All right, so again, welcome this evening. It’s really a pleasure to have everybody here and thank you for being here. And actually I had my slides backwards, so I apologize. So first I have one disclosure which is not relevant to what we’re going to be talking about. And actually I had my slides backwards, so I apologize.

So first I want to start by thanking Connecticut brain tumor alliance and the national brain tumor society who have partnered with us in support of this seminar.
They are wonderful organizations who.

Really help and support patients with brain tumors and we are grateful for their support and their partnership.

I want to talk a little bit and introduce Susie Barris to all of you. She was my patient and she was practicing as a pediatrician in Connecticut. Very beloved pediatrician and one day she had a seizure in her office.

She was then diagnosed with a glioblastoma in her motor strip and so she was transferred to a local hospital and was told that her tumor was inoperable. Because of its location in the motor
00:01:10.379 --> 00:01:12.999 strip and that a biopsy was offered,
00:01:13.000 --> 00:01:13.338 Susie,
00:01:13.338 --> 00:01:14.352 being a physician,
00:01:14.352 --> 00:01:16.881 thought to to see if maybe there
00:01:16.881 --> 00:01:19.046 were some options or alternatives,
00:01:19.050 --> 00:01:20.890 or she sought opinions throughout
00:01:20.890 --> 00:01:21.994 the Northeast Corridor.
00:01:22.000 --> 00:01:24.135 I was thankful and privileged enough to
00:01:24.135 --> 00:01:26.638 be the one to end up caring for her.
00:01:26.640 --> 00:01:28.740 I performed in awake craniotomy on her.
00:01:28.740 --> 00:01:31.132 We removed all of the tumor safely and
00:01:31.132 --> 00:01:34.235 this is a picture of her and I at the
00:01:34.235 --> 00:01:36.540 Connecticut brain tumor lions path of hope.
00:01:36.540 --> 00:01:38.700 Two weeks after her surgery.
00:01:38.700 --> 00:01:40.110 They have, uh,
their annual 5K.

She ran it twice and I walked it once so she is an amazing person.

And in gratitude for her success she is now about almost four years after her surgery.

In her gratitude, she has been incredibly generous to us and to our program, and so we recently named our Nurse Surgical Oncology program in her honor and her fund support. The seminar, as well as other efforts to try to educate the community patients and providers about the importance...
00:02:15.428 --> 00:02:18.369 of of brain tumor care and and
NOTE Confidence: 0.84976193
00:02:18.369 --> 00:02:19.557 brain tumor management,
NOTE Confidence: 0.84976193
00:02:19.560 --> 00:02:21.920 so very grateful to her
NOTE Confidence: 0.84976193
00:02:21.920 --> 00:02:23.808 and to her friendship.
NOTE Confidence: 0.84976193
00:02:23.810 --> 00:02:24.314 So tonight,
NOTE Confidence: 0.84976193
00:02:24.314 --> 00:02:26.078 my portion of the talk is going
NOTE Confidence: 0.84976193
00:02:26.078 --> 00:02:27.897 to be talking about surgical
NOTE Confidence: 0.84976193
00:02:27.897 --> 00:02:29.782 strategies for primary brain tumors.
NOTE Confidence: 0.84976193
00:02:29.790 --> 00:02:31.662 We have Zach Corbin who’s going
NOTE Confidence: 0.84976193
00:02:31.662 --> 00:02:34.950 to follow me talking about neural
NOTE Confidence: 0.84976193
00:02:33.960 --> 00:02:34.950 oncology approaches.
NOTE Confidence: 0.84976193
00:02:34.950 --> 00:02:37.030 Bruce Mcgibbons talking about
NOTE Confidence: 0.84976193
00:02:37.030 --> 00:02:38.590 radiation oncology approaches,
NOTE Confidence: 0.84976193
00:02:38.590 --> 00:02:40.858 and then the probably the most
NOTE Confidence: 0.84976193
00:02:40.858 --> 00:02:42.790 important aspect of the talk.
NOTE Confidence: 0.84976193
00:02:42.790 --> 00:02:45.989 Brian Jin talking about from social work,
NOTE Confidence: 0.84976193
00:02:45.990 --> 00:02:47.895 talking about the management and
NOTE Confidence: 0.84976193
00:02:47.895 --> 00:02:50.420 support of patients and their families.
NOTE Confidence: 0.84976193
00:02:50.420 --> 00:02:53.136 So again, one disclosure that’s not relevant,
NOTE Confidence: 0.84976193
00:02:53.140 --> 00:02:55.135 so we are fortunate to perform the
NOTE Confidence: 0.84976193
00:02:55.135 --> 00:02:57.084 most number of brain tumor surgeries
NOTE Confidence: 0.84976193
00:02:57.084 --> 00:02:59.142 each year in Connecticut and care
NOTE Confidence: 0.84976193
00:02:59.142 --> 00:03:01.358 for the highest volume of patients.
NOTE Confidence: 0.84976193
00:03:01.360 --> 00:03:03.536 We do try to partner with the Community
NOTE Confidence: 0.84976193
00:03:03.536 --> 00:03:05.480 in that a lot of the Community,
NOTE Confidence: 0.84976193
00:03:05.480 --> 00:03:06.900 neurosurgeons and other providers,
NOTE Confidence: 0.84976193
00:03:06.900 --> 00:03:09.030 will refer patients to us for
NOTE Confidence: 0.899649423076923
00:03:09.086 --> 00:03:11.352 more complex cases, and I’ll show some
NOTE Confidence: 0.899649423076923
00:03:11.352 --> 00:03:13.500 examples of where and how we can.
NOTE Confidence: 0.899649423076923
00:03:13.500 --> 00:03:14.604 We can be helpful.
NOTE Confidence: 0.899649423076923
00:03:14.604 --> 00:03:17.092 All of the tumors that we operate on
undergo what we call whole exome sequencing, which is a really Next generation sequencing technique that allows us to understand the tumor from a molecular standpoint and that enables us to treat people from a very precise and personalized manner. And we discussed every patient in our multidisciplinary tumor board, which I direct and everybody here attends, as well as our precision brain tumor board each week. These are just an example of some cases. I always show my patients the preop and POSTOP scans.
I don’t know if you’re seeing my mouse or not, but preop is on the left post OP is on the right and you can see for instance, the glioblastoma Mirren and in the motor strip that was gross, totally resected, some more aggressive meningiomas

the motor strip that was gross, totally resected, some more aggressive meningiomas

that we manage, and take care of again

vestibular schwannomas,

which we’ll talk a little bit about interventricular tumors,

and again, pre and postop.

With the comparisons with showing the extent of resection and we’ll
00:04:17.159 --> 00:04:19.532 talk about how removing as much tumor
00:04:19.532 --> 00:04:21.718 as safely as possible is really the
00:04:21.718 --> 00:04:24.042 goal to any type of of neurosurgical
00:04:24.042 --> 00:04:26.247 care for brain tumor patients.
00:04:26.250 --> 00:04:28.074 So the goal of primary brain
00:04:28.074 --> 00:04:29.290 tumor surgery of course,
00:04:29.290 --> 00:04:32.650 to establish a diagnosis and and to
00:04:32.650 --> 00:04:35.367 establish sorry and to establish
00:04:35.367 --> 00:04:38.010 an accurate diagnosis to maintain,
00:04:38.010 --> 00:04:40.590 improve quality and quantity of life.
00:04:40.590 --> 00:04:42.442 And by what I.
00:04:42.442 --> 00:04:43.469 What I mean by that is that there’s
00:04:43.469 --> 00:04:45.884 great evidence that shows the more tumor.
00:04:45.890 --> 00:04:47.970 We’re able to remove safely.
00:04:47.970 --> 00:04:49.810 The better the patient does,
this really has shown effect across all tumor types. Maybe without the exception of of lymphomas. In small cell lung cancer, but otherwise brain tumors benefit from being gross, totally resected, and patients benefit from the resection while maintaining their neurological function, or even improving their neurological function. How do we do that? And so similar to Susie’s tumor patients can be told that they have an inoperable tumor because it’s in
00:05:18.607 --> 00:05:20.758 in an eloquent part of the brain,
00:05:20.760 --> 00:05:22.440 an eloquent meaning a highly
00:05:22.440 --> 00:05:24.120 functioning part of the brain,
00:05:24.120 --> 00:05:26.059 and So what are the secrets to
00:05:26.059 --> 00:05:28.192 the success we have all the the
00:05:28.192 --> 00:05:30.040 gadgets and and gazebos that that
00:05:30.109 --> 00:05:32.005 that gadgets and gizmos that that
00:05:32.005 --> 00:05:34.380 we need in our state of the art
00:05:34.380 --> 00:05:36.293 operating rooms with GPS systems and
00:05:36.293 --> 00:05:38.357 ultrasounds were the only center in
00:05:38.357 --> 00:05:40.930 the state to have an intraoperative MRI,
00:05:40.930 --> 00:05:42.526 which I’ll show the benefit of.
00:05:42.530 --> 00:05:43.168 But really,
00:05:43.168 --> 00:05:45.720 I think a lot of it comes down
00:05:45.800 --> 00:05:47.928 to expertise and experience,
and in fact that has a lot to do with more sophisticated microsurgical techniques, and especially when we’re talking about preserving function. And really the gold standard for that is is neuromonitoring or use of neuromonitoring and functional mapping, as well as a weak surgery, which I’ll show some examples of. This was a slide that was given to me by the Chair of mass general Neurosurgery, and I I really like it because I think it. It speaks volumes. This is as you can see, as the case volume increases and this is
the percentage of cranial specialization. What this shows is that surgeons who do higher volume and are more specialized in a particular area of neurosurgery, cranial versus spine, that would even argue tumor versus other aspects of neurosurgery. Have better outcomes in terms of their patients, and that's certainly something that we see here. I have a short video which I hope you don't mind me sharing. Unfortunately I have to pull it up elsewhere, but this is a great example and I've shown this before,
so forgive me if you’ve seen my talks
before and have seen the video,
but I think it’s a real great example of what we’re able to do.
Sixty one can you hear it OK?
Surgery, waking up in the middle of the procedure and knowing what’s going on.
But in some cases that can be a lifesaver,
lifesaver and necessary.
We’re going to explain that in a moment,
but first we do want to introduce you to a man named Andy Andy is a husband and father of two kids and a nurse.
Another interesting fact about him,
he’s also a professionally trained singer.
He’s even performed with his
church choir at Carnegie Hall,
but Andy felt his entire life come to a halt when he was diagnosed with brain cancer.
He needed surgery to remove as much of a tumor.
It’s possible that tumor in the part of his brain that controls speech and,
That’s where a special surgery comes in.
Surgeons at Yale, New Haven Smilow Cancer Hospital have perfected a procedure called in a weight craniotomy.
They invited us into the operating room and we did not hesitate to see
this incredible procedure first hand.

In an operating room at Yale, New Haven Hospital.

Doctors are working to remove the tumor from the brain of a 31-year-old man named Andy, who is a singer and a husband and father of two. Most surgeries waking up in the middle of the operation would be a disaster. An anesthesiologist doing his best to make sure Andy does just that. surgeons have drilled through his skull and have already begun to remove part of the tumor. Located on the left side.
of his temporal lobe.
The area which controls language.
Medical staff puts a microphone on him.
It’s not for our cameras, it’s so the entire room, including the operating surgeon,
Medical staff puts a microphone on him.
It’s not for our cameras, it’s so the entire room, including the operating surgeon,
I was telling you earlier I don’t know if it’s from the brain surgery or the fact
I have to have a couple of copies
for neurophysiologist. Brook Callahan
sits next to him and begins her work. I
am going to say a sentence and I
want you to repeat it after me.
The seashore smells like salt.

It's like. Action can be heard on a speaker throughout the room.

Neurosurgeon Doctor Jennifer moliterno. Has mastered multitasking, operating and listening.

Great Doctor Moliterno and her team worked diligently to remove as much of the tumor as possible.

