:43:54.850 it means the therapy isn't

NOTE Confidence: 0.97143877

00:43:54.850 --> 00:43:56.390 working. It's not doing anything.

NOTE Confidence: 0.97143877

00:43:56.610 --> 00:43:57.489 So it is a good

NOTE Confidence: 0.97143877

00:43:57.489 --> 00:43:58.930 thing that it's changing, but

NOTE Confidence: 0.97143877

00:43:58.930 --> 00:43:59.970 it's something that we should

NOTE Confidence: 0.97143877

00:43:59.970 --> 00:44:01.570 be taking into account. The

NOTE Confidence: 0.97143877

00:44:01.570 --> 00:44:02.610 paper that I'm showing here

NOTE Confidence: 0.97143877

00:44:02.610 --> 00:44:04.065 on the slide shows you

NOTE Confidence: 0.97143877

00:44:04.065 --> 00:44:05.185 the what we call the

NOTE Confidence: 0.97143877

00:44:05.185 --> 00:44:06.805 sink effects, which exacerbates,

NOTE Confidence: 0.9984777

00:44:07.825 --> 00:44:09.045 this during the treatment.

NOTE Confidence: 0.9940049

00:44:09.344 --> 00:44:10.785 What this means the sink

NOTE Confidence: 0.9940049

00:44:10.785 --> 00:44:12.085 effect means is that

NOTE Confidence: 0.99431527

00:44:12.385 --> 00:44:13.665 the more the tumor is

NOTE Confidence: 0.99431527

00:44:13.665 --> 00:44:15.205 gonna take up

NOTE Confidence: 0.7754843

00:44:15.585 --> 00:44:16.085 the,

NOTE Confidence: 0.8738297

00:44:17.369 --> 00:44:18.029 the treatment,

NOTE Confidence: 0.9978589

00:44:18.489 --> 00:44:19.769 and the less of that

NOTE Confidence: 0.9978589

00:44:19.769 --> 00:44:21.230 molecule will be available

NOTE Confidence: 0.9997571

00:44:21.930 --> 00:44:23.710 to circulate for the normal

NOTE Confidence: 0.9831154

00:44:24.010 --> 00:44:25.529 tissues, which is a good

NOTE Confidence: 0.9831154

00:44:25.529 --> 00:44:26.510 thing for us.

NOTE Confidence: 0.9976108

00:44:26.890 --> 00:44:27.390 And

NOTE Confidence: 0.8765228

00:44:27.769 --> 00:44:29.130 it shows you here that

NOTE Confidence: 0.8765228

00:44:29.130 --> 00:44:29.950 in the scatterplot

NOTE Confidence: 0.92770785

00:44:30.730 --> 00:44:31.230 that

NOTE Confidence: 0.9781243

00:44:31.645 --> 00:44:33.405 the the tissue uptake or

NOTE Confidence: 0.9781243

00:44:33.405 --> 00:44:33.905 SUV,

NOTE Confidence: 0.9986429

00:44:34.445 --> 00:44:35.425 right, decreases

NOTE Confidence: 0.9998536

00:44:35.725 --> 00:44:36.465 as a function

NOTE Confidence: 0.9478391

00:44:37.085 --> 00:44:37.585 of,

NOTE Confidence: 0.99567413

00:44:37.965 --> 00:44:38.625 the total,

NOTE Confidence: 0.97431856

00:44:39.085 --> 00:44:41.165 lesion burden or total lesion

NOTE Confidence: 0.97431856

00:44:41.165 --> 00:44:42.525 uptake. So the more the

NOTE Confidence: 0.97431856

00:44:42.525 --> 00:44:44.820 lesions take up the the

NOTE Confidence: 0.97431856

00:44:44.820 --> 00:44:46.340 the tracer, which is either

NOTE Confidence: 0.97431856

00:44:46.340 --> 00:44:47.640 the treatment or the imaging,

NOTE Confidence: 0.97431856

00:44:47.860 --> 00:44:49.300 and the less of the

NOTE Confidence: 0.97431856

00:44:49.300 --> 00:44:50.920 uptake is in the liver

NOTE Confidence: 0.97431856

00:44:51.140 --> 00:44:52.680 or in the parotid gland.

NOTE Confidence: 0.97431856

00:44:52.739 --> 00:44:53.860 And remember, I showed you

NOTE Confidence: 0.97431856

00:44:53.860 --> 00:44:55.140 some of those kidney and

NOTE Confidence: 0.97431856

00:44:55.140 --> 00:44:56.420 spleen, which are the organs

NOTE Confidence: 0.97431856

00:44:56.420 --> 00:44:57.460 at risk that we wanna

NOTE Confidence: 0.97431856

00:44:57.460 --> 00:44:57.960 preserve.

NOTE Confidence: 0.96519667

00:44:58.525 --> 00:44:59.665 So this reinforces

NOTE Confidence: 0.9996541

00:45:00.045 --> 00:45:01.105 the idea that

NOTE Confidence: 0.9970293

00:45:01.805 --> 00:45:03.645 instead of giving everybody the

NOTE Confidence: 0.9970293

00:45:03.645 --> 00:45:04.765 same dose, which is what

NOTE Confidence: 0.9970293

00:45:04.765 --> 00:45:05.905 we do now,

NOTE Confidence: 0.98419714

00:45:06.205 --> 00:45:07.805 we could give maybe higher

NOTE Confidence: 0.98419714

00:45:07.805 --> 00:45:09.405 doses to start because they

NOTE Confidence: 0.98419714

00:45:09.405 --> 00:45:10.525 could be tolerated in the

NOTE Confidence: 0.98419714

00:45:10.525 --> 00:45:12.670 beginning when the tumor burden

NOTE Confidence: 0.98419714

00:45:12.670 --> 00:45:14.030 is largest, and then there's

NOTE Confidence: 0.98419714

00:45:14.030 --> 00:45:16.110 the most, sync effect. And

NOTE Confidence: 0.98419714

00:45:16.110 --> 00:45:17.410 then as we go,

NOTE Confidence: 0.9728955

00:45:18.030 --> 00:45:19.870 down the the treatment path,

NOTE Confidence: 0.9728955

00:45:19.870 --> 00:45:21.390 well, we reduce that dose.

NOTE Confidence: 0.9728955

00:45:21.390 --> 00:45:22.830 So this is one way

NOTE Confidence: 0.9728955

00:45:22.830 --> 00:45:23.730 we can individualize

NOTE Confidence: 0.9941462

00:45:24.590 --> 00:45:25.994 our treatment to lesions.

NOTE Confidence: 0.9901224

00:45:27.575 --> 00:45:28.234 We can

NOTE Confidence: 0.8740796

00:45:28.695 --> 00:45:30.535 personalize in the treatment also.

NOTE Confidence: 0.8740796

00:45:30.535 --> 00:45:32.695 Leasing personalization matters. So not

NOTE Confidence: 0.8740796

00:45:32.695 --> 00:45:34.075 only patient personalization

NOTE Confidence: 0.87502533

00:45:34.375 --> 00:45:35.835 matter, but the lesion personalization

NOTE Confidence: 0.87502533

00:45:35.974 --> 00:45:37.815 matter. You see here that

NOTE Confidence: 0.87502533

00:45:37.815 --> 00:45:38.935 the PET uptake, what we

NOTE Confidence: 0.87502533

00:45:38.935 --> 00:45:39.835 call the study

NOTE Confidence: 0.9357775

00:45:40.170 --> 00:45:41.770 uptake value SUV, the PET

NOTE Confidence: 0.9357775

00:45:41.770 --> 00:45:42.270 uptake

NOTE Confidence: 0.9386583

00:45:42.730 --> 00:45:44.190 is significantly correlated

NOTE Confidence: 0.9620575

00:45:44.809 --> 00:45:46.329 with the SPECT uptake that

NOTE Confidence: 0.9620575

00:45:46.329 --> 00:45:47.290 we can see during the

NOTE Confidence: 0.9620575

00:45:47.290 --> 00:45:47.790 treatment.

NOTE Confidence: 0.9739035

00:45:48.329 --> 00:45:49.369 But there's a lot of

NOTE Confidence: 0.9739035

00:45:49.369 --> 00:45:49.869 variance,

NOTE Confidence: 0.91619694

00:45:50.489 --> 00:45:50.989 alright,

NOTE Confidence: 0.94186634

00:45:51.290 --> 00:45:52.489 which is what we just

NOTE Confidence: 0.94186634

00:45:52.489 --> 00:45:53.690 said. You know, every tumor

NOTE Confidence: 0.94186634

00:45:53.690 --> 00:45:55.015 is unique. Every patient is

NOTE Confidence: 0.94186634

00:45:55.015 --> 00:45:56.715 unique. Every cycle is unique.

NOTE Confidence: 0.94186634

00:45:56.935 --> 00:45:58.235 But you can see intuitively,

NOTE Confidence: 0.94186634

00:45:58.535 --> 00:45:59.995 you could understand here

NOTE Confidence: 0.96707535

00:46:00.614 --> 00:46:02.375 that the tumor control appear

NOTE Confidence: 0.96707535

00:46:02.375 --> 00:46:03.255 to be a function of

NOTE Confidence: 0.96707535

00:46:03.255 --> 00:46:05.335 the absorb dose. Why? Because

NOTE Confidence: 0.96707535

00:46:05.335 --> 00:46:06.695 the more you absorb dose

NOTE Confidence: 0.96707535

00:46:06.695 --> 00:46:07.975 and the more you're likely

NOTE Confidence: 0.96707535

00:46:07.975 --> 00:46:08.955 to kill the tumor.

NOTE Confidence: 0.9592116

00:46:09.339 --> 00:46:10.619 So we do wanna have

NOTE Confidence: 0.9592116

00:46:10.619 --> 00:46:11.819 an absorb dose that is

NOTE Confidence: 0.9592116

00:46:11.819 --> 00:46:13.180 maximized because that would give

NOTE Confidence: 0.9592116

00:46:13.180 --> 00:46:14.719 us the best tumor control.

NOTE Confidence: 0.9592116

00:46:14.780 --> 00:46:15.980 You can see also here

NOTE Confidence: 0.9592116

00:46:15.980 --> 00:46:17.579 that for the higher observed

NOTE Confidence: 0.9592116

00:46:17.579 --> 00:46:18.880 dose, there was higher,

NOTE Confidence: 0.97343737

00:46:19.500 --> 00:46:21.020 better outcome than for lower

NOTE Confidence: 0.97343737

00:46:21.020 --> 00:46:21.855 observed dose.

NOTE Confidence: 0.9989643

00:46:22.335 --> 00:46:23.875 So how do we

NOTE Confidence: 0.97690594

00:46:24.175 --> 00:46:25.855 quantify this? How do we

NOTE Confidence: 0.97690594

00:46:25.855 --> 00:46:28.015 maximize this? Well, this makes

NOTE Confidence: 0.97690594

00:46:28.015 --> 00:46:28.975 the point that we should

NOTE Confidence: 0.97690594

00:46:28.975 --> 00:46:30.835 aim to tailor the treatment

NOTE Confidence: 0.980618

00:46:31.295 --> 00:46:32.975 to maximize those for all

NOTE Confidence: 0.980618

00:46:32.975 --> 00:46:34.575 tumors, not just the average

NOTE Confidence: 0.980618

00:46:34.575 --> 00:46:35.880 tumor, not not one of

NOTE Confidence: 0.980618

00:46:35.880 --> 00:46:36.920 the average tumors, but for

NOTE Confidence: 0.980618

00:46:36.920 --> 00:46:37.980 each tumor alone.

NOTE Confidence: 0.981737

00:46:38.280 --> 00:46:39.239 And the only way you

NOTE Confidence: 0.981737

00:46:39.239 --> 00:46:40.039 can do this is by

NOTE Confidence: 0.981737

00:46:40.039 --> 00:46:41.319 imaging. Because remember, when we

NOTE Confidence: 0.981737

00:46:41.319 --> 00:46:42.280 do imaging, we see all

NOTE Confidence: 0.981737

00:46:42.280 --> 00:46:44.219 those tumors one by one,

NOTE Confidence: 0.981737

00:46:44.359 --> 00:46:45.640 and we see what is

NOTE Confidence: 0.981737

00:46:45.640 --> 00:46:46.680 the uptake in each of

NOTE Confidence: 0.981737

00:46:46.680 --> 00:46:48.440 them. So the higher the

NOTE Confidence: 0.981737

00:46:48.440 --> 00:46:48.940 tumors,

NOTE Confidence: 0.9361344

00:46:49.239 --> 00:46:50.359 the more likely we can

NOTE Confidence: 0.9361344

00:46:50.359 --> 00:46:51.955 give a higher dose to

NOTE Confidence: 0.9361344

00:46:51.955 --> 00:46:52.455 start.

NOTE Confidence: 0.9323314

00:46:53.555 --> 00:46:54.994 And and, you know, it's

NOTE Confidence: 0.9323314

00:46:54.994 --> 00:46:56.935 worth noting also again that

NOTE Confidence: 0.94244826

00:46:57.395 --> 00:46:58.435 these numbers are on the

NOTE Confidence: 0.94244826

00:46:58.435 --> 00:46:59.955 low side, meaning that, you

NOTE Confidence: 0.94244826

00:46:59.955 --> 00:47:01.155 know, there is room to

NOTE Confidence: 0.94244826

00:47:01.155 --> 00:47:03.015 increase within reason our treatments.

NOTE Confidence: 0.9995756

00:47:03.630 --> 00:47:04.910 So how can we do

NOTE Confidence: 0.9995756

00:47:04.910 --> 00:47:05.410 this?

NOTE Confidence: 0.96126765

00:47:05.789 --> 00:47:06.829 This is something that we

NOTE Confidence: 0.96126765

00:47:06.829 --> 00:47:08.269 are actively working on with

NOTE Confidence: 0.96126765

00:47:08.269 --> 00:47:09.869 doctor Coons to try to

NOTE Confidence: 0.96126765

00:47:09.869 --> 00:47:10.369 personalize,

NOTE Confidence: 0.8845281

00:47:11.069 --> 00:47:12.269 the treatment planning for the

NOTE Confidence: 0.8845281

00:47:12.269 --> 00:47:12.769 pharmaceutical

NOTE Confidence: 0.82788765

00:47:13.069 --> 00:47:14.289 neuroendocrine therapies,

NOTE Confidence: 0.8960369

00:47:14.829 --> 00:47:16.529 and neon radiology and radiation

NOTE Confidence: 0.8960369

00:47:16.589 --> 00:47:18.109 oncology and the cancer center

NOTE Confidence: 0.8960369

00:47:18.109 --> 00:47:19.984 are collaboratively working on this.

NOTE Confidence: 0.8960369

00:47:20.045 --> 00:47:21.424 The idea is the following.

NOTE Confidence: 0.988863

00:47:22.125 --> 00:47:23.484 If I do my,

NOTE Confidence: 0.9062522

00:47:24.364 --> 00:47:24.864 pretreatment

NOTE Confidence: 0.927053

00:47:25.244 --> 00:47:26.924 of gallium dota tape, I

NOTE Confidence: 0.927053

00:47:26.924 --> 00:47:27.964 have a good idea of

NOTE Confidence: 0.927053

00:47:27.964 --> 00:47:29.724 what the my tumors where

NOTE Confidence: 0.927053

00:47:29.724 --> 00:47:31.329 my tumors are. I can

NOTE Confidence: 0.927053

00:47:31.329 --> 00:47:32.869 define the targets.

NOTE Confidence: 0.98540497

00:47:33.170 --> 00:47:34.710 I can define the sensitive

NOTE Confidence: 0.98540497

00:47:34.849 --> 00:47:35.349 organs,

NOTE Confidence: 0.9980108

00:47:35.650 --> 00:47:36.469 and I can

NOTE Confidence: 0.9966631

00:47:37.010 --> 00:47:39.010 try to then extrapolate from

NOTE Confidence: 0.9966631

00:47:39.010 --> 00:47:39.750 this imaging

NOTE Confidence: 0.9594904

00:47:40.130 --> 00:47:41.489 what would the dose be

NOTE Confidence: 0.9594904

00:47:41.489 --> 00:47:43.010 for each of those. And

NOTE Confidence: 0.9594904

00:47:43.010 --> 00:47:43.829 I could put

NOTE Confidence: 0.9817461

00:47:44.435 --> 00:47:46.594 bars and thresholds on. I'm

NOTE Confidence: 0.9817461

00:47:46.594 --> 00:47:47.795 not gonna allow more than

NOTE Confidence: 0.9817461

00:47:47.795 --> 00:47:48.835 a certain dose to the

NOTE Confidence: 0.9817461

00:47:48.835 --> 00:47:49.335 bladder.

NOTE Confidence: 0.9725944

00:47:49.635 --> 00:47:50.594 I'm not gonna allow more

NOTE Confidence: 0.9725944

00:47:50.594 --> 00:47:51.555 than a certain dose to

NOTE Confidence: 0.9725944

00:47:51.555 --> 00:47:52.915 the marrow, to the liver,

NOTE Confidence: 0.9725944

00:47:52.915 --> 00:47:54.675 to the pituitary gland. And

NOTE Confidence: 0.9725944

00:47:54.675 --> 00:47:56.114 with that, what is the

NOTE Confidence: 0.9725944

00:47:56.114 --> 00:47:57.315 maximum dose that I can

NOTE Confidence: 0.9725944

00:47:57.315 --> 00:47:58.594 do then for my for

NOTE Confidence: 0.9725944

00:47:58.594 --> 00:47:59.255 my tumor?

NOTE Confidence: 0.99653727

00:47:59.760 --> 00:48:00.960 And then I can try

NOTE Confidence: 0.99653727

00:48:00.960 --> 00:48:01.920 to hit the tumor with

NOTE Confidence: 0.99653727

00:48:01.920 --> 00:48:02.739 a lot more,

NOTE Confidence: 0.96122175

00:48:03.120 --> 00:48:04.320 than a standard dose of

NOTE Confidence: 0.96122175

00:48:04.320 --> 00:48:06.000 two hundred millicurie per cycle

NOTE Confidence: 0.96122175

00:48:06.000 --> 00:48:06.980 for six cycles.

NOTE Confidence: 0.993192

00:48:07.360 --> 00:48:08.320 So in a way, we

NOTE Confidence: 0.993192

00:48:08.320 --> 00:48:08.820 are

NOTE Confidence: 0.9964095

00:48:09.280 --> 00:48:11.380 tuning the dose to maximize

NOTE Confidence: 0.9964095

00:48:11.600 --> 00:48:12.500 tumor killing

NOTE Confidence: 0.982744

00:48:12.800 --> 00:48:13.620 while minimizing

NOTE Confidence: 0.9811382

00:48:14.395 --> 00:48:15.915 the side effects to the

NOTE Confidence: 0.9811382

00:48:15.915 --> 00:48:16.975 organs at risk.

NOTE Confidence: 0.993888

00:48:17.755 --> 00:48:18.255 Great.

NOTE Confidence: 0.9851744

00:48:18.635 --> 00:48:19.915 I could do this at

NOTE Confidence: 0.9851744

00:48:19.915 --> 00:48:21.755 every cycle, but you can

NOTE Confidence: 0.9851744

00:48:21.755 --> 00:48:23.755 imagine that and you are

NOTE Confidence: 0.9851744

00:48:23.755 --> 00:48:24.255 probably

NOTE Confidence: 0.9431553

00:48:24.555 --> 00:48:25.835 the best you can imagine

NOTE Confidence: 0.9431553

00:48:25.835 --> 00:48:27.275 this, that this is gonna

NOTE Confidence: 0.9431553

00:48:27.275 --> 00:48:28.635 take a lot of effort

NOTE Confidence: 0.9431553

00:48:28.635 --> 00:48:30.420 on our part but also

NOTE Confidence: 0.9431553

00:48:30.420 --> 00:48:32.260 on your part. Because now

NOTE Confidence: 0.9431553

00:48:32.260 --> 00:48:34.099 we're talking about you're getting

NOTE Confidence: 0.9431553

00:48:34.099 --> 00:48:35.719 not only a pet scan,

NOTE Confidence: 0.9431553

00:48:35.859 --> 00:48:36.839 but also getting

NOTE Confidence: 0.9141628

00:48:37.140 --> 00:48:38.200 a SPECT scan

NOTE Confidence: 0.9916106

00:48:39.140 --> 00:48:40.119 at four hours,

NOTE Confidence: 0.9993264

00:48:40.420 --> 00:48:41.480 twenty four hours,

NOTE Confidence: 0.9984301

00:48:41.859 --> 00:48:43.000 forty eight hours,

NOTE Confidence: 0.9804329

00:48:43.344 --> 00:48:44.545 seventy two hours to see,

NOTE Confidence: 0.9804329

00:48:44.545 --> 00:48:45.905 well, how is the activity

NOTE Confidence: 0.9804329

00:48:45.905 --> 00:48:47.425 changing in your body? What

NOTE Confidence: 0.9804329

00:48:47.425 --> 00:48:48.385 is the dose that you're

NOTE Confidence: 0.9804329

00:48:48.385 --> 00:48:49.605 getting for the tumor?

NOTE Confidence: 0.99896157

00:48:49.905 --> 00:48:50.864 What is the dose that

NOTE Confidence: 0.99896157

00:48:50.864 --> 00:48:51.925 you're getting for,

NOTE Confidence: 0.868431

00:48:52.545 --> 00:48:53.364 the lesions?

NOTE Confidence: 0.85248375

00:48:53.825 --> 00:48:55.265 For the, sorry, for the

NOTE Confidence: 0.85248375

00:48:55.265 --> 00:48:56.625 healthy tissues, the organs that

NOTE Confidence: 0.85248375

00:48:56.625 --> 00:48:57.125 risk.

