Upgrade Your Brain With This New Technology Transcript

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Introduction and Background

Hey Cheng Ruan, I am so glad that you agreed to be part of my Multiple Sclerosis and Neuroimmune Summit. You have such an interesting area of expertize.

What I'd like to have you do is introduce yourself, explain why you have this expertize, and then we'll get down to our interview. Sure. Absolutely. So, first of all, thank you for having me on.

So my big passion is brain health. So a little bit about my background. So my mother's Chinese medicine, Eastern medicine, then kind of grew up with that mindset.

I'm a classically trained M. D., board certified internal medicine. Most of the founders, CEO of Texas Center for Lifestyle Medicine. And what we do here in Texas, which where I currently am, is that we are basically investigators.

We try to find out the root cause of chronic illnesses. And, of course, the brain is the most complicated one, which is why I'm super happy to be on this particular summit.

And so I host my own brain health summit a few months ago, which is called the Reverse Brain Disorder Summits, which you run. So I want to thank you for that.

But a big portion of what I do is I look for patterns. So I work with companies who engineer artificial intelligence machine, learning to look at data patterns of how we can really reverse chronic illnesses.

And so a lot of a lot of those a lot of the things I learn from those patterns we're really going to be discussing today. So I really got into brain imaging, specifically EEG, which is a technology that's traditionally used for seizures.

But now we're using it for something that's far, far more relevant, which is what is the root cause of brain health issues. So I'm super excited to be on here. Thank you so much.

Well, this is really great. So let's talk about that EEG and how we might use that for the messenger immune patient. Excellent. So. So the EEG, which is a electroencephalogram.

EEG and Brain Mapping Basics

And if the people listening to this are wondering what it is, it's basically similar to like an EKG that doctors put on your heart, except there's more leads and it goes on your brain or actually on your scalp, technically.

And it's then it's sensing very specific things from the brain. So our brains are very much a biologically active organ and it can pick up frequencies similar to sound frequencies, right?

And so these different frequencies of the brain, you're supposed to have a specific amount at a specific time, at a specific part of the brain. So so we take EEG further and do an additional analysis called a quantitative EEG.

And instead of looking at just brainwave patterns or we're looking at, well, how far away from the normal population this part of the brain. So it's kind of a functional brain test, right?

And so what we do with that is that we recreate that data into its own set of images, which we call a brain map or quantitative EEG. And and. Loretta And so these brain maps basically turn words into numbers.

So what I mean by that. So if someone were to say, I'm really tired all the time, you know, I keep falling asleep

between like one and 3:00 and I want to take a nap or have so much brain fog or something's just not right with me, but I can't put my finger on what it is, what it considers EEG allows us to turn those words into actual numbers so we can actually see those patterns.

And it does three things for the patients. One validates the patient's concern. So sometimes the report comes out and the quantity of it is like, Well, we expect this symptom and this symptom, this symptom.

So most patients like, yeah, that's me as weak as me, you know. So it's sort of a yes or no. And the second thing it does is that, well, how much how far away from a normal is this person's brain in this particular area from other from normal populations?

So give us what's called a standard deviation statistics, right? Mm hmm. And the third thing that it does is the caregivers actually gives us a lot of information from the caregivers standpoint of what their family members may actually be feeling.

Right. And put those into numbers. And so sometimes with the caregivers, it's really hard to determine, like, what's a good day, what's a bad day, what are the factors there?

And so when we analyze all of those patterns, it provides multiple points of validation so that when when people progress on their health journey, let's say they adopt a really awesome diet and they get healthy, they exercise.

We can see how far they actually improved per brain area compared to the normal population. Once again, turning those words into numbers. And oftentimes the patient themselves can't say it was better.

They just know something's a little better. We can say, Oh, look at this area of the brain, and look at this area of the brain from a functional standpoint, what you cannot get in like MRI or CTS or anything like that.

Now, everyone who's listening, I'll tell you that I had a concussion and was left with a significant problem with headaches. So I went to one of my local practitioners who does this fancy Q EEG, and I got the EEG in their office and began a program of training with the monitors.