What she can’t see are critical microscopic language fibers which are splayed over the tumor.

The best way to try to remove as much tumor and preserve his language is to do it with him away.

Get too close to those critical fibers.
You’ll know it. What can you do in a chair?
Yeah, a little bit of confusion, so that’s a great way to tell me to stop.
And so even though there might be a little bit of tumor there, the risk and benefit of removing that tumor and having him not speak for the rest of his life.
Tells you exactly what the right decision is. If he was asleep, I would have had no idea.
As Doctor Moliterno continues operating at a safer spot and he surprises us when this happens.
He does in the middle of surgery.

Andy's a classically trained singer, shares his talent.

2 1/2 hours into the procedure, doctor Moliterno decides it's time to wrap up.

The surgeons are done with the first part of the surgery.

So what’s happening now is they’re bringing in an MRI machine and they’re going to look at the work they did and see how much of the tumor they were able to remove.

We go into another room that are able to sit with Doctor Moliterno as she analyzes her work.
The before kierans think tumor and after.

You don’t have to go back in and feel satisfied pending a week allowed us to get that outcome and preserve this function.

Now Andy was back home with his family two days after surgery, five days after the surgery, he was able to sing at his son’s baptism.

He’s also saying again with his church choir and the Yale Camerata, which is a professional choir.

Just a couple of weeks ago, Andy is undergoing chemotherapy and radiation, but he does say he’s feeling good.

And, of course, warm wishes to him.
He is just.

So that is a great example in my mind as to why we do what we do and how we can really push the limits from a surgical perspective.

OK, another example of a patient of mine who underwent 10 away craniotomy and so this was an in another man who presented with language trouble. He was at a different hospital and outside hospital and you can see here was his initial scan. He had a glioblastoma just around his language area and that was prohibiting him from speaking. You can see that he underwent a
postop MRI just a short time.

After and really there was not much tumor, if any that was removed, and so they had achieved a diagnosis of glioblastoma, but he was then referred to me because as you can imagine, which Zach and Bruce will get to it can be quite hard to radiate an area such as this, especially near critical language structures. So we ended up getting a functional chemotherapy when there’s that much mass and and Mass Effect and and edema, especially near critical language structures. So we ended up getting a functional.
00:13:07.373 --> 00:13:09.526 MRI similar to Andy. We kept him.
NOTE Confidence: 0.876471472692308
00:13:09.526 --> 00:13:11.398 Awake during surgery and we were
NOTE Confidence: 0.876471472692308
00:13:11.398 --> 00:13:14.229 able to remove the tumor and his
NOTE Confidence: 0.876471472692308
NOTE Confidence: 0.876471472692308
00:13:15.460 --> 00:13:17.735 Not all patients need to be awake
NOTE Confidence: 0.876471472692308
00:13:17.735 --> 00:13:19.641 during surgery in order for us
NOTE Confidence: 0.876471472692308
00:13:19.641 --> 00:13:21.650 to safely remove and get the
NOTE Confidence: 0.876471472692308
NOTE Confidence: 0.876471472692308
00:13:23.760 --> 00:13:26.357 This is one of my favorite stories
NOTE Confidence: 0.876471472692308
00:13:26.357 --> 00:13:29.460 and I have a lot that are similar,
NOTE Confidence: 0.876471472692308
00:13:29.460 --> 00:13:32.344 but I think this one really highlights
NOTE Confidence: 0.876471472692308
00:13:32.344 --> 00:13:33.976 the multidisciplinary effort that
NOTE Confidence: 0.876471472692308
00:13:33.976 --> 00:13:35.974 that we provide on every patient.
NOTE Confidence: 0.876471472692308
00:13:35.980 --> 00:13:38.154 So this is a gentleman in 2013.
NOTE Confidence: 0.876471472692308
00:13:38.154 --> 00:13:39.490 As you can see.
NOTE Confidence: 0.876471472692308
00:13:39.490 --> 00:13:42.480 He presented to another hospital.
And underwent a biopsy for this tumor. That’s located here, turned out to be a glioblastoma. He was told that the mass was too risky to remove. He then was referred to me for consideration of another opinion. I thought that this could be safely removed, and so we did, and even for someone like me, who does brain tumor surgery every day, you can still get fooled and you can still miss some tumor. And so this is an example of our interoperative MRI, which you can see here.
That’s housed in our operating room and a little bit of tumor I left behind that got tucked and hidden underneath the brain. So while he was asleep on the table after I removed most of the mass, we got the intraoperative MRI saw that and I went back and was able to resect it. This pathology was confirmed as GPM, showing an unmethylated MGMT status, which is usually a poor prognostic factor. His care was then provided by Yoocom bearing our neuro oncologist, as well as Renji. Who had the patient on our standard of care?
Stoop radiation and temozolomide and one of our fantastic homegrown Yale clinical trials that Ranjeet was Pi and really found it. He was enrolled on other clinical trials that we offer and then switched on various chemotherapies until he progressed and when he did he welcome sent him back to me with this recurrence. So I operated on him again and here you can see we did a wider resection and of course pathology was the same but the whole exome sequencing that we performed that really helps us.
00:15:24.700 --> 00:15:26.660 understand the tumors better showed
NOTE Confidence: 0.8984197475
00:15:26.728 --> 00:15:29.056 he had what we call a hyper mutated
NOTE Confidence: 0.8984197475
00:15:29.056 --> 00:15:30.577 phenotype and the significance of
NOTE Confidence: 0.8984197475
00:15:30.577 --> 00:15:33.015 this is that we know based on the
NOTE Confidence: 0.8984197475
00:15:33.015 --> 00:15:35.780 literature that these tumors tend to be
NOTE Confidence: 0.8984197475
00:15:35.780 --> 00:15:37.789 more susceptible to immune checkpoint
NOTE Confidence: 0.8984197475
00:15:37.789 --> 00:15:40.878 inhibitors and so he was then started on
NOTE Confidence: 0.8984197475
00:15:40.878 --> 00:15:43.114 nivolumab and then also with Avastin.
NOTE Confidence: 0.8984197475
00:15:43.114 --> 00:15:43.546 Intermittently,
NOTE Confidence: 0.8984197475
00:15:43.546 --> 00:15:47.008 and he is currently about 8 1/2 years
NOTE Confidence: 0.8984197475
00:15:47.008 --> 00:15:49.535 from his initial time of diagnosis and
NOTE Confidence: 0.8984197475
00:15:49.535 --> 00:15:52.417 I love this story and when I presented
NOTE Confidence: 0.8984197475
00:15:52.417 --> 00:15:54.975 I always say that this is in no way
NOTE Confidence: 0.8984197475
00:15:54.975 --> 00:15:57.080 and I had rejected him one other time.
NOTE Confidence: 0.8984197475
00:15:57.080 --> 00:15:59.072 Sorry I forgot to mention that I in
NOTE Confidence: 0.8984197475
00:15:59.072 --> 00:16:01.801 no way I’m saying that all of our GBM
patients will survive 8 1/2 years or longer.

I really do wish that was the case, but he is a great example of how
he would still be alive 8 1/2 years after a biopsy.

And so this is a great example of how when
we work together with aggressive surgery,
maximal safe resection even a few times,
we can really push the limits of
what we can do with the other
clinical trials and other adjuvants.
This is a more recent example
of a patient who was seen at
another hospital in Connecticut.

He had this large tumor that you can see here in his fourth ventricle.

This actually caused some obstruction of fluid, so at the outside hospital he underwent a placement of a shunt to address the management and build up of the fluid and also underwent a biopsy of the mass.

The biopsy showed that it was a malignant tumor, but unfortunately it wasn’t able to characterize.

What type of the tumor it was?

And so this patient was followed with a serial scan a few months later.
00:17:10.349 --> 00:17:12.726 that showed increase in size of the tumor and further backup of fluid.

00:17:12.726 --> 00:17:14.844 Despite the shunt he was referred to me for surgical resection.

00:17:14.850 --> 00:17:16.962 We were able to remove all of the tumor and now we can target his treatment better.

00:17:16.962 --> 00:17:19.120 Now knowing exactly what type of tumor it is and also the shunt was removed because he doesn’t need it.

00:17:19.120 --> 00:17:21.361 Given the fact that the tumor was removed and the backup of fluid was alleviated.

00:17:21.361 --> 00:17:23.936 So again, another great example for diagnosis how it can really be helpful in guiding management.

00:17:23.940 --> 00:17:25.500 The maximal set extent of resection doesn’t
necessarily apply just to malignant tumors, and so this is an example of a vestibular schwannoma patient and acoustic neuroma patient, and these tumors are 99.9% benign, and so they're not malignant, but they're tricky and that they occur next to the brain stem, and they have a very intimate association and relationship with the facial nerve, and so this patient presents it elsewhere. He underwent a surgery by another. Surgeon and this is his preoperative scan. This is his post operative scan. Three months later in 2012 and you can see
00:18:18.311 --> 00:18:21.076 not much of a difference between the two.

00:18:21.080 --> 00:18:23.456 Not much tumor had been removed.

00:18:23.460 --> 00:18:27.116 They continued to monitor this and in 2017

00:18:27.120 --> 00:18:29.775 in conjunction with another radiation

00:18:29.775 --> 00:18:32.430 oncologist ended up giving focused

00:18:32.513 --> 00:18:35.318 radiation or gamma knife radiosurgery.

00:18:35.320 --> 00:18:38.414 She went on about a year later

00:18:38.414 --> 00:18:40.260 to start experiencing this,

00:18:40.260 --> 00:18:41.708 which is pretty bad.

00:18:41.708 --> 00:18:43.156 Swelling in her brainstem.

00:18:43.160 --> 00:18:44.540 As a result,

00:18:44.540 --> 00:18:47.760 she became pretty debilitated by this tumor,

00:18:47.760 --> 00:18:49.916 so much so that she required very,

00:18:49.920 --> 00:18:51.312 very high dose steroids,

00:18:51.312 --> 00:18:54.294 which led to a steroid myopathy which led

NOTE Confidence: 0.897949013076923
to significant muscle wasting and weakness.

She was confined to a wheelchair, and Zach was actually became involved with her care at that point, and kindly referred her to me when he did this. You can still see the swelling in the brain stem over here and we took her to surgery and got a nice resection. So another example where working with people and and providing the best possible surgical outcome really does impact people’s lives. Another type of brain tumor that
everyone usually thinks of as being benign as meningioma and we at Yale have really done a lot of work to understand these tumors and the biology of these tumors and why sometimes they don’t behave as benign as one would think. So this is another patient who underwent a resection in 2015. I don’t have those films, but he had what we call a convexity meningioma and so another. Hospital in 2015 underwent resection. Was told it was a grade one meningioma, not to be worried about it.
It was removed and he can go about his life.

He ended up having some weakness due to as you can see, some swelling in 2017 that was associated with regrowth of the tumor and so he got this scan.

He saw a few other surgeons not me at the time and the decision was to do gamma knife radiosurgery targeted.

Then two years after.

The radio surgery he progressively worsened.

He was confined to a wheelchair.

The tumor had grown more and he had intractable seizures at that point.

