Brain Health Breakthroughs: The Role of AI in Cognitive Assessment Transcript

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Introduction to the summit and guest

Hello and welcome to a very special interview for the Reversing Alzheimer's Summit. I am your summit co-host, Doctor Kristine Burke. Over the last decade, I've helped many patients reverse their cognitive decline, and that's why I have co-founded True Neuro, a brain health software company designed to help patients and practitioners be extraordinarily successful in this work.

In this summit, I'm bringing you interviews with thought leaders who can help you understand the pillars of brain health and the root causes of cognitive decline.

I want you to learn what you need to know to prevent and reverse cognitive decline and Alzheimer's disease for yourself and your loved ones. I am very excited to introduce you today to a dear friend and brilliant colleague, Sanjay Schweiger, MD.

Doctor Zweig is founder and president of the California Center for Functional Medicine, also called CFM, which is at the forefront of the functional medicine movement, offering patients a deep investigative approach to health care that is personalized, collaborative and data driven.

Doctor Zweig received his bachelor's from UC Berkeley and received a full scholarship to attend medical school at UC Irvine. There, he helped design and lead the Complementary and Alternative Medicine curriculum.

He also served on the board of the Susan Samueli Center for Complementary and Alternative Medicine, and was chosen as one of 20 medical students to attend the NIH Leadership Training Program in Complementary and Alternative Medicine.

Doctor Schweich completed his family medicine residency at UC San Francisco and his residency in Santa Rosa, California. During his residency, he was instrumental in developing and founding the Integrative Medicine Fellowship Program.

He has been in private practice since 2007, and is board certified in Integrative and Holistic Medicine. He's active in contributing to medical education, both at the UCSF Santa Rosa Residency and as adjunct faculty at Touro University College of Osteopathic Medicine.

He is active in medical research and lectures both nationally and internationally. Please join me in welcoming Doctor Schweich to speak with us about AI, tech, and the future of brain health.

Welcome. Thank you so much. It's a pleasure to be here. So great to have you here. I wonder if you could maybe just start us off by jumping in on maybe how AI is transforming cognitive health, and a little bit of an overview on some of the key AI platforms for doctors and patients.

Yeah, absolutely. So it's a really, really exciting time right now with regards to medicine and technology and the tools that we have available to us, and then the tools that are quickly coming online and, and, you know, it seems like every day, every week there are new advances in tech and in AI.

How AI is transforming brain health

And it's something that we've been really passionate about tracking and just use it using for the best ability for our practice and for our patients, and just really generating a, you know, data driven approach.

And I know it's something that you're passionate about too. So I love our conversations, the ability to connect. And so so I'm glad to be here. And you know, to start off.

I think that it would help just to have a basic understanding of AI and what some of these platforms are, you know, so we hear a lot about things like ChatGPT or Claude from a company called anthropic or this, this company called Deep Seek out of China.

And that was in the news a lot this last few weeks, you know, but AI is really becoming essential for all aspects of health, and particularly in cognitive health and brain health.

And it can really help in, you know, researching, understanding more information, digesting information, you know, and also early detection and diagnosis.

And so, you know, three key things I want to touch on briefly. One is like, what is AI first of all. And the other one is what does this concept of large language models or LMS that the AI is built on right now.

And then briefly, this concept of what's called prompt engineering of how do you interact with these models to get the best information out of them. So I really, you know, briefly, is this the this kind of a computer system that can perform tasks that usually required human intelligence, right.

So things like problem solving, pattern recognition, language understanding, decision making and it works by analyzing huge, huge, huge amounts of data.

They just went out and basically put as much data off the end as they could analyze and ran it through these AI models and created these LMS. So analyze all this data, looks for trends and basically can make predictions based on learning patterns or how things are written, etc.

in brain health specifically. I think there's incredible opportunity for patients and doctors to use these tools to understand their health. And, you know, we talk a lot about other, other aspects of of AI and technologies.

You know, I being able to help with neuroimaging, looking for changes, AI being able to help analyze speech patterns and look for changes that might be diagnostic of cognitive decline or Alzheimer's.

You know, I, you know, to look for mild cognitive impairment, ADHD, etc., reaction times, other behavioral data. And so all of that can be fed in. And then these work called large language models can be created.

And these basically are specialized forms of AI that can understand and generate human language. And so you know, with a couple of these most common models are OpenAI's model called GPT or GPT four.