Why don't we talk? It was, by the way, extremely helpful. Took care of my headaches. And why don't we talk a little bit about what that training experience looks like?

Yeah. So I think what you're talking about is neurofeedback.

Neurofeedback for Brain Retraining

And whenever we get this image, we're like, Well, what do we do now, doc? Right. Well, there's certain things that we can do. We can get into lifestyle adjustment.

It's we can talk about what worked in mindfulness and meditation, which is extremely powerful to talk about dietary changes. We can talk about sleep improvements, hydration, right?

All the pillars of health. And we can see that improve. Now, we can also do something called neurofeedback. And neurofeedback is not a replacement for everything I just said, because you can't you know, it can't replace all the lifestyle stuff.

It's really an enhancement. And neurofeedback is okay. Well, we now know these areas of the brain are outside of the desired frequency that may be causing the symptoms.

Can we can we create a program for your brain specifically that that will allow you to do things to kind of get into that zone, the desire zone. And that's called a that's called a neurofeedback.

So there's a difference between psychological neurofeedback and medical neurofeedback. It's a huge difference.

And I'll tell you what that is. A psychological neurofeedback is people feedback being based on psychiatric diagnoses, anxiety, depression, attention deficit, etc., etc..

Okay. And then the medical neurofeedback. Instead of saying that this person has the symptoms, I want to feedback the symptoms we're looking at medically.

What does this patient diagnosed with this patient diagnosed with multiple sclerosis, Parkinson's. Alzheimer's. Like what is right. And we're looking at, well, how can we help the brain kind of restore the function a little bit based on based on what we see on the quantitative EEG model here.

And so if we're able to answer that question, we can potentially create something that will help the patient on a medical journey. So you and I both know that one of the biggest inhibitors to brain improvement is people get really poor quality sleep or they have terrible insomnia. Right.

And so instead of saying, hey, you, the patient have depression, anxiety, let's say, hey, let's let's let's look at the fact that you have insomnia. First, let's see, we can program the brain to get out of the the high frequency beta zone into the theta zone on this particular part of the brain.

And when you fit that in, you see that the insomnia gets better eventually. And then we can see from a brain mapping again, well, what else do we need to really improve?

Because if you just work on one area of the brain getting better, call it a sleep regeneration. The whole brain actually, you know, they all talk to each other.

It's not like we're feeding back one area. The whole brain actually starts that improvement process. And so I think that's a big difference between neurofeedback.

Another thing about neurofeedback, there's different types as well, depending on the neurofeedback practitioner. Ours is the type that we have people do at home and home.

Neurofeedback is extraordinarily powerful because people can put on the system. They can do it, you know, 3 to 5 times a week, seven times a week or even smaller increments.

And we find that that's far more effective because people can understand what their triggers are. And the other thing about neurofeedback is it's like they're iPad or their phone, so they can actually see are there things that are triggering it today that is causing my insomnia, whatever symptoms it is.

For example, one really good example is this patient who started a neurofeedback and couldn't really get into the zone and then went and stayed somewhere else for spring break and was in a zone like 90% of time when he moved back.

He's like, No, I can't get into my my zone anymore. And lo and behold, found out he had water damage in his house and there was mold everywhere. Right.

And so we're we're seeing that the triggering mechanism is disallowing the patient to go into a desired desired feedback system. So that's what that's what neurofeedback is, is sort of like, you know, upgrading the software process of the brain and kind of re-engineering that.

Okay. So let me make sure we're describing this accurately. There is a diagnostic EEG, correct. Then we recommend a neurofeedback where I'm getting feedback through the EEG ports that then we I can monitor that I'm a see achieving the targeted changes in my EEG pattern.

And then over time things improve. And again, everyone who's listening, I've gone through this type of neurofeedback and I personally have found it to be a very helpful.

Sleep, Airway, and Brain Fog

This is a more advanced technologies. Are there other impacts in terms of my skull or my teeth or anything else that will impact this EEG process? Yeah, a lot.