In 2019, he was sent to me.
This was a pretty straightforward surgery, despite the radiation, and we were able to roast, totally remove it. His weakness improved, and his seizures went away. But the question that we've been asking here at Yale, from a research perspective is, could this have been better predicted or managed the first time? And the answer is yes, and I'll show you briefly why.
sporadic meningiomas and we now know about 80 or 85% of sporadic meningiomas are caused by mutation. Somatic mutations in these genes, and so the most common and in the interest of time I won’t get into everything but the most common mutation underlying sporadic meningiomas is somatic mutation involving NF2 with or without chromosome 22 loss. These this, this abnormality has been seen as part of the pathway to more aggressive meningioma formation, and I’ll talk about that in a few minutes and so when we think
of grade one meningiomas, there’s also grade 2 meningiomas and grade 2 meningiomas can either arise as grade 2 meningiomas, which we call denova with certain genomic characteristics, or they can progress from low grade. High grade, very similar to gliomas. Part of the work that I have focused on is the clinical correlations and so initially and and we’ve revised this even even more so to be more inclusive. More recently is localizing the meningioma subgroups based on genomic mutation with intracranial location,
and so I use this all the time in the sense that when patients come to my clinic based on where their tumor where, their meningeal might is located in their head, I can predict with a pretty good degree of certainty. And the underlying genomic mutation. And so why is that relevant? Because we’ve gone on with thanks in part to the Connecticut brain tumor alliance and their support of our work to understand the clinical relevance. And so these genomic subgroups we have found to be linked to various clinical manifestations,
whether that’s seizure. Whether that’s also to do with histological subtypes, or Bony involvement, etcetera, we have been able to uncover that one area I wanted to touch upon, and I apologize for the. We were the first to publish on recurrence being related to meningioma molecular subgroup, and so again very busy slide, but the take home message is that we identified for the genomic subgroups with more aggressive clinical
behavior in terms of recurrence,

and so specifically those tumors with an NF2 mutation,

those with an AKT1 mutation or other molecules involving the Pi3 kinase signaling pathway, hedgehog.

Familiar pathway or trap?

Seven or more likely to record an average 22 times higher than others,

and this held true at 17 times higher amongst grade ones.

And so what type of mutation is underlying or driving the meningioma biology is associated with whether or not the tumor will occur and even when it will occur in that
some of these tumors with a KT1 mutations in the PI3 kinase signaling pathway typically recurs sooner.

And this is 1 aspect of the answer to the puzzle as to why some grade one meningioma is behave more aggressively, and so here going back to our patient, how could this have been predicted in managed differently the first time? This is how and so this is an example of our molecular analysis report that we receive on every patient we operate on at Yale. And here the histological diagnosis of this
patient was actually a Grade 2 meningioma,

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not a grade. And Angioma,

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which was initially diagnosed in 2015.

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So you might say, well,

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maybe I transitioned from

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a low grade to high grade.

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The answer is no.

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Looking at the molecular information,

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there’s an NF2 mutation and then based

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on the chromosomal abnormalities

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in the copy number alterations,

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we can tell that this was one that

NOTE Confidence: 0.8791293652

was denovo and had been a typical

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meningioma but was misdiagnosed

NOTE Confidence: 0.8791293652

histologically back in 2015.

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And so, in our hands we would have
respected that tumor and likely radiated the tumor up front after, or at least kept a very close follow up. Another patient with another one of these grade one meningiomas. This was a patient that was operated on by someone else. Had this large tumor surgeon left a small residual to preserve endocrine function and just six months later you can see the growth. That’s not growth that you would expect with a Grade 1 meningioma, and so then the patient underwent radiation and then continued to have growth.
This is actually not the most recent follow up.

I'm sorry for that error.

She's had more growth, more recurrence.

I've operated on her a couple of times.

Since then she's had more radiation and has been enrolled in clinical trials.

And here's her Histology and molecular report,

so it still remains a grade one meningioma,

but you can see that a KT1 missense mutation and based on our findings in the neural oncology paper and here,

you see that these tumors tend to occur earlier.

And the last patient example,
very complicated, patient with another grade, one meningioma who underwent surgery elsewhere a few times.

Radiation elsewhere a few times, was enrolled in a clinical trial with Priscilla Brosterhous at MGH. She recurred.

This was her recurrence, highly vascular tumor. As you can see, Priscilla center down here.

We got a nice surgical resection, and here's her genomics again that. Act one mutation and so the point.
being is that maximizing the surgical resection is of course a huge part in survival and progression free survival. Getting a good tissue diagnosis is incredibly important, but really managing patients as we do in most academic centers do based on the molecular diagnosis and not just not relying on Histology, is incredibly important. We hope that our patients find it easy to navigate through the system through our multi disciplines and of course through our health system including Bruce and and others who are located in Greenwich and other
satellite places throughout the state.

We're so thankful to the Lovemark Foundation and the Connecticut brain tumor alliance to provide support to our patients, and I am incredibly thankful to these ladies and men who I work with every day. Jillian and Marcy, who are nurse practitioners in our brain tumor surgery program. Kelly and Marsala, who are nurse coordinators Larry and the other staff who work in the operating room who assist me every day, my clinical research fellow Sagar.
Shari and a bunch of other people, who unfortunately aren’t on this picture, and Neil and Mary, and I them my clinical fellow, so thank you once again for listening. Thank you to Doctor Barris for her generosity and her friendship. I will turn this over to Zach and I guess we’ll take questions at the end and I’ll stop sharing. So Zach Corbin. A friend, a colleague. A wonderful neuro oncologist, and I’m really exciting. Because excited, because he’s going to speak to you now about emerging therapies for brain tumors.
And he’s also going to talk about some of his exciting research and work that he’s doing with imaging. Perfect thank you so much for that wonderful introduction and talk and what a lovely dovetail. I wish if I had actually been able to modify my title, I would say emerging classifications and therapies of brain tumors because a lot of what I’m going to talk about is exactly that.

The really we have changed recently. The way we’re thinking about primary brain tumors.
00:28:56.270 --> 00:28:58.490 So yeah, so I’m Zachary Corbin.

NOTE Confidence: 0.881477025625

00:28:58.490 --> 00:28:59.966 I’m one of the neuro oncologists

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00:28:59.966 --> 00:29:01.816 based at Smilo and I look forward to

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00:29:01.816 --> 00:29:03.470 talking to you for a few minutes.

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00:29:03.470 --> 00:29:07.478 Today and thank you for having me so.

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00:29:07.480 --> 00:29:09.360 I’d like to start by saying that I

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00:29:09.360 --> 00:29:11.839 do have a disclosure that I will be

NOTE Confidence: 0.881477025625

00:29:11.839 --> 00:29:13.860 discussing off label use of procarbazine,

NOTE Confidence: 0.881477025625

00:29:13.860 --> 00:29:15.596 otherwise no relevant disclosures.

NOTE Confidence: 0.881477025625

00:29:15.596 --> 00:29:18.200 I’m going to talk about my

NOTE Confidence: 0.881477025625

00:29:18.271 --> 00:29:20.046 the structure of my talk.

NOTE Confidence: 0.881477025625

00:29:20.050 --> 00:29:22.558 We talk about glioma and meningioma

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00:29:22.558 --> 00:29:24.930 very similarly to doctor Moliterno

NOTE Confidence: 0.881477025625

00:29:24.930 --> 00:29:26.790 talk about the classification that

NOTE Confidence: 0.881477025625

00:29:26.790 --> 00:29:29.670 we have begun to use very recently.

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00:29:29.670 --> 00:29:33.282 Based on the 2021 WHO and then
00:29:33.282 --> 00:29:34.710 standards of care,  
00:29:34.710 --> 00:29:38.110 including some relatively new ASCO  
00:29:38.110 --> 00:29:40.592 snow guidelines that can help  
00:29:40.592 --> 00:29:42.462 clinicians make the decision about  
00:29:42.462 --> 00:29:44.814 patients who are not able to or choose  
00:29:44.814 --> 00:29:46.889 not to enroll in clinical trials.  
00:29:46.890 --> 00:29:48.114 And then,  
00:29:48.114 --> 00:29:50.420 of course,  
00:29:50.420 --> 00:29:52.256 That we have available at Yale,  
00:29:52.260 --> 00:29:54.500 and the approaches that they may offer.  
00:29:54.500 --> 00:29:56.384 Then I’ll switch to meningioma and  
00:29:56.384 --> 00:29:58.531 doctor Moliterno has covered a lot of the  
00:29:58.531 --> 00:30:00.439 standard of care have been in GMs already,  
00:30:00.440 --> 00:30:01.379 but I’ll summarize,
and then I'll discuss a couple of clinical trials we have available. And absolutely at the end. I look forward to. Sharing some research that I'm doing and some observational studies that are available to patients who are seen at her Cancer Center. So without further ado, I'd like to talk a little bit about glioma, and I'm sure most people watching this talk are familiar with the disease, but some I think underappreciated facts include that it is the second most common type of primary brain tumor. It has a higher burden than I
think most realized that 19,000.

New diagnosis in the US.

The most recent count annually and over

of these patients have glioblastomas,

despite even even more than what

doctor Moliterno has had a chance to cover.

What we do clinically and research.

Despite all of this and for decades.

Less than excuse me,

just a little bit over one in 20

patients at five years remain alive.

The most recent count is 7.2% and

I’m going to end by saying the silver

lining is that count is going up

and so we are making gains and we
are continuing on our quest as I'm sure most watching this talk are. Pathologically or histopathologically, and hopefully you guys can see my point here, feel blastoma appears like this. You can see lots of areas in the tumor microscopically that have different shapes and nuclei. You can see necrosis. You can see pseudo palisading areas, which is what this call where you can see the sheets kind of dive into the necrosis and you can see areas of vascular proliferation. Another thing that I always like to talk about is how important
publicly this disease is. So these three men all died of glioblastoma or high grade glioma and for those of you who don’t know who one of these people are, I’m sure that most people know all of them. This is Ted Kennedy, who was President John F. Kennedy’s brother. This is Beau Biden, President Biden son and this is John McCain’s most recent example of this picture, but I think. That this really goes to show how, although a rare disease, officially an extremely important
disease in many other ways

than we might initially think.

So as I said,

I’m going to talk about the way we classify gliomas in the context of the 2021, WHO classification of tumors of the central nervous system. This is actually very recent,

and last time I checked,

we still didn’t have the because of COVID related printing delays.

We still didn’t have the actual final results to review ourselves,

but we have this preview and I’m going to summarize it for you today.

So the preview I think is
best summarized in a diagram, and you can see starting here that. Really, we start where we used to be with histopathology and then as doctor Moliterno was discussing. The answer is largely now related to molecular findings and the first dichotomy is the IDH isocitrate dehydrogenase genes. So a tumor that expresses an IDH mutation is a tumor for which we understand the patient who has that tumor. Their outcomes are better and the tumor grows less and then a dichotomy.
After IDH mutation is whether or not that tumor expresses another genetic change, it’s called 1P19.

Q code deletion and so an IDH mutant 1P19 Q code deleted tumor almost no matter what it appears under. The microscope isn’t all the good enough, Ryoma and I’ll get into gliomas are actually graded histologically, as are the other tumors. So that is where we can use Histology and molecular features so WHO grade two and WHO grade 3 all the good and agree on this. And then if actually there is no one P. 19 Q code deletion,
you can see that there are astrocytomas which are IH mutant. These are kind of cousins of the stoma, but actually even a Grade 4 astrocytoma that is an NIH mutant is in this classification, not considered a glioblastoma. That is a big change we used to call patients who had tumors that were WHO grade 4. If they were astrocytic, whether or not they had ID communications. So you can see that this whole category of tumors is quite different because it has different molecular
features and also different clinical outcomes and so moving right. Unfortunately these tumors grow more aggressively in patients who have them have generally shorter outcomes, although with aggressive treatments, we’re hoping that also will change. So if the patient does not have an ID quotation we refer to that as an IH wild type tumor. And you can see that those characteristics under the microscope I described before can help describe a glioblastoma which is also called glioblastoma idh, wildtype CCNS, WHO grade four. And then you can see that there are other
similar Leo Blastomas or similar gliomas.
Sorry that have a Grade 4 characteristic
and in general these are considered diffuse,
midline and diffuse hemispheric
gliomas with the midline glioma has
an H3K27 alteration so moving on.
The standard of care for glioblastoma
is still based on a study that was
actually old when I was a fellow,
which is the study protocol.
And you'll hear us discuss the study
protocol when we discuss management and
a couple things I want to highlight
on this slide is that the curves
despite aggressive treatment,
continue to go down,

but this is actually continues to be the basis for which we treat many patients and maybe motivation to keep these curves.