Google has a platform called Gemini. Anthropic has a platform called cloud. And again, these are all trained on these huge data sets in order to allow them to process and respond to inputs that we can kind of type out information and ask them questions, basically.

Pretty amazing opportunities here for, for, us as humans to really expand our capacity and expand our efficiency and expand our ability to access information and understand information.

So, you know, I've talked a little bit about prompt engineering, right? So prompt engineering sounds really fancy, but when you're using an AI system, you know, you're typing into a box or speaking to the model and you're, you're, you know, putting in information, you're asking it questions basically.

And so you can say like, you know, tell me about Alzheimer's. And, and it's a very general question and you'll get a bunch of information, but it will be very general still.

But if you tell that model this is prompt engineering is to have, you know, building a better prompt to get better information out. You tell that model who you are, why you need the information.

You know who the audience might be. And then also, interestingly, you tell the model who it it. Right. So that's an interesting nuance. So for example, you know you could tell this model you could and I've written out this prompt,

that it can be helpful to put in the back end of queries for patients. Right.

So they're thinking about this summer and people out there trying to learn about their own health. And I'll leave this to you. And then people can come back later, I think, and either you know, or off of it, or we could provide them in some other way.

But, you know, for example, a good prompt that really would lay the groundwork for, a really subtle response coming back to you would be, for example, and again, this is you telling the model where you how you want to think before you even gives you information before you even ask a question. So you're a medical expert in functional medicine, systems, medicine, longevity, brain health, attention and cognitive decline and reversal with top expert knowledge and all the science around brain, brain health, as well as the entire field of Alzheimer's dementia.

Mild cognitive decline. You're also an expert in all areas of lifestyle prevention supplements, exercise, emerging therapies, etc. as related to brain health, cognitive decline, reversing cognitive decline, health span, longevity, etc.

you're also an amazing communicator and deliver responses in a clear and concise manner with an ability to take complex science and explain it extremely well so that non-experts can understand.

Finally, you're a great coach, expert in health, behavior change, and able to support me so that you can help me take recommendations and integrate them successfully in my life.

There's a lot, right? So you're asking this model to do a lot of things, but these are like all kind of like keywords. And they bring in this extra capacity for this model to then really provide you with information.

And it might be that that's even too much. You might play that, it might take pieces of it and just keep iterating and see what happens. But if you want me to, I can jump into some examples of some, some of these outputs, for folks.

Right. Any questions about that so far? Yeah. No, I think it'd be great if you could show some examples. And while you're pulling that up and just, you know, I would just share that in part because of your coaching over the years, I have definitely gotten much better at crafting the questions that I want to ask when I'm using a large language model, like like ChatGPT for example, because it really is true that you get that much more meaningful and useful information.

If you're very clear about what it is that you're asking and how you want it to respond. Yeah, yeah. So this is absolutely. And it's really it's a practice.

You know, practice makes perfect on this. And just feel free for folks out there and feel free to just try things and iterate and see what you know, what produces work for you.

In this, you know, example, I gave a very simple prompt and that quick that that larger instructions into the back end of this GPT, which is really easy to do.

You just go to your, you have a chat account, you go to your account and you build your own GPT. So it's really simple. It sounds it might sound a little bit intimidating, but don't be intimidated.

Just click on there. You can give it directions. You can also in the settings you know, create you know, different ways of this system, remembering kind of what you want to think about with those larger instructions.

So then you ask a quick question and all of a sudden, you know, really quickly, you know, within a number of seconds, you know, it's giving me, you know, evidence based lifestyle recommendations for reducing Alzheimer's rates, including IT, diet supplements and cognitive gain.

You know, so basically has gone now and given me a bunch of information about exercise, different types of exercise, different kinds of diet, even the mind diet, you know, ketogenic, intermittent fasting, you know, different supplements.

It pretty abridged list. So we'll talk about that in a second. But, you know, some supplements based on dosing and then cognitive training, your brain training apps like brand HQ remastered etc., you know being social mindfulness and sleep and then blood sugar and cardiovascular toxins, hormones etc..

So this is already like I don't know what 60 or 70% of you know, the basic bread is in protocol, right? And so pretty cool, right? So you can kind of get that information digested.

And then I give everyone the example and you can ask it out and more questions about this. So you can keep keep going on it. But I want to also show an example of you know, how this can help us to digest information.

Prompt engineering and practical AI examples

I'm going to switch screen shares for just to segue to the other one, what I did here was took you see the the book scanning I this pages moving I can cool.