NOTE Confidence: 0.925977

00:48:57.609 --> 00:48:58.890 But this is a a

NOTE Confidence: 0.925977

00:48:58.890 --> 00:49:00.570 good start because the pre

NOTE Confidence: 0.925977

00:49:00.570 --> 00:49:01.070 therapy

NOTE Confidence: 0.92619985

00:49:01.450 --> 00:49:02.810 is giving us a highly

NOTE Confidence: 0.92619985

00:49:02.810 --> 00:49:03.310 predictive,

NOTE Confidence: 0.9507221

00:49:05.050 --> 00:49:06.670 indicator of the patient response,

NOTE Confidence: 0.9823669

00:49:07.210 --> 00:49:08.329 and this is now a

NOTE Confidence: 0.9823669

00:49:08.329 --> 00:49:09.690 standard that we use for,

NOTE Confidence: 0.9823669

00:49:09.930 --> 00:49:12.045 patient selection to decide who

NOTE Confidence: 0.9823669

00:49:12.045 --> 00:49:13.965 qualifies and who doesn't. And

NOTE Confidence: 0.9823669

00:49:13.965 --> 00:49:14.925 I'm showing you here a

NOTE Confidence: 0.9823669

00:49:14.925 --> 00:49:15.425 patient.

NOTE Confidence: 0.91392547

00:49:16.445 --> 00:49:17.965 This is where hope there's

NOTE Confidence: 0.91392547

00:49:17.965 --> 00:49:19.505 a lot of hope where,

NOTE Confidence: 0.96557844

00:49:20.925 --> 00:49:21.805 you see, this is the

NOTE Confidence: 0.96557844

00:49:21.805 --> 00:49:23.984 patient scan after one cycle,

NOTE Confidence: 0.99122816

00:49:24.339 --> 00:49:25.940 after four cycles, and you

NOTE Confidence: 0.99122816

00:49:25.940 --> 00:49:27.219 can see that the activity

NOTE Confidence: 0.99122816

00:49:27.219 --> 00:49:27.960 is decreasing.

NOTE Confidence: 0.9288441

00:49:28.339 --> 00:49:29.780 And this is one where

NOTE Confidence: 0.9288441

00:49:29.780 --> 00:49:31.160 we started with one milligram,

NOTE Confidence: 0.9775382

00:49:31.700 --> 00:49:33.540 where we escalated and then

NOTE Confidence: 0.9775382

00:49:33.540 --> 00:49:35.859 went down again. So there's

NOTE Confidence: 0.9775382

00:49:35.859 --> 00:49:37.665 there's hope. There's also a

NOTE Confidence: 0.9775382

00:49:37.665 --> 00:49:39.045 lot of work we're doing,

NOTE Confidence: 0.99907714

00:49:40.385 --> 00:49:41.665 in my lab to try

NOTE Confidence: 0.99907714

00:49:41.665 --> 00:49:42.165 to

NOTE Confidence: 0.9590652

00:49:42.625 --> 00:49:44.405 avoid some of what

NOTE Confidence: 0.99642456

00:49:44.864 --> 00:49:45.905 you would have to go

NOTE Confidence: 0.99642456

00:49:45.905 --> 00:49:47.445 through to have every single,

NOTE Confidence: 0.93332446

00:49:48.385 --> 00:49:48.885 dose,

NOTE Confidence: 0.9507148

00:49:49.344 --> 00:49:50.864 measured every so have, you

NOTE Confidence: 0.9507148

00:49:50.864 --> 00:49:52.480 know, multiple scan. And the

NOTE Confidence: 0.9507148

00:49:52.480 --> 00:49:54.820 idea here is using artificial

NOTE Confidence: 0.6882521

00:49:55.280 --> 00:49:57.440 intelligence and new networks to,

NOTE Confidence: 0.99889207

00:49:57.760 --> 00:49:58.580 from our

NOTE Confidence: 0.79874724

00:49:58.960 --> 00:49:59.460 pretreatment,

NOTE Confidence: 0.9952254

00:50:00.320 --> 00:50:00.820 and

NOTE Confidence: 0.79046535

00:50:01.680 --> 00:50:02.580 what are two,

NOTE Confidence: 0.95954406

00:50:03.200 --> 00:50:05.120 treatments predict the next treatment.

NOTE Confidence: 0.95954406

00:50:05.120 --> 00:50:06.719 So instead of having one

NOTE Confidence: 0.95954406

00:50:06.719 --> 00:50:08.585 size fits all, we use

NOTE Confidence: 0.95954406

00:50:08.585 --> 00:50:09.625 a wealth of data from

NOTE Confidence: 0.95954406

00:50:09.625 --> 00:50:11.405 the redose pet

NOTE Confidence: 0.9723176

00:50:11.785 --> 00:50:13.385 and plenty of scans of

NOTE Confidence: 0.9723176

00:50:13.385 --> 00:50:14.825 plenty of patients that we've

NOTE Confidence: 0.9723176

00:50:14.825 --> 00:50:16.984 scanned before you to say,

NOTE Confidence: 0.9723176

00:50:16.984 --> 00:50:18.585 well, you know, your scan

NOTE Confidence: 0.9723176

00:50:18.585 --> 00:50:19.944 fits your pet scan fits

NOTE Confidence: 0.9723176

00:50:19.944 --> 00:50:20.844 best as

NOTE Confidence: 0.9804425

00:50:21.224 --> 00:50:23.099 this person, like a digital

NOTE Confidence: 0.9804425

00:50:23.099 --> 00:50:24.079 twin of yourself.

NOTE Confidence: 0.99964607

00:50:24.619 --> 00:50:25.839 And this is how

NOTE Confidence: 0.9860885

00:50:26.299 --> 00:50:28.219 these guys all these girls

NOTE Confidence: 0.9860885

00:50:28.219 --> 00:50:28.719 did,

NOTE Confidence: 0.9881626

00:50:29.180 --> 00:50:30.140 when we treated them with

NOTE Confidence: 0.9881626

00:50:30.140 --> 00:50:31.099 this dose. And that gives

NOTE Confidence: 0.9881626

00:50:31.099 --> 00:50:32.079 us a good indication

NOTE Confidence: 0.9921247

00:50:32.700 --> 00:50:34.400 as a predictive dose distribution

NOTE Confidence: 0.99651366

00:50:34.700 --> 00:50:35.660 of what we should be

NOTE Confidence: 0.99651366

00:50:35.660 --> 00:50:36.160 doing.

NOTE Confidence: 0.98674554

00:50:37.015 --> 00:50:37.895 And then, of course, we

NOTE Confidence: 0.98674554

00:50:37.895 --> 00:50:39.335 do cross training validation of

NOTE Confidence: 0.98674554

00:50:39.335 --> 00:50:40.635 these. So here's an example,

NOTE Confidence: 0.93504864

00:50:40.935 --> 00:50:42.135 and I'll I'll finish with

NOTE Confidence: 0.93504864

00:50:42.135 --> 00:50:43.175 this. This is an example

NOTE Confidence: 0.93504864

00:50:43.175 --> 00:50:44.635 of one where

NOTE Confidence: 0.9722422

00:50:45.255 --> 00:50:46.955 we did the first dose.

NOTE Confidence: 0.99936706

00:50:47.575 --> 00:50:48.935 And from the first dose,

NOTE Confidence: 0.99936706

00:50:48.935 --> 00:50:49.435 we

NOTE Confidence: 0.9640043

00:50:49.770 --> 00:50:51.130 predicted what the second dose

NOTE Confidence: 0.9640043

00:50:51.130 --> 00:50:52.609 is, and then we compare

NOTE Confidence: 0.9640043

00:50:52.609 --> 00:50:53.690 it to what we measured

NOTE Confidence: 0.9640043

00:50:53.690 --> 00:50:55.050 in the second dose. So

NOTE Confidence: 0.9640043

00:50:55.050 --> 00:50:56.350 we did the first dose,

NOTE Confidence: 0.96893966

00:50:56.969 --> 00:50:58.570 and we measured it. We

NOTE Confidence: 0.96893966

00:50:58.570 --> 00:51:00.650 did the cycle two. Again,

NOTE Confidence: 0.96893966

00:51:00.650 --> 00:51:02.265 second cycle of treatment, we

NOTE Confidence: 0.96893966

00:51:02.265 --> 00:51:04.045 measured the dose. But then

NOTE Confidence: 0.96893966

00:51:04.105 --> 00:51:05.385 we used only the first

NOTE Confidence: 0.96893966

00:51:05.385 --> 00:51:07.325 dose in our artificial networks

NOTE Confidence: 0.96893966

00:51:07.385 --> 00:51:08.585 to predict what the second

NOTE Confidence: 0.96893966

00:51:08.585 --> 00:51:10.105 dose would be. And the

NOTE Confidence: 0.96893966

00:51:10.105 --> 00:51:11.625 error you see is mostly

NOTE Confidence: 0.96893966

00:51:11.625 --> 00:51:13.164 in the bladder, which is

NOTE Confidence: 0.96893966

00:51:13.224 --> 00:51:14.525 the least of our worries.

NOTE Confidence: 0.96893966

00:51:14.664 --> 00:51:15.864 So our prediction for the

NOTE Confidence: 0.96893966

00:51:15.864 --> 00:51:17.340 tumors was very good. So

NOTE Confidence: 0.96893966

00:51:17.340 --> 00:51:18.880 we really hope that this

NOTE Confidence: 0.9489655

00:51:19.260 --> 00:51:20.620 prediction from one cycle of

NOTE Confidence: 0.9489655

00:51:20.620 --> 00:51:22.080 the next cycle would be

NOTE Confidence: 0.9489655

00:51:22.220 --> 00:51:23.739 would be a huge step

NOTE Confidence: 0.9489655

00:51:23.739 --> 00:51:26.160 to personalize the treatment without

NOTE Confidence: 0.9489655

00:51:26.220 --> 00:51:27.739 increasing too much the burden

NOTE Confidence: 0.9489655

00:51:27.739 --> 00:51:28.480 on the patient,

NOTE Confidence: 0.9476538

00:51:29.820 --> 00:51:30.640 and and

NOTE Confidence: 0.9881837

00:51:31.205 --> 00:51:32.245 and and making it more

NOTE Confidence: 0.9881837

00:51:32.245 --> 00:51:33.685 of a personalized treatment for

NOTE Confidence: 0.9881837

00:51:33.685 --> 00:51:34.344 every patient.

NOTE Confidence: 0.9546275

00:51:35.125 --> 00:51:36.325 This is all I have.

NOTE Confidence: 0.9546275

00:51:36.325 --> 00:51:37.605 So thank you for tuning

NOTE Confidence: 0.9546275

00:51:37.605 --> 00:51:38.485 in, and I'll turn it

NOTE Confidence: 0.9546275

00:51:38.485 --> 00:51:39.465 back to you, Pam.

NOTE Confidence: 0.9710605

00:51:40.885 --> 00:51:42.805 Great. Thanks, doctor Alfaqueray. So

NOTE Confidence: 0.9710605

00:51:42.805 --> 00:51:44.085 we will finish up,

NOTE Confidence: 0.9434476

00:51:44.485 --> 00:51:46.325 with doctor Kunstmann talking about

NOTE Confidence: 0.9434476

00:51:46.325 --> 00:51:46.825 surgery.

NOTE Confidence: 0.990407

00:51:47.310 --> 00:51:48.910 So, hopefully, our audience can

NOTE Confidence: 0.990407

00:51:48.910 --> 00:51:50.670 start thinking about questions and

NOTE Confidence: 0.990407

00:51:50.670 --> 00:51:51.710 start putting them in the

NOTE Confidence: 0.990407

00:51:51.710 --> 00:51:53.230 q and a. So, John,

NOTE Confidence: 0.990407

00:51:53.230 --> 00:51:54.370 we'll turn to you.

NOTE Confidence: 0.9934427

00:51:56.510 --> 00:51:57.810 Everybody hear me?

NOTE Confidence: 0.9133965

00:51:58.510 --> 00:51:59.410 Yes. Great.

NOTE Confidence: 0.99892104

00:52:01.070 --> 00:52:01.570 Okay.

NOTE Confidence: 0.94469637

00:52:04.955 --> 00:52:06.094 Let's see here.

NOTE Confidence: 0.99934673

00:52:09.675 --> 00:52:10.175 Alright.

NOTE Confidence: 0.9939755

00:52:11.835 --> 00:52:13.275 Everybody can see my slides,

NOTE Confidence: 0.9939755

00:52:13.275 --> 00:52:13.855 I hope.

NOTE Confidence: 0.91046524

00:52:17.739 --> 00:52:19.180 Alright. So hi. I'm John

NOTE Confidence: 0.91046524

00:52:19.180 --> 00:52:20.719 Kunstler. I'm a surgical oncologist,

NOTE Confidence: 0.99652207

00:52:21.579 --> 00:52:22.319 at Yale.

NOTE Confidence: 0.9898072

00:52:22.619 --> 00:52:23.739 Happy to be chatting tonight

NOTE Confidence: 0.9898072

00:52:23.739 --> 00:52:25.260 about neuroendocrine tumors, one of

NOTE Confidence: 0.9898072

00:52:25.260 --> 00:52:27.040 my favorite surgical topics.

NOTE Confidence: 0.9983906

00:52:27.945 --> 00:52:29.545 So for my portion of

NOTE Confidence: 0.9983906

00:52:29.545 --> 00:52:30.205 the discussion,

NOTE Confidence: 0.89272606

00:52:31.065 --> 00:52:31.885 really three,

NOTE Confidence: 0.9660981

00:52:32.425 --> 00:52:33.625 objectives that we wanna get

NOTE Confidence: 0.9660981

00:52:33.625 --> 00:52:35.305 across is what are the

NOTE Confidence: 0.9660981

00:52:35.305 --> 00:52:36.905 indications for surgery? I'm gonna

NOTE Confidence: 0.9660981

00:52:36.905 --> 00:52:38.505 try to not be too

NOTE Confidence: 0.9660981

00:52:38.505 --> 00:52:40.600 duplicative with, doctor Coons.

NOTE Confidence: 0.9947958

00:52:41.380 --> 00:52:42.420 But I did wanna spend

NOTE Confidence: 0.9947958

00:52:42.420 --> 00:52:43.620 a moment talking about other

NOTE Confidence: 0.9947958

00:52:43.620 --> 00:52:45.400 times when neuroendocrine tumors

NOTE Confidence: 0.94139344

00:52:45.780 --> 00:52:47.300 can actually forego surgery even

NOTE Confidence: 0.94139344

00:52:47.300 --> 00:52:48.360 though they might be operative,

NOTE Confidence: 0.94139344

00:52:48.660 --> 00:52:49.560 you know, candidates.

NOTE Confidence: 0.98746794

00:52:49.940 --> 00:52:51.060 What are the options for

NOTE Confidence: 0.98746794

00:52:51.060 --> 00:52:51.560 surgery?

NOTE Confidence: 0.9667153

00:52:52.260 --> 00:52:53.540 And we're gonna really focus

NOTE Confidence: 0.9667153

00:52:53.540 --> 00:52:54.945 on two paradigms, One being

NOTE Confidence: 0.9667153

00:52:54.945 --> 00:52:56.545 pancreatic neuroendocrine tumors and the

NOTE Confidence: 0.9667153

00:52:56.545 --> 00:52:58.165 other being enteric or intestinal

NOTE Confidence: 0.9667153

00:52:58.225 --> 00:52:59.765 neuroendocrine tumors, the two

NOTE Confidence: 0.9760372

00:53:00.145 --> 00:53:01.665 most commonly encountered in our

NOTE Confidence: 0.9760372

00:53:01.665 --> 00:53:02.165 practice,

NOTE Confidence: 0.9628317

00:53:02.945 --> 00:53:04.145 and then also learn what

NOTE Confidence: 0.9628317

00:53:04.145 --> 00:53:05.185 role surgery can play in

NOTE Confidence: 0.9628317

00:53:05.185 --> 00:53:06.885 the setting of metastatic disease.

NOTE Confidence: 0.99733466

00:53:07.650 --> 00:53:09.030 So just to remind you,

NOTE Confidence: 0.89521676

00:53:09.730 --> 00:53:11.650 for pancreatic neuroendocrine tumors, I

NOTE Confidence: 0.89521676

00:53:11.650 --> 00:53:12.450 know this is touched on

NOTE Confidence: 0.89521676

00:53:12.450 --> 00:53:12.950 before,

NOTE Confidence: 0.9893734

00:53:13.329 --> 00:53:15.109 you know, the broad classifications,

NOTE Confidence: 0.99866927

00:53:16.210 --> 00:53:17.829 that are relevant for surgery

NOTE Confidence: 0.99866927

00:53:17.969 --> 00:53:18.630 are those

NOTE Confidence: 0.99452794

00:53:19.010 --> 00:53:21.010 pancreatic neuroendocrine tumors that secrete

NOTE Confidence: 0.99452794

00:53:21.010 --> 00:53:22.630 hormones or functional tumors.

NOTE Confidence: 0.9435086

00:53:24.114 --> 00:53:25.075 Yeah. Some of those are

NOTE Confidence: 0.9435086

00:53:25.075 --> 00:53:26.515 more aggressive, others are are

NOTE Confidence: 0.9435086

00:53:26.515 --> 00:53:27.255 more indolent.

NOTE Confidence: 0.97857666

00:53:28.114 --> 00:53:29.474 But most cases that we

NOTE Confidence: 0.97857666

00:53:29.474 --> 00:53:31.315 diagnose today are nonfunctional. In

NOTE Confidence: 0.97857666

00:53:31.315 --> 00:53:32.934 other words, they're not secreting

NOTE Confidence: 0.97857666

00:53:32.994 --> 00:53:33.815 any hormones

NOTE Confidence: 0.9755087

00:53:34.275 --> 00:53:35.335 that we can detect.

NOTE Confidence: 0.8318941

00:53:36.674 --> 00:53:38.340 And most cases in such

NOTE Confidence: 0.9265732

00:53:38.820 --> 00:53:40.739 diagnoses are incidental, although some

NOTE Confidence: 0.9265732

00:53:40.739 --> 00:53:41.880 patients can have

NOTE Confidence: 0.99655205

00:53:42.260 --> 00:53:43.960 discomfort, weight loss, pancreatitis

NOTE Confidence: 0.9638098

00:53:44.340 --> 00:53:44.840 associated

NOTE Confidence: 0.9717474

00:53:45.540 --> 00:53:46.180 with their,

NOTE Confidence: 0.9992067

00:53:47.140 --> 00:53:48.120 with their lesion.

NOTE Confidence: 0.9968828

00:53:50.435 --> 00:53:52.535 Treatment of pancreatic neuroendocrine tumors

NOTE Confidence: 0.95304275

00:53:52.835 --> 00:53:54.855 is very stage specific. So

NOTE Confidence: 0.95304275

00:53:54.994 --> 00:53:56.915 the first question as alluded

NOTE Confidence: 0.95304275

00:53:56.915 --> 00:53:58.515 to by doctor Coons when

NOTE Confidence: 0.95304275

00:53:58.515 --> 00:53:59.734 we make a new diagnosis

NOTE Confidence: 0.95304275

00:53:59.875 --> 00:54:01.734 is whether or not this

NOTE Confidence: 0.96490544

00:54:02.035 --> 00:54:03.795 tumor is localized to the

NOTE Confidence: 0.96490544

00:54:03.795 --> 00:54:04.295 pancreas,

NOTE Confidence: 0.9688968

00:54:05.600 --> 00:54:06.640 or has it spread to

NOTE Confidence: 0.9688968

00:54:06.640 --> 00:54:07.460 other organs.

NOTE Confidence: 0.97391754

00:54:08.320 --> 00:54:09.360 As we'll talk about a

NOTE Confidence: 0.97391754

00:54:09.360 --> 00:54:10.800 little later, even in stage

NOTE Confidence: 0.97391754

00:54:10.800 --> 00:54:11.940 four disease surgery,

NOTE Confidence: 0.9623868

00:54:12.400 --> 00:54:14.000 potentially with curative intent is

NOTE Confidence: 0.9623868

00:54:14.000 --> 00:54:15.700 still appropriate in some cases.

NOTE Confidence: 0.9512602

00:54:16.160 --> 00:54:17.040 But we'll come back to

NOTE Confidence: 0.9512602

00:54:17.040 --> 00:54:19.360 that. But for localized PNET,

NOTE Confidence: 0.9512602

00:54:19.360 --> 00:54:20.055 in other words,

NOTE Confidence: 0.94813514

00:54:20.535 --> 00:54:21.655 a case where the tumor

NOTE Confidence: 0.94813514

00:54:21.655 --> 00:54:22.855 is localized only to the

NOTE Confidence: 0.94813514

00:54:22.855 --> 00:54:23.355 pancreas,

NOTE Confidence: 0.9942178

00:54:23.815 --> 00:54:25.335 surgery is the primary treatment

NOTE Confidence: 0.9942178

00:54:25.335 --> 00:54:25.835 modality.

NOTE Confidence: 0.96834266

00:54:26.375 --> 00:54:28.555 We almost always will resect

NOTE Confidence: 0.96834266

00:54:28.614 --> 00:54:29.755 functional PNETs.

NOTE Confidence: 0.9385495

00:54:30.214 --> 00:54:31.575 Again, those are those hormone

NOTE Confidence: 0.9385495

00:54:31.575 --> 00:54:32.650 secreting peanuts,

NOTE Confidence: 0.9106061

00:54:33.510 --> 00:54:35.210 and certainly any any nonfunctional

NOTE Confidence: 0.9996149

00:54:35.590 --> 00:54:37.050 peanuts that are symptomatic.

NOTE Confidence: 0.96608335

00:54:38.710 --> 00:54:40.550 Some cases can involve some

NOTE Confidence: 0.96608335

00:54:40.550 --> 00:54:42.070 other critical structures, so we

NOTE Confidence: 0.96608335

00:54:42.070 --> 00:54:43.690 call locally advanced tumors.

NOTE Confidence: 0.981375

00:54:45.110 --> 00:54:46.905 These have previously been called

NOTE Confidence: 0.981375

00:54:46.905 --> 00:54:48.585 unresectable. Sometimes they truly are

NOTE Confidence: 0.981375

00:54:48.585 --> 00:54:50.585 unresectable, but we've been able

NOTE Confidence: 0.981375

00:54:50.585 --> 00:54:52.105 to devise ways to to

NOTE Confidence: 0.981375

00:54:52.105 --> 00:54:53.225 offer surgery to many of

NOTE Confidence: 0.981375

00:54:53.225 --> 00:54:53.965 these patients.