Up for pursuing more clinical trials and then the other thing I’d like to show once again is that it’s 2005.

So now 17 years old and we do have additional advancements.

I’m not trying to say that we have been frozen since 2005, but it is remarkable to think about how long we’ve been.

We’ve had these results so as I was saying, I’d like to move forward just
because guidelines not just have the tree clear blastoma, but all gliomas and so this is the American Society for clinical ecology ASCO and the Society for Neuro Oncology. 2 American organizations to manage Neuro ONC and they issued combined recommendations for the different categories of tumor and so I thought I would just go through the different categories one by one. I mentioned all of these in the diagram. that I discussed before all go into gliomas, Deputy O grade one.
I should say,

but you guys already know.

The maximum safe for section and when possible is the start to management of almost all of these tumors.

But once we get to maximum safer section and have the best pathologic evidence, observation is possible, which means we monitor closely with scans and these patients low risk disease has specific features,

but if a patient is over 40 or a patient has remaining tumor, they are not considered low risk, and so we proceed with radiation combined with.
Either procarbazine Lomustine and Chris Vincristine, which you’ll hear me discuss for here on as PCV or team ITAR or TMZ. Temodar is emphasized as an option if there’s concerns for someone tolerating PCV. However, I would say that there are also oncologists that actually favor temodar because the evidence is also strong for temodar in that the stoop protocol, for example, is a more treated and more aggressive tumor with team donor, and this is an open question.
which we are actually trying to address at Yale.

Olive good good inglima is Newton grade three. We do not have any ability to monitor these, whether or not the tumor is entirely removed, we would proceed with radiation combined with PCV or possibly all using team radar as an alternative.

I astrocytomas IH mutants that are WHO grade 2. For those of you who are familiar with the old classification,
these used to be called diffuse astrocytomas.

These are possible to observe, once again with good characteristics.

Some some would argue that they should be treated with radiation followed by adjuvant chemotherapy,

but the guidelines offer a choice between both.

In case it’s not clear why one would prefer team at our over PCV,

PCV is a chemotherapy regimen that
00:39:05.720 --> 00:39:07.752 involves multiple chemotherapies that
NOTE Confidence: 0.923252333333334
00:39:07.752 --> 00:39:09.992 each involve different side effects
NOTE Confidence: 0.923252333333334
00:39:09.992 --> 00:39:11.408 that can be difficult to tolerate,
NOTE Confidence: 0.923252333333334
00:39:11.410 --> 00:39:14.818 and they can also limit the ability for
NOTE Confidence: 0.923252333333334
00:39:14.818 --> 00:39:17.130 the patient to take the whole regimen.
NOTE Confidence: 0.923252333333334
00:39:17.130 --> 00:39:22.020 Temodar is less prone to those limitations.
NOTE Confidence: 0.923252333333334
00:39:22.020 --> 00:39:23.526 So moving forward,
NOTE Confidence: 0.923252333333334
00:39:23.526 --> 00:39:26.538 astrocytoma ID student debt charade 3.
NOTE Confidence: 0.923252333333334
00:39:26.540 --> 00:39:28.584 This is a tumor that there is
NOTE Confidence: 0.923252333333334
00:39:28.584 --> 00:39:30.340 some debate about how to treat,
NOTE Confidence: 0.923252333333334
00:39:30.340 --> 00:39:32.590 but radiation with adjuvant temodar
NOTE Confidence: 0.923252333333334
00:39:32.590 --> 00:39:35.313 is the recommended method and the
NOTE Confidence: 0.923252333333334
00:39:35.313 --> 00:39:37.719 guidelines and then maybe there’s more
NOTE Confidence: 0.923252333333334
00:39:37.719 --> 00:39:40.799 debate with IDH mutant tumors WHO grade 4.
NOTE Confidence: 0.923252333333334
00:39:40.800 --> 00:39:41.382 Once again,
NOTE Confidence: 0.923252333333334
00:39:41.382 --> 00:39:43.419 these tumors used to be called gliomas,
tumors that we now refer to them as astrocytoma, IDH, Newton. So radiation with adjuvant temodar is offered or treatment for the study protocol as a glioblastoma is treated. So moving forward glioblastoma. Sorry IH wild type tumors. Astrocytoma IH well typed either grades two or three are generally recommended to be treated as the oldest. Thomas Glioblastoma is our idea 12 type who grade 4 so those tumors. We recommend treating either with the study protocol or possibly additional.
changes in a subset of patients, so the study protocol, which I’ve now mentioned probably 8 times by name, but haven’t actually told you what it is. This is where you do radiation combined with Team Adar. At the same time, that’s called Chemoradiotherapy with temodar and then patients receive 6 cycles or six months of team that are thereafter. You patients are certainly are physicians and patients together are certainly allowed to receive more chemotherapy. Up to 12 is is still standard,
but most of the field is considering moving back to six cycles at this point. Certainly in some patients. And alternating electric fields are delivered by a device called the Optune device, and this may be added either actually at diagnosis, which is what this recommendation is about, or have recurrence actually in a subset of patients. These patients are patients who may be elderly or may have some reasons why we don’t think they could tolerate what it ends up being. Quite an intense therapy we can proceed.
with hypofractionated radiation with concurrent and adjuvant Thermidor
hypofractionated is only three weeks long.
As opposed to six weeks long,
but I'm not going to get into any more details about radiation because Doctor Mcgibbon is the expert and we'll be speaking later.
And then alternatively, if we think that team radar may not be useful because of other molecular features which are outside of the scope of this talk, you could do hypofractionated radiation alone.
You could do team at our monotherapy
alone and then of course there are some patients that either choose or may not tolerate any treatment and supportive care is an option to proceed with glioblastoma.

So on a brighter note, I’d like to talk about clinical trials that we offer. So one thing to talk about clinical trials is that these trials often don’t replace the standard of care we get that question a lot. Often they will augment the standard of care, or they ask questions about the standard of care and the other thing...
to note about clinical trials is that a clinical trial that I would recommend to a patient is going to be one that exhibits equipoise. This is a true experiment where we’re trying to answer something we don’t know the answer to, and so. I mentioned the the question that this trial is trying to address already, so we have a trial for patients who have oligodendrogliomas WHO grade two who have high risk disease. Once again, they’re over 40 or they have a residual tumor or grade three. They can enroll in a trial where
we are actually proceeding with adjuvant radiation that’s either combined with temodar or they proceed with radiation followed by PCP. Because once again we have this question where we don’t know what is better and all the good and. Family and patients who have all the good nucleonics. We have more trials in patients who have leonas demo. So we have a Phase 01 trial which is an early phase trial where we’re testing an immunotherapy regimen that targets a type of checkpoint that’s
called TIGIT that is used in addition to or possibly alternating with, the PD1 checkpoint, which is a more famous checkpoint that others may have heard of. Drugs like pembrolizumab and nivolumab target the PD one checkpoint, we have a phase one trial of a drug called FB PMT, which is targeting cancer cell signaling. And that is for patients who have glioblastoma appearance or when the tumor is growing back as doctor Moliterno showed in multiple of the cases. And then we have a trial that’s really complex and really kind of marvelous.
That’s called the GBM agile trial. In this trial was designed to exist for a long time at a brain tumor center like Yale and allow us to sub installed agile because we’re able to sub in drugs that may be exciting without having to close the trial and open a new trial. And so we have multiple arms in this trial, so patients can receive multiple types of therapies. And also the trial allows for enrollment of patients in different phases of their disease. So there are GBM agile arms where
patients can enroll at diagnosis and where patients can enroll at recurrence. So it’s complex to describe, but really an amazing thing and pretty advanced. A pretty remarkable advance. I think in clinical trial design and it’s a privilege to be able to offer patients the agents that are being tested in GBM agile and they will continue to change over time. We also have a phase three, double blind placebo controlled trial where we are adding. As I said, we often add adding a experimental agent
called Enza Star in to the street protocol.

So to shift gears now.

So I’m going to talk about meningioma briefly and then some trials.

We have. Meningioma meningioma is actually the most common type of primary brain tumor. This annual incidence is around 35,000, which I also think is remarkable and as doctor Moliterno covered many patients who have meningioma are patients who have benign meningiomas, although I prefer to call them meningioma dibujo grade one. This will be labeled them pathologically.
That’s about 80%, and the overall survival of these tumors is difficult to categorize and has been reported in different ways over multiple sources. But I’m giving you summaries here so patients who have Grade 1 tumors. Certainly live over 10 years and they may live longer. Patients often don’t even need surgery with these tumors, and so we don’t actually really know the true burden of WHO grade one minute GMs. But about 18% or about 1/5 of patients have more aggressive tumors that Doctor Mall
Turner has lots of experience with called atypical meningiomas Debuchy grade two and there’s variable reports about how long patients in general live at this point with these tumors. But we think about 80 to 100% of patients remain alive at five years, which is good. Unfortunately, WHO grade 3 tumors, also called in plastic and angiomas I guess. Fortunately, approximately 2% or so patients have these tumors who have meningioma, but the median overall survival is 83
much more dramatically lower that measured in a couple years two to three.

So standard of care with meningioma, so we have to discuss something that we don’t generally talk about in gliomas which is presumed meningioma is a whole category of patients who have a scan. I think some of the times they get very scared they come to see either in their surgeon neurologist and we may tell them this tumor may not cause you difficulty with it looks like it may be a WHO Grade 1 meningioma and we can monitor it. So we call those presumed meningioma.
They’re often asymptomatic, and imaging surveillance may be appropriate, but once it becomes.

Medical jobs than they do, and then I might prefer that patient to doctor Moliterno. Then we proceed with maximum security just the same way, with glioma and surgery or radiation. If surgery is not possible or the options for these presumed the options for these presumed or asymptomatic managements.

And really as I was saying with all grades one, two and three we start otherwise
with maximal surgical resection.

Meningioma, specifically if it has recurrent disease we consider radiation and then we get into controversy. Which we are having also a clinical trial at Yale to address. So the controversy is what to do with someone who has an atypical meningioma. W2 grade two that has had a gross total resection as doctor Moliterno showed. In a case. These do recur, but not all the time, and sometimes we think that the radiation may not actually benefit as much as it put causes.
Some patients harm, so we then proceed to more specific cases where there is residual disease on the scan. After a surgery and for those patients, we often do recommend radiation for patients who have anaplastic meningioma, or there’s even less controversy for those patients, resection or otherwise. We recommend radiation. So the clinical trials that are available in Ninja for WHO Grade 2 after gross total resections. This controversy is addressed by a phase three trial.
Whether it’s randomized patients either go on surveillance or we proceed with radiation and we continue to monitor.