So basically I just this as I'm working on this you know generated this talkers took down two books and just scanned, ten or so pages out of these using my phone.

Super easy. You know, took pictures basically of some of the my favorite pages or know protocols and you know, so in here, you know, this is helpful but it's complicated.

It's all kind of layered in here for folks. And so, you know, you have, you know, the different categories and then he talks about supplements in here and why they're helpful.

And you know it reads you know it's very comprehensive. So it's it's dense and it's hard sometimes to extract that energy out okay. Why are these things being used and what am I using them for and what the dosing etc..

And so again took this document, you know, again just took pictures of those pages and then brought it over here and put it into this is clogged. Now this is anthropic model.

And so I just uploaded that whole document here and I just said, hey, create a list of all the supplements in the document with doses and rationale for using them and what they do.

Right. And that, you know, really nice list comes out of that, with all the doses. So I can then, you know, pull these out and look at which ones I'm taking, which ones I'm not taking.

And then you can dive deep on any of these. For example, this guy, you know, whole coffee fruit extract, you know, so interesting. Dale mentions that he mentioned a little bit about the research about like, what do I know about that and what can I learn about that?

And so then there's a couple of platforms that I really, really enjoy using. This one is called consensus. Consensus app. Anyone can access, there's a free version you can sign for a paid version.

It's not super expensive. It's like $20 a month. And, you know, you can say, what's the research on whole coffee fruit extract for brain health and cognitive protection.

And then this is really helpful because it gives you a breakdown. It gives you a summary of of that research and it gives you all the articles. Right.

And so this is very very helpful because what people do need to know about things like ChatGPT and Cod, they sometimes have a problem with what's called hallucinations, where they will make stuff up, literally make it up.

And and like I would say, 80% of the time, if you ask it for references, research articles, it'll give you real articles. But then 20, 25% of time it just makes them up.

And I've even asked it sometimes when I made up articles where I'd like gone and taken a title and searched the article. Can't find it anywhere. I look for PubMed. Can't find it.

Article doesn't exist. And I'm back to I said, hey, that's not a real article, you know, did you make that up? And I said, oh yeah, actually, sorry about that.

I made that up and I just made it in the same format with the author and title and year and everything, because that's how articles are supposed to be formatted.

And sorry about that. Okay. Groups. Right. So that's just an interesting little hiccup with these models. But the the moral of the story is be aware that and also, you know, use some of these medical grade research tools.

Now they're using the power of AI but really carefully training them on, on just on you know, these kinds of actually all research articles, consensus is kind of cool.

Like the name sounds because it will give you the consensus on the set piece. And so if I could ask a yes no question, like does all coffee fruit extract have benefit?

Or let's see what it says. So say yes no question. And it should give us a rating. Let's see what it does. Yeah I put a rating. And it says yes half. Yeah 50%.

You know, probably 30%. Yes. According to this research that the 1211 papers and then 32% of those are possible and then mix and now so really pretty strong evidence here.

Right. So you know, up to, you know, 88% in that yes or possibly category is another platform. Yeah. So again really find it really easy for just digesting that information.

And I interject here for one second, if you go back to what you were just showing with the the research, I think that that brings up a really interesting piece about large language models, and that is that they only they know what they know, they know what they've been taught.

And since so much of the research has been done in a different way, perhaps than than we do it in multimodal therapy, in systems biology, where we're trying to orchestrate the symphony of them of multiple different systems together, as opposed to just trying to change one variable.

And so we do have to remember that the output of the large language model is only as good as the input. And until we have a larger preponderance of studies where we're looking at things through this new paradigm, we won't really have a full perspective of how much these things may or may not impact whatever the question is we're asking in this case, cognitive decline.

Absolutely. Yeah. And the more sinister explanation for that is that we have a lot of value. And I think it's good for evidence, quote unquote, evidence based medicine in our medical society.

But, a lot of evidence is, is is paid for is bot right. And so a lot of big pharma companies, when I try to prove that a drug works, I'll spend millions, if not billions of dollars and, you know, publish the positive results if people may hide the negatives, you know.

And so, yes, like even the research articles are a little bit of a cherry picking, but you can also take your own research or articles that you found that or you know, or authors that you trust and take that content and, and basically create documents.

You can create Google Docs, you can create whatever it is, you know, you know, take different podcasts and take information from those. And then you can take those and put them as PDFs or as Google Docs into the back end of these systems now very seamlessly.