NOTE Confidence: 0.95647615

00:54:54.985 --> 00:54:56.265 And also, you know, another

NOTE Confidence: 0.95647615

00:54:56.265 --> 00:54:57.385 special case is those that

NOTE Confidence: 0.95647615

00:54:57.385 --> 00:54:59.325 are associated with genetic syndromes,

NOTE Confidence: 0.9809942

00:55:00.210 --> 00:55:02.210 as alluded to, by doctor

NOTE Confidence: 0.9809942

00:55:02.210 --> 00:55:03.570 Klimstra, but we're not gonna

NOTE Confidence: 0.9809942

00:55:03.570 --> 00:55:05.030 necessarily touch on those tonight.

NOTE Confidence: 0.9844974

00:55:06.050 --> 00:55:06.790 For people,

NOTE Confidence: 0.96156263

00:55:07.330 --> 00:55:09.730 that have their peanut diagnosed

NOTE Confidence: 0.96156263

00:55:09.730 --> 00:55:10.230 incidentally,

NOTE Confidence: 0.94093776

00:55:11.010 --> 00:55:12.369 which again is the majority

NOTE Confidence: 0.94093776

00:55:12.369 --> 00:55:13.670 of patients these days,

NOTE Confidence: 0.97230506

00:55:14.394 --> 00:55:15.194 we try to make a

NOTE Confidence: 0.97230506

00:55:15.194 --> 00:55:17.035 determination about whether it's, you

NOTE Confidence: 0.97230506

00:55:17.035 --> 00:55:18.394 know, the more or or

NOTE Confidence: 0.97230506

00:55:18.394 --> 00:55:19.214 less aggressive

NOTE Confidence: 0.94095606

00:55:21.194 --> 00:55:22.474 behavior based on some of

NOTE Confidence: 0.94095606

00:55:22.474 --> 00:55:23.994 those factors here, some some

NOTE Confidence: 0.94095606

00:55:23.994 --> 00:55:25.355 other ones as well. You

NOTE Confidence: 0.94095606

00:55:25.355 --> 00:55:26.394 can really see why that

NOTE Confidence: 0.94095606

00:55:26.394 --> 00:55:28.315 pathologic assessment is so important

NOTE Confidence: 0.94095606

00:55:28.315 --> 00:55:28.954 in these,

NOTE Confidence: 0.906098

00:55:29.730 --> 00:55:31.270 in making these treatment decisions.

NOTE Confidence: 0.96993995

00:55:31.969 --> 00:55:33.250 I think, you know, boiling

NOTE Confidence: 0.96993995

00:55:33.250 --> 00:55:34.210 it down though, the thing

NOTE Confidence: 0.96993995

00:55:34.210 --> 00:55:35.030 I always try

NOTE Confidence: 0.9760017

00:55:35.330 --> 00:55:36.450 to describe to patients is

NOTE Confidence: 0.9760017

00:55:36.450 --> 00:55:37.430 that all peanuts,

NOTE Confidence: 0.9882214

00:55:38.290 --> 00:55:39.489 are cancers, and they have

NOTE Confidence: 0.9882214

00:55:39.489 --> 00:55:40.690 the potential to grow and

NOTE Confidence: 0.9882214

00:55:40.690 --> 00:55:42.050 spread. It just so happens

NOTE Confidence: 0.9882214

00:55:42.050 --> 00:55:43.425 that the likelihood of spread

NOTE Confidence: 0.9882214

00:55:43.745 --> 00:55:44.565 is extraordinarily

NOTE Confidence: 0.99254936

00:55:44.945 --> 00:55:46.405 low in a certain subset

NOTE Confidence: 0.99254936

00:55:46.545 --> 00:55:48.785 of pancreatic neuroendocrine tumors, which

NOTE Confidence: 0.99254936

00:55:48.785 --> 00:55:50.225 has given rise to this,

NOTE Confidence: 0.9777896

00:55:50.785 --> 00:55:52.625 paradigm for observation that we've

NOTE Confidence: 0.9777896

00:55:52.625 --> 00:55:54.065 seen. And this has really

NOTE Confidence: 0.9777896

00:55:54.065 --> 00:55:55.585 come, about I'm gonna go

NOTE Confidence: 0.9777896

00:55:55.585 --> 00:55:56.790 through this kinda quickly, but

NOTE Confidence: 0.9777896

00:55:56.950 --> 00:55:57.910 this has really come about

NOTE Confidence: 0.9777896

00:55:57.910 --> 00:55:58.710 in the last ten to

NOTE Confidence: 0.9777896

00:55:58.710 --> 00:56:00.390 fifteen years with a number

NOTE Confidence: 0.9777896

00:56:00.390 --> 00:56:01.430 of case series, and there's

NOTE Confidence: 0.9777896

00:56:01.430 --> 00:56:02.890 some newer studies as well

NOTE Confidence: 0.9777896

00:56:03.110 --> 00:56:04.870 that shows that patients, you

NOTE Confidence: 0.9777896

00:56:04.870 --> 00:56:06.489 know, that undergo observation,

NOTE Confidence: 0.9908868

00:56:06.950 --> 00:56:08.630 if they're carefully selected, they

NOTE Confidence: 0.9908868

00:56:08.630 --> 00:56:09.525 actually have,

NOTE Confidence: 0.9745303

00:56:10.565 --> 00:56:11.625 you know, oftentimes

NOTE Confidence: 0.984931

00:56:12.005 --> 00:56:13.525 no change in their overall

NOTE Confidence: 0.984931

00:56:13.525 --> 00:56:15.045 outcome as to patients that

NOTE Confidence: 0.984931

00:56:15.045 --> 00:56:16.265 go straight to surgery.

NOTE Confidence: 0.9898122

00:56:16.645 --> 00:56:17.844 So this has really become

NOTE Confidence: 0.9898122

00:56:17.844 --> 00:56:18.825 kind of the new,

NOTE Confidence: 0.9917252

00:56:19.684 --> 00:56:21.525 mindset for patients with small

NOTE Confidence: 0.9917252

00:56:21.525 --> 00:56:22.025 asymptomatic

NOTE Confidence: 0.7353587

00:56:22.645 --> 00:56:23.385 non functional

NOTE Confidence: 0.9809301

00:56:23.910 --> 00:56:25.030 incidentally discovered,

NOTE Confidence: 0.9908072

00:56:25.430 --> 00:56:26.489 pancreatic NETs.

NOTE Confidence: 0.95548755

00:56:26.790 --> 00:56:27.989 So the question about are

NOTE Confidence: 0.95548755

00:56:27.989 --> 00:56:29.270 some safe to observe? Well,

NOTE Confidence: 0.95548755

00:56:29.270 --> 00:56:30.230 the answer to that is

NOTE Confidence: 0.95548755

00:56:30.230 --> 00:56:31.349 is yes. But who are

NOTE Confidence: 0.95548755

00:56:31.349 --> 00:56:31.849 they?

NOTE Confidence: 0.9940978

00:56:33.190 --> 00:56:34.710 You know, as I said,

NOTE Confidence: 0.9940978

00:56:34.710 --> 00:56:35.849 they have to be asymptomatic

NOTE Confidence: 0.85542417

00:56:36.150 --> 00:56:37.130 and and nonfunctioning.

NOTE Confidence: 0.97163755

00:56:37.430 --> 00:56:38.635 In other words, not secreting

NOTE Confidence: 0.97163755

00:56:38.635 --> 00:56:40.395 a hormone in excess. No

NOTE Confidence: 0.97163755

00:56:40.395 --> 00:56:41.995 evidence of spread to the

NOTE Confidence: 0.97163755

00:56:41.995 --> 00:56:43.215 lymph nodes or elsewhere.

NOTE Confidence: 0.9981412

00:56:44.235 --> 00:56:45.295 A well differentiated

NOTE Confidence: 0.97027266

00:56:45.755 --> 00:56:47.515 pathology, in other words, one

NOTE Confidence: 0.97027266

00:56:47.515 --> 00:56:49.535 that we believe will behave,

NOTE Confidence: 0.9482896

00:56:50.155 --> 00:56:51.855 a little bit more indolent.

NOTE Confidence: 0.9434898

00:56:52.440 --> 00:56:54.280 Ly. Generally speaking, a small

NOTE Confidence: 0.9434898

00:56:54.280 --> 00:56:55.560 tumor because it's much likely

NOTE Confidence: 0.9434898

00:56:55.640 --> 00:56:56.680 it's less likely to spread

NOTE Confidence: 0.9434898

00:56:56.680 --> 00:56:58.140 without us understanding it.

NOTE Confidence: 0.9707455

00:56:58.440 --> 00:56:59.880 And, also, I think probably

NOTE Confidence: 0.9707455

00:56:59.880 --> 00:57:01.080 the most important thing is

NOTE Confidence: 0.9707455

00:57:01.080 --> 00:57:02.280 the patient has to,

NOTE Confidence: 0.9990516

00:57:02.680 --> 00:57:04.540 be amenable to surveillance.

NOTE Confidence: 0.9956247

00:57:05.594 --> 00:57:06.875 What does that mean? Both

NOTE Confidence: 0.9956247

00:57:06.875 --> 00:57:08.955 follow-up and and scans to

NOTE Confidence: 0.9956247

00:57:08.955 --> 00:57:10.155 make sure that this this

NOTE Confidence: 0.9956247

00:57:10.155 --> 00:57:11.775 tumor doesn't grow and spread.

NOTE Confidence: 0.9979631

00:57:12.715 --> 00:57:14.094 So if all those criteria

NOTE Confidence: 0.99894154

00:57:14.395 --> 00:57:15.055 are met,

NOTE Confidence: 0.99381346

00:57:15.594 --> 00:57:16.715 we we can and and

NOTE Confidence: 0.99381346

00:57:16.715 --> 00:57:18.255 do observe some of these.

NOTE Confidence: 0.99381346

00:57:18.350 --> 00:57:19.470 But when we take patients

NOTE Confidence: 0.99381346

00:57:19.470 --> 00:57:20.590 to surgery, what are our

NOTE Confidence: 0.99381346

00:57:20.590 --> 00:57:21.070 goals?

NOTE Confidence: 0.9840766

00:57:21.470 --> 00:57:22.510 For me as a surgeon,

NOTE Confidence: 0.9840766

00:57:22.510 --> 00:57:23.970 obviously, I wanna maximize,

NOTE Confidence: 0.96071595

00:57:24.830 --> 00:57:25.790 the control of the tumor.

NOTE Confidence: 0.96071595

00:57:25.790 --> 00:57:26.670 And by that, I mean,

NOTE Confidence: 0.96071595

00:57:26.670 --> 00:57:28.110 remove it, and have doctor

NOTE Confidence: 0.96071595

00:57:28.110 --> 00:57:29.550 Klimstra come back and tell

NOTE Confidence: 0.96071595

00:57:29.550 --> 00:57:31.070 me that, those margins are

NOTE Confidence: 0.96071595

00:57:31.070 --> 00:57:32.770 completely clear and it's been

NOTE Confidence: 0.96071595

00:57:33.045 --> 00:57:34.325 entirely removed, and we wanna

NOTE Confidence: 0.96071595

00:57:34.325 --> 00:57:35.625 remove the lymph nodes

NOTE Confidence: 0.99903333

00:57:36.005 --> 00:57:37.545 along that area as well

NOTE Confidence: 0.95826703

00:57:38.484 --> 00:57:40.165 because we don't know usually

NOTE Confidence: 0.95826703

00:57:40.165 --> 00:57:41.845 before surgery whether or not

NOTE Confidence: 0.95826703

00:57:41.845 --> 00:57:43.145 any of those lymph nodes,

NOTE Confidence: 0.9809236

00:57:43.845 --> 00:57:45.204 carry disease, and we certainly

NOTE Confidence: 0.9809236

00:57:45.204 --> 00:57:46.005 want them out of the

NOTE Confidence: 0.9809236

00:57:46.005 --> 00:57:47.580 body. You know, the overall

NOTE Confidence: 0.9809236

00:57:47.580 --> 00:57:49.360 goals are to prolong survival

NOTE Confidence: 0.9809236

00:57:49.420 --> 00:57:50.780 and and also improve quality

NOTE Confidence: 0.9809236

00:57:50.780 --> 00:57:51.820 of life, especially in the

NOTE Confidence: 0.9809236

00:57:51.820 --> 00:57:53.020 cases where the tumor is

NOTE Confidence: 0.9809236

00:57:53.020 --> 00:57:54.240 symptomatic or metastatic.

NOTE Confidence: 0.9622371

00:57:55.020 --> 00:57:56.380 But we also wanna minimize

NOTE Confidence: 0.9622371

00:57:56.380 --> 00:57:57.520 the risks of surgery.

NOTE Confidence: 0.8830629

00:57:57.980 --> 00:57:58.940 And by risk, I mean

NOTE Confidence: 0.8830629

00:57:58.940 --> 00:57:59.440 complication.

NOTE Confidence: 0.99157506

00:58:00.075 --> 00:58:00.955 You can see some of

NOTE Confidence: 0.99157506

00:58:00.955 --> 00:58:02.315 the complications there that we

NOTE Confidence: 0.99157506

00:58:02.315 --> 00:58:03.994 watch out for. Each are

NOTE Confidence: 0.99157506

00:58:03.994 --> 00:58:05.295 are sort of individualized

NOTE Confidence: 0.9292704

00:58:05.675 --> 00:58:06.415 and unique,

NOTE Confidence: 0.9969308

00:58:06.795 --> 00:58:07.675 in terms of how we

NOTE Confidence: 0.9969308

00:58:07.675 --> 00:58:08.655 mitigate them.

NOTE Confidence: 0.998229

00:58:09.595 --> 00:58:10.635 But in terms of what

NOTE Confidence: 0.998229

00:58:10.635 --> 00:58:11.135 operation

NOTE Confidence: 0.9700911

00:58:11.435 --> 00:58:13.035 we choose, it really depends

NOTE Confidence: 0.9700911

00:58:13.035 --> 00:58:14.315 on where the tumor is

NOTE Confidence: 0.9700911

00:58:14.315 --> 00:58:16.050 and how much, you know,

NOTE Confidence: 0.9700911

00:58:16.050 --> 00:58:17.190 lymph node harvest

NOTE Confidence: 0.942488

00:58:17.570 --> 00:58:18.450 and and really what kind

NOTE Confidence: 0.942488

00:58:18.450 --> 00:58:18.690 of,

NOTE Confidence: 0.98711663

00:58:19.570 --> 00:58:21.730 you know, comorbid conditions or

NOTE Confidence: 0.98711663

00:58:21.730 --> 00:58:23.090 or other medical conditions a

NOTE Confidence: 0.98711663

00:58:23.090 --> 00:58:25.090 patient may have. Certainly, some

NOTE Confidence: 0.98711663

00:58:25.090 --> 00:58:25.590 patients,

NOTE Confidence: 0.9788517

00:58:26.450 --> 00:58:27.410 you know, may not be

NOTE Confidence: 0.9788517

00:58:27.410 --> 00:58:28.610 a candidate for a very

NOTE Confidence: 0.9788517

00:58:28.610 --> 00:58:30.370 extensive operation. We may look

NOTE Confidence: 0.9788517

00:58:30.370 --> 00:58:32.915 for nonsurgical alternatives to treatment.

NOTE Confidence: 0.9885559

00:58:33.455 --> 00:58:34.815 You know, the simplest operation

NOTE Confidence: 0.9885559

00:58:34.815 --> 00:58:35.775 we do is something called

NOTE Confidence: 0.9885559

00:58:35.775 --> 00:58:36.275 enucleation.

NOTE Confidence: 0.9958999

00:58:36.815 --> 00:58:38.255 That's really just taking the

NOTE Confidence: 0.9958999

00:58:38.255 --> 00:58:39.635 tumor out of the pancreas

NOTE Confidence: 0.9958999

00:58:39.775 --> 00:58:41.155 itself. You can see it's,

NOTE Confidence: 0.9765692

00:58:41.935 --> 00:58:43.055 not quite as easy as

NOTE Confidence: 0.9765692

00:58:43.055 --> 00:58:44.435 the cartoon suggests,

NOTE Confidence: 0.98174936

00:58:45.819 --> 00:58:46.859 but it really is just

NOTE Confidence: 0.98174936

00:58:46.859 --> 00:58:48.220 removing the tumor itself while

NOTE Confidence: 0.98174936

00:58:48.220 --> 00:58:49.760 leaving all of the pancreas

NOTE Confidence: 0.98174936

00:58:49.900 --> 00:58:51.099 behind. It does have a

NOTE Confidence: 0.98174936

00:58:51.099 --> 00:58:52.700 very low complication rate, but

NOTE Confidence: 0.98174936

00:58:52.700 --> 00:58:53.660 the problem with that is

NOTE Confidence: 0.98174936

00:58:53.660 --> 00:58:54.640 it's really only,

NOTE Confidence: 0.99404764

00:58:55.339 --> 00:58:56.720 correct for the most,

NOTE Confidence: 0.98706067

00:58:57.420 --> 00:58:59.359 indolent and small tumors.

NOTE Confidence: 0.9138357

00:58:59.985 --> 00:59:00.485 Insulinomas

NOTE Confidence: 0.9848008

00:59:00.785 --> 00:59:02.065 are are the kind of

NOTE Confidence: 0.9848008

00:59:02.065 --> 00:59:03.345 classic example. You can see

NOTE Confidence: 0.9848008

00:59:03.345 --> 00:59:04.865 a pathology specimen there, what

NOTE Confidence: 0.9848008

00:59:04.865 --> 00:59:06.145 it looks like when it

NOTE Confidence: 0.9848008

00:59:06.145 --> 00:59:07.185 comes out. It also has

NOTE Confidence: 0.9848008

00:59:07.185 --> 00:59:08.065 to be away from the

NOTE Confidence: 0.9848008

00:59:08.065 --> 00:59:08.565 pancreatic

NOTE Confidence: 0.9057075

00:59:10.145 --> 00:59:11.345 duct so we don't get

NOTE Confidence: 0.9057075

00:59:11.345 --> 00:59:13.525 a pancreatic leak after surgery.

NOTE Confidence: 0.96659344

00:59:15.720 --> 00:59:17.400 Most patients are not candidates

NOTE Confidence: 0.96659344

00:59:17.400 --> 00:59:18.220 for enucleation.

NOTE Confidence: 0.9602831

00:59:18.840 --> 00:59:19.800 Again, the main thing is

NOTE Confidence: 0.9602831

00:59:19.800 --> 00:59:20.940 the tumor location,

NOTE Confidence: 0.93134916

00:59:21.720 --> 00:59:22.920 but mostly, and what I'm

NOTE Confidence: 0.93134916

00:59:22.920 --> 00:59:23.960 gonna talk about today is

NOTE Confidence: 0.93134916

00:59:23.960 --> 00:59:25.240 two main procedures, what's called

NOTE Confidence: 0.93134916

00:59:25.240 --> 00:59:26.760 a Whipple procedure, a pancreatic

NOTE Confidence: 0.93134916

00:59:26.760 --> 00:59:28.359 or duodenectomy for tumors in

NOTE Confidence: 0.93134916

00:59:28.359 --> 00:59:28.845 the head,

NOTE Confidence: 0.9917839

00:59:29.244 --> 00:59:30.545 and then a distal pancreatectomy

NOTE Confidence: 0.9782188

00:59:30.845 --> 00:59:31.805 for tumors in the neck

NOTE Confidence: 0.9782188

00:59:31.805 --> 00:59:32.785 or or body.

NOTE Confidence: 0.97625834

00:59:34.285 --> 00:59:35.325 You know, is it safe?

NOTE Confidence: 0.97625834

00:59:35.325 --> 00:59:36.605 You know, especially when people

NOTE Confidence: 0.97625834

00:59:36.605 --> 00:59:37.345 talk about

NOTE Confidence: 0.96409124

00:59:37.885 --> 00:59:39.405 Whipple procedures, they may have

NOTE Confidence: 0.96409124

00:59:39.405 --> 00:59:40.605 heard that or Googled that

NOTE Confidence: 0.96409124

00:59:40.605 --> 00:59:41.965 or, you know, heard about

NOTE Confidence: 0.96409124

00:59:41.965 --> 00:59:42.765 it from a friend or

NOTE Confidence: 0.96409124

00:59:42.765 --> 00:59:43.744 a TV show.

NOTE Confidence: 0.97847515

00:59:44.369 --> 00:59:45.970 The bottom line is, it

NOTE Confidence: 0.97847515

00:59:45.970 --> 00:59:47.250 is a big operation. And

NOTE Confidence: 0.97847515

00:59:47.250 --> 00:59:48.930 even a distal pancreatectomy is

NOTE Confidence: 0.97847515

00:59:48.930 --> 00:59:49.750 a big operation.

NOTE Confidence: 0.98922443

00:59:50.210 --> 00:59:51.349 But at the same time,

NOTE Confidence: 0.9316439

00:59:52.130 --> 00:59:53.809 at centers and with surgeons

NOTE Confidence: 0.9316439

00:59:53.809 --> 00:59:55.170 that have experience and high

NOTE Confidence: 0.9316439

00:59:55.170 --> 00:59:55.670 volume,

NOTE Confidence: 0.96486175

00:59:56.454 --> 00:59:57.734 of patients, it can be

NOTE Confidence: 0.96486175

00:59:57.734 --> 00:59:58.855 done safely and it can

NOTE Confidence: 0.96486175

00:59:58.855 --> 01:00:00.375 be done with a reasonable

NOTE Confidence: 0.96486175

01:00:00.375 --> 01:00:01.355 risk of complication.