For patients who have either WHO grade one, two, or three, if they have a specific target, they are offered enrollment in what is a multi-arm trial as well that currently has an AKT inhibitor called Kappa Vasser tip, where CDK inhibitor that’s called abemaciclib Bemis cycling is actually currently an approved medication, so it’s interesting to be able to offer it in this trial.
So now I’m going to switch gears and talk about. One of my true loves which is measuring, Metabolic disease and also metabolic processes in primary brain tumors, and I’d like to talk briefly about what target you would do or what metabolic change you would target. You would measure, so that is called the Warburg effect. The Warburg effect is really a biochemical principle, and really briefly. When any cell which is this is the outside of the cell in my diagram.
00:49:34.350 --> 00:49:35.645 This is the inside of the cell,
NOTE Confidence: 0.846576206
00:49:35.650 --> 00:49:36.182 cause glucose,
NOTE Confidence: 0.846576206
00:49:36.182 --> 00:49:37.778 which most people are familiar with.
NOTE Confidence: 0.846576206
00:49:37.780 --> 00:49:39.410 The each you get glucose,
NOTE Confidence: 0.846576206
00:49:39.410 --> 00:49:41.414 glucose comes in and becomes a
NOTE Confidence: 0.846576206
00:49:41.414 --> 00:49:42.750 certain molecule called pyruvate,
NOTE Confidence: 0.846576206
00:49:42.750 --> 00:49:45.118 and then the body may process it either
NOTE Confidence: 0.846576206
00:49:45.118 --> 00:49:46.983 through a process called oxidative
NOTE Confidence: 0.846576206
00:49:46.983 --> 00:49:49.003 phosphorylation through a part of
NOTE Confidence: 0.846576206
00:49:49.003 --> 00:49:51.329 the cell called the mitochondria,
NOTE Confidence: 0.846576206
00:49:51.330 --> 00:49:53.090 which is the Semitic cartoon,
NOTE Confidence: 0.846576206
00:49:53.090 --> 00:49:54.788 and then it may either and.
NOTE Confidence: 0.846576206
00:49:54.790 --> 00:49:56.690 Then it evolves CO2 which
NOTE Confidence: 0.846576206
00:49:56.690 --> 00:49:57.830 might be bicarbonate,
NOTE Confidence: 0.846576206
00:49:57.830 --> 00:50:00.245 because bicarbonate and CO2 exist in water.
NOTE Confidence: 0.846576206
00:50:00.250 --> 00:50:02.293 Which most of the inside of the cell is.
Alternatively, pyruvate may become lactate, but it actually does not use oxygen in this case, and that’s called lysis. So the Warburg effect defines the fact that even in normal oxygen, a tumor cell or tumor process favors lactate and glycolysis, and so that Warburg effect shifts tumor Physiology in this diagram to the right. And so to measure this difference, might help us with lots of insights about how tumors work, and I have two ways that I’ve.
opened observational studies.

These are not trials, we’re actually just trying to measure characteristics of the tumors and not affect anyone’s care.

But two ways we might measure the Warburg effect. This is called the Warburg index. We take patients and offer them a what’s called an FDG or floor deoxy glucose PET scan. So FDG is a small dose of radioactivity that also comes via the blood. comes into the cell and it’s phosphorylated or phosphorus is added to FDG and it stays there.
and we can actually observe it in something called the scintillator.

Now the very observant ones would say that we’re only watching one part of metabolism. That’s right, so this is actually basically total glucose metabolism.

This is a rough estimate of oxidative phosphorylation, so we use a different technique in these patients as well, called Mrs. Petrosky or spectroscopic imaging, and we can detect the lactate, and so we have the both sides,
lactate and FDG.

We give us the Warburg index. This is a clinically available tool and we're very excited to be able to offer it to patients who are otherwise. It's even care or brain tumor center.

And earlier, but also very exciting and its development process is called deuterium metabolic imaging.

We use deuterated glucose that patients can just drink the same way you drink a soda or Gatorade, and the glucose comes in and becomes pyruvate.
It becomes lactate and it becomes molecules called glutamate and glutamine. The point is that in a marvelous way, in this specific MRI scanner, we can actually see lactate, and we can see glutamine, glutamine representing these two. Processes directly, and so we can see the Warburg index shifting to the right and we call this the Warburg effect once again. And so here’s a great example that we were able to publish of a patient who had a brain tumor. And this is actually an IDH wild type wheel.
Best drama and you can see that they have a very large forberg effect, so there's there's lots of possibilities here about what we might use this for patients who have higher warburger effects.

We have a theory that and it has been shown there. Tumors are more aggressive and can we actually walk the way the Warburg effect might change over the course of their treatment year, either in radiation or chemotherapy? Can we predict whether or not someone might survive the way the patient with the tumor?
That doctor Moliterno showed, we predict better survival or poorer survival based on metabolic signatures.

So thank you guys so much for listening. I want to acknowledge all of my current and prior lab mates and they have done so well. Two of them are already in medical school and also my funding. I received the Yci scholar word as well as my collaborators R1, and this is really a process both clinical care for brain tumors as well as clinical research for brain tumors takes a village and not only doctor Moliterno and the other neurosurgeons.
not only doctors bearing and Amuro
and Hafler and the other neurologists.
Of course my mentors from before the YCI,
my colleagues at MRC the Pet Center.
And of course, radiation oncology,
including Doctor Mcgibbon.
So thanks so much everyone,
and I will now stop sharing
so that everyone can.
Move forward,
I guess we’ll take questions at the end.
Yeah, people can just throw questions
into question and answer or into the chat,
but that was really an excellent talk.
Zach. Thank you so much.
So next I just want to introduce
Doctor Bruce McGibbon who is from Greenwich Hospital. He is the medical director there for radiation oncology.

Thank you so much. Great talk so far. I’m really pleased to be invited to give this talk. Like Jim was mentioning, I’m down at the Greenwich site, previously at the Trumbull site and it’s just really great to be able to collaborate with our experts in New Haven and extend care down the state to really have
00:54:33.974 --> 00:54:36.158 a broader outreach to what
NOTE Confidence: 0.7516892
00:54:36.158 --> 00:54:38.410 we can help patients with with
NOTE Confidence: 0.7516892
00:54:38.410 --> 00:54:40.310 this type of collaborative care.
NOTE Confidence: 0.7516892
00:54:40.310 --> 00:54:42.038 Let me share my screen here.
NOTE Confidence: 0.80795234
00:54:46.470 --> 00:54:46.670 OK.
NOTE Confidence: 0.0492509
00:54:51.180 --> 00:54:51.650 No.
NOTE Confidence: 0.807291375821429
00:54:55.840 --> 00:54:58.288 Go back OK, so I'll be talking about the
NOTE Confidence: 0.807291375821429
00:54:58.288 --> 00:55:00.699 role of radiation therapy in the treatment
NOTE Confidence: 0.807291375821429
00:55:00.699 --> 00:55:03.393 of brain tumors and with a particular
NOTE Confidence: 0.807291375821429
00:55:03.393 --> 00:55:05.473 focus on glioblastoma and meningioma,
NOTE Confidence: 0.807291375821429
00:55:05.480 --> 00:55:08.768 I have no disclosures.
NOTE Confidence: 0.807291375821429
00:55:08.770 --> 00:55:11.206 So where does radiation therapy fit in?
NOTE Confidence: 0.807291375821429
00:55:11.210 --> 00:55:13.590 Uh, you've heard about it a little
NOTE Confidence: 0.807291375821429
00:55:13.590 --> 00:55:16.023 bit this evening, but just briefly.
NOTE Confidence: 0.807291375821429
00:55:16.023 --> 00:55:18.849 I would say for benign tumors,
NOTE Confidence: 0.807291375821429
00:55:18.850 --> 00:55:20.290 sometimes radiation is given
in place of surgery.

If it’s something quite small and really doesn’t require surgery,

but more often given sometimes as postoperative treatment.

if the tumor is left behind, or were some extra worried that it will progress and then for malignant tumors.

That, like, uh, we talk about glioblastoma and the anaplastic tumors, and so on.

That doctor Cogan was doing such a nice job of going through.

Sometimes we’ll offer radiation when there’s only been a biopsy,
but more commonly as we heard a lot about.

We really love when a maximum safe section that can be done and the outcomes are so much better.

And, you know, we really are hand in glove with all the other experts from neurology, surgery and the other folks being mentioned on this talk series.

The radiation most of the treatments are done in what’s called a linear accelerator, which is what you see in the top left corner here, and that is the cursor.

So the patient would lie on
the table like this.

Kind of zooming in.

There's usually a mask that's done to help hold people.

Still, it's not painful in any way you can see and breathe through it,

but it helps to hold the head still.

So when we're delivering radiation with,

you know millimeter something,

submillimeter accuracy,

we're really delivering exactly where we want,

and not a little to one side or the other.

The radiation comes out of
the head of the machine here, and this portion of machine can rotate around so we can come at the tumor from different angles. In the head of the Machine is a really nifty device called a multi leaf collimator which is represented here. Each is ignacy, their own like little slats, and these are very thin leaves. They’re very tall, but they’re made of a tungsten alloy, which is a really heavy metal. And when patients often ask, you know when I go to the dentist, I have a lead apron, what do I get here and say,
well, the lead apron is not going to cut it for therapeutic radiation or go straight through it, but if you have a the equivalent of lead apron which is several. Inches thick in the head of the gene. That’s what’s really giving the protection and doing the shaping. We also have something that’s been developed over the last. I’d say 10 to 15 years and was really hitting its stride now called image guided radiation therapy.
So we do some planning scans before radiation, including a CAT scan and overlay that as I'll show later and talk with MRI studies and other studies will help us to show where we want to treat what we want to avoid, and then when the patients come we can do imaging on the table. So if you look here on the right, the head of the machine here again is where the ration comes out. But these panels on the sides can do imaging, so we can look in the head and say OK, how does the skull align today?
00:58:06.518 --> 00:58:08.252 compared to yesterday compared to
00:58:08.252 --> 00:58:10.087 when we did the planning scan and
00:58:10.087 --> 00:58:12.063 so these images in the in the left
00:58:12.063 --> 00:58:13.871 in the middle are representing
00:58:13.871 --> 00:58:16.115 really a fusion or overlay between
00:58:16.178 --> 00:58:18.166 a daily scan and a planning scan.
00:58:21.020 --> 00:58:23.890 Just give one example here of a
00:58:23.890 --> 00:58:25.692 glioblastoma this the patient presented
00:58:25.692 --> 00:58:27.432 with headaches and some difficulties
00:58:27.432 --> 00:58:29.888 with concentrating and the image showed
00:58:29.888 --> 00:58:32.400 this large tumor on the left side.
00:58:35.110 --> 00:58:36.778 I'll just go briefly through this.
00:58:36.780 --> 00:58:37.632 It's already been discussed.
00:58:37.632 --> 00:58:39.231 Very nice doctor Corbin, but you know,
00:58:39.231 --> 00:58:40.466 for glioblastoma we're always looking
00:58:40.466 --> 00:58:42.365
for that maximum safe resection. We usually allow about 3:00 to 5:00 or up to three to six weeks between surgery and when we start the chemotherapy and radiation and then to be followed by more chemo and sometimes the Optune device. When we’re making decision about what style of radiation uh, to use, uh, we’re looking at the the age, the overall performance status, other features like MGMT that was mentioned a little bit before we’re looking to see if there any clinical trials that are available to really try to advance the field in that way as well, and give patients you know the
best that’s possible. So we put all the together and see which style reason we’re going to do. I would say the majority of the time will use that stoop protocol time will use that stoop protocol with 30 treatments that actually. These are done Monday to Friday, so it’s a six week course. It actually has two phases. The 1st 23 treatments in the final seven were the 1st 23 a little bit broader and the final seven are a little bit smaller. They called it a come down idea and that’s the most the most common one by far. But we have what’s called hypofractionated
treatments and those could be offered in someone who is elderly and and has some other performance issues or there’s a travel concern or. You know things of that nature. We’re trying to be creative, and we’re going to deliver the treatment and and you know balance side effects with treatment intensity and intent. So in the hyperfractionated realm, the one that we use the most is a 15 treatment course. But we have actually data for five and 10 treatments. Usually for going all the way down to five.
Those are pretty intensive, so that’s usually somewhere we’re not doing a chemotherapy. And I would say probably the same with the 10, but 15 can be done. Throughout chemo so going back to the case, we have the square button where now things have been removed. We get a postoperative MRI to assess what that looks like now and and then we get into the planning phase. So what we’ll do is we’ll take where things were before surgery, where they are after surgery and do
some drawings which are represented by this kind of teal color,
cyan color and the purplish pink color, and we're trying to really dial in.
What we need to treat and this could involve,
uh, you know, collaboration with the surgeon as well.
If we're not sure about you know an area talking to the radiologists
we're really dialing in what?
What's at risk here and creating a margin around that to account for any microscopic extension that could have happened?
There's a very intensive design process where we work with our physics crew,
typically between the time that we got our planning caps going to make that mask, and when we start treatments about one week, sometimes up to a week and a half and some more complicated. Days and these images on the left are representing kind of vaguely make out that there's also a person's head that's represented in this treatment planning software. And then again that this kind of pink and bluish colors are present. We're trying to treat and usually these things are done in arcs, so this picture on the bottom is
trying to represent how the machine is going to move around the head. So at each we can play with different things. We can move the angle of the table to create a different angle of attack. We can. Move the gantry or the head of the machine around and at every position. We can vary the intensity of the beam and the shape of the beam, and ultimately that allows us to create what we call a dose distribution, which is seeing here where we are trying to conform the the higher dose region of the radiation to what we’re trying to treat and then
01:02:17.898 --> 01:02:19.377 have it drop off away.