And then create an ability for you to interact with all those documents and query them. Right. And so notebook LM is another platform briefly called Open Evidence.

This is more for doctors out there on this that you do have to be a licensed physician or, or a medical professional. You have to put your license in, but similarly still super helpful.

I pose the research caveat is it's super important. Like we don't totally believe in on this. Yeah. Because you do want to be able to, you know, bring in your own sources too.

So notebook allow me the Google product, which is pretty cool. And then again, same thing. I just took that scan of Dell's, you know, findings and generally really nice less.

This is actually when I was playing around with the most sterile list of all the supplements. But you can put in any sources here. You can put in any documents here, any Google Docs, any PDFs and a Google Slide docs, whatever it is that you want to interact with and ask questions of.

And, you know, probably there any different query that you can think of to synthesize that data. Before we transition out of this topic, I want to kind of maybe blow your mind, I don't know, have you seen this, audio overview podcast, that notebook.

How lamda did you heard this thing? No, I've heard about this thing, though. It. Yeah, it's pretty cool. And spooky. So again, I did to generate this once I put this one document out, I sat 12 pages all day elsewhere.

And then when you come over here on this platform, you just, you know, the button. It says generate audio overview and it takes a few minutes. You has to think about it.

But then what you get is this podcast version of that content. These two people are these two voices, not people. These two voices talking about your content, which is really actually pretty fascinating and powerful for learning, because you can take written content and then listen to it and have it here, it be discussed.

But I won't play this for long, but I just want to show you what this is like. And then here we go. Welcome back to the Deep Dive. Today we're diving into something a lot of you have been asking about how to optimize brain health and cognitive function.

Well, excerpts from a couple of books by neurologist doctor Dale Ritson, The End Times and the End of Alzheimer's program. Great books. Yeah, we're getting our covered.

Actionable insights on protecting our brains can help improve alertness and focus. Okay. There's also go to kola, an herb traditionally used to enhance cognitive.

Then that's incredible. Yeah. So when I first heard that, I was like kind of blown away. And because it's like a bit or not a bit, is it really almost right.

A pretty significant cognitive realization. About where this can go. Right. Yeah. The scary is often there it is because like, you realize that pretty soon we're not going to know the difference between is this me and you talking on an interview or is this some AI version of us talking?

Right. Like we're going to have 2000 words? Yeah. Oh my goodness. So wow I, I'm, I'm a little speechless after hearing that that maybe you could start maybe you could talk a bit about some of the tech platforms that are out there for assessing cognitive health and brain function and how maybe we can best use those both as clinicians and then as patients.

Yeah, absolutely. And so we use these a lot.

Cognitive assessment platforms and brain testing

And the, the science and the technology is really catching up with these being super useful women. We're getting ready for our interview today. We're a little bit about what we're using in the clinic.

You know what each of us are using. And so I want to talk a little bit about a platform, several different platforms actually. There's, there's and these are for, for online computer based brain assessments that give us a readout of all those areas in our brain and functioning and give us a breakdown of different tasks.

What happened on that task, and then what brain areas those might be connected to. And so we can kind of get a really interesting snapshot of the brain.

I'm going to go deep today on a platform called radios. But there's three that are really kind of in this space that we track a lot. I know that you're using one called CNS Vital Signs a lot, which is pretty commonly used in a lot of the folks within the cognitive decline space.

There's another one called, Brain Check, which is pretty cool. And then there's this one called crayons, which I think is actually very, very interesting.

And maybe the most comprehensive of these platforms. Basically, you know, it was it's a digital cognitive assessment platform, and they can provide objective and scientifically validated cognitive testing.

And so it can be really helpful for getting baseline assessments. And then also kind of tracking people over time. And as a clinician we can choose different cognitive tests to to assign to people.

And then we can also create custom batteries or test based on what we're worried about. Right. And so this can be really helpful for dementia or the cognitive decline Alzheimer's can also be really helpful for attention and ADHD.

AB it can be, you know, maybe you might need a different set of assessments or trying to work with somebody with long Covid for example, or me, CFS or Lyme disease, you know, so you can kind of tailor this to the different patients.

And, you know, you can randomize those, you know, so if you do repeated assessments on people and track them over time, you know, you can, you know, really jack nicely valid results and then not seeing the same test.

So don't get better and better over time. And so, you know, basically really, really comprehensive, over 30 years of academic research, you know, about 400 purity studies.