NOTE Confidence: 0.9657188

01:00:02.775 --> 01:00:04.135 You know, for instance, here

NOTE Confidence: 0.9657188

01:00:04.135 --> 01:00:05.415 at Yale, these numbers are

NOTE Confidence: 0.9657188

01:00:05.415 --> 01:00:06.395 a year too old,

NOTE Confidence: 0.9693104

01:00:07.095 --> 01:00:08.135 but we do about a

NOTE Confidence: 0.9693104

01:00:08.135 --> 01:00:10.795 hundred, pancreatic resections a year.

NOTE Confidence: 0.968585

01:00:11.640 --> 01:00:12.519 Know, that number has gone

NOTE Confidence: 0.968585

01:00:12.519 --> 01:00:13.240 up in the last two

NOTE Confidence: 0.968585

01:00:13.240 --> 01:00:14.140 or three years,

NOTE Confidence: 0.9953714

01:00:14.839 --> 01:00:16.279 and we've also developed a

NOTE Confidence: 0.9953714

01:00:16.279 --> 01:00:17.960 number of of things here

NOTE Confidence: 0.9953714

01:00:17.960 --> 01:00:19.480 at Yale to minimize risk

NOTE Confidence: 0.9953714

01:00:19.480 --> 01:00:20.140 of complication.

NOTE Confidence: 0.9835216

01:00:20.839 --> 01:00:22.200 You know, the mortality for

NOTE Confidence: 0.9835216

01:00:22.200 --> 01:00:23.819 a Whipple procedure, for instance,

NOTE Confidence: 0.97309583

01:00:24.655 --> 01:00:25.535 you know, used to be

NOTE Confidence: 0.97309583

01:00:25.535 --> 01:00:26.815 considered to be three percent

NOTE Confidence: 0.97309583

01:00:26.815 --> 01:00:27.775 or less was was a

NOTE Confidence: 0.97309583

01:00:27.775 --> 01:00:29.375 good number here. It's under

NOTE Confidence: 0.97309583

01:00:29.375 --> 01:00:30.735 two percent. The length of

NOTE Confidence: 0.97309583

01:00:30.735 --> 01:00:32.035 stay has gone down.

NOTE Confidence: 0.9872792

01:00:32.975 --> 01:00:34.495 And, you know, at at

NOTE Confidence: 0.9872792

01:00:34.495 --> 01:00:35.615 Yale, again, the risk of

NOTE Confidence: 0.9872792

01:00:35.615 --> 01:00:36.115 complication,

NOTE Confidence: 0.99382657

01:00:37.295 --> 01:00:38.255 you know, is better than

NOTE Confidence: 0.99382657

01:00:38.255 --> 01:00:40.460 the ninetieth percentile nationally. So

NOTE Confidence: 0.99382657

01:00:40.460 --> 01:00:41.520 a distal pancreatectomy,

NOTE Confidence: 0.9954777

01:00:41.900 --> 01:00:42.880 which is oftentimes

NOTE Confidence: 0.90460014

01:00:43.180 --> 01:00:44.940 the tumor or the treatment

NOTE Confidence: 0.90460014

01:00:44.940 --> 01:00:46.160 of choice for a neuroendocrine

NOTE Confidence: 0.90460014

01:00:46.299 --> 01:00:46.799 tumor,

NOTE Confidence: 0.9812638

01:00:47.980 --> 01:00:49.020 is for tumors that are

NOTE Confidence: 0.9812638

01:00:49.020 --> 01:00:49.980 located in the body or

NOTE Confidence: 0.9812638

01:00:49.980 --> 01:00:51.180 tail of pancreas. It can

NOTE Confidence: 0.9812638

01:00:51.180 --> 01:00:52.140 be done open. It can

NOTE Confidence: 0.9812638

01:00:52.140 --> 01:00:53.420 be done laparoscopic. It can

NOTE Confidence: 0.9812638

01:00:53.420 --> 01:00:54.700 be done robot assisted. We

NOTE Confidence: 0.9812638

01:00:54.700 --> 01:00:55.865 do all of them here

NOTE Confidence: 0.9812638

01:00:55.865 --> 01:00:57.145 at Yale. We certainly favor

NOTE Confidence: 0.9812638

01:00:57.145 --> 01:00:58.825 a minimally invasive approach in

NOTE Confidence: 0.9812638

01:00:58.825 --> 01:00:59.805 in most patients,

NOTE Confidence: 0.9976657

01:01:01.224 --> 01:01:02.345 you know, that are that

NOTE Confidence: 0.9976657

01:01:02.345 --> 01:01:03.645 are candidates for it.

NOTE Confidence: 0.9949389

01:01:04.744 --> 01:01:06.185 Removal of the spleen is

NOTE Confidence: 0.9949389

01:01:06.185 --> 01:01:07.145 done on a case by

NOTE Confidence: 0.9949389

01:01:07.145 --> 01:01:08.609 case basis. You can see

NOTE Confidence: 0.9949389

01:01:08.609 --> 01:01:09.730 there in the cartoon, you

NOTE Confidence: 0.9949389

01:01:09.730 --> 01:01:10.950 know, the reason the spleen

NOTE Confidence: 0.97341216

01:01:11.329 --> 01:01:13.250 is oftentimes removed is that

NOTE Confidence: 0.97341216

01:01:13.250 --> 01:01:15.009 the vessels, both the artery

NOTE Confidence: 0.97341216

01:01:15.009 --> 01:01:16.130 and the vein that go

NOTE Confidence: 0.97341216

01:01:16.130 --> 01:01:17.910 to the spleen, are oftentimes

NOTE Confidence: 0.97086304

01:01:18.210 --> 01:01:19.970 very, very intimately involved with

NOTE Confidence: 0.97086304

01:01:19.970 --> 01:01:20.630 the tumor.

NOTE Confidence: 0.95646435

01:01:21.785 --> 01:01:23.225 You know, for adults, removal

NOTE Confidence: 0.95646435

01:01:23.225 --> 01:01:24.425 of the spleen has has

NOTE Confidence: 0.95646435

01:01:24.425 --> 01:01:25.485 really no consequence,

NOTE Confidence: 0.9984143

01:01:26.585 --> 01:01:27.865 in terms of your overall

NOTE Confidence: 0.9984143

01:01:27.865 --> 01:01:28.365 health.

NOTE Confidence: 0.9244992

01:01:29.705 --> 01:01:31.465 However, sometimes it can be

NOTE Confidence: 0.9244992

01:01:31.465 --> 01:01:31.965 spared,

NOTE Confidence: 0.975815

01:01:32.585 --> 01:01:34.605 in in properly selected patients,

NOTE Confidence: 0.950517

01:01:36.260 --> 01:01:37.240 but not really

NOTE Confidence: 0.88822895

01:01:37.780 --> 01:01:38.660 a concern that,

NOTE Confidence: 0.9970378

01:01:39.140 --> 01:01:40.260 we worry about too much

NOTE Confidence: 0.9970378

01:01:40.260 --> 01:01:41.460 if that spleen needs to

NOTE Confidence: 0.9970378

01:01:41.460 --> 01:01:42.119 be removed.

NOTE Confidence: 0.9818066

01:01:43.300 --> 01:01:44.260 I'm gonna put just a

NOTE Confidence: 0.9818066

01:01:44.260 --> 01:01:45.619 couple of surgical photos. So

NOTE Confidence: 0.9818066

01:01:45.619 --> 01:01:46.500 if you're a little bit

NOTE Confidence: 0.9818066

01:01:46.740 --> 01:01:47.780 you don't like the the

NOTE Confidence: 0.9818066

01:01:47.780 --> 01:01:49.220 sight of of organs, you

NOTE Confidence: 0.9818066

01:01:49.220 --> 01:01:50.260 may wanna close your eyes

NOTE Confidence: 0.9818066

01:01:50.260 --> 01:01:51.400 for just a moment.

NOTE Confidence: 0.9915414

01:01:51.885 --> 01:01:52.725 But just to show you

NOTE Confidence: 0.9915414

01:01:52.725 --> 01:01:53.565 a picture, you know, this

NOTE Confidence: 0.9915414

01:01:53.565 --> 01:01:54.205 is what it looks like

NOTE Confidence: 0.9915414

01:01:54.205 --> 01:01:55.505 when you perform a laparoscopic

NOTE Confidence: 0.9915414

01:01:55.725 --> 01:01:56.225 procedure.

NOTE Confidence: 0.9784136

01:01:56.765 --> 01:01:58.225 This is a spleen preserving

NOTE Confidence: 0.9784136

01:01:58.445 --> 01:01:59.965 procedure. You can see this

NOTE Confidence: 0.9784136

01:01:59.965 --> 01:02:01.165 staple line here is on

NOTE Confidence: 0.9784136

01:02:01.165 --> 01:02:02.525 the remaining pancreas, which is

NOTE Confidence: 0.9784136

01:02:02.525 --> 01:02:03.885 over here. The part of

NOTE Confidence: 0.9784136

01:02:03.885 --> 01:02:05.325 the pancreas that's been removed

NOTE Confidence: 0.9784136

01:02:05.325 --> 01:02:06.830 is right over here. Here's

NOTE Confidence: 0.9784136

01:02:06.830 --> 01:02:08.910 that splenic artery that's going

NOTE Confidence: 0.9784136

01:02:08.910 --> 01:02:10.450 along and the splenic vein

NOTE Confidence: 0.9784136

01:02:10.590 --> 01:02:11.630 that's going on, and here's

NOTE Confidence: 0.9784136

01:02:11.630 --> 01:02:12.590 the spleen. You know, if

NOTE Confidence: 0.9784136

01:02:12.590 --> 01:02:13.470 the spleen needs to be

NOTE Confidence: 0.9784136

01:02:13.470 --> 01:02:14.990 removed, then these vessels are

NOTE Confidence: 0.9784136

01:02:14.990 --> 01:02:15.950 are removed. But you can

NOTE Confidence: 0.9784136

01:02:15.950 --> 01:02:16.830 see all of the lymph

NOTE Confidence: 0.9784136

01:02:16.830 --> 01:02:18.510 nodes and tissue has been

NOTE Confidence: 0.9784136

01:02:18.510 --> 01:02:19.730 removed along there.

NOTE Confidence: 0.99840385

01:02:20.345 --> 01:02:21.464 This this case was done

NOTE Confidence: 0.99840385

01:02:21.464 --> 01:02:23.244 in a minimally invasive way.

NOTE Confidence: 0.88039017

01:02:24.825 --> 01:02:25.325 Anyways,

NOTE Confidence: 0.9714137

01:02:26.105 --> 01:02:28.744 so for peanuts, pancreatic neuroendocrine

NOTE Confidence: 0.9714137

01:02:28.744 --> 01:02:29.785 tumors, again, the goal of

NOTE Confidence: 0.9714137

01:02:29.785 --> 01:02:30.825 the surgery is to control

NOTE Confidence: 0.9714137

01:02:30.825 --> 01:02:31.484 the disease,

NOTE Confidence: 0.97268414

01:02:32.390 --> 01:02:33.590 increase the quality of life

NOTE Confidence: 0.97268414

01:02:33.590 --> 01:02:34.630 if we can, and do

NOTE Confidence: 0.97268414

01:02:34.630 --> 01:02:36.650 it with minimal complication rig.

NOTE Confidence: 0.9583931

01:02:37.190 --> 01:02:38.870 Three operations are are usually

NOTE Confidence: 0.9583931

01:02:38.870 --> 01:02:40.230 done most frequently, a Whipple

NOTE Confidence: 0.9583931

01:02:40.230 --> 01:02:41.530 procedure, a distal pancreatectomy,

NOTE Confidence: 0.9023471

01:02:41.910 --> 01:02:42.730 or or enucleation

NOTE Confidence: 0.9652374

01:02:43.350 --> 01:02:45.025 in rare cases. And, again,

NOTE Confidence: 0.9652374

01:02:45.025 --> 01:02:46.305 the operation is dictated by

NOTE Confidence: 0.9652374

01:02:46.305 --> 01:02:47.345 the location of the tumor,

NOTE Confidence: 0.9652374

01:02:47.345 --> 01:02:48.785 and the outcomes really are

NOTE Confidence: 0.9652374

01:02:48.785 --> 01:02:50.145 are excellent at high volume

NOTE Confidence: 0.9652374

01:02:50.145 --> 01:02:50.645 centers.

NOTE Confidence: 0.9952009

01:02:50.945 --> 01:02:52.625 I'm gonna shift gears, for

NOTE Confidence: 0.9952009

01:02:52.625 --> 01:02:53.585 the last few minutes to

NOTE Confidence: 0.9952009

01:02:53.585 --> 01:02:55.845 talk about intestinal neuroendocrine tumors.

NOTE Confidence: 0.9766308

01:02:56.545 --> 01:02:57.925 These can occur anywhere,

NOTE Confidence: 0.9731161

01:02:59.250 --> 01:03:00.690 from your esophagus to your

NOTE Confidence: 0.9731161

01:03:00.690 --> 01:03:01.190 rectum,

NOTE Confidence: 0.97615814

01:03:01.970 --> 01:03:03.410 but most commonly, they occur

NOTE Confidence: 0.97615814

01:03:03.410 --> 01:03:04.690 in the small intestine or

NOTE Confidence: 0.97615814

01:03:04.690 --> 01:03:05.190 appendix,

NOTE Confidence: 0.9606218

01:03:06.770 --> 01:03:08.630 what we call midgut neuroendocrine

NOTE Confidence: 0.9606218

01:03:08.850 --> 01:03:09.350 tumor.

NOTE Confidence: 0.9690266

01:03:09.970 --> 01:03:11.330 So it is the most

NOTE Confidence: 0.9690266

01:03:11.330 --> 01:03:12.450 common tumor of the small

NOTE Confidence: 0.9690266

01:03:12.450 --> 01:03:12.950 bowel.

NOTE Confidence: 0.9878256

01:03:14.405 --> 01:03:16.244 Some patients do present with

NOTE Confidence: 0.9878256

01:03:16.244 --> 01:03:16.744 obstruction

NOTE Confidence: 0.99493265

01:03:17.045 --> 01:03:19.045 or abdominal discomfort or symptoms

NOTE Confidence: 0.99493265

01:03:19.045 --> 01:03:19.704 from them.

NOTE Confidence: 0.93835825

01:03:20.484 --> 01:03:21.685 Sometimes it can cause a

NOTE Confidence: 0.93835825

01:03:21.685 --> 01:03:22.805 full blown obstruction or what

NOTE Confidence: 0.93835825

01:03:22.805 --> 01:03:23.785 was called an interoception,

NOTE Confidence: 0.96761537

01:03:24.085 --> 01:03:24.964 which I think there's a

NOTE Confidence: 0.96761537

01:03:24.964 --> 01:03:26.085 photo here. Yep. That's an

NOTE Confidence: 0.96761537

01:03:26.085 --> 01:03:27.305 interoception there,

NOTE Confidence: 0.9860898

01:03:28.410 --> 01:03:29.770 some bowel. You can see

NOTE Confidence: 0.9860898

01:03:29.770 --> 01:03:31.050 that that that could cause

NOTE Confidence: 0.9860898

01:03:31.050 --> 01:03:32.089 a problem there. It's sort

NOTE Confidence: 0.9860898

01:03:32.089 --> 01:03:32.910 of like a windsock,

NOTE Confidence: 0.9516382

01:03:33.930 --> 01:03:35.230 going inside out.

NOTE Confidence: 0.9980796

01:03:35.770 --> 01:03:37.290 But most patients are diagnosed

NOTE Confidence: 0.9980796

01:03:37.290 --> 01:03:37.790 incidentally.

NOTE Confidence: 0.98269093

01:03:39.825 --> 01:03:41.505 Patients that do have these

NOTE Confidence: 0.98269093

01:03:41.505 --> 01:03:43.025 tumors, the primary tumor actually

NOTE Confidence: 0.98269093

01:03:43.025 --> 01:03:44.464 tends to be rather small

NOTE Confidence: 0.98269093

01:03:44.464 --> 01:03:45.685 and starts in the intestines

NOTE Confidence: 0.98269093

01:03:45.744 --> 01:03:47.185 here, but when they spread

NOTE Confidence: 0.98269093

01:03:47.185 --> 01:03:48.464 to the lymph nodes, these

NOTE Confidence: 0.98269093

01:03:48.464 --> 01:03:48.964 yellow

NOTE Confidence: 0.9973834

01:03:49.265 --> 01:03:50.785 nodules here along the blood

NOTE Confidence: 0.9973834

01:03:50.785 --> 01:03:51.285 vessels,

NOTE Confidence: 0.98403466

01:03:51.920 --> 01:03:53.760 those lesions the lymph nodes

NOTE Confidence: 0.98403466

01:03:53.760 --> 01:03:55.200 can get quite large, and

NOTE Confidence: 0.98403466

01:03:55.200 --> 01:03:56.560 those lymph nodes actually are

NOTE Confidence: 0.98403466

01:03:56.560 --> 01:03:57.860 oftentimes the source

NOTE Confidence: 0.9852869

01:03:58.160 --> 01:03:59.360 of the pain or discomfort

NOTE Confidence: 0.9852869

01:03:59.360 --> 01:04:00.880 or obstruction or what's noticed

NOTE Confidence: 0.9852869

01:04:00.880 --> 01:04:02.400 on a scan that leads

NOTE Confidence: 0.9852869

01:04:02.400 --> 01:04:03.280 a patient to get the

NOTE Confidence: 0.9852869

01:04:03.280 --> 01:04:03.780 diagnosis.

NOTE Confidence: 0.9544901

01:04:05.375 --> 01:04:06.494 You know, the staging of

NOTE Confidence: 0.9544901

01:04:06.494 --> 01:04:07.155 these patients,

NOTE Confidence: 0.9597509

01:04:07.775 --> 01:04:09.935 as before can include testing

NOTE Confidence: 0.9597509

01:04:09.935 --> 01:04:11.875 both labs, studies, biopsies.

NOTE Confidence: 0.9576292

01:04:13.055 --> 01:04:14.415 If possible, we wanna try

NOTE Confidence: 0.9576292

01:04:14.415 --> 01:04:15.935 and understand the grade so

NOTE Confidence: 0.9576292

01:04:15.935 --> 01:04:17.395 we understand the best treatments.

NOTE Confidence: 0.98271215

01:04:18.015 --> 01:04:18.895 But the goal of all

NOTE Confidence: 0.98271215

01:04:18.895 --> 01:04:20.480 these, you know, tests is

NOTE Confidence: 0.98271215

01:04:20.480 --> 01:04:21.920 to determine the resectability and,

NOTE Confidence: 0.98271215

01:04:21.920 --> 01:04:22.960 again, whether or not there's

NOTE Confidence: 0.98271215

01:04:22.960 --> 01:04:23.940 been any spread.

NOTE Confidence: 0.97694814

01:04:25.359 --> 01:04:26.079 You know, so you can

NOTE Confidence: 0.97694814

01:04:26.079 --> 01:04:27.460 see here, you know, this

NOTE Confidence: 0.97694814

01:04:27.599 --> 01:04:28.960 teeny tiny thing here is

NOTE Confidence: 0.97694814

01:04:28.960 --> 01:04:30.160 a is a one of

NOTE Confidence: 0.97694814

01:04:30.160 --> 01:04:31.220 these lymph nodes,

NOTE Confidence: 0.96558625

01:04:32.325 --> 01:04:34.405 you know, along the vessel

NOTE Confidence: 0.96558625

01:04:34.405 --> 01:04:35.365 there. You can see on

NOTE Confidence: 0.96558625

01:04:35.365 --> 01:04:37.045 the cartoon the matched set

NOTE Confidence: 0.96558625

01:04:37.045 --> 01:04:38.165 from the CAT scan there

NOTE Confidence: 0.96558625

01:04:38.165 --> 01:04:39.145 on the left side.

NOTE Confidence: 0.9485826

01:04:39.765 --> 01:04:40.805 But sometimes they can be

NOTE Confidence: 0.9485826

01:04:40.805 --> 01:04:41.845 quite large as you can

NOTE Confidence: 0.9485826

01:04:41.845 --> 01:04:43.045 see here. Here's that same

NOTE Confidence: 0.9485826

01:04:43.045 --> 01:04:43.865 lymph node,

NOTE Confidence: 0.9692631

01:04:44.165 --> 01:04:45.365 much, much larger in this

NOTE Confidence: 0.9692631

01:04:45.365 --> 01:04:46.830 particular patient. And like I

NOTE Confidence: 0.9692631

01:04:46.830 --> 01:04:48.110 said, that that's usually what

NOTE Confidence: 0.9692631

01:04:48.110 --> 01:04:48.990 catches the eye of the

NOTE Confidence: 0.9692631

01:04:48.990 --> 01:04:50.190 radiologist when you get a

NOTE Confidence: 0.9692631

01:04:50.190 --> 01:04:50.690 scan.

NOTE Confidence: 0.97376025

01:04:51.470 --> 01:04:52.590 And you can see sometimes

NOTE Confidence: 0.97376025

01:04:52.590 --> 01:04:53.890 they can be quite involved,

NOTE Confidence: 0.9835395

01:04:55.070 --> 01:04:56.750 including some major blood vessels

NOTE Confidence: 0.9835395

01:04:56.750 --> 01:04:58.430 and and, sometimes be quite

NOTE Confidence: 0.9835395

01:04:58.430 --> 01:04:59.810 a challenge for removal.

NOTE Confidence: 0.99150705

01:05:01.315 --> 01:05:02.515 Again, just like with the

NOTE Confidence: 0.99150705

01:05:02.515 --> 01:05:03.015 pancreatic

NOTE Confidence: 0.97499907

01:05:04.035 --> 01:05:05.395 operations, our goal is to

NOTE Confidence: 0.97499907

01:05:05.395 --> 01:05:07.655 remove the primary tumor. Oftentimes,

NOTE Confidence: 0.97499907

01:05:07.875 --> 01:05:09.395 in these cases, there is

NOTE Confidence: 0.97499907

01:05:09.395 --> 01:05:10.435 quite a bit of lymph

NOTE Confidence: 0.97499907

01:05:10.435 --> 01:05:11.795 node spread or or even

NOTE Confidence: 0.97499907

01:05:11.795 --> 01:05:12.295 multiple

NOTE Confidence: 0.99233997

01:05:12.675 --> 01:05:14.035 primary tumors in a third

NOTE Confidence: 0.99233997

01:05:14.035 --> 01:05:14.550 of cases.