01:02:19.377 --> 01:02:23.000 So in this case on the right we’re trying to.

01:02:23.000 --> 01:02:24.316 These images are done as if you’re

01:02:24.316 --> 01:02:25.337 looking at someone from their

01:02:25.337 --> 01:02:26.165 feet towards their head,

01:02:26.170 --> 01:02:28.231 so this this kind of right side of the

01:02:28.231 --> 01:02:30.488 image is actually the left side of the body.

01:02:30.490 --> 01:02:31.144 And vice versa.

01:02:31.144 --> 01:02:32.452 So in this case we’re really

01:02:32.452 --> 01:02:33.749 trying to avoid radiation dose,

01:02:33.750 --> 01:02:36.110 especially going to the right

01:02:36.110 --> 01:02:37.998 side of the brain.

01:02:38.000 --> 01:02:39.500 We go through an intensive process

01:02:39.500 --> 01:02:41.440 where we when we design the fields,

01:02:41.440 --> 01:02:43.588 we get this complicated graph called
A dose volume histogram where every color here represents a different structure that we're trying to either treat or avoid, and so there's this iterative process with the physics crews saying OK, this plan was good or no. We need to shape the doses a little bit more to stay off the brain stem. We're off the copay or whatever it might be. So we look at these and ultimately sign off on one that looks like the best balance. I'm moving to meningioma is an answer for real great statement from the the
National Comprehensive Cancer Network

01:03:12.637 --> 01:03:14.137 saying just really hear treatment

01:03:14.137 --> 01:03:15.951 selection should be based on assessment

01:03:17.955 --> 01:03:19.770 of a variety of interrelated factors,

01:03:21.330 --> 01:03:22.370 including patient features,

01:03:22.370 --> 01:03:23.800 potential for causing their logic,

01:03:25.540 --> 01:03:27.715 and severity of symptoms and

01:03:29.169 --> 01:03:31.018 and I'll skip the bond multidisciplinary

01:03:31.018 --> 01:03:32.747 input for treatment planning is recommended

01:03:32.747 --> 01:03:34.850 and this is where I feel so blessed to be.

01:03:34.850 --> 01:03:36.542 You know, part of this yellow

01:03:36.542 --> 01:03:38.040 network is really having these.
Super skilled trusted colleagues where we have these weekly conferences and we can call each other anytime and get advice on a case or have someone seen and it’s just really critical to have that. And it’s nice to see it represented as as the you know, the goal according to national guidelines as well. So meningiomas again touched on a lot better detail and more thorough detail of Doctor Corbin, but just it’s kind of a very quick overview. Again, sometimes we can do just observation. If these are small grade one tumors, but the game more advanced than
we typically would do surgery.

And if it’s a grade one, it’s usually just observation or sometimes radiation.

If there is a further issue that we should be considering grade two, we, let’s say most often do radiation, especially if there is a little tumor left behind and for grade through we definitely.

This case is a little shorter than glioblastoma, it’s it can be up to 30 treatments like wheel, bustamonte,
sometimes a little less,

but the dose per day is a little bit lower.

And it’s usually done as Monday to Friday course sometimes,

epecially if it’s being done for a very small tumor and it’s lower grade.

We can do what’s called stereotactic radiosurgery,

where it’s only one treatment or up to five treatments.

But I’d say a lot of what we do is the multi treatment option

and again I think that just a short presentation case presentation is really helpful.

So this was a patient who presented
01:05:07.116 --> 01:05:09.187 with Double Vision followed by
01:05:09.187 --> 01:05:11.411 a right I decreased vision and.
01:05:11.411 --> 01:05:13.179 You can see in the sand with the
01:05:13.179 --> 01:05:15.000 red arrow there’s something that
01:05:15.000 --> 01:05:16.540 really doesn’t belong there,
01:05:16.540 --> 01:05:17.988 and if you track if you look here,
01:05:17.990 --> 01:05:19.478 here’s the eyeball and you see
01:05:19.478 --> 01:05:20.750 this darker Gray coming back.
01:05:20.750 --> 01:05:22.930 That’s the optic nerve bringing
01:05:22.930 --> 01:05:25.110 the visual information coming back.
01:05:25.110 --> 01:05:27.390 So this tumor is really not only near
01:05:27.390 --> 01:05:29.420 some really important blood vessels,
01:05:29.420 --> 01:05:32.436 but is also near the Super important nerve.
01:05:32.440 --> 01:05:35.040 So what? What to do?
01:05:35.040 --> 01:05:37.250 Radiation alone is really not
01:05:37.250 --> 01:05:39.460 gonna be her best option.
NOTE Confidence: 0.770064625333333
01:05:39.460 --> 01:05:39.886 Uh,
NOTE Confidence: 0.770064625333333
01:05:39.886 --> 01:05:41.164 radiation is excellent.
NOTE Confidence: 0.770064625333333
01:05:41.164 --> 01:05:43.294 I’d say it’s stopping millenniums
NOTE Confidence: 0.770064625333333
01:05:43.294 --> 01:05:45.178 from growing further and can
NOTE Confidence: 0.770064625333333
01:05:45.178 --> 01:05:47.266 make them slowly rest at least
NOTE Confidence: 0.770064625333333
01:05:47.337 --> 01:05:49.077 sometimes give enough time,
NOTE Confidence: 0.919600757
01:05:49.080 --> 01:05:50.640 but it’s really not going
NOTE Confidence: 0.919600757
01:05:50.640 --> 01:05:52.200 it’s really not going
NOTE Confidence: 0.919600757
01:05:52.200 --> 01:05:53.551 it’s really not going
NOTE Confidence: 0.919600757
01:05:53.551 --> 01:05:55.220 these kind of symptoms like double vision,
NOTE Confidence: 0.919600757
01:05:55.220 --> 01:05:58.676 things we need. We need something.
NOTE Confidence: 0.919600757
01:05:58.680 --> 01:05:59.772 More quickly effective,
NOTE Confidence: 0.919600757
01:05:59.772 --> 01:06:02.320 and that’s really comes down to surgery,
NOTE Confidence: 0.919600757
01:06:02.320 --> 01:06:05.421 so this late underwent a right sided
NOTE Confidence: 0.919600757
01:06:05.421 --> 01:06:07.580 craniotomy with Doctor Moliterno.
And because of that location there next it was called the cavernous science or some of the special blood vessels are. It's really not possible to fully remove the tumor, but a lot of it was removed. It turned out to be a WHO grade one and she had a great great response. Revision came back to 2020 and had, I would say, a near resolution of the double vision. But ultimately fully resolved, so we got a postoperative MRI and as expected, there was a little bit of residual, but much, much better as reflected by her symptoms as well.
01:06:40.150 --> 01:06:41.788 So you see the post op.
NOTE Confidence: 0.919600757
01:06:41.790 --> 01:06:43.308 Sorry pre op on the left
NOTE Confidence: 0.919600757
01:06:43.308 --> 01:06:44.750 and postop on the right.
NOTE Confidence: 0.919600757
01:06:44.750 --> 01:06:47.606 And of course we don’t want this growing
NOTE Confidence: 0.919600757
01:06:47.606 --> 01:06:50.147 back and so we offered radiation.
NOTE Confidence: 0.919600757
01:06:50.150 --> 01:06:52.400 Similar idea in terms of the mask and so on.
NOTE Confidence: 0.919600757
01:06:52.400 --> 01:06:54.485 Using arcs again here working
NOTE Confidence: 0.919600757
01:06:54.485 --> 01:06:57.081 with the physics crew to design
NOTE Confidence: 0.919600757
01:06:57.081 --> 01:06:59.210 A set of radiation fields.
NOTE Confidence: 0.919600757
01:06:59.210 --> 01:06:60.810 If you look behind here,
NOTE Confidence: 0.919600757
01:06:60.810 --> 01:06:63.760 this is where the brain stem is,
NOTE Confidence: 0.919600757
01:06:63.760 --> 01:06:66.857 so we’re trying to stay off
NOTE Confidence: 0.919600757
01:06:66.857 --> 01:06:69.700 that and off the eyeball,
NOTE Confidence: 0.919600757
01:06:69.700 --> 01:06:72.685 so we’re able to create this really.
NOTE Confidence: 0.919600757
01:06:72.685 --> 01:06:75.690 As you say,
NOTE Confidence: 0.919600757
01:06:75.690 --> 01:06:78.259 conformal radiation technique and the
combination of the surgery and then the radiation was able to really permanently control this tiller. Just a quick shout out to my colleagues and doctor Bindra here. You know, there’s really great and super detailed work that’s going on with all these different mutations and you know, adults and the kids, and there’s just a lot of work to be done and it’s just really impressive.
This is one trial here, working on with the million gliomas and the Doctor Bindra had shared with me just. Look through and then another one looking at adolescence and young adults and other tricky glioma case where there's more work to be done and really great collaborations happening. Thank you very much. I'll be happy to answer any questions later. That was really an outstanding talk. Thank you Bruce, and there was already one question. If we want to take an hour later, but it was about how cyber knife radiation fits in,
and I think that was with regards to glioma. So you can start thinking about that answer. You know well and then also what actually is the radiation as compared to an X ray or dental X-ray? So that’s another radiation question coming your way. So we will conclude with Brian Jin who’s the licensed social worker who leads our brain tumor support group. Along with our team Jillian Bongard, who’s on as well and he’s going to talk about probably even more important than surgery or radiation or chemotherapy. But how we can support our
01:08:59.058 --> 01:09:00.210 patients and their families?
NOTE Confidence: 0.88611179875
01:09:02.480 --> 01:09:03.686 Hello hello everyone,
NOTE Confidence: 0.88611179875
01:09:03.686 --> 01:09:05.696 thank you for that introduction.
NOTE Confidence: 0.88611179875
01:09:05.700 --> 01:09:07.740 I have the privilege of facilitating
NOTE Confidence: 0.88611179875
01:09:07.740 --> 01:09:09.706 the brain tumor support group with
NOTE Confidence: 0.88611179875
01:09:09.706 --> 01:09:11.610 Jillian and they have taught me a
NOTE Confidence: 0.88611179875
01:09:11.610 --> 01:09:13.567 lot and I think about them a lot
NOTE Confidence: 0.88611179875
01:09:13.567 --> 01:09:14.926 as I’m doing this presentation,
NOTE Confidence: 0.88611179875
01:09:14.926 --> 01:09:18.000 so I’ll go ahead and bring up my funds.
NOTE Confidence: 0.736066045928572
01:09:31.040 --> 01:09:32.432 So I’m Brian Jean.
NOTE Confidence: 0.736066045928572
01:09:32.432 --> 01:09:34.520 I’m one of the clinical social
NOTE Confidence: 0.736066045928572
01:09:34.520 --> 01:09:36.508 workers at Smilow Trumbull.
NOTE Confidence: 0.736066045928572
01:09:36.510 --> 01:09:40.526 I work with primarily Dr and I
NOTE Confidence: 0.736066045928572
01:09:40.526 --> 01:09:42.416 have the privilege of facilitating
NOTE Confidence: 0.736066045928572
01:09:42.416 --> 01:09:45.395 the support group so my my role is
NOTE Confidence: 0.736066045928572
01:09:45.395 --> 01:09:46.871 primarily supporting patients and
family both emotionally and also helping them navigate the system, find resources within the Community, and it looks different for everybody. Every family system is extremely complex. They bring different compositions. They have different rules, different stages of life, they have different. Previously existing diagnosis that might impact how they respond to maladaptive behaviors that.
help them cope at one point,

but not that I don’t know.