And they validated this testing using fMRI and Pet scans. So they kind of done some imaging to kind of show and as well as along with, you know, the standard 2 to 3 hour neuroscience testing, and they do have some data to show that this actually outperforms the Moca testimonial test is the Montreal Cognitive Assessment Test, which is, either usually a paper form, but they also have like an app now an iPad app.

And so which is kind of, you know, cool way to get a really, really comprehensive snapshot of people's brains. And then I want to do another quick screen share.

I want to show people what this looks like. So there you and you can tell me I've done a lot of CNS Bioscience, so you can tell me if this is the same kind of thing, but basically you get like readouts on the test subjects.

You know, in, you know, you go in and you compare to you by your age group and by your gender. And so basically, you know, you can get these different tests, you get a readout of for where you are on that test and then also measures, you know, gives you this kind of visual of your percentile and tells you what, everyday activities or tasks are kind of associated with this type of a test.

So you can kind of understand the validity and why that might be important to you. And they also give you a cool readout of, and so here. I've sort of which test kind of correlates with which brain area is right.

And so you can kind of understand and track over time, you know, how you're how you're performing. And then also, you know how that relates to different brain area functions, which then could correlate with different ways that we might want to work with people, different ways you might want to intervene.

I have a question out. So there's a platform called Brain Age Cue right where you can do brain exercises. And so I reached out to them to ask them, hey, if I bring this data over and we have this sort of, you know, performance on these tests, and we kind of know a little bit about what brain areas are there, then exercises are things that we can assign them from brain HQ that's a little bit more tailored, a little bit more precise and specific question for you.

Do you know the CNS vital signs do that? Can you kind of provide different specific areas of brain HQ for people to use? Yes. You have you actually can and it's always interesting because, you know, we'll test someone and then we're going over the results.

And maybe it's a, you know, a patient with their spouse. And then, you know, the spouse will say, oh my gosh, this person has never been good. You know, my my wife has never been good at organizing things, or my husband has never been good at remembering what he sees.

And so it's really interesting because when you're starting with someone that's already suffering from cognitive decline, we have the unfortunate situation of not really knowing what their optimal functioning was for our comparison.

We just know where they are relative to other people as you showed their age and their gender. So it is very interesting that we do get specific, domains that we can see for cognitive functioning, whether it's visual or spatial memory or it's the processing speed or executive function in organizational patterns.

So you can really refine that with the brain. And we'd use both of those in the research study and in our, in our practice. And with brain HQ it's nice because the patient can actually see their progress.

They can see how much they've improved from the beginning, which is motivating because that program is specifically designed to always get harder. So as soon as you're achieving about 80% success in whatever, whenever patterning whatever piece of the program that you're working in, then it makes it incrementally harder.

So for high achievers or people who just like to feel that sense of success, they get really frustrated because they can never win. It's not a game you can win.

Yeah, it's like going to the gym and working out your muscles. And as you get stronger, you want to increase the weight, right? You know, it's a lot of longevity and health span.

Folks say it's not about how many reps you can do. It's about that you should have enough weight. So you you fail. You fail at a certain point. And that's the right amount of weight for you.

Right. And so it's very analogous to that as which is a real good workout for your brain. Yes, exactly. It's a great analogy for that. So you talked about Chris as a way of analyzing how how well someone's cognition.

And then we've talked about CNS vitals, for example. What are some other ways or new developments that are emerging for a more comprehensive assessment of brain health.

Is there anything on the horizon? Yeah, yeah. So one company I'm tracking, and this is after I went to a longevity conference up at the Buck Institute in December, and I learned about this company called Neuro Age, started by Doctor Christine.

Glorious. So and very, very fascinating platform. So we're very interested in this work, whether it's cognitive decline, dementia, Alzheimer's or also some of those other health conditions that people that I mentioned where people have cognitive impairment, brain fog, you know, can't think clearly, have trouble with their memory, right, or sleep issues, etc.

we're very interested in what's going on in the brain. And also we will frequently be able to see changes to the brain and changes, particularly in, you know, the volume of different brain structures.

Right. So this is something that you've done a lot of work on. Dale presents a lot of work on doctor cat tubes and Hathaway like and putting research on top of this and, and publishing a lot of research raising.

So I really appreciate that work and talk about the traditional tech that's used for that is an MRI. And then to do what's called a neuro quant, right.

Which is a software program that you put on top of the MRI images. And then it generates a quantification of these different brain volume, different structures.