NOTE Confidence: 0.9185106

01:05:15.830 --> 01:05:17.190 And again, if the patient

NOTE Confidence: 0.9185106

01:05:17.190 --> 01:05:18.870 is metastatic or symptomatic, we,

NOTE Confidence: 0.9185106

01:05:18.870 --> 01:05:19.830 of course, want to improve

NOTE Confidence: 0.9185106

01:05:19.830 --> 01:05:20.710 quality of life in the

NOTE Confidence: 0.9185106

01:05:20.710 --> 01:05:21.690 operating room.

NOTE Confidence: 0.9018908

01:05:22.150 --> 01:05:23.350 And as before, we wanna

NOTE Confidence: 0.9018908

01:05:23.350 --> 01:05:25.270 minimize complications, different set of

NOTE Confidence: 0.9018908

01:05:25.270 --> 01:05:25.770 complications,

NOTE Confidence: 0.99566036

01:05:27.234 --> 01:05:28.835 with these particular patients as

NOTE Confidence: 0.99566036

01:05:28.835 --> 01:05:29.815 opposed to the pancreatic

NOTE Confidence: 0.95797145

01:05:30.595 --> 01:05:32.435 surgery, but, still something we

NOTE Confidence: 0.95797145

01:05:32.435 --> 01:05:34.115 watch out for. Here's a

NOTE Confidence: 0.95797145

01:05:34.195 --> 01:05:35.234 just a couple of more

NOTE Confidence: 0.95797145

01:05:35.234 --> 01:05:36.835 surgical photos again so you

NOTE Confidence: 0.95797145

01:05:36.835 --> 01:05:37.955 can see what I'm talking

NOTE Confidence: 0.95797145

01:05:37.955 --> 01:05:38.455 about.

NOTE Confidence: 0.99726516

01:05:39.075 --> 01:05:40.615 You know, here's somebody with

NOTE Confidence: 0.977986

01:05:40.970 --> 01:05:42.569 multiple lesions in the bowel.

NOTE Confidence: 0.977986

01:05:42.569 --> 01:05:43.529 You can see one, two,

NOTE Confidence: 0.977986

01:05:43.529 --> 01:05:44.890 three, four, five there. And

NOTE Confidence: 0.977986

01:05:44.890 --> 01:05:46.010 then on the picture on

NOTE Confidence: 0.977986

01:05:46.010 --> 01:05:47.210 on the right, you can

NOTE Confidence: 0.977986

01:05:47.210 --> 01:05:48.410 see these lumps and bumps

NOTE Confidence: 0.977986

01:05:48.410 --> 01:05:49.690 here, not necessarily in the

NOTE Confidence: 0.977986

01:05:49.690 --> 01:05:50.809 intestine, which is on the

NOTE Confidence: 0.977986

01:05:50.809 --> 01:05:52.170 outside, but these are those

NOTE Confidence: 0.977986

01:05:52.170 --> 01:05:53.529 lymph nodes that the instruments

NOTE Confidence: 0.977986

01:05:53.529 --> 01:05:54.809 are are are pointing to

NOTE Confidence: 0.977986

01:05:54.809 --> 01:05:55.309 there.

NOTE Confidence: 0.9876473

01:05:55.905 --> 01:05:57.105 And that's that's all disease,

NOTE Confidence: 0.9876473

01:05:57.105 --> 01:05:57.985 so we need to clear

NOTE Confidence: 0.9876473

01:05:57.985 --> 01:05:58.865 that out if we're we're

NOTE Confidence: 0.9876473

01:05:58.865 --> 01:06:00.165 in the operating room.

NOTE Confidence: 0.98362345

01:06:01.745 --> 01:06:02.865 Just real briefly at the

NOTE Confidence: 0.98362345

01:06:02.865 --> 01:06:03.365 end,

NOTE Confidence: 0.9633632

01:06:03.745 --> 01:06:05.025 just wanna touch on on

NOTE Confidence: 0.9633632

01:06:05.025 --> 01:06:06.965 stage four of metastatic disease,

NOTE Confidence: 0.97766304

01:06:07.265 --> 01:06:08.625 which oftentimes is in the

NOTE Confidence: 0.97766304

01:06:08.625 --> 01:06:10.020 liver, but can be in

NOTE Confidence: 0.97766304

01:06:10.020 --> 01:06:11.080 many other sites.

NOTE Confidence: 0.86695886

01:06:12.580 --> 01:06:13.320 In these

NOTE Confidence: 0.99759495

01:06:13.620 --> 01:06:14.120 operations,

NOTE Confidence: 0.98167294

01:06:15.540 --> 01:06:16.820 we do believe there's a

NOTE Confidence: 0.98167294

01:06:16.820 --> 01:06:18.740 survival benefit if we can

NOTE Confidence: 0.98167294

01:06:18.740 --> 01:06:20.580 clear the majority or all

NOTE Confidence: 0.98167294

01:06:20.580 --> 01:06:21.480 of the disease.

NOTE Confidence: 0.98158324

01:06:22.525 --> 01:06:23.725 Sometimes we can do that.

NOTE Confidence: 0.98158324

01:06:23.725 --> 01:06:24.845 Other times, you know, we

NOTE Confidence: 0.98158324

01:06:24.845 --> 01:06:25.645 can't, and we have to

NOTE Confidence: 0.98158324

01:06:25.645 --> 01:06:27.025 rely on systemic treatments.

NOTE Confidence: 0.9888416

01:06:27.485 --> 01:06:29.025 Most often in these cases,

NOTE Confidence: 0.9888416

01:06:29.165 --> 01:06:31.085 we actually use both. In

NOTE Confidence: 0.9888416

01:06:31.085 --> 01:06:32.125 other words, a patient might

NOTE Confidence: 0.9888416

01:06:32.125 --> 01:06:33.565 get a systemic treatment as

NOTE Confidence: 0.9888416

01:06:33.565 --> 01:06:34.765 a bridge to surgery or

NOTE Confidence: 0.9888416

01:06:34.765 --> 01:06:36.160 hopefully to reduce the size

NOTE Confidence: 0.9888416

01:06:36.160 --> 01:06:37.280 of the tumors in order

NOTE Confidence: 0.9888416

01:06:37.280 --> 01:06:38.580 to facilitate surgery.

NOTE Confidence: 0.9537346

01:06:40.320 --> 01:06:41.920 So there's a a particular

NOTE Confidence: 0.9537346

01:06:41.920 --> 01:06:43.360 p tumor in the liver,

NOTE Confidence: 0.9537346

01:06:43.360 --> 01:06:44.480 and then we remove that

NOTE Confidence: 0.9537346

01:06:44.480 --> 01:06:45.940 portion of the liver there.

NOTE Confidence: 0.98440355

01:06:46.640 --> 01:06:47.920 And so that patient was

NOTE Confidence: 0.98440355

01:06:47.920 --> 01:06:49.280 was rendered free of disease

NOTE Confidence: 0.98440355

01:06:49.280 --> 01:06:49.780 again.

NOTE Confidence: 0.9957042

01:06:50.934 --> 01:06:51.915 So just in summary,

NOTE Confidence: 0.9815983

01:06:52.535 --> 01:06:53.895 as always, each patient should

NOTE Confidence: 0.9815983

01:06:53.895 --> 01:06:55.915 be managed individually based on

NOTE Confidence: 0.9815983

01:06:56.055 --> 01:06:57.095 how their, you know, how

NOTE Confidence: 0.9815983

01:06:57.095 --> 01:06:58.934 their symptoms and presentation go

NOTE Confidence: 0.9815983

01:06:58.934 --> 01:07:00.214 and, you know, as their

NOTE Confidence: 0.9815983

01:07:00.214 --> 01:07:01.335 disease and the grade and

NOTE Confidence: 0.9815983

01:07:01.335 --> 01:07:02.454 whether or not surgery is

NOTE Confidence: 0.9815983

01:07:02.454 --> 01:07:03.570 the right choice for them.

NOTE Confidence: 0.9815983

01:07:03.810 --> 01:07:05.090 We always wanna talk about

NOTE Confidence: 0.9815983

01:07:05.090 --> 01:07:06.370 these patients with our colleagues

NOTE Confidence: 0.9815983

01:07:06.370 --> 01:07:08.530 from medical oncology, radiation oncology

NOTE Confidence: 0.9815983

01:07:08.530 --> 01:07:09.250 to come up with a

NOTE Confidence: 0.9815983

01:07:09.250 --> 01:07:09.750 multidisciplinary

NOTE Confidence: 0.8186255

01:07:10.290 --> 01:07:10.790 plan.

NOTE Confidence: 0.98596376

01:07:12.530 --> 01:07:13.490 But when we do these

NOTE Confidence: 0.98596376

01:07:13.490 --> 01:07:14.930 operations, we need to you

NOTE Confidence: 0.98596376

01:07:14.930 --> 01:07:16.130 know, there's usually more than

NOTE Confidence: 0.98596376

01:07:16.130 --> 01:07:17.250 one side of disease, and

NOTE Confidence: 0.98596376

01:07:17.250 --> 01:07:18.770 we wanna try and and

NOTE Confidence: 0.98596376

01:07:18.770 --> 01:07:19.545 clear out

NOTE Confidence: 0.9618205

01:07:20.345 --> 01:07:21.625 as much as we can,

NOTE Confidence: 0.9618205

01:07:21.625 --> 01:07:23.224 preferably all the disease if

NOTE Confidence: 0.9618205

01:07:23.224 --> 01:07:24.265 we're going to the operating

NOTE Confidence: 0.9618205

01:07:24.265 --> 01:07:25.645 room and committing to surgery.

NOTE Confidence: 0.9780089

01:07:27.865 --> 01:07:28.905 And then like I said,

NOTE Confidence: 0.9780089

01:07:28.984 --> 01:07:29.944 even in the setting of

NOTE Confidence: 0.9780089

01:07:29.944 --> 01:07:31.724 advanced or metastatic disease,

NOTE Confidence: 0.94022065

01:07:32.570 --> 01:07:34.090 some patients can, again, still

NOTE Confidence: 0.94022065

01:07:34.090 --> 01:07:35.630 be treated with curative intent.

NOTE Confidence: 0.97444284

01:07:35.930 --> 01:07:37.050 In the future, we hope

NOTE Confidence: 0.97444284

01:07:37.050 --> 01:07:37.450 some of,

NOTE Confidence: 0.9695032

01:07:38.090 --> 01:07:39.530 those newer drugs that doctor

NOTE Confidence: 0.9695032

01:07:39.530 --> 01:07:40.670 Coons was mentioning

NOTE Confidence: 0.99233645

01:07:41.130 --> 01:07:43.230 can help facilitate operative candidacy

NOTE Confidence: 0.99233645

01:07:43.290 --> 01:07:44.270 for more patients,

NOTE Confidence: 0.89818716

01:07:45.855 --> 01:07:46.835 you know, including,

NOTE Confidence: 0.9808429

01:07:47.375 --> 01:07:49.135 treatment that could downstage or

NOTE Confidence: 0.9808429

01:07:49.135 --> 01:07:50.095 or reduce the size of

NOTE Confidence: 0.9808429

01:07:50.095 --> 01:07:51.234 their tumor to facilitate,

NOTE Confidence: 0.9470096

01:07:52.175 --> 01:07:53.535 an operation as well as

NOTE Confidence: 0.9470096

01:07:53.535 --> 01:07:54.815 image guided surgery and some

NOTE Confidence: 0.9470096

01:07:54.815 --> 01:07:56.175 of those molecular targets that

NOTE Confidence: 0.9470096

01:07:56.175 --> 01:07:57.475 doctor Klimster mentioned.

NOTE Confidence: 0.9936582

01:07:57.935 --> 01:07:59.340 So I think that's my

NOTE Confidence: 0.9936582

01:07:59.340 --> 01:08:01.040 last slide. Here's my partners,

NOTE Confidence: 0.98555493

01:08:01.420 --> 01:08:02.720 and our research staff.

NOTE Confidence: 0.9287936

01:08:03.420 --> 01:08:04.860 Thanks everybody for their your

NOTE Confidence: 0.9287936

01:08:04.860 --> 01:08:05.360 attention,

NOTE Confidence: 0.97440964

01:08:05.820 --> 01:08:07.180 and, of course, be happy

NOTE Confidence: 0.97440964

01:08:07.180 --> 01:08:08.320 to answer any questions.

NOTE Confidence: 0.91842294

01:08:12.535 --> 01:08:13.835 Thank you, doctor Kunstman.

NOTE Confidence: 0.99627775

01:08:14.135 --> 01:08:15.095 Well, that was great. I'm

NOTE Confidence: 0.99627775

01:08:15.095 --> 01:08:16.235 gonna ask my

NOTE Confidence: 0.9839057

01:08:16.775 --> 01:08:18.215 co presenters to turn on

NOTE Confidence: 0.9839057

01:08:18.215 --> 01:08:19.595 video if they can.

NOTE Confidence: 0.9949558

01:08:20.135 --> 01:08:20.615 And,

NOTE Confidence: 0.98112106

01:08:20.935 --> 01:08:22.535 we had one question come

NOTE Confidence: 0.98112106

01:08:22.535 --> 01:08:23.655 into the chat, and then

NOTE Confidence: 0.98112106

01:08:23.655 --> 01:08:24.615 I will I also have

NOTE Confidence: 0.98112106

01:08:24.615 --> 01:08:26.295 some other questions. But please,

NOTE Confidence: 0.98112106

01:08:26.295 --> 01:08:28.010 to our audience, feel free

NOTE Confidence: 0.98112106

01:08:28.010 --> 01:08:29.610 to put in your burning

NOTE Confidence: 0.98112106

01:08:29.610 --> 01:08:30.110 questions.

NOTE Confidence: 0.97589135

01:08:31.770 --> 01:08:33.210 So the first question is

NOTE Confidence: 0.97589135

01:08:33.210 --> 01:08:34.970 a really practical one. I

NOTE Confidence: 0.97589135

01:08:34.970 --> 01:08:36.010 know some of the answer,

NOTE Confidence: 0.97589135

01:08:36.010 --> 01:08:36.970 but I might ask doctor

NOTE Confidence: 0.97589135

01:08:36.970 --> 01:08:38.350 Elfockery to answer it.

NOTE Confidence: 0.961758

01:08:39.304 --> 01:08:40.425 So how can we get

NOTE Confidence: 0.961758

01:08:40.425 --> 01:08:41.324 pets faster?

NOTE Confidence: 0.973086

01:08:41.945 --> 01:08:43.784 And, maybe, George, you can

NOTE Confidence: 0.973086

01:08:43.784 --> 01:08:45.465 speak to kind of newer

NOTE Confidence: 0.973086

01:08:45.465 --> 01:08:46.985 pet modalities that are coming,

NOTE Confidence: 0.973086

01:08:46.985 --> 01:08:48.284 but really the practicality

NOTE Confidence: 0.9991856

01:08:48.665 --> 01:08:49.165 of

NOTE Confidence: 0.935384

01:08:49.545 --> 01:08:50.905 getting pets. And I think

NOTE Confidence: 0.935384

01:08:50.905 --> 01:08:52.744 this really speaks to we

NOTE Confidence: 0.935384

01:08:52.744 --> 01:08:54.045 are using them more.

NOTE Confidence: 0.9871456

01:08:54.590 --> 01:08:55.550 Buried on one of your

NOTE Confidence: 0.9871456

01:08:55.550 --> 01:08:56.750 slides was the fact that

NOTE Confidence: 0.9871456

01:08:56.750 --> 01:08:58.510 we are actually using this

NOTE Confidence: 0.9871456

01:08:58.510 --> 01:09:00.369 approach of getting pets and

NOTE Confidence: 0.9871456

01:09:00.590 --> 01:09:03.070 targeted radioligand therapy also for

NOTE Confidence: 0.9871456

01:09:03.070 --> 01:09:04.050 prostate cancer.

NOTE Confidence: 0.9665789

01:09:04.670 --> 01:09:06.189 We are gonna see just

NOTE Confidence: 0.9665789

01:09:06.189 --> 01:09:08.050 an explosion of this this

NOTE Confidence: 0.9665789

01:09:08.205 --> 01:09:09.985 PETS and treatment combined,

NOTE Confidence: 0.9616413

01:09:10.685 --> 01:09:12.545 and other solid tumors. So

NOTE Confidence: 0.9616413

01:09:12.604 --> 01:09:13.564 how are we meeting those

NOTE Confidence: 0.9616413

01:09:13.564 --> 01:09:14.064 needs?

NOTE Confidence: 0.99481654

01:09:15.485 --> 01:09:16.465 Right. So,

NOTE Confidence: 0.945552

01:09:16.765 --> 01:09:17.585 we are,

NOTE Confidence: 0.9710222

01:09:18.525 --> 01:09:19.965 and somebody has asked also

NOTE Confidence: 0.9710222

01:09:19.965 --> 01:09:21.005 how does that compare to

NOTE Confidence: 0.9710222

01:09:21.005 --> 01:09:22.604 a CT scan. I can

NOTE Confidence: 0.9710222

01:09:22.604 --> 01:09:23.104 try

NOTE Confidence: 0.9968098

01:09:23.870 --> 01:09:25.070 to answer that as well.

NOTE Confidence: 0.9968098

01:09:25.070 --> 01:09:27.150 So we are trying not

NOTE Confidence: 0.9968098

01:09:27.150 --> 01:09:28.270 to be victims of our

NOTE Confidence: 0.9968098

01:09:28.270 --> 01:09:29.810 own success. This is,

NOTE Confidence: 0.9997672

01:09:30.670 --> 01:09:32.670 an incredible opportunity to be

NOTE Confidence: 0.9997672

01:09:32.670 --> 01:09:33.490 a lot more

NOTE Confidence: 0.96043235

01:09:35.150 --> 01:09:36.770 personalized to each patient.

NOTE Confidence: 0.9355397

01:09:37.785 --> 01:09:39.705 The difficulty is twofold. One

NOTE Confidence: 0.9355397

01:09:39.705 --> 01:09:41.005 is in terms of scanners,

NOTE Confidence: 0.9696614

01:09:41.864 --> 01:09:43.705 and we are putting in

NOTE Confidence: 0.9696614

01:09:43.705 --> 01:09:45.064 more scanners. There are,

NOTE Confidence: 0.91679

01:09:45.945 --> 01:09:47.545 there are new PETCTs that

NOTE Confidence: 0.91679

01:09:47.545 --> 01:09:48.425 are coming to Yale New

NOTE Confidence: 0.91679

01:09:48.425 --> 01:09:49.864 Haven Hospital and some are

NOTE Confidence: 0.91679

01:09:49.864 --> 01:09:51.005 up and running now.

NOTE Confidence: 0.96184814

01:09:51.600 --> 01:09:53.300 We are also working on

NOTE Confidence: 0.96184814

01:09:53.360 --> 01:09:54.739 more efficient scanners.

NOTE Confidence: 0.9986608

01:09:56.159 --> 01:09:57.219 One of the things

NOTE Confidence: 0.9633006

01:09:57.679 --> 01:10:00.000 that technology is available now

NOTE Confidence: 0.9633006

01:10:00.000 --> 01:10:01.920 is for full body scanner

NOTE Confidence: 0.9633006

01:10:01.920 --> 01:10:03.199 where instead of having a

NOTE Confidence: 0.9633006

01:10:03.199 --> 01:10:04.880 thirty centimeter axial field, you

NOTE Confidence: 0.9633006

01:10:04.880 --> 01:10:05.840 have a meter and a

NOTE Confidence: 0.9633006

01:10:05.840 --> 01:10:06.340 half.

NOTE Confidence: 0.9799375

01:10:06.835 --> 01:10:07.875 So that would be a

NOTE Confidence: 0.9799375

01:10:07.875 --> 01:10:09.314 scan in two minutes instead

NOTE Confidence: 0.9799375

01:10:09.314 --> 01:10:10.275 of twenty five minutes, and

NOTE Confidence: 0.9799375

01:10:10.275 --> 01:10:10.994 then you can imagine you

NOTE Confidence: 0.9799375

01:10:10.994 --> 01:10:12.054 can do a lot more.

NOTE Confidence: 0.9079645

01:10:12.594 --> 01:10:13.314 We don't have one of

NOTE Confidence: 0.9079645

01:10:13.314 --> 01:10:14.514 those at Yale New Haven

NOTE Confidence: 0.9079645

01:10:14.514 --> 01:10:16.114 yet, but one will be

NOTE Confidence: 0.9079645

01:10:16.114 --> 01:10:17.814 coming to the Imaging Institute

NOTE Confidence: 0.9079645

01:10:18.034 --> 01:10:19.235 in two years from now,

NOTE Confidence: 0.9079645

01:10:19.235 --> 01:10:20.135 and we will

NOTE Confidence: 0.9994973

01:10:20.490 --> 01:10:21.850 be making every effort to

NOTE Confidence: 0.9994973

01:10:21.850 --> 01:10:24.030 have days available for clinical

NOTE Confidence: 0.99865645

01:10:24.650 --> 01:10:25.710 use. So that's the equipment

NOTE Confidence: 0.99865645

01:10:25.770 --> 01:10:27.530 side. The other side of

NOTE Confidence: 0.99865645

01:10:27.530 --> 01:10:28.830 this is the radiopharmaceutical

NOTE Confidence: 0.81595373

01:10:29.530 --> 01:10:30.030 because,

NOTE Confidence: 0.9528669

01:10:30.970 --> 01:10:32.170 as you know, most of

NOTE Confidence: 0.9528669

01:10:32.170 --> 01:10:33.050 the time we talked about

NOTE Confidence: 0.9528669

01:10:33.050 --> 01:10:34.875 gallium sixty eight dotatate, so

NOTE Confidence: 0.9528669

01:10:34.875 --> 01:10:35.914 that's a half life of

NOTE Confidence: 0.9528669

01:10:35.914 --> 01:10:36.895 sixty eight minutes.