Identify the work work and

where we can have. So it’s.

The framework that helps me helps

me navigate and support people,

and also I’ll go through some of

the primary challenges that people

experience with the brain tumor,

and then I will go into ways

that smilo and the community

supports patients and families.

So one of the frameworks I use to help me

the work is by Doctor Wallin’s family,

system illness model and how it’s useful.
Is it? It really takes the whole family into account. It really spends time looking at the system and incorporating the medical team within it, looking at the various ways that families interact and support each other, what strengths they have, whether they bring culturally. It’s a very broad and very fluid model. To use and then it breaks down the work, both the emotional aspects and dimensions. The concrete basic needs that need to be addressed. And also you know how these interplays work with each other,
and then it takes it within each freight phase of time.

What initially we experienced during that first diagnosis period, what it looks like when we become stable and we found a period of equilibrium. And then anytime we experience. I need to change. I need to adapt to a new struggle or limitation.

So this is one of the ways it is extremely useful for supporting families. So the crisis phase. This is the most difficult time this is like being shot out of a cannon. Oftentimes I’ve sat and heard the
stories of being diagnosed and being in the car and suddenly having a seizure and then waking up post surgery and how they adapt to that. How do they absorb that information? How their family is responding to suddenly? Maybe the primary bed breadwinner not being able to work. What do you do at that time? There’s so many questions. There’s so many unknowns. And fears that are arising at that time. One of the things that is a challenge is that they have to absorb this.
new information about the diagnosis

that they would never assumed

they would encounter.

They have to understand medically,

they have to understand how it's impacting

their whole family system emotionally.

They have to understand it in the

short term and then the long term.

What is my plan?

What is what is my treatment

options and that what is one of

Having a really grounded and supportive plan?

Being connected to a medical providers

that can guide them through so.

These challenges as they arise,
they take a lot out of the family, they engender a lot of uncertainty, and one of the roles that I have to support people with is identifying their strengths, identifying their sense of faith, what narratives they’re using, their family resiliency, legacies that they have within themselves that have helped them through adversity. And we’re looking for a stabilization. We’re looking for a place for the difficult. Emotions a place for identifying what they feel at the moment,
whether it be anxiety or feeling overwhelmed or shocked and then gradually lessening those giving those a chance to sort of dissolve and have their moment, but then move towards the positive side. And what is their course of action? One of the big emotional things that tends to come up that I see and oftentimes isn’t always identified as grief. One a lot of times families are in the state of shock and they’ve lost something. They’ve even lost the ability to look at life as this is stable. This is known. This is safe. I’ve had a family member say I’m
01:14:28.050 --> 01:14:29.610 Going to the diner because
NOTE Confidence: 0.854334599047619
01:14:31.170 --> 01:14:33.557 It’s so normal and now we’re suddenly
NOTE Confidence: 0.854334599047619
01:14:35.650 --> 01:14:36.970 and these are the really the
NOTE Confidence: 0.854334599047619
01:14:37.850 --> 01:14:39.440 Phase is recalibrated,
NOTE Confidence: 0.854334599047619
01:14:41.560 --> 01:14:43.040 finding order finding mastery,
NOTE Confidence: 0.854334599047619
01:14:44.890 --> 01:14:46.630 with their medical providers.
NOTE Confidence: 0.7832680378
01:14:48.900 --> 01:14:50.292 The next phase is.
NOTE Confidence: 0.7832680378
01:14:50.292 --> 01:14:52.764 Titled the chronic phase and this is
NOTE Confidence: 0.7832680378
01:14:52.764 --> 01:14:55.276 the Phase I wish the support group.
NOTE Confidence: 0.7832680378
01:14:55.276 --> 01:14:57.874 could be here to to share because
NOTE Confidence: 0.7832680378
01:14:57.874 --> 01:14:59.635 they’re they’re the they’re the.
NOTE Confidence: 0.7832680378
01:14:59.635 --> 01:15:01.915 They’re the ones who should give the the
NOTE Confidence: 0.7832680378
01:15:01.915 --> 01:15:03.890 master lesson and it’s a difficult phase.
NOTE Confidence: 0.7832680378
01:15:03.890 --> 01:15:05.969 It’s it has its own unique challenges.
NOTE Confidence: 0.7832680378
01:15:05.970 --> 01:15:07.764 One of the ones that universally
NOTE Confidence: 0.7832680378
01:15:07.764 --> 01:15:09.622 here is living with uncertainty and
NOTE Confidence: 0.7832680378
01:15:09.622 --> 01:15:12.014 any person who has had to go through
NOTE Confidence: 0.7832680378
01:15:12.079 --> 01:15:13.934 a scan and wait for the results
NOTE Confidence: 0.7832680378
01:15:13.934 --> 01:15:15.888 and knows what that feels like.
NOTE Confidence: 0.7832680378
01:15:15.888 --> 01:15:17.818 It holds all the hopes.
NOTE Confidence: 0.7832680378
01:15:17.820 --> 01:15:19.759 All the fears at the same time.
NOTE Confidence: 0.7832680378
01:15:19.760 --> 01:15:22.290 And this is a really.
NOTE Confidence: 0.7832680378
01:15:22.290 --> 01:15:23.490 Difficult thing to manage.
NOTE Confidence: 0.7832680378
01:15:23.490 --> 01:15:25.290 It produces a lawn being anxiety,
NOTE Confidence: 0.7832680378
01:15:25.290 --> 01:15:26.246 a lot of worry.
I know a lot of questions that arise from that, and the tendency is to project the future, sometimes catastrophize and so it can be a very challenging. Emotional process to address, but it’s something that’s going to be universally have to be managed, and you know the support group is one of the ways that we manage it. Everybody coming together to share how they cope, everyone sharing the ways they managed it, and a lot of it is really for me.
This is about being present, being present in the moment, connecting with what is good. Connecting with makes you happy. You know that relationship with the providers you know, that’s also there. You know sometimes you’re going through all these treatments. And and I’ve had patients say I want a week off so I can go to a wedding or a graduation. And this is part of that. Responsibility and where the report comes, comes becomes so important and and and another part that my support group.
01:16:28.510 --> 01:16:30.838 Shared with me and is knowing your new limitations and how do you transcend them?
01:16:30.838 --> 01:16:32.877 What do you have to be sensitive to?
01:16:32.880 --> 01:16:34.608 What can you do?
01:16:34.610 --> 01:16:35.758 What can you have to modify and finding that New Balance in life?
01:16:35.758 --> 01:16:37.896 Which is is a lot of work.
01:16:37.896 --> 01:16:39.666 And in the final phase is transitions anytime we have to find a new way of adapting.
01:16:39.970 --> 01:16:42.770 If we’re meeting a new struggle, a new challenge, that’s the stage of change, that requires recalibration.
01:16:51.110 --> 01:16:53.560 Again, maybe not as shocking. Sometimes it is,
but there’s different work to be done.

Sometimes this phase really hones in.

What is our priorities?

What is the most important thing for us to do?

And it has its own special nuance.

So from there, using this framework you know there’s different things to address.

Sometimes in that beginning it’s a question of how do I meet the world doesn’t stop, and unfortunately we have to pay bills we have to do, to bring the kids to school.

It depends on everybody’s stage and where they are and
who they're responsible for. And so one of the questions I often get is like how do I? How do I find the balance of making ends meet and prioritizing my health, which is now my job? Questions about disability, whether or not you have short or long term disability. Applying for Social Security disability, nobody gives us these this information out in school or college or anywhere, so these are one of the things you can access through your team through your social worker.
You can ask your team if you need assistance and help. There are resources out in the community, including the Connecticut Bureau of Rehabilitation, which you know will help people reengage in a new profession or work with accommodations. Your team can also be a source of referrals to occupational health and things that get you back on your feet. You’re making you operate a little bit better. One of the big things for me is maintaining health insurance because anytime we have a shift from disability from employment, there’s concerns about making
1:18:34.966 --> 1:18:36.928 maintaining health insurance.

1:18:36.930 --> 1:18:38.304 There are Cobra,

1:18:38.304 --> 1:18:39.678 there is Medicaid.

1:18:39.680 --> 1:18:42.395 There’s the access health CT marketplace that’s there.

1:18:42.395 --> 1:18:44.024 Sometimes people are transitioning to Medicare,

1:18:44.030 --> 1:18:46.663 and which you can reach the choices program.

1:18:49.330 --> 1:18:50.902 These are all very vital questions for a lot of people who are going through this process is how do I take care of my family and myself,

It’s been impressed upon me. Just how much it is your identity. This is who you are. This is your signature. You may be losing. This might be your ability to drive, it might be tied to your passion and. And there’s also been that work to connect. And and this is something that our our support group talks about in terms of.

How do you connect to gardening
even if you have a little bit of limitations in terms of balance, you’ll find a way and that work is.

Is there the two emotional processes that I typically see. I tend to focus on very natural emotional processes that this can be a traumatic event which triggers our fight or flight survival mechanism. A lot of times I see people in the crisis stage where they’re hypervigilant other than difficulty sleeping. I’m a little bit more irritable and I’m picking fights with my loved ones, which is home normal because the
fact that you’re in fight or flight,

NOTE Confidence: 0.908499378571428

you’re primed for it.

NOTE Confidence: 0.908499378571428

Things are a little bit more difficult.

NOTE Confidence: 0.908499378571428

The problem is when it becomes

NOTE Confidence: 0.908499378571428

cyclical and it taps into anxiety

NOTE Confidence: 0.908499378571428

and becomes a habitual process.

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Then we need to find a way to sort

NOTE Confidence: 0.908499378571428

different ways to sort

NOTE Confidence: 0.908499378571428

of pull you out of fight or flight.

NOTE Confidence: 0.908499378571428

That could be meditation.

NOTE Confidence: 0.908499378571428

It could be yoga and there’ll be

NOTE Confidence: 0.908499378571428

other resources I’ll talk about at

NOTE Confidence: 0.908499378571428

the end that you can connect to.

NOTE Confidence: 0.908499378571428

The other part is the Greek process and.

NOTE Confidence: 0.908499378571428

I always I’m a broken record with

NOTE Confidence: 0.908499378571428

this one because anytime any person
NOTE Confidence: 0.908499378571428
01:20:41.172 --> 01:20:43.923 hits a limitation they suffer a brief
NOTE Confidence: 0.908499378571428
01:20:43.997 --> 01:20:46.044 process and so this is something we
NOTE Confidence: 0.908499378571428
01:20:46.044 --> 01:20:48.361 can’t take a pill for. We can’t avoid.
NOTE Confidence: 0.908499378571428
01:20:48.361 --> 01:20:50.323 It’s really about feeling it and
NOTE Confidence: 0.908499378571428
01:20:50.323 --> 01:20:52.017 then doing good self care,
NOTE Confidence: 0.908499378571428
01:20:52.020 --> 01:20:53.380 not getting stuck in it.
NOTE Confidence: 0.908499378571428
01:20:53.380 --> 01:20:55.252 And so I really spent a lot of
NOTE Confidence: 0.908499378571428
01:20:55.252 --> 01:20:57.520 time with individuals.
NOTE Confidence: 0.908499378571428
01:20:57.520 --> 01:20:58.798 Talking about where is your safe
NOTE Confidence: 0.908499378571428
01:20:58.798 --> 01:21:00.060 place to feel these emotions?
NOTE Confidence: 0.908499378571428
01:21:00.060 --> 01:21:01.896 Who do you have to talk to about this?
NOTE Confidence: 0.908499378571428
01:21:01.900 --> 01:21:03.664 And a lot of times it’s our
NOTE Confidence: 0.908499378571428
01:21:03.664 --> 01:21:05.065 spiritual practice because it sort
NOTE Confidence: 0.908499378571428
01:21:05.065 --> 01:21:06.249 of addresses it existentially.
NOTE Confidence: 0.835712328
01:21:08.780 --> 01:21:11.210 So this might seem strange.
NOTE Confidence: 0.835712328
The Unsought yes of brain tumor.