And let me tell you my aha moments I had really over the last three years in looking at brain chemistry. So I think it really started in 2018 when we started doing a project with the VA hospital here of looking at military veterans and psychosocial states and recognizing that there's a pattern on the EEG that's very predictive of something called hypersomnia.

The word hypersomnia hyper means a lot. Something, I mean, sleepy. So people's brains get super sleepy during the daytime, right? And so one of the actually not one of the most common reason for that is people have what's called sleep disorder breathing.

So sleep disorder breathing is basically when people have issues maintaining oxygen levels at nighttime as well as breathing. So the more severe form of that, we call it sleep apnea and then the not so severe form of that, we call it UARS or Upper Airway Resistance Syndrome.

And so what I did is I correlated symptom clusters in association with either the sleep apnea or upper airway resistance and found that most people with flight traumatic responses, PTSD, tend to have one of the two.

And so their specific. Hang on, this is a big observation. So people have had post-traumatic stress disorder. Would you include early life stress, adverse childhood experiences in that group?

Yeah. And so when people think PTSD, they're thinking that some major trauma will not necessarily so. Right. Yeah. Yeah. Ringing it could be. Well, it could be anything.

Most people have some level of trauma, but the people who exhibit it more on the brain tend to be people with, like, sleep disorder, breathing. And so hang on.

Everyone who's listening, I think you've heard me talk about or you will be hearing me talk about the high prevalence of early life stress, adverse childhood experiences and people with multiple sclerosis and neuro immune conditions.

And we know that we have higher rates of sleep apnea and this upper airway resistance that Chang just described. Now back to you, Chang. Okay. Now, what I love to do is tie exactly what you just said into a publication that was published on March eight, 2023 in Nature.

Okay. And this is a big deal for me because it really validates what I've been really thinking. So they did this study in mice and they call it the airway brain connection.

Okay. And so what they found is that you have this nerve that comes from the brainstem to the back of your throat and to the tongue. It's called the colossal pharyngeal nerve or cranial nerve nine this multiple name for it.

And there's receptors in there that are receiving signals from toxins and pathogens. But this one specifically, they looked at influenza, which the flu or the flu.

And they found that when the flu activates these receptors, these receptors are also across the gland. And receptors and prostate gland receptors are basically these receptors that releases massive inflammatory cascade of inflammatory cytokines.

So basically the body senses something in the throat and it creates inflammation. Okay. And this so feeds directly into the brain to affect neural signaling.

And so the brain almost looked like super inflamed when that occurs. Okay. And so we see this now officially with

influenza based on this study was published.

But we've also I guess what we've also seen as we saw seen is with COVID, with exposure of some spike protein. Right. And we see this in other before coronaviruses as well.

And we also saw in different medical therapeutics worth of our components as well. So there's something there's there's this great honor of mind, which I thought in medical school only did a few things.

Ashley is one of the most powerful sensing nerves that we actually have in the body that's able to release this giant amount of inflammation that's in the brain based on something that triggers it.

And so we're at a sensory well, it's in our tongue and in the back of her throat also. And probably going down into into the bottom her throat. So those people with obstructive airway disease, sleep disorder, breathing like sleep apnea or anything like that have a narrow airway.

Well, there's actually a lot more inflammation that can be triggered potentially by the same glottal pharyngeal nerve, which creates or does this brain fog effect now going back into 2018, when I saw this on the veterans and seemed they all have this thing, this this sort of hypersomnia or sleepiness effect on the brain and we're time that we're sleep disorders.

Can we link airway disorders with neuro immune? The answer is absolutely yes. We have PGE two receptors and in the colossal pharyngeal areas in the pharynx that are there.

And so that kind of explains what we're seeing now is virus airway and brain fog. So makes sense. Okay, so what about our teeth? You know, how important are teeth?

And, you know, is losing our wisdom teeth a problem for us? Really good question. So in the teeth is also part of the airway. So as it turns out, and I just did a podcast with Dr.