NOTE Confidence: 0.9989988

01:10:37.434 --> 01:10:37.934 So

NOTE Confidence: 0.99500394

01:10:38.395 --> 01:10:40.155 that means you you can't

NOTE Confidence: 0.99500394

01:10:40.155 --> 01:10:41.534 make that in,

NOTE Confidence: 0.9900188

01:10:42.074 --> 01:10:43.755 say, California and then ship

NOTE Confidence: 0.9900188

01:10:43.755 --> 01:10:44.715 it over. By the time

NOTE Confidence: 0.9900188

01:10:44.715 --> 01:10:46.255 it's here, there's nothing left.

NOTE Confidence: 0.8565723

01:10:46.635 --> 01:10:47.375 So there,

NOTE Confidence: 0.9693601

01:10:47.860 --> 01:10:49.140 so far, we have been

NOTE Confidence: 0.9693601

01:10:49.140 --> 01:10:50.900 tributaries of, you know, who

NOTE Confidence: 0.9693601

01:10:50.900 --> 01:10:52.900 is delivering those. We are

NOTE Confidence: 0.9693601

01:10:52.900 --> 01:10:54.740 also on that front working

NOTE Confidence: 0.9693601

01:10:54.740 --> 01:10:55.479 on making,

NOTE Confidence: 0.91514003

01:10:56.340 --> 01:10:58.340 there's a major effort happening

NOTE Confidence: 0.91514003

01:10:58.340 --> 01:10:59.700 at the ATL to,

NOTE Confidence: 0.9388174

01:11:00.820 --> 01:11:02.260 have a GMP facility that

NOTE Confidence: 0.9388174

01:11:02.260 --> 01:11:03.525 would be also in three

NOTE Confidence: 0.9388174

01:11:03.525 --> 01:11:04.405 years from now, two and

NOTE Confidence: 0.9388174

01:11:04.405 --> 01:11:05.445 a half years from now,

NOTE Confidence: 0.9388174

01:11:05.445 --> 01:11:06.405 where we'll be able to

NOTE Confidence: 0.9388174

01:11:06.405 --> 01:11:08.005 make those compounds ourselves and

NOTE Confidence: 0.9388174

01:11:08.005 --> 01:11:08.805 then send them to the

NOTE Confidence: 0.9388174

01:11:08.805 --> 01:11:10.405 hospital so that we won't

NOTE Confidence: 0.9388174

01:11:10.405 --> 01:11:11.765 be tributaries where there's a

NOTE Confidence: 0.9388174

01:11:11.765 --> 01:11:13.445 snowstorm which happens in the

NOTE Confidence: 0.9388174

01:11:13.445 --> 01:11:15.525 winter or there's a a

NOTE Confidence: 0.9388174

01:11:15.525 --> 01:11:16.805 a strike or or there's

NOTE Confidence: 0.9388174

01:11:16.805 --> 01:11:18.104 no a failure of synthesis.

NOTE Confidence: 0.8846573

01:11:18.405 --> 01:11:18.949 And I would be able

NOTE Confidence: 0.8846573

01:11:18.949 --> 01:11:20.030 to do more of those.

NOTE Confidence: 0.8846573

01:11:20.030 --> 01:11:20.989 And working on both of

NOTE Confidence: 0.8846573

01:11:20.989 --> 01:11:21.489 those.

NOTE Confidence: 0.9655358

01:11:22.269 --> 01:11:23.550 The question that was asked

NOTE Confidence: 0.9655358

01:11:23.550 --> 01:11:24.670 is how does a PET

NOTE Confidence: 0.9655358

01:11:24.670 --> 01:11:26.369 compare to a CT scan?

NOTE Confidence: 0.88884455

01:11:27.630 --> 01:11:28.989 In three words, much much

NOTE Confidence: 0.88884455

01:11:28.989 --> 01:11:30.829 better. Much more. That's three

NOTE Confidence: 0.88884455

01:11:30.829 --> 01:11:31.329 words.

NOTE Confidence: 0.9165596

01:11:32.375 --> 01:11:33.415 So in a PET CT,

NOTE Confidence: 0.9165596

01:11:33.415 --> 01:11:34.455 you always get a CT

NOTE Confidence: 0.9165596

01:11:34.455 --> 01:11:35.695 for free because there's a

NOTE Confidence: 0.9165596

01:11:35.695 --> 01:11:36.854 a PET CT, it has

NOTE Confidence: 0.9165596

01:11:36.854 --> 01:11:37.515 a CT,

NOTE Confidence: 0.9284399

01:11:37.895 --> 01:11:39.015 a scanner, and a PET

NOTE Confidence: 0.9284399

01:11:39.015 --> 01:11:39.515 scanner.

NOTE Confidence: 0.9077462

01:11:39.895 --> 01:11:40.375 But,

NOTE Confidence: 0.96081865

01:11:41.655 --> 01:11:42.955 to give you an analogy,

NOTE Confidence: 0.9962589

01:11:43.895 --> 01:11:44.635 and I think

NOTE Confidence: 0.77014107

01:11:45.260 --> 01:11:45.760 Doctor.

NOTE Confidence: 0.9384671

01:11:46.300 --> 01:11:48.460 Kunstmann had very nice CTs

NOTE Confidence: 0.9384671

01:11:48.460 --> 01:11:49.660 that were all obvious. You

NOTE Confidence: 0.9384671

01:11:49.660 --> 01:11:50.699 know these were like the

NOTE Confidence: 0.9384671

01:11:50.699 --> 01:11:51.820 ones if you have this

NOTE Confidence: 0.9384671

01:11:51.820 --> 01:11:53.199 there's nothing else you need.

NOTE Confidence: 0.9384671

01:11:53.420 --> 01:11:54.780 More often than not that's

NOTE Confidence: 0.9384671

01:11:54.780 --> 01:11:55.660 not what we have. What

NOTE Confidence: 0.9384671

01:11:55.660 --> 01:11:56.880 we have is something where

NOTE Confidence: 0.9384671

01:11:56.939 --> 01:11:58.540 this could be a tumor,

NOTE Confidence: 0.9384671

01:11:58.540 --> 01:11:59.920 it could be something else.

NOTE Confidence: 0.9603135

01:12:00.305 --> 01:12:01.425 What you're looking at with

NOTE Confidence: 0.9603135

01:12:01.425 --> 01:12:02.545 CT is just a change

NOTE Confidence: 0.9603135

01:12:02.545 --> 01:12:03.825 in density, and that will

NOTE Confidence: 0.9603135

01:12:03.825 --> 01:12:05.425 happen sometimes in the tumor,

NOTE Confidence: 0.9603135

01:12:05.425 --> 01:12:06.305 but it can happen for

NOTE Confidence: 0.9603135

01:12:06.305 --> 01:12:07.525 all sort of other reasons.

NOTE Confidence: 0.9603135

01:12:07.665 --> 01:12:08.865 That is so if you

NOTE Confidence: 0.9603135

01:12:08.865 --> 01:12:09.825 if you touch if you

NOTE Confidence: 0.9603135

01:12:09.825 --> 01:12:11.265 look at those images, the

NOTE Confidence: 0.9603135

01:12:11.265 --> 01:12:12.785 beautiful images that we saw

NOTE Confidence: 0.9603135

01:12:12.785 --> 01:12:14.225 from doctor Kunstmann, you can

NOTE Confidence: 0.9603135

01:12:14.225 --> 01:12:15.265 see, like, it has a

NOTE Confidence: 0.9603135

01:12:15.265 --> 01:12:15.765 different

NOTE Confidence: 0.917614

01:12:16.350 --> 01:12:17.489 appearance and consistency.

NOTE Confidence: 0.97080183

01:12:18.189 --> 01:12:19.070 But then there could be

NOTE Confidence: 0.97080183

01:12:19.070 --> 01:12:19.949 all sort of other things

NOTE Confidence: 0.97080183

01:12:19.949 --> 01:12:20.989 that have the same changes

NOTE Confidence: 0.97080183

01:12:20.989 --> 01:12:22.830 in density. Whereas with PET,

NOTE Confidence: 0.97080183

01:12:22.830 --> 01:12:24.130 we're looking at the somatostatin

NOTE Confidence: 0.97080183

01:12:24.270 --> 01:12:25.869 receptor that will be only

NOTE Confidence: 0.97080183

01:12:25.869 --> 01:12:27.310 expressed when it is a

NOTE Confidence: 0.97080183

01:12:27.310 --> 01:12:28.909 tumor. So it's a lot

NOTE Confidence: 0.97080183

01:12:28.909 --> 01:12:29.729 more sensitive,

NOTE Confidence: 0.97399575

01:12:30.354 --> 01:12:31.155 meaning you can see a

NOTE Confidence: 0.97399575

01:12:31.155 --> 01:12:32.115 lot less of it, a

NOTE Confidence: 0.97399575

01:12:32.115 --> 01:12:33.475 lot more specific it's only

NOTE Confidence: 0.97399575

01:12:33.475 --> 01:12:34.835 for tumors. You can see

NOTE Confidence: 0.97399575

01:12:34.835 --> 01:12:35.795 it on CT when you

NOTE Confidence: 0.97399575

01:12:35.795 --> 01:12:36.675 have a lot of the

NOTE Confidence: 0.97399575

01:12:36.675 --> 01:12:37.495 tumor present.

NOTE Confidence: 0.8502585

01:12:38.835 --> 01:12:39.335 That's

NOTE Confidence: 0.98830694

01:12:39.955 --> 01:12:40.455 probably

NOTE Confidence: 0.9540727

01:12:41.314 --> 01:12:42.675 about a million times you

NOTE Confidence: 0.9540727

01:12:42.675 --> 01:12:44.115 need a million times more

NOTE Confidence: 0.9540727

01:12:44.115 --> 01:12:45.120 cells to see it on

NOTE Confidence: 0.9540727

01:12:45.120 --> 01:12:46.479 CT that you'd need on

NOTE Confidence: 0.9540727

01:12:46.479 --> 01:12:47.600 PET. So it's a lot

NOTE Confidence: 0.9540727

01:12:47.600 --> 01:12:48.960 more sensitive. But it's also

NOTE Confidence: 0.9540727

01:12:48.960 --> 01:12:49.939 a lot more expensive,

NOTE Confidence: 0.9857985

01:12:50.320 --> 01:12:51.840 a lot slower, and there

NOTE Confidence: 0.9857985

01:12:51.840 --> 01:12:52.560 are a lot fewer of

NOTE Confidence: 0.9857985

01:12:52.560 --> 01:12:53.060 them.

NOTE Confidence: 0.9321954

01:12:53.439 --> 01:12:54.479 I I I would just

NOTE Confidence: 0.9321954

01:12:54.479 --> 01:12:55.439 add to I would just

NOTE Confidence: 0.9321954

01:12:55.439 --> 01:12:56.320 add because I was gonna

NOTE Confidence: 0.9321954

01:12:56.320 --> 01:12:57.280 ask you to comment on

NOTE Confidence: 0.9321954

01:12:57.280 --> 01:12:58.979 that, John. Yeah.

NOTE Confidence: 0.97163874

01:12:59.985 --> 01:13:00.945 I would just add to

NOTE Confidence: 0.97163874

01:13:00.945 --> 01:13:02.705 that that depending on the

NOTE Confidence: 0.97163874

01:13:02.705 --> 01:13:04.085 question that's being

NOTE Confidence: 0.9894279

01:13:04.785 --> 01:13:05.285 asked,

NOTE Confidence: 0.9911105

01:13:06.385 --> 01:13:08.225 the scans can be much,

NOTE Confidence: 0.9911105

01:13:08.225 --> 01:13:10.064 much better to answer one

NOTE Confidence: 0.9911105

01:13:10.064 --> 01:13:12.005 particular question versus another.

NOTE Confidence: 0.9961322

01:13:12.479 --> 01:13:12.979 So,

NOTE Confidence: 0.9990519

01:13:13.360 --> 01:13:14.880 you know, patients that are

NOTE Confidence: 0.9990519

01:13:14.880 --> 01:13:16.660 being evaluated for surgery

NOTE Confidence: 0.99706626

01:13:17.680 --> 01:13:18.500 may need

NOTE Confidence: 0.9758746

01:13:19.439 --> 01:13:21.380 a particular type of CT

NOTE Confidence: 0.9758746

01:13:21.439 --> 01:13:23.200 scan or PET scan or,

NOTE Confidence: 0.9758746

01:13:23.200 --> 01:13:24.160 you know, depending on the

NOTE Confidence: 0.9758746

01:13:24.160 --> 01:13:25.200 question being asked. So for

NOTE Confidence: 0.9758746

01:13:25.200 --> 01:13:25.700 instance,

NOTE Confidence: 0.985176

01:13:27.385 --> 01:13:28.425 you know, as I was

NOTE Confidence: 0.985176

01:13:28.425 --> 01:13:30.265 alluding to in those small

NOTE Confidence: 0.985176

01:13:30.265 --> 01:13:31.085 bowel neuroendocrine

NOTE Confidence: 0.99915254

01:13:31.385 --> 01:13:31.885 tumor

NOTE Confidence: 0.98781955

01:13:32.505 --> 01:13:33.005 slides,

NOTE Confidence: 0.93616104

01:13:33.785 --> 01:13:35.965 many times these very infiltrative

NOTE Confidence: 0.99332845

01:13:36.585 --> 01:13:38.285 masses and and nodes

NOTE Confidence: 0.9571194

01:13:38.665 --> 01:13:40.025 will be along the major

NOTE Confidence: 0.9571194

01:13:40.025 --> 01:13:40.525 vessels,

NOTE Confidence: 0.98845905

01:13:41.100 --> 01:13:42.619 and it's very hard for

NOTE Confidence: 0.98845905

01:13:42.619 --> 01:13:43.920 us to tell on a

NOTE Confidence: 0.98845905

01:13:43.979 --> 01:13:45.420 PET scan, which is lower

NOTE Confidence: 0.98845905

01:13:45.420 --> 01:13:47.179 resolution CT as opposed to

NOTE Confidence: 0.98845905

01:13:47.179 --> 01:13:47.840 a dedicated

NOTE Confidence: 0.99859005

01:13:48.380 --> 01:13:48.880 CT

NOTE Confidence: 0.99881905

01:13:49.260 --> 01:13:49.760 angiogram

NOTE Confidence: 0.94590616

01:13:50.139 --> 01:13:51.360 or sometimes venogram

NOTE Confidence: 0.9524997

01:13:53.465 --> 01:13:55.704 that, you know, we'll get

NOTE Confidence: 0.9524997

01:13:55.704 --> 01:13:57.965 to facilitate surgical planning.

NOTE Confidence: 0.9868152

01:13:58.425 --> 01:13:59.385 So it may be a

NOTE Confidence: 0.9868152

01:13:59.385 --> 01:14:01.064 different question that's being asked.

NOTE Confidence: 0.9868152

01:14:01.064 --> 01:14:02.104 It's not just that we're

NOTE Confidence: 0.9868152

01:14:02.104 --> 01:14:03.645 being, you know, sticklers.

NOTE Confidence: 0.9966729

01:14:05.030 --> 01:14:06.550 It's it's really to answer

NOTE Confidence: 0.9966729

01:14:06.550 --> 01:14:08.150 a very specific question. So,

NOTE Confidence: 0.9966729

01:14:08.150 --> 01:14:09.210 you know, for instance,

NOTE Confidence: 0.99125445

01:14:11.110 --> 01:14:12.470 the operation I just did

NOTE Confidence: 0.99125445

01:14:12.470 --> 01:14:13.750 today on a patient with

NOTE Confidence: 0.99125445

01:14:13.750 --> 01:14:15.190 a neuroendocrine tumor in the

NOTE Confidence: 0.99125445

01:14:15.190 --> 01:14:15.690 mesentery,

NOTE Confidence: 0.9996495

01:14:16.150 --> 01:14:17.590 it was critical that we

NOTE Confidence: 0.9996495

01:14:17.590 --> 01:14:18.970 understood how many

NOTE Confidence: 0.9969849

01:14:19.485 --> 01:14:21.645 branches of the intestinal blood

NOTE Confidence: 0.9969849

01:14:21.645 --> 01:14:23.345 supply were were free

NOTE Confidence: 0.9670691

01:14:23.885 --> 01:14:25.085 such that we could do

NOTE Confidence: 0.9670691

01:14:25.085 --> 01:14:26.925 the operation and preserve the

NOTE Confidence: 0.9670691

01:14:26.925 --> 01:14:29.005 intestines and the digestive function.

NOTE Confidence: 0.9670691

01:14:29.005 --> 01:14:30.125 So, you know, that's the

NOTE Confidence: 0.9670691

01:14:30.125 --> 01:14:31.805 kind of specific question we

NOTE Confidence: 0.9670691

01:14:31.805 --> 01:14:33.245 may get a particular scan

NOTE Confidence: 0.9670691

01:14:33.245 --> 01:14:34.305 to to understand.

NOTE Confidence: 0.9317877

01:14:35.030 --> 01:14:35.990 And and those are things

NOTE Confidence: 0.9317877

01:14:35.990 --> 01:14:37.590 that that cannot answer because

NOTE Confidence: 0.9317877

01:14:37.590 --> 01:14:38.470 you only see in the

NOTE Confidence: 0.9317877

01:14:38.470 --> 01:14:40.229 somatostatin receptor. You don't see

NOTE Confidence: 0.9317877

01:14:40.470 --> 01:14:41.590 think of it as, like,

NOTE Confidence: 0.9317877

01:14:41.590 --> 01:14:42.390 you know, the Where is

NOTE Confidence: 0.9317877

01:14:42.390 --> 01:14:44.070 Waldo kind of cartoons. You'll

NOTE Confidence: 0.9317877

01:14:44.070 --> 01:14:45.190 see Waldo lighting up, and

NOTE Confidence: 0.9317877

01:14:45.190 --> 01:14:46.310 you won't know anything around

NOTE Confidence: 0.9317877

01:14:46.310 --> 01:14:47.830 him. Whereas with a CT

NOTE Confidence: 0.9317877

01:14:47.830 --> 01:14:49.245 scan, you'll see all the

NOTE Confidence: 0.9317877

01:14:49.485 --> 01:14:51.325 anatomical details that are, around

NOTE Confidence: 0.9317877

01:14:51.325 --> 01:14:52.125 you, but you may not

NOTE Confidence: 0.9317877

01:14:52.125 --> 01:14:52.945 see well dilating.

NOTE Confidence: 0.9398723

01:14:53.325 --> 01:14:54.285 So both of those are

NOTE Confidence: 0.9398723

01:14:54.285 --> 01:14:56.465 incredibly useful. Yeah. All good.

NOTE Confidence: 0.9398723

01:14:56.685 --> 01:14:57.585 Doctor Klimstra,

NOTE Confidence: 0.99963826

01:14:57.885 --> 01:14:59.104 nice to have you live.

NOTE Confidence: 0.9980885

01:14:59.564 --> 01:15:00.604 I'm gonna ask you a

NOTE Confidence: 0.9980885

01:15:00.604 --> 01:15:02.545 question. I know you focused

NOTE Confidence: 0.99981976

01:15:02.869 --> 01:15:05.449 primarily on the well differentiated

NOTE Confidence: 0.99905074

01:15:05.750 --> 01:15:07.050 neuroendocrine tumors.

NOTE Confidence: 0.95770043

01:15:07.590 --> 01:15:08.550 I wondered if you could

NOTE Confidence: 0.95770043

01:15:08.550 --> 01:15:09.590 comment just briefly for our

NOTE Confidence: 0.95770043

01:15:09.590 --> 01:15:10.729 audience. What's a neuroendocrine

NOTE Confidence: 0.9979488

01:15:11.110 --> 01:15:11.610 carcinoma?

NOTE Confidence: 0.98955536

01:15:12.710 --> 01:15:14.150 We treat those very differently

NOTE Confidence: 0.98955536

01:15:14.150 --> 01:15:15.130 in medical oncology.

NOTE Confidence: 0.98023343

01:15:15.750 --> 01:15:16.250 Sure.

NOTE Confidence: 0.98110986

01:15:16.625 --> 01:15:18.385 So, yes, what I talked

NOTE Confidence: 0.98110986

01:15:18.385 --> 01:15:20.145 about was exclusively the well

NOTE Confidence: 0.98110986

01:15:20.145 --> 01:15:21.665 differentiated category. And as I

NOTE Confidence: 0.98110986

01:15:21.665 --> 01:15:23.104 said, they can be low

NOTE Confidence: 0.98110986

01:15:23.104 --> 01:15:25.364 grade, intermediate grade, or rarely

NOTE Confidence: 0.98110986

01:15:25.425 --> 01:15:26.085 high grade.

NOTE Confidence: 0.99393517

01:15:26.705 --> 01:15:28.085 The neuroendocrine carcinomas

NOTE Confidence: 0.9667996

01:15:28.465 --> 01:15:29.985 are really not that closely

NOTE Confidence: 0.9667996

01:15:29.985 --> 01:15:31.265 related even though the name

NOTE Confidence: 0.9667996

01:15:31.265 --> 01:15:32.720 sounds very similar.

NOTE Confidence: 0.9509268

01:15:33.340 --> 01:15:35.180 These are proper carcinomas that

NOTE Confidence: 0.9509268

01:15:35.180 --> 01:15:36.960 are that more closely related

NOTE Confidence: 0.9646133

01:15:37.820 --> 01:15:38.480 to adenocarcinomas,

NOTE Confidence: 0.9921093

01:15:39.020 --> 01:15:40.620 squamous cell carcinoma, other types

NOTE Confidence: 0.9921093

01:15:40.620 --> 01:15:41.820 of cancer that can arise

NOTE Confidence: 0.9921093

01:15:41.820 --> 01:15:42.860 in the pancreas or the

NOTE Confidence: 0.9921093

01:15:42.860 --> 01:15:44.380 lung or the or the

NOTE Confidence: 0.9921093

01:15:44.380 --> 01:15:44.880 colon.