I’ve been it’s been remarkable how many people who have gone through such trials and hardships and loss. Say they wouldn’t change a thing and and that’s just an amazing thing to hear, because what they’ve gained from this experience,

their gratitude, their appreciation, their recognition of what is most important in their life is irreplaceable. And it’s not anything that can be replicated.

And you know, that’s it really taps into why we fight and what makes us happy. And it makes us more authentically ourselves.
Some people have shared, like I wasn’t happy before and now I’m spending my time baking bread and doing photography. And this is one of the things that comes from this experience. It’s like altering and part of the work that we do is making sure that people access what makes the map. What gives them purpose. And you know when we hit limitations, how do we transcend? But just a note for the caregivers, because there’s a profound feeling of healthiness helplessness.
being a caregiver,

I like to tell them they’re always doing. They’re doing a great job. They’re just being there. Being attentive, being attuned. It’s, they’re doing enough and then self care, just in terms of putting 2 moral virtues together, you can never win, so it’s really vital for both patient and family to spend time being soulful and taking care of themselves.

So resources that we do have, we have the brain tumor support group. It’s every third Monday, three to four by Zoom.
You can reach out to me.

I can add you to the list service.

We also have a caregiver support group that is the 1st and 3rd of every Thursday. It's in the evening to make it a little bit more accessible.

Also by zoom, we have the meeting centered psychotherapy group, which is really how do you tap into the meeting and through adversity?

We also have a cognitive behavioral skills. Super Cancer Survivor is run by Doctor Kilkis.

I put her email up there so if I put her email up there so if
you’d like and you’re interested,

you can email her for the next session.

Additional resources. We have nutrition.

Any way to help you guys.

Holistically take care of yourself.

Support yourselves,

stronger as much as you can.

We have yoga guided imagery,

meditation, a lot of this is by zoom.

Unfortunately now we do have

art therapy classes.

We also have parenting at a challenging time.

As specifically for parents

with younger children.

You want guidance and ask what to

ask questions about communication,
developmental stages, and how to share with their kids what they're going to. There's also palliative care, which is a very comprehensive team comprising psychiatry, psychology, chaplain, social worker, nurse, art therapy, the whole gamut and they can be very supportive and helpful. Community resources the Connecticut brain tumor alliance. They provide education and peer support. You can give them a call and you can just speak to somebody who truly
01:24:14.587 --> 01:24:15.952 understands what you’re going through,
NOTE Confidence: 0.623200197142857
01:24:15.960 --> 01:24:18.592 and we’ll help you through for cancer.
NOTE Confidence: 0.623200197142857
NOTE Confidence: 0.623200197142857
NOTE Confidence: 0.623200197142857
01:24:25.240 --> 01:24:26.815 There’s an American Cancer Society
NOTE Confidence: 0.623200197142857
01:24:26.815 --> 01:24:28.841 which has a lot of educational
NOTE Confidence: 0.623200197142857
01:24:28.841 --> 01:24:31.193 information and also some supports in
NOTE Confidence: 0.623200197142857
01:24:31.193 --> 01:24:33.690 terms of staying like if you needed
NOTE Confidence: 0.623200197142857
01:24:33.690 --> 01:24:35.580 to stay and receive radiation and.
NOTE Confidence: 0.623200197142857
01:24:35.580 --> 01:24:37.368 This isn’t your local you could.
NOTE Confidence: 0.623200197142857
01:24:37.370 --> 01:24:39.806 You could access some of the
NOTE Confidence: 0.623200197142857
01:24:39.806 --> 01:24:42.427 resources there’s family reach for a
NOTE Confidence: 0.623200197142857
01:24:42.427 --> 01:24:44.732 cancer patients which provides free
NOTE Confidence: 0.623200197142857
01:24:44.732 --> 01:24:46.950 financial planning within an advisor.
NOTE Confidence: 0.623200197142857
01:24:46.950 --> 01:24:48.738 There’s the LIVESTRONG program,
NOTE Confidence: 0.623200197142857
01:24:48.738 --> 01:24:52.450 which is allows people to go to YMCA’s
for a tailored physical exercise
routine to help strengthen their body.
There's cancer in careers and triage cancers,
which it really helps people navigate.
Rejoining the workforce with their
cancer diagnosis and it gives
a lot of excellent resources.
There's financial grants for cancer patients.
There's cancer,
Connecticut Cancer Foundation and the
cancer cares for brain tumor specific.
There's a lovemark foundation and also
the Connecticut brain tumor alliance.
And just a closing note on for me.
Occasionally people do require
additional assistance, and for the younger patients I’ve been seeing, that’s the personal care waiver program. The one thing that I’ve noticed is the wait list is four to five years, so if you ever have an opportunity to call your state representative, please do and say that’s really unacceptable. For older individuals, 65 years and older there is the Connecticut Home Care program and this is long term. There assistance at home which is sometimes needed, so these are these are the resources available if you have any concerns reach out to your team.
They will guide you to somebody that can help support you in any of these areas.

I just want to thank everyone for the opportunity and just some references and I had known disclosures.

Thank you guys.

Thank you Brian. It’s always such a beautiful talk and to hear you speak so passionately about it and thank you again to you and to Julian for the support.

Group One question are our support groups open to all patients or only those being treated at your institution?

Absolutely open to all patients and so the more the better.
And Brian, I don’t know if you want to put your contact in the chat or do you want to put my contact in the chat or whichever but. Please reach out to us and everybody is welcome to come to the support group and it’s virtual, which makes it really easily accessible. All right, Bruce. Back to you for those two tough questions.

So how does cyber knife radiation fit in and what actually is the radiation as compared to an X ray or dental X ray? Alright thanks yeah, great question. So cyber knife is really just the name like a brand name of one of the
01:27:16.429 --> 01:27:18.590 machines that does that stereotactic
NOTE Confidence: 0.676786746
01:27:18.590 --> 01:27:22.153 technique which is 1 to 5 treatments.
NOTE Confidence: 0.676786746
01:27:22.160 --> 01:27:23.595 There's quite a bit of
NOTE Confidence: 0.676786746
01:27:23.595 --> 01:27:24.743 advertising around that machine,
NOTE Confidence: 0.676786746
NOTE Confidence: 0.676786746
01:27:27.990 --> 01:27:28.929 With something good,
NOTE Confidence: 0.676786746
01:27:28.929 --> 01:27:30.807 something I think a little misleading
NOTE Confidence: 0.676786746
01:27:30.807 --> 01:27:32.787 and and things are kind of implying,
NOTE Confidence: 0.676786746
01:27:32.790 --> 01:27:33.735 but it's a.
NOTE Confidence: 0.676786746
01:27:33.735 --> 01:27:35.506 It's a very nice machine and
NOTE Confidence: 0.676786746
01:27:35.506 --> 01:27:36.290 does a great job.
NOTE Confidence: 0.676786746
01:27:36.290 --> 01:27:38.516 There are other machines that are equally
NOTE Confidence: 0.676786746
01:27:38.516 --> 01:27:41.150 as good and are actually more flexible,
NOTE Confidence: 0.676786746
01:27:41.150 --> 01:27:42.482 so for example that stood protocol
NOTE Confidence: 0.676786746
01:27:42.482 --> 01:27:43.924 with six weeks of radiation that's
NOTE Confidence: 0.676786746
not possible with the cyber knife

that can only do the short treatment,

so it’s a great tool in certain

programs and you know we used to

have one in our system up in the.

Through the same refills group that joined,

but ultimately we decided that we

like the the machines that are more

flexible that can do the stereotactic

and can do other treatments

and focus more more on those.

So a good machine, but with some limitations.

I think

I mean gamma radiosurgery

essentially is is the same.

It’s just stereotactic radiosurgery.
Maybe one thing if you could mention, I'm not sure if this is what the person was asking, but I think a good question is why. Why do you use? Why can't you use radio surgery for GBM? Whether it's cyber knife or gamma knife, why do you have to use? So, yeah, that's a good question. So yeah, the gamma knife, which we do have it at Yale wonderful program with Doctor Veronica Chang Neurosurgery and then others helping out from radiation college and so on.
But that machine uses radioactive cobalt sources to all focus in. It’s really best at doing the single fraction treatments. The latest iteration can do two and three treatments, but it’s probably best with the one treatment, especially for brain metastases. We have other machines like machine one for it.
You know what’s interesting about tumors is that radiation is remarkably effective at a lot of different tumors, but it has its limitation. Sometimes there’s just not enough dose that we can get to, and sometimes we’ve study what are called escalation trials where we try to go higher and higher with more sophisticated machinery. And sometimes you find that that just doesn’t work better, or in fact it can be worse sometimes.
because we have more side effects

and we’re still not controlling the tumor any better.

And so for glioblastoma in particular,

I think in the earlier days of gaming and some of the machines people were saying,

some of these. MGMT and all these.

These nifty things Doctor Chrome was pointing out,

and so one thing would say hey,

but let’s do more radiation and

I would say pretty uniformly.
Those efforts and trials were failures.

They just did not replace, didn’t?

They certainly didn’t replace the surgery,

can do, and even within radiation,

they just really weren’t adding lots.

So at this point,

you know we very selectively use

radiosurgery techniques for people who had.

Usually multiple recurrences where

are not a surgical candidate,

and I think in that respect,

there’s been a gap of time

since the original radiation.

It can be quite effective there,

and we’re studying it with in
combination with certain other drugs,
but but definitely not a substitute for surgery when at all possible.
The other question,
so most these machines that we’re talking about whether cyber knife or you know a true beam or any of these ones are are using X rays.
the gamma knife machine uses gamma rays as it’s a radioactive pieces of cobalt,
and so they really share a fundamental architecture with the same machine in your dentist office or a mammogram,

01:31:17.635 --> 01:31:20.125 The difference is that those diagnostic X rays are in the kilovoltage.

01:31:22.580 --> 01:31:24.146 Range is the energy and when we treat with therapeutic relations, the mega voltage range.

01:31:27.702 --> 01:31:31.213 So it’s 1000 times more energetic and really has some unique properties about how it can damage the tissues and which then sets up the type of shielding that’s necessary and everything else.

01:31:34.015 --> 01:31:37.500 So they are X rays, they’re just more powerful that we’re using.

01:31:40.610 --> 01:31:42.654 Great thank you. There was one final question with regards to surgery.
Somebody who’s watching from Germany.

So thanks for joining from Germany question

do we have any thoughts on the autologous,

all mental free flap technique from Doctor

John Boockvar and has this been done at Yale?

And so John is a a good friend of

mine and I'm familiar with his trials.

This one is is something just

to update others about.

This is. Using a piece of

laproscopically obtained omentum,

which is highly vascularized with a pedicle,

a vascular pedicle to it,

and the idea there is to bypass

the blood brain barrier and he’s had

some other trials that had that same.
From type of of thought behind them,

bypassing the blood brain barrier to get more direct targeted therapy to the resection cavity.

We personally don’t have that trial here.

We haven’t tried that that trial here,

but we’ll certainly look to to John and his team to see how the the results are early on in that trial.

I don’t know if Zach you have any thoughts or comments.

He does not.

All right, well it is 807 and I think we are done with all of the questions.
friends and colleagues here tonight.

So thank you again to Zach and Bruce and Brian.

Really wonderful talks.

Really a pleasure to work with all of you.

Thank you for being here tonight and thank you to everyone for listening.

Thank you for your patience as part of the brain tumor center.

Thank you for being here tonight and thank you to everyone for listening.

Please reach out anytime.

Brian put his.

Email in that chat for the support group and you can email me at.

anytime with anything, all right.

So have a good night.

Thank you so much goodnight,
01:33:44.540 --> 01:33:46.000 thank you.