And then we can track that and we can kind of see, you know, how people improve over time. And that was really a big part of the backbone of of Dale Bryson being able to show. And all those folks being able to show.

And you this is actually reversible, right? You know, in a very objective way. So neuro age is a young company, but it's very cool. And the research that they've been doing is this goes back, you know, ten plus years and they use is imaging and it uses brain MRI.

They actually use a company called Brain Age to generate those volumetric pieces of the brain, but then they stack two other pieces on top of that. So they this technique, the imaging and the brain volumes, maybe different structures, but then they do also, a cognitive assessment, you know, section kind of similar to chaos or file science, etc..

And then the third piece, which is really, really fascinating, is a blood test. And the blood test looks at as a whole genome sequencing, and they pull out 52 different RNA, sequences, gene sequences, that are risk factors, that are their genetic risk factors for Alzheimer's and for, for cognitive decline.

And so basically, it's his ability now and then generating like that predictive score. Right. And so, you know, if you have, you know, this blood test and it has these genetic risks and you have this, you know, assessment on your brain function based on the computer assessment.

And then you have this imaging, you know, here's your brain age, basically your neuro age, right? That's the company's name. And they've been able to show that.

And they correlated the data on the blood testing etc.. Based on, you know, on, on actually autopsy samples of 800 people over 15 years, medical center.

And they were doing central nervous system sampling of some of those RNA changes, but they were able to correlate now blood testing, because that's what we can get, right.

We can get the blood compartment easily. So those two pieces and they've been able to show that if if you have a younger brain age, a five years younger than your chronological age.

Yeah, your age number on your birthday, that is very protective. And conversely, if you have an elevated brain age, especially if you have an ability for either one copy or two copies, that you have a significantly higher risk of, of suffering from cognitive decline or Alzheimer's.

And so this is something that's pretty cool. It's kind of like, again, you get a score, you get your your your age score, and then you get an opportunity to track that over time, you know, pretty non-invasively.

And so, you know, again, we'll see. They're a young company. They've got some really good brains on it and some amazing research behind it. And so I think here in the next 1 to 3 years, we'll see kind of how they pick up and where they go with it. But but very, very fascinating.

And they're available now. So people actually want to sign up and try it. You know, it's somewhere between, I think two and $3,000 to get all three of those things.

So blood test, you know, tracking over time on the computer as well as the MRI and the imaging on top of it. So, wow, that is really something that could be so useful in helping people understand where they are on this continuum.

And I think, you know, one of the things that's kept people from wanting to know, we call it dementia denial, right? Because in the past, as soon as you recognize and identify that cognitive impairment and cognitive decline are happening, it's a it's a one way trip.

And so people don't want to know when they're afraid to know when they're afraid to learn about their risk factors.

NeuroAge, brain imaging, and objective risk scoring

But all of that needs to change because there's so much that we can do and tools like this that help you to see and to understand where you are in that process, can help you to access the tools that you need to make changes so that you can change that course, change the trajectory that you're on, tools and objective data on the power of objective data that you know and we know is amazing.

Right. So and yeah, giving people hope and giving people direction, because it is really, really terrifying to get these diagnoses or to know that you have a genetic risk and to feel paralyzing.

But that's what I get really excited about, that the imaging and the data and the and the, you know, support that's that we can now provide people. So we're really cool time.

It is a really cool time. I know Dale, Doctor Bateson likes to say that dementia is now optional. And I think that needs to be the second message. As soon as we give people information about their risk or even where they are on the continuum, if there are a little bit more advanced than where you'd expect for their chronological age, that dementia is optional.

You have available to you now all of the tools that you need to change the course of this disease that's empowering the Super Bowl, it's super exciting.

Yeah. Now, one of the things that one of the tools that we use in accomplishing some of this reversal work is sometimes the use of photo, bio modulation, or different types of light therapy to help improve brain function.

I know it's a little bit of a jump from what we've been talking about, that there's some overlap in terms of the of the data and the science around that.

Maybe you can if you can help us connect those dots. Absolutely. Yeah, I know this is a fascinating story in my opinion. So the use of light, you know, there's a company called vie like which has been around for a while, and they have a head gear, you know, and they use light actually transcranial and also into the nose.

Right. So it's an interesting way of getting light forces up into the brain. So other companies are doing headset form factor. But so this new company, it's, it's just ramping up right now came out, UC Berkeley and, they're being developed here in California as well as in Denmark.

And it's company called up to students. And so they're using this science around, flickering light, specifically a 40Hz or 40 cycles per second flickering light.