NOTE Confidence: 0.99922186

01:15:45.580 --> 01:15:46.960 They're very highly aggressive.

NOTE Confidence: 0.99916625

01:15:48.275 --> 01:15:49.014 They share

NOTE Confidence: 0.9742382

01:15:49.395 --> 01:15:50.614 the the immunohistochemical

NOTE Confidence: 0.98886865

01:15:51.074 --> 01:15:52.375 staining that I demonstrated,

NOTE Confidence: 0.9880913

01:15:53.395 --> 01:15:55.955 for for neuroendocrine markers, but

NOTE Confidence: 0.9880913

01:15:55.955 --> 01:15:57.314 they differ in almost every

NOTE Confidence: 0.9880913

01:15:57.314 --> 01:15:58.835 other way. They're very, very

NOTE Confidence: 0.9880913

01:15:58.835 --> 01:16:01.014 highly proliferative, rapidly growing.

NOTE Confidence: 0.9974796

01:16:01.739 --> 01:16:03.439 They have a totally different

NOTE Confidence: 0.9974796

01:16:03.500 --> 01:16:04.960 spectrum of mutations

NOTE Confidence: 0.96639365

01:16:05.500 --> 01:16:06.400 and they respond

NOTE Confidence: 0.95050555

01:16:07.340 --> 01:16:09.099 predominantly to different drugs, which

NOTE Confidence: 0.95050555

01:16:09.099 --> 01:16:10.380 of course you'd be much

NOTE Confidence: 0.95050555

01:16:10.380 --> 01:16:11.420 better to comment on than

NOTE Confidence: 0.95050555

01:16:11.420 --> 01:16:12.000 I, but,

NOTE Confidence: 0.99618846

01:16:12.539 --> 01:16:13.439 so the distinction

NOTE Confidence: 0.992117

01:16:13.935 --> 01:16:15.534 between the well differentiated and

NOTE Confidence: 0.992117

01:16:15.534 --> 01:16:17.314 the poorly differentiated is extraordinarily

NOTE Confidence: 0.992117

01:16:17.534 --> 01:16:18.034 important.

NOTE Confidence: 0.9696748

01:16:18.974 --> 01:16:20.435 It can sometimes be challenging,

NOTE Confidence: 0.9696748

01:16:20.494 --> 01:16:22.014 but, we're we're we're pretty

NOTE Confidence: 0.9696748

01:16:22.014 --> 01:16:22.835 good at it.

NOTE Confidence: 0.96861213

01:16:23.375 --> 01:16:24.895 Yep. Thank thank you. That's

NOTE Confidence: 0.96861213

01:16:24.895 --> 01:16:26.494 great. I'm gonna mention one

NOTE Confidence: 0.96861213

01:16:26.494 --> 01:16:28.335 thing that a, an audience

NOTE Confidence: 0.96861213

01:16:28.335 --> 01:16:30.340 member texted in or or

NOTE Confidence: 0.96861213

01:16:30.340 --> 01:16:31.860 messaged in. Is is this

NOTE Confidence: 0.96861213

01:16:31.860 --> 01:16:33.620 webinar available afterwards? The answer

NOTE Confidence: 0.96861213

01:16:33.620 --> 01:16:35.080 is yes. So stay tuned.

NOTE Confidence: 0.99705505

01:16:35.620 --> 01:16:37.060 Our team will actually send

NOTE Confidence: 0.99705505

01:16:37.060 --> 01:16:38.420 out a message with that

NOTE Confidence: 0.99705505

01:16:38.420 --> 01:16:39.300 link, and it will be

NOTE Confidence: 0.99705505

01:16:39.300 --> 01:16:40.995 available on our YouTube channel.

NOTE Confidence: 0.9667406

01:16:41.555 --> 01:16:42.354 So if you didn't take

NOTE Confidence: 0.9667406

01:16:42.354 --> 01:16:43.155 notes or if you want

NOTE Confidence: 0.9667406

01:16:43.155 --> 01:16:44.115 to send it on to

NOTE Confidence: 0.9667406

01:16:44.115 --> 01:16:45.715 family members or friends, this

NOTE Confidence: 0.9667406

01:16:45.715 --> 01:16:46.935 will be available afterwards.

NOTE Confidence: 0.9851058

01:16:47.955 --> 01:16:49.314 I'm gonna tackle one of

NOTE Confidence: 0.9851058

01:16:49.314 --> 01:16:50.695 the questions in the chat.

NOTE Confidence: 0.9488713

01:16:51.235 --> 01:16:52.595 So one of those was

NOTE Confidence: 0.9488713

01:16:52.595 --> 01:16:53.895 why wouldn't you immediately

NOTE Confidence: 0.99970025

01:16:54.195 --> 01:16:55.555 start treatment for a patient

NOTE Confidence: 0.99970025

01:16:55.555 --> 01:16:55.860 with

NOTE Confidence: 0.9581902

01:16:56.420 --> 01:16:57.939 a small intestine or any

NOTE Confidence: 0.9581902

01:16:57.939 --> 01:16:59.380 NET that is stable and

NOTE Confidence: 0.9581902

01:16:59.380 --> 01:17:01.060 nonfunctional but has spread to

NOTE Confidence: 0.9581902

01:17:01.060 --> 01:17:02.900 other places? That's an awesome

NOTE Confidence: 0.9581902

01:17:02.900 --> 01:17:04.100 question and one that we

NOTE Confidence: 0.9581902

01:17:04.100 --> 01:17:05.699 actually talk quite a bit

NOTE Confidence: 0.9581902

01:17:05.699 --> 01:17:07.080 with patients about.

NOTE Confidence: 0.9805897

01:17:07.619 --> 01:17:08.900 So for patients who have

NOTE Confidence: 0.9805897

01:17:08.900 --> 01:17:09.400 a

NOTE Confidence: 0.9649127

01:17:09.844 --> 01:17:10.344 asymptomatic,

NOTE Confidence: 0.9629298

01:17:10.725 --> 01:17:12.665 maybe they were an incidentally

NOTE Confidence: 0.9629298

01:17:12.885 --> 01:17:13.925 diagnosed. They came in for

NOTE Confidence: 0.9629298

01:17:13.925 --> 01:17:15.604 a completely different reason and

NOTE Confidence: 0.9629298

01:17:15.604 --> 01:17:16.965 were found to have a

NOTE Confidence: 0.9629298

01:17:16.965 --> 01:17:17.784 low grade,

NOTE Confidence: 0.94128406

01:17:18.725 --> 01:17:20.645 neuroendocrine tumor that is spread

NOTE Confidence: 0.94128406

01:17:20.645 --> 01:17:21.925 perhaps to the liver as

NOTE Confidence: 0.94128406

01:17:21.925 --> 01:17:22.885 a as a very common

NOTE Confidence: 0.94128406

01:17:22.885 --> 01:17:23.385 scenario.

NOTE Confidence: 0.9950108

01:17:23.970 --> 01:17:25.090 Why wouldn't we start treatment

NOTE Confidence: 0.9950108

01:17:25.090 --> 01:17:25.590 immediately?

NOTE Confidence: 0.9987559

01:17:26.610 --> 01:17:27.970 There is an option to

NOTE Confidence: 0.9987559

01:17:27.970 --> 01:17:28.470 either

NOTE Confidence: 0.95314085

01:17:28.850 --> 01:17:30.790 observe those patients and monitor

NOTE Confidence: 0.95314085

01:17:30.850 --> 01:17:32.290 very closely with scans or

NOTE Confidence: 0.95314085

01:17:32.290 --> 01:17:33.810 just start perhaps on something

NOTE Confidence: 0.95314085

01:17:33.810 --> 01:17:35.350 like octreotide or lanreotide.

NOTE Confidence: 0.9483679

01:17:36.685 --> 01:17:38.045 The reason is be many

NOTE Confidence: 0.9483679

01:17:38.045 --> 01:17:39.165 of those patients, you may

NOTE Confidence: 0.9483679

01:17:39.165 --> 01:17:40.525 have had that for years

NOTE Confidence: 0.9483679

01:17:40.525 --> 01:17:41.725 already, and we don't know

NOTE Confidence: 0.9483679

01:17:41.725 --> 01:17:42.865 the pace of growth.

NOTE Confidence: 0.9841901

01:17:43.325 --> 01:17:45.005 And if the tumor itself

NOTE Confidence: 0.9841901

01:17:45.005 --> 01:17:46.385 is gonna remain stable,

NOTE Confidence: 0.98643416

01:17:46.925 --> 01:17:48.925 generally, my recommendation is to

NOTE Confidence: 0.98643416

01:17:48.925 --> 01:17:50.365 monitor until we see clear

NOTE Confidence: 0.98643416

01:17:50.365 --> 01:17:52.130 evidence of growth. We are

NOTE Confidence: 0.98643416

01:17:52.130 --> 01:17:53.650 sparing you side effects of

NOTE Confidence: 0.98643416

01:17:53.650 --> 01:17:55.750 that those monthly injections

NOTE Confidence: 0.96146095

01:17:56.210 --> 01:17:57.170 until the time that you

NOTE Confidence: 0.96146095

01:17:57.170 --> 01:17:58.130 really need it where we

NOTE Confidence: 0.96146095

01:17:58.130 --> 01:17:59.329 start seeing some evidence of

NOTE Confidence: 0.96146095

01:17:59.329 --> 01:17:59.829 growth.

NOTE Confidence: 0.9991433

01:18:00.210 --> 01:18:01.270 Now that is a

NOTE Confidence: 0.9833853

01:18:01.729 --> 01:18:03.729 difficult conversation, especially with a

NOTE Confidence: 0.9833853

01:18:03.729 --> 01:18:05.329 patient that's newly diagnosed, and

NOTE Confidence: 0.9833853

01:18:05.329 --> 01:18:07.170 we use shared decision making.

NOTE Confidence: 0.9833853

01:18:07.170 --> 01:18:08.425 And if if it is

NOTE Confidence: 0.9833853

01:18:08.425 --> 01:18:09.885 really important to you,

NOTE Confidence: 0.97624415

01:18:10.905 --> 01:18:12.844 to start something, we absolutely

NOTE Confidence: 0.97624415

01:18:12.905 --> 01:18:14.265 will have that conversation, and

NOTE Confidence: 0.97624415

01:18:14.265 --> 01:18:14.765 I,

NOTE Confidence: 0.9771938

01:18:15.225 --> 01:18:16.604 really try to do that

NOTE Confidence: 0.9771938

01:18:16.824 --> 01:18:17.705 as a kind of a

NOTE Confidence: 0.9771938

01:18:17.705 --> 01:18:19.485 joint decision with the patient.

NOTE Confidence: 0.9648464

01:18:21.020 --> 01:18:22.540 So, doctor Kuntzmann, there was

NOTE Confidence: 0.9648464

01:18:22.540 --> 01:18:23.820 a question that came in

NOTE Confidence: 0.9648464

01:18:23.820 --> 01:18:24.320 around

NOTE Confidence: 0.9799188

01:18:24.780 --> 01:18:26.080 stage four disease,

NOTE Confidence: 0.995732

01:18:27.260 --> 01:18:28.400 and the goals

NOTE Confidence: 0.9981703

01:18:28.700 --> 01:18:30.160 of of surgery.

NOTE Confidence: 0.98491204

01:18:31.500 --> 01:18:33.100 Can we cure patients with

NOTE Confidence: 0.98491204

01:18:33.100 --> 01:18:34.320 stage four disease?

NOTE Confidence: 0.9735808

01:18:34.965 --> 01:18:37.365 And is specifically, the question

NOTE Confidence: 0.9735808

01:18:37.365 --> 01:18:38.564 is in a situation where

NOTE Confidence: 0.9735808

01:18:38.564 --> 01:18:40.025 the primary tumor is pancreatic

NOTE Confidence: 0.9735808

01:18:40.085 --> 01:18:41.365 and will differentiate and has

NOTE Confidence: 0.9735808

01:18:41.365 --> 01:18:43.285 metastasized to the liver, if

NOTE Confidence: 0.9735808

01:18:43.285 --> 01:18:44.564 you're able to remove those

NOTE Confidence: 0.9735808

01:18:44.564 --> 01:18:46.025 liver spots in the pancreas

NOTE Confidence: 0.9735808

01:18:46.085 --> 01:18:47.285 spot, how often do you

NOTE Confidence: 0.9735808

01:18:47.285 --> 01:18:47.945 see recurrence?

NOTE Confidence: 0.9904601

01:18:49.130 --> 01:18:50.409 Yeah. It's a great question

NOTE Confidence: 0.9904601

01:18:50.409 --> 01:18:52.570 too. And much like everything

NOTE Confidence: 0.9904601

01:18:52.570 --> 01:18:54.110 in neuroendocrine disease,

NOTE Confidence: 0.99933195

01:18:54.570 --> 01:18:55.229 it depends.

NOTE Confidence: 0.99535245

01:18:56.729 --> 01:18:58.030 So, you know, the scenario

NOTE Confidence: 0.99535245

01:18:58.250 --> 01:18:58.750 where

NOTE Confidence: 0.9711027

01:18:59.290 --> 01:18:59.949 we have,

NOTE Confidence: 0.90472794

01:19:00.745 --> 01:19:01.945 you know, doctor Klimster was

NOTE Confidence: 0.90472794

01:19:01.945 --> 01:19:03.145 talking about a really well

NOTE Confidence: 0.90472794

01:19:03.145 --> 01:19:03.645 differentiated

NOTE Confidence: 0.9501614

01:19:04.185 --> 01:19:05.625 low grade tumor. Actually, many

NOTE Confidence: 0.9501614

01:19:05.625 --> 01:19:06.205 of these

NOTE Confidence: 0.9840834

01:19:06.665 --> 01:19:08.104 with a single or or

NOTE Confidence: 0.9840834

01:19:08.104 --> 01:19:09.385 maybe even two or three

NOTE Confidence: 0.9840834

01:19:09.385 --> 01:19:09.885 lesions

NOTE Confidence: 0.9685257

01:19:10.505 --> 01:19:12.265 can be resected, and patients

NOTE Confidence: 0.9685257

01:19:12.265 --> 01:19:13.465 can go for many, many,

NOTE Confidence: 0.9685257

01:19:13.465 --> 01:19:14.665 many years being free of

NOTE Confidence: 0.9685257

01:19:14.665 --> 01:19:16.560 disease, perhaps their entire life.

NOTE Confidence: 0.950977

01:19:17.840 --> 01:19:19.520 Again, as doctor Coons was

NOTE Confidence: 0.950977

01:19:19.520 --> 01:19:20.740 just alluding to,

NOTE Confidence: 0.9957769

01:19:21.520 --> 01:19:22.880 one of the challenging things

NOTE Confidence: 0.9957769

01:19:22.880 --> 01:19:23.840 is at the time of

NOTE Confidence: 0.9957769

01:19:23.840 --> 01:19:25.439 diagnosis, you don't know whether

NOTE Confidence: 0.9957769

01:19:25.439 --> 01:19:26.340 this particular

NOTE Confidence: 0.98929834

01:19:26.960 --> 01:19:28.479 tumor or tumors have been

NOTE Confidence: 0.98929834

01:19:28.479 --> 01:19:30.525 there for six months or

NOTE Confidence: 0.98929834

01:19:30.525 --> 01:19:32.525 six years or sixteen years

NOTE Confidence: 0.98929834

01:19:32.525 --> 01:19:33.025 sometimes.

NOTE Confidence: 0.9976921

01:19:34.445 --> 01:19:36.125 So when we are operating

NOTE Confidence: 0.9976921

01:19:36.125 --> 01:19:37.345 in the setting of metastatic

NOTE Confidence: 0.9976921

01:19:37.565 --> 01:19:38.065 disease,

NOTE Confidence: 0.984581

01:19:39.005 --> 01:19:40.865 I often use the analogy,

NOTE Confidence: 0.9981012

01:19:41.645 --> 01:19:43.005 of sort of resetting the

NOTE Confidence: 0.9981012

01:19:43.005 --> 01:19:44.305 clock on patients.

NOTE Confidence: 0.9645257

01:19:45.469 --> 01:19:46.670 You know, yes, we still

NOTE Confidence: 0.9645257

01:19:46.670 --> 01:19:48.290 need to watch and and

NOTE Confidence: 0.9645257

01:19:48.350 --> 01:19:50.030 basically watch them for life

NOTE Confidence: 0.9645257

01:19:50.030 --> 01:19:51.150 for any other signs of

NOTE Confidence: 0.9645257

01:19:51.150 --> 01:19:51.650 recurrence.

NOTE Confidence: 0.9685066

01:19:52.910 --> 01:19:54.830 But sometimes we can reset

NOTE Confidence: 0.9685066

01:19:54.830 --> 01:19:55.790 the clock to such a

NOTE Confidence: 0.9685066

01:19:55.790 --> 01:19:56.910 point and the pace of

NOTE Confidence: 0.9685066

01:19:56.910 --> 01:19:58.350 the disease is slow enough

NOTE Confidence: 0.9685066

01:19:58.350 --> 01:19:59.310 that they go through the

NOTE Confidence: 0.9685066

01:19:59.310 --> 01:20:00.615 rest of the natural life

NOTE Confidence: 0.97371167

01:20:01.415 --> 01:20:02.935 and, you know, without any

NOTE Confidence: 0.97371167

01:20:02.935 --> 01:20:04.775 recurrence of disease. That can

NOTE Confidence: 0.97371167

01:20:04.775 --> 01:20:05.975 be a little more challenging

NOTE Confidence: 0.97371167

01:20:05.975 --> 01:20:07.415 in higher grade disease, grade

NOTE Confidence: 0.97371167

01:20:07.415 --> 01:20:09.175 two, grade three disease. You

NOTE Confidence: 0.97371167

01:20:09.175 --> 01:20:10.775 know, recurrence is more often

NOTE Confidence: 0.97371167

01:20:10.775 --> 01:20:11.975 and is essentially the rule

NOTE Confidence: 0.97371167

01:20:11.975 --> 01:20:13.195 rather than the exception.

NOTE Confidence: 0.9670888

01:20:14.620 --> 01:20:16.140 At the same time, you

NOTE Confidence: 0.9670888

01:20:16.140 --> 01:20:18.000 know, same kind of scenario

NOTE Confidence: 0.9670888

01:20:18.060 --> 01:20:19.260 if we can knock the

NOTE Confidence: 0.9670888

01:20:19.260 --> 01:20:20.719 disease back considerably.

NOTE Confidence: 0.9848929

01:20:21.340 --> 01:20:22.860 There's also some evidence that

NOTE Confidence: 0.9848929

01:20:22.860 --> 01:20:24.060 some of the treatments doctor

NOTE Confidence: 0.9848929

01:20:24.060 --> 01:20:25.820 Coons can give work better

NOTE Confidence: 0.9848929

01:20:25.820 --> 01:20:27.020 in the setting of lower

NOTE Confidence: 0.9848929

01:20:27.020 --> 01:20:28.939 volume disease than higher volume

NOTE Confidence: 0.9848929

01:20:28.939 --> 01:20:29.439 disease.

NOTE Confidence: 0.9009211

01:20:30.604 --> 01:20:31.205 You know, this is part

NOTE Confidence: 0.9009211

01:20:31.205 --> 01:20:32.445 of the reason, you know,

NOTE Confidence: 0.9009211

01:20:32.445 --> 01:20:34.625 having a a multi specialty

NOTE Confidence: 0.9009211

01:20:34.845 --> 01:20:35.665 and multidisciplinary,

NOTE Confidence: 0.9772

01:20:37.564 --> 01:20:39.265 management team is so important

NOTE Confidence: 0.9772

01:20:39.325 --> 01:20:40.845 is not only are these

NOTE Confidence: 0.9772

01:20:40.845 --> 01:20:42.225 treatments tough to align,

NOTE Confidence: 0.9850198

01:20:42.525 --> 01:20:43.025 but

NOTE Confidence: 0.99921006

01:20:43.380 --> 01:20:45.620 they're sometimes really important to

NOTE Confidence: 0.99921006

01:20:45.620 --> 01:20:47.479 sequence correctly as well.

NOTE Confidence: 0.9811863

01:20:48.100 --> 01:20:48.979 You know, in other words,

NOTE Confidence: 0.9811863

01:20:48.979 --> 01:20:50.100 what comes first, second, or

NOTE Confidence: 0.9811863

01:20:50.100 --> 01:20:51.880 third really matters. So,

NOTE Confidence: 0.9985241

01:20:52.580 --> 01:20:53.620 I hope that answered the

NOTE Confidence: 0.9985241

01:20:53.620 --> 01:20:54.120 question.

NOTE Confidence: 0.985254

01:20:55.060 --> 01:20:56.500 Yeah. That's great, John. Thank

NOTE Confidence: 0.985254

01:20:56.500 --> 01:20:56.895 you.

NOTE Confidence: 0.99738026

01:20:57.935 --> 01:20:59.555 So one of my favorite

NOTE Confidence: 0.99738026

01:20:59.615 --> 01:21:01.235 ways to end these webinars

NOTE Confidence: 0.9819702

01:21:01.535 --> 01:21:03.314 is really forward looking.

NOTE Confidence: 0.99315464

01:21:04.015 --> 01:21:05.395 I'm gonna go around.

NOTE Confidence: 0.99486107

01:21:06.015 --> 01:21:06.895 John, I'll start with you

NOTE Confidence: 0.99486107

01:21:06.895 --> 01:21:07.854 since you've heard me ask

NOTE Confidence: 0.99486107

01:21:07.854 --> 01:21:08.595 this before.