And what that can do is it actually can entrain gamma waves in the brain, and that can help to restore neuronal function in people with cognitive disorders.

And so it's a little complicated, but we'll go through it step by step. You know, basically the brain waves are

happening all the time and they're happening at different frequencies and different oscillations or fluctuations.

And this is like kind of like, you know, coordinating neuronal activity the way a conductor might do for an orchestra. And gamma waves, particularly at this frequency of 40Hz, really are critical for learning, for memory and for sensory processing.

And there's been studies showing that people with Alzheimer's with dementia have reduced power and synchrony, and that we think that that's related disease progression.

And so this company has actually built a light box which you can expose yourself to. And that can help to in train. I have one here actually I got one from the company to try out.

And so is this light box here. And you know, basically I have it on my desk and I use it for an hour every morning. But it can also actually, incidentally, be helpful for attention and ADHD.

And cognitive function. So I'm just checking it out. But you basically put it on and you'll see the light flickering, you know, and and it's actually tolerable the, you know, to sit in front of it's, not, too disruptive.

One of the things that they developed as a core part of their technology is actually to hack that piece of it, because 40Hz light by itself is, is, really annoying and and hard to stay present for.

And you wouldn't be able to do work, you know, and for people who have a risk of flashing lights having seizures or epilepsy, that would be a danger to them.

And so they patented this method of, of, of, of hiding the light behind a constant light source and modulating those two together so that it actually is very doable for people to sit in front of this device, for an extended period of time.

And so that was kind of their hack on the system of, of how to make this a tolerable technology and then be able to deliver it to the end user. And I won't go too deep on this in the interest of time.

But it's super fascinating to me how this works. And so super briefly, that these interneurons in the brain and there's these PV positive and SST positive interneurons, and these are specialized for Gaba or calming neurotransmission.

Right. And so these are the ones that are also responsible then for the gamma oscillations. And so these are really, really critical for maintaining brain's network stability preventing excess excitation.

And for cognitive tasks like memory formation and attention. And early in Alzheimer's, these neurons, these peak positive SSD positive neurons lose their function.

They get metabolically stressed. They get neuroinflammation, they get amyloid toxicity, etc.. And that's, we think, connected to the drop in gamma oscillation.

And they're very, very sensitive to stimulation. And so literally by sitting it it's like being exposed to your eyes to the sporty Hertz. You trigger those neurons.

They actually re myelinated and they regain this ability to send back calming GABAergic response to the brain. And so that's super cool. The other thing it's amazing to me is that this actually enhances what's called lymphatic clearance.

So they speak directly then to these astrocyte cells which during deep sleep shrink a little bit, open up these spaces and allow the brain to drain the toxins out.

That's another connection. Why as we age, we sleep and get less deep sleep.

Photobiomodulation and light therapy for the brain

As you get less of that time of those astrocytes being shrunken and the drainage happening as your toxins build up in the brain, this is sort of very simple way of externally stimulating the brain, external stimuli, those neurons, the gamma oscillation and improving the lymphatic system, which is just pretty mind blowing.

It might be like super simple, but super repressive and cool. It is really fascinating. We've got a couple of other types of photo bio modulation that we work with as well.

We've got the neuron IC, which is a helmet with infrared and red light. And we also have Sarah Thrive, which is another really fascinating way of utilizing light therapy to stimulate both the gut to help improve the gut microbiome and also the brain through the forehead.

So kind of harnessing the power of the gut brain axis. So there's so many interesting ways that we can now utilize this light therapy to help the brain to heal, to help it to generate more energy, to help it to basically rinse, lather, rinse and repeat during the night and clean itself.

It's just it's fascinating. The power of light. Yeah, it's super, super fascinating and is awesome to me too. Like when you start to develop this technology in there.

Well, if I didn't research that, you know, because like a lot of people would think like, wow, light therapy is kind of woowoo like like rapid quackery, like, what's the deal like?

But you have it's pretty amazing. The actually the body of research out there. And now you have these device companies trying to target that to our brains and to our bodies, to our gut.

We're pretty impressive effects. So yeah, it's exciting. It is really exciting. And like you said, with lots of really good data behind it, which is amazing, amazing.

So looking ahead, what do you think or what excites you most about the future of brain and cognitive health? Yeah, I mean this is just an incredibly exciting time.

And, you know, it's just a pleasure to kind of research this stuff and look at it and bring it to folks out there listening to this summit. And it's just, you know, it's a very, very rapid time of evolution.