NOTE Confidence: 0.9816358

01:21:09.055 --> 01:21:10.515 I really like asking

NOTE Confidence: 0.9402416

01:21:10.895 --> 01:21:12.030 what are you most hopeful

NOTE Confidence: 0.9402416

01:21:12.030 --> 01:21:13.229 for? What are you most

NOTE Confidence: 0.9402416

01:21:13.229 --> 01:21:15.010 excited about in your field,

NOTE Confidence: 0.952422

01:21:15.710 --> 01:21:17.150 for NETs? So, John, I'll

NOTE Confidence: 0.952422

01:21:17.150 --> 01:21:18.210 I'll start with you.

NOTE Confidence: 0.9888919

01:21:18.910 --> 01:21:20.110 Well, I I'll answer it

NOTE Confidence: 0.9888919

01:21:20.110 --> 01:21:20.750 the same way I did

NOTE Confidence: 0.9888919

01:21:20.750 --> 01:21:21.630 a few months ago.

NOTE Confidence: 0.9741136

01:21:22.590 --> 01:21:24.670 The, thing that's most exciting

NOTE Confidence: 0.9741136

01:21:24.670 --> 01:21:25.735 to me, you know, what

NOTE Confidence: 0.9741136

01:21:25.735 --> 01:21:27.275 what really, really,

NOTE Confidence: 0.9787125

01:21:27.814 --> 01:21:28.614 gets me out of the

NOTE Confidence: 0.9787125

01:21:28.614 --> 01:21:29.814 bed, out of bed in

NOTE Confidence: 0.9787125

01:21:29.814 --> 01:21:30.395 the morning,

NOTE Confidence: 0.9998113

01:21:31.335 --> 01:21:32.155 is taking

NOTE Confidence: 0.8843188

01:21:32.775 --> 01:21:34.935 tumors, you know, neuroendocrine tumors,

NOTE Confidence: 0.8843188

01:21:34.935 --> 01:21:36.535 either the pancreas or the

NOTE Confidence: 0.8843188

01:21:36.535 --> 01:21:37.835 intestines that

NOTE Confidence: 0.9850381

01:21:38.360 --> 01:21:40.280 some other institution or surgeon

NOTE Confidence: 0.9850381

01:21:40.280 --> 01:21:41.659 or oftentimes surgeons

NOTE Confidence: 0.90900016

01:21:41.960 --> 01:21:43.260 have said is unresectable,

NOTE Confidence: 0.9872913

01:21:45.000 --> 01:21:46.280 and turning it into something

NOTE Confidence: 0.9872913

01:21:46.280 --> 01:21:47.099 that's resectable.

NOTE Confidence: 0.9915147

01:21:48.199 --> 01:21:49.239 You know, all of those

NOTE Confidence: 0.9915147

01:21:49.320 --> 01:21:50.199 one of the best things

NOTE Confidence: 0.9915147

01:21:50.199 --> 01:21:52.455 about neuroendocrine disease is that

NOTE Confidence: 0.9915147

01:21:52.455 --> 01:21:54.554 it is moving so quickly.

NOTE Confidence: 0.99615204

01:21:55.895 --> 01:21:57.014 You know, and some of

NOTE Confidence: 0.99615204

01:21:57.014 --> 01:21:58.215 the treatments that are coming

NOTE Confidence: 0.99615204

01:21:58.215 --> 01:21:59.255 out in the last few

NOTE Confidence: 0.99615204

01:21:59.255 --> 01:22:00.475 years and imminently

NOTE Confidence: 0.95152885

01:22:01.415 --> 01:22:03.895 can sometimes cytoreduce, shrink, or

NOTE Confidence: 0.95152885

01:22:03.895 --> 01:22:05.094 alter tumors in such a

NOTE Confidence: 0.95152885

01:22:05.094 --> 01:22:05.915 way that,

NOTE Confidence: 0.9880234

01:22:06.740 --> 01:22:08.920 we can consider curative operations

NOTE Confidence: 0.9880234

01:22:09.140 --> 01:22:10.820 on patients that we never

NOTE Confidence: 0.9880234

01:22:10.820 --> 01:22:11.939 could have thought about that

NOTE Confidence: 0.9880234

01:22:11.939 --> 01:22:12.439 before.

NOTE Confidence: 0.99288017

01:22:13.140 --> 01:22:14.340 So that's that's what's really,

NOTE Confidence: 0.99288017

01:22:14.340 --> 01:22:15.880 really satisfying to me,

NOTE Confidence: 0.97120345

01:22:16.260 --> 01:22:17.700 and exciting in terms of,

NOTE Confidence: 0.97120345

01:22:18.020 --> 01:22:18.840 what's next.

NOTE Confidence: 0.98345727

01:22:19.965 --> 01:22:21.104 Great. Thanks, John.

NOTE Confidence: 0.98771137

01:22:22.445 --> 01:22:23.564 David, I'll I'll go to

NOTE Confidence: 0.98771137

01:22:23.564 --> 01:22:24.225 you next.

NOTE Confidence: 0.9677647

01:22:24.604 --> 01:22:25.725 You and and me I

NOTE Confidence: 0.9677647

01:22:25.725 --> 01:22:27.725 will, just acknowledge David has

NOTE Confidence: 0.9677647

01:22:27.725 --> 01:22:29.165 been in the neuroendocrine field

NOTE Confidence: 0.9677647

01:22:29.165 --> 01:22:30.445 and has really, like, literally

NOTE Confidence: 0.9677647

01:22:30.445 --> 01:22:31.824 written the book on neuroendocrine

NOTE Confidence: 0.9677647

01:22:31.885 --> 01:22:32.784 tumor pathology

NOTE Confidence: 0.98226184

01:22:33.085 --> 01:22:33.479 books.

NOTE Confidence: 0.9831585

01:22:34.760 --> 01:22:36.120 And so you have seen

NOTE Confidence: 0.9831585

01:22:36.120 --> 01:22:38.360 the field evolve over many

NOTE Confidence: 0.9831585

01:22:38.360 --> 01:22:38.860 years.

NOTE Confidence: 0.9994491

01:22:39.640 --> 01:22:40.760 What are you most excited

NOTE Confidence: 0.9994491

01:22:40.760 --> 01:22:41.260 about?

NOTE Confidence: 0.98726803

01:22:42.439 --> 01:22:43.420 It's a great question,

NOTE Confidence: 0.778745

01:22:43.800 --> 01:22:44.360 Pam. And,

NOTE Confidence: 0.9259076

01:22:45.080 --> 01:22:45.495 I think,

NOTE Confidence: 0.94330287

01:22:46.935 --> 01:22:48.615 John Kunstwena alluded to this

NOTE Confidence: 0.94330287

01:22:48.615 --> 01:22:49.495 a minute ago in one

NOTE Confidence: 0.94330287

01:22:49.495 --> 01:22:50.375 of the comments he made

NOTE Confidence: 0.94330287

01:22:50.375 --> 01:22:50.875 about

NOTE Confidence: 0.98028207

01:22:51.175 --> 01:22:52.235 staging treatments.

NOTE Confidence: 0.9961535

01:22:52.695 --> 01:22:53.895 You know, we've we've learned

NOTE Confidence: 0.9961535

01:22:53.895 --> 01:22:55.755 so much about the pathology,

NOTE Confidence: 0.9998056

01:22:56.135 --> 01:22:56.795 the genetics

NOTE Confidence: 0.9601151

01:22:57.590 --> 01:22:59.689 of these various neuroendocrine tumors,

NOTE Confidence: 0.9806698

01:23:00.469 --> 01:23:02.949 and especially for some sites

NOTE Confidence: 0.9806698

01:23:02.949 --> 01:23:04.389 like pancreas, we now have

NOTE Confidence: 0.9806698

01:23:04.389 --> 01:23:05.849 many different treatment options,

NOTE Confidence: 0.99922806

01:23:06.389 --> 01:23:07.590 but I think it's still

NOTE Confidence: 0.99922806

01:23:07.590 --> 01:23:09.429 challenging to decide which one

NOTE Confidence: 0.99922806

01:23:09.429 --> 01:23:10.489 to try first

NOTE Confidence: 0.9959877

01:23:11.014 --> 01:23:12.395 in a given patient.

NOTE Confidence: 0.9830064

01:23:13.335 --> 01:23:14.215 You can correct me if

NOTE Confidence: 0.9830064

01:23:14.215 --> 01:23:15.494 I'm wrong about that, but

NOTE Confidence: 0.9830064

01:23:15.494 --> 01:23:16.775 I think we can use

NOTE Confidence: 0.9830064

01:23:16.775 --> 01:23:17.835 a lot more information

NOTE Confidence: 0.9937866

01:23:18.295 --> 01:23:19.655 about which treatments are most

NOTE Confidence: 0.9937866

01:23:19.655 --> 01:23:20.715 likely to be effective.

NOTE Confidence: 0.99896616

01:23:21.175 --> 01:23:22.935 And we're beginning to unravel

NOTE Confidence: 0.99896616

01:23:22.935 --> 01:23:24.295 this based on the fact

NOTE Confidence: 0.99896616

01:23:24.295 --> 01:23:25.050 that some

NOTE Confidence: 0.99713707

01:23:25.530 --> 01:23:26.989 treatments target specific

NOTE Confidence: 0.9030416

01:23:27.689 --> 01:23:28.750 mutational pathways,

NOTE Confidence: 0.9886339

01:23:29.449 --> 01:23:30.409 but a lot more study

NOTE Confidence: 0.9886339

01:23:30.409 --> 01:23:31.849 is necessary. And so my

NOTE Confidence: 0.9886339

01:23:32.329 --> 01:23:33.449 what I get excited about

NOTE Confidence: 0.9886339

01:23:33.449 --> 01:23:34.570 is the possibility that we

NOTE Confidence: 0.9886339

01:23:34.570 --> 01:23:35.229 can discover

NOTE Confidence: 0.973961

01:23:35.770 --> 01:23:37.210 ways to predict response to

NOTE Confidence: 0.973961

01:23:37.210 --> 01:23:38.409 therapy that we don't have

NOTE Confidence: 0.973961

01:23:38.409 --> 01:23:39.849 today so we know which

NOTE Confidence: 0.973961

01:23:39.849 --> 01:23:40.510 of these

NOTE Confidence: 0.99968195

01:23:40.854 --> 01:23:41.594 various approved therapies

NOTE Confidence: 0.9962197

01:23:42.375 --> 01:23:43.255 would be the best for

NOTE Confidence: 0.9962197

01:23:43.255 --> 01:23:44.474 each individual patient.

NOTE Confidence: 0.9054659

01:23:46.854 --> 01:23:48.314 Thanks, David. George.

NOTE Confidence: 0.93899393

01:23:49.895 --> 01:23:50.875 I would say,

NOTE Confidence: 0.94552416

01:23:51.335 --> 01:23:52.295 you know, my answer is

NOTE Confidence: 0.94552416

01:23:52.295 --> 01:23:53.435 gonna be on the thermostat

NOTE Confidence: 0.94552416

01:23:53.574 --> 01:23:54.540 side, but I I think

NOTE Confidence: 0.94552416

01:23:54.540 --> 01:23:56.059 moving Can you define can

NOTE Confidence: 0.94552416

01:23:56.059 --> 01:23:57.179 you define that word for

NOTE Confidence: 0.94552416

01:23:57.179 --> 01:23:57.679 everybody?

NOTE Confidence: 0.95223045

01:23:57.979 --> 01:23:59.260 Yes. Oh, well, if you

NOTE Confidence: 0.95223045

01:23:59.260 --> 01:24:00.219 haven't if you missed the

NOTE Confidence: 0.95223045

01:24:00.219 --> 01:24:00.719 lecture,

NOTE Confidence: 0.9792555

01:24:01.260 --> 01:24:03.340 or the presentation. So being

NOTE Confidence: 0.9792555

01:24:03.340 --> 01:24:04.540 able to use the same

NOTE Confidence: 0.9792555

01:24:04.540 --> 01:24:05.040 molecule

NOTE Confidence: 0.9829454

01:24:05.579 --> 01:24:07.185 to image and to treat

NOTE Confidence: 0.9829454

01:24:07.265 --> 01:24:08.465 So that you can have

NOTE Confidence: 0.9829454

01:24:08.465 --> 01:24:09.665 a PET scan, you see

NOTE Confidence: 0.9829454

01:24:09.665 --> 01:24:12.064 where your somatostatin receptors are,

NOTE Confidence: 0.9829454

01:24:12.064 --> 01:24:13.205 and then you change

NOTE Confidence: 0.989325

01:24:13.745 --> 01:24:14.245 one

NOTE Confidence: 0.96759397

01:24:14.785 --> 01:24:15.285 radioisotope

NOTE Confidence: 0.9337208

01:24:15.745 --> 01:24:17.345 from a positron emitter to

NOTE Confidence: 0.9337208

01:24:17.345 --> 01:24:18.705 a beta emitter or better

NOTE Confidence: 0.9337208

01:24:18.705 --> 01:24:20.545 yet alpha emitter. And now

NOTE Confidence: 0.9337208

01:24:20.545 --> 01:24:21.445 you are treating.

NOTE Confidence: 0.94534636

01:24:21.960 --> 01:24:23.560 Moving to alpha emitters is

NOTE Confidence: 0.94534636

01:24:23.560 --> 01:24:25.720 a huge promise. It's still

NOTE Confidence: 0.94534636

01:24:25.720 --> 01:24:27.479 not there yet but because

NOTE Confidence: 0.94534636

01:24:27.479 --> 01:24:28.520 the kill, the cell kill

NOTE Confidence: 0.94534636

01:24:28.520 --> 01:24:29.640 will be much higher. There

NOTE Confidence: 0.94534636

01:24:29.640 --> 01:24:30.440 will be a lot more

NOTE Confidence: 0.94534636

01:24:30.440 --> 01:24:32.120 DNA damage. I think the

NOTE Confidence: 0.94534636

01:24:32.120 --> 01:24:33.400 other part that is very

NOTE Confidence: 0.94534636

01:24:33.400 --> 01:24:35.160 exciting in addition to moving

NOTE Confidence: 0.94534636

01:24:35.160 --> 01:24:35.895 earlier and

NOTE Confidence: 0.7879995

01:24:36.455 --> 01:24:37.354 using theranostics

NOTE Confidence: 0.9449496

01:24:37.895 --> 01:24:39.975 is combining theranostics with other

NOTE Confidence: 0.9449496

01:24:39.975 --> 01:24:41.335 treatments because so far it

NOTE Confidence: 0.9449496

01:24:41.335 --> 01:24:42.075 has been

NOTE Confidence: 0.91107243

01:24:42.455 --> 01:24:43.835 done on its own. So

NOTE Confidence: 0.91107243

01:24:43.975 --> 01:24:46.055 combining this with other treatments

NOTE Confidence: 0.91107243

01:24:46.055 --> 01:24:47.255 that are already that some

NOTE Confidence: 0.91107243

01:24:47.255 --> 01:24:49.020 many discussed today I think

NOTE Confidence: 0.91107243

01:24:49.020 --> 01:24:50.700 is another exciting area where,

NOTE Confidence: 0.91107243

01:24:51.020 --> 01:24:52.479 hopefully we'll see better results.

NOTE Confidence: 0.9976099

01:24:53.100 --> 01:24:53.840 That's great.

NOTE Confidence: 0.9967699

01:24:54.620 --> 01:24:56.400 I'll I'll I'll go also.

NOTE Confidence: 0.92942774

01:24:56.700 --> 01:24:57.020 So,

NOTE Confidence: 0.9898857

01:24:57.660 --> 01:24:58.540 I have to say as

NOTE Confidence: 0.9898857

01:24:58.540 --> 01:25:00.140 someone who's a clinical trialist

NOTE Confidence: 0.9898857

01:25:00.140 --> 01:25:00.939 and has been in the

NOTE Confidence: 0.9898857

01:25:00.939 --> 01:25:02.220 neuroendocrine space for a long

NOTE Confidence: 0.9898857

01:25:02.220 --> 01:25:03.820 time, I'm really excited about

NOTE Confidence: 0.9898857

01:25:03.820 --> 01:25:04.814 the attention

NOTE Confidence: 0.9570217

01:25:05.195 --> 01:25:06.635 that NETZ has finally been

NOTE Confidence: 0.9570217

01:25:06.635 --> 01:25:08.074 getting over the last five

NOTE Confidence: 0.9570217

01:25:08.074 --> 01:25:08.895 to ten years,

NOTE Confidence: 0.9483944

01:25:09.434 --> 01:25:11.034 in clinical trials. We need

NOTE Confidence: 0.9483944

01:25:11.034 --> 01:25:12.414 data to really

NOTE Confidence: 0.9996893

01:25:12.795 --> 01:25:14.014 provide us with information

NOTE Confidence: 0.9891789

01:25:14.395 --> 01:25:15.835 on the best treatments to

NOTE Confidence: 0.9891789

01:25:15.835 --> 01:25:17.275 use, what order we can

NOTE Confidence: 0.9891789

01:25:17.275 --> 01:25:18.619 do them in, how to

NOTE Confidence: 0.9891789

01:25:18.619 --> 01:25:20.639 better select patients and identify

NOTE Confidence: 0.9891789

01:25:20.699 --> 01:25:22.380 patients. And when I meet

NOTE Confidence: 0.9891789

01:25:22.380 --> 01:25:23.820 with patients in clinic and

NOTE Confidence: 0.9891789

01:25:23.820 --> 01:25:25.020 I'm asked, well, what's the

NOTE Confidence: 0.9891789

01:25:25.020 --> 01:25:26.079 next best treatment?

NOTE Confidence: 0.9800015

01:25:26.860 --> 01:25:27.979 You know, we don't we

NOTE Confidence: 0.9800015

01:25:27.979 --> 01:25:30.460 haven't historically had clinical trials

NOTE Confidence: 0.9800015

01:25:30.460 --> 01:25:32.245 like our colleagues in colon

NOTE Confidence: 0.9800015

01:25:32.245 --> 01:25:33.765 cancer or breast cancer to

NOTE Confidence: 0.9800015

01:25:33.765 --> 01:25:34.805 say we have hundreds of

NOTE Confidence: 0.9800015

01:25:34.805 --> 01:25:36.245 patients that have been treated

NOTE Confidence: 0.9800015

01:25:36.245 --> 01:25:37.125 in this trial, and this

NOTE Confidence: 0.9800015

01:25:37.125 --> 01:25:38.565 is what we this is

NOTE Confidence: 0.9800015

01:25:38.565 --> 01:25:39.765 our best evidence or best

NOTE Confidence: 0.9800015

01:25:39.765 --> 01:25:40.805 data. And I think we're

NOTE Confidence: 0.9800015

01:25:40.805 --> 01:25:41.545 getting there.

NOTE Confidence: 0.99808925

01:25:42.245 --> 01:25:43.604 So I find that really

NOTE Confidence: 0.99808925

01:25:43.604 --> 01:25:45.065 exciting and very hopeful.

NOTE Confidence: 0.99029523

01:25:45.445 --> 01:25:47.300 I think that many patients

NOTE Confidence: 0.99029523

01:25:47.439 --> 01:25:49.280 who are alive now with

NOTE Confidence: 0.99029523

01:25:49.280 --> 01:25:51.199 NETs will directly benefit from

NOTE Confidence: 0.99029523

01:25:51.199 --> 01:25:52.900 clinical trials that are ongoing

NOTE Confidence: 0.7840527

01:25:53.520 --> 01:25:54.000 and,

NOTE Confidence: 0.9954227

01:25:54.800 --> 01:25:56.560 you know, with really help

NOTE Confidence: 0.9954227

01:25:56.560 --> 01:25:58.659 from from this entire multidisciplinary

NOTE Confidence: 0.9370582

01:25:59.119 --> 01:26:00.675 team. And so I think

NOTE Confidence: 0.9370582

01:26:00.675 --> 01:26:02.054 a key takeaway is,

NOTE Confidence: 0.9865843

01:26:02.435 --> 01:26:03.814 be sure you have some

NOTE Confidence: 0.9865843

01:26:03.955 --> 01:26:06.114 NET experts, whether they're NET

NOTE Confidence: 0.9865843

01:26:06.114 --> 01:26:06.614 pathologists,

NOTE Confidence: 0.95985097

01:26:06.994 --> 01:26:07.735 NET radiologists,

NOTE Confidence: 0.98032653

01:26:08.114 --> 01:26:09.635 or NET surgeons, or medical

NOTE Confidence: 0.98032653

01:26:09.635 --> 01:26:11.175 oncologists on your team.

NOTE Confidence: 0.9774874

01:26:11.554 --> 01:26:12.354 There are ways to get

NOTE Confidence: 0.9774874

01:26:12.354 --> 01:26:13.875 that regardless of where you

NOTE Confidence: 0.9774874

01:26:13.875 --> 01:26:15.710 live, and we are we

NOTE Confidence: 0.9774874

01:26:15.710 --> 01:26:17.489 work well with community oncologists

NOTE Confidence: 0.9774874

01:26:17.630 --> 01:26:18.370 and community

NOTE Confidence: 0.9964479

01:26:18.750 --> 01:26:20.270 team members, to really try

NOTE Confidence: 0.9964479

01:26:20.270 --> 01:26:21.229 to help get you best

NOTE Confidence: 0.9964479

01:26:21.229 --> 01:26:22.130 of both worlds.

NOTE Confidence: 0.99821174

01:26:22.670 --> 01:26:23.170 So

NOTE Confidence: 0.98572284

01:26:23.949 --> 01:26:25.310 we are gonna end there.

NOTE Confidence: 0.98572284

01:26:25.310 --> 01:26:26.670 This again, this webinar will

NOTE Confidence: 0.98572284

01:26:26.670 --> 01:26:28.750 be available afterwards. Huge thank

NOTE Confidence: 0.98572284

01:26:28.750 --> 01:26:30.126 you to my colleagues for

NOTE Confidence: 0.98572284

01:26:30.126 --> 01:26:31.106 spending their evening,

NOTE Confidence: 0.93593055

01:26:31.566 --> 01:26:33.725 and happy net awareness day.

NOTE Confidence: 0.93593055

01:26:33.725 --> 01:26:35.245 So thank you everybody. Have

NOTE Confidence: 0.93593055

01:26:35.245 --> 01:26:36.066 a great night.