I think that, you know, even like we talked before we began recording, even by the time this summit launches in May, there's going to be new developments.

Right? But if we look out a year, we look out three years, five years, you know, the steal is advancing so quickly that it's just a really, really exciting time to to be practicing medicine.

And I think we're going to see more AI platforms where we see more AI powered detection, cognitive assessments, new digital biomarkers that are going to really help to build earlier and more accurate detection of cognitive decline, catching people earlier, allowing for earlier interventions, better outcomes.

We can now measure speech and understand, you know, even a decade or more before that person might be a higher risk of cognitive decline or Parkinson's, for example.

And so where phones will be able to do this and give us though, hey, you're high risk. This is a digital biomarker that we can develop, right? I think that we're going to start seeing more and more personalized brain health plans. Right.

You know, advances in data integration, you know, genetics, biomarkers, cognitive labs, etc. and making it recommendations more tailored. I think that you're working on a cool thing that you near us, Alex really excited to see this where it matches.

But that's a lot of what that's about, right. It really is. It's about helping helping the patient to be able to keep track of all the changes that they basically the menu of options for change that they have and what they can implement, and then how successful they are at achieving those changes to improve their brain health, and then helping the practitioner to keep track of all of the many biomarkers and the laboratory data and information that we have that we know needs to be optimized to create that environment in which the brain can heal.

And that's really what it's all about. And all of these things are that we can use either tin to improve the lymphatic flow, for example, with our light therapy that we were just talking about, or the changes that we can make in our diet, which then impact our our epigenetics, how our genes are expressed, making the vulnerabilities that we came with either more or less active and important in what our path is going to be.

So yeah, it is. It's a really, really exciting time. Yeah. I think it also is a huge piece around, you know, being to do more work around prevention and being able to support people better using technology.

And it sounds a little spooky right now, but yeah, there's a lot of this whole wave right now of early phase of AI coaches. Yeah, health coaches. And I worked as an advisor for a company called Marie Health and developing a nutrition. Yeah. Coach.

And yeah so know yeah people are back to those especially at first of interacting with these bots. But they're really interesting and really compelling.

And they're solving for this piece around, you know, the fact that making health behavior change is difficult and sticking to it is really difficult. And so that's one thing that we've been really passionate about at our practice, about giving people the support they need, whether it's a clinician or it's a health coaches nutritionist, or as technology or data.

Future of cognitive health and closing remarks

But building all those now into this sort of asynchronous, you know, I, I forward, I don't see I don't think I only for us but I forward bridging those gaps.

You know when you're at home by 10 p.m. and you have a question and, you know, interact with us as a practice. So yeah, I'm really bullish on that. I think it's a really, really, a lot of opportunity a lot of opportunity.

With that in mind, I just want to thank you so much for the time that you've spent with us today. It feels like we have just barely scratched the surface of what's out there and what's possible.

But I really appreciate you walking us through some of these things and making it feel a lot more accessible, both for the practitioner and then also, I think for our viewers.

I would like to ask you if people are interested in working with you or learning more about you and your team at CFM, how can they get in touch with you?

Yeah, so we're the California Center for Functional Medicine, and we take care of patients all over the country. And our website is CF Med Doc. And yeah, you can find out we're also on social all over the place.

So feel free to, poke around and, see what you find. And you have a really cool health assessment that you offer too, don't you? Yeah, yeah. We have a really fun symptom questionnaire on our, our webpage where you can get, you know, a deep dive of your own health.

And really, we've rebuilt that so that you get information and then you get also an understanding of some of what some of the options are for you to, to attack that.

And we have an amazing, amazing team at our clinic. We have some brilliant, nurse practitioners and CPAs and health coach, health coaching nutritionist, and I just feel blessed to work daily with a really, really smart team.

All of us working together to put our brains together and just, you know, we're just really passionate about helping people in any way possible to either recover their health or prevent chronic illness, prevent and live the best and longest life possible.

That's fantastic. I think the power of the team cannot be overstated. It's amazing to work with an incredible team. It is. Yeah. I feel very grateful.

All right. Well, I'm sure our viewers have enjoyed this discussion today as much as I have. And if so, please join some of our other sessions on the summit where we continue to dive into my passion solving the root causes of cognitive decline.

Thank you all for joining us today. And thank you, Doctor Zweig, for being with us. My pleasure. Thanks so much for having me. Absolutely. Bye bye. Now.