Felix Leo, who wrote this wonderful book called Your Child's Best Face.

Dental Health and Neurological Risk

And it talks about how there is associate Asian with neurological and mental health disorders with with sleep disorder breathing. And what happens is that it depends on the structure and the chemistry of your teeth and your gingiva with your gums.

And so, once again, back in 2018, I was seeing this pattern that's right here. But there's some people have specific really high inflammation patterns that were actually correlating that were periodontal disease or gum infections.

Right. And we're seeing that a lot of people have periodontal infections over and over again, even if they have great hygiene. Gum line recessions, they actually clenched their jaws a lot.

And when they clench their jaws a lot, the brain is actually trying to compensate every evening to get the jaw to open up its airway. Okay. And that's what a clenching, the grinding really comes in.

So people can have TMJ issues, have jaw pain, they can have migraines. And so as they clench the jaw to to protrude open the lower jaw to allow it to go forward, that's where the grinding actually comes in.

And as it turns out, when people have their teeth removed, there's less there's less stabilization of the width of the actual palate in the jaw. And so that grinding and clenching, they actually get worse over time.

So we know that there's an anatomical issue with smaller, smaller faces, lower faces and jaws, and that creates an even more sleep disorder, breathing, more obstructive airway effects and that we see.

Combine that with the gum disease and periodontal disease, we're seeing a very humongous trigger for brain disorder is stimulated by by a sort of immune response.

So what do we do? Well, yeah. So. So here's what we already know, right? In the Journal of Alzheimer's Disease, we already know that those people with Alzheimer's and other forms of memory loss and dementia tend to have p gingivalis, which is a bacteria that's in the gums into the brain plaques.

There's there's postmortem studies that look at that right where, you know, it kind of goes there. But it's not just that. It's other different things like spider keeps are really common.

So spider kits are a form of organism. And two examples are syphilis and Lyme disease. So these are spider keeps that that basically aggregate in our actual plaques around the gum lines and that is a close communication between the mouth in the actual brain.

And so what we have to do is we have to like, I believe that all neural immune systems, brain degeneration patients have to have a huge focus on dental hygiene work with dentists, preferably biological dentists, who can look at things much deeper, who can actually scan people's faces to look at different pockets of infections, because those are the people who have the best improvements of outcomes in our clinic after being treated for four of those things.

And you can actually see on the quantitative IG, the brain just starts calming down over the next year, you know, after a lot of that stuff's been really dealt with and the people have sleep disorder, breathing, obstructive sleep apnea, like if they're not using either a CPAP or appliance or something to improve the airway, it's almost impossible for long term progressive improvements to really occur because there is such an important factor and this is how the jaw shape structured teeth gum line.

So that's all they're really have a really close interface with brain function. So as I'm listening to this, I'm thinking it's important to have a careful dental exam, a baby, a sleep study.

Yes. Yes. And if there's someone in your area you could think about looking into getting this cue EEG to get a sort of a brain checkup. And what you're finding then you would suggest sort of this neurofeedback training as part of a way to retrain and everyone is listening.

My experience with the neurofeedback is that it's actually a very fun, pleasant experience. It's, it's was certainly a very enjoyable part of my training and all of the residuals I had from that concussion, you know, completely resolved.

Awesome. So how would people find these kind of resources in their community? So that's a good question. Finding people that do quantitative EEGs is very difficult outside of psychiatrists and psychologists and neurofeedback experts doing it.

And so I would say that you don't necessarily have to go that route. Like, if you work with your primary care doctor and you snore and you're and well, not even snoring.

I shouldn't say that if you're sleepy during the daytime and if you clench your jaw, if you grind your teeth, even if you don't know you're going to your dentist tells you grind a lot.

That is a telltale sign for sleep disorder, breathing. And if you're suffering neurological issues on top of that, that's really the thing to really hyper focus on for improvement.

So you don't need a quantitative EEG to tell you that. I think and more importantly, I think there's there's a big limitation of access to technologies like this and most of the country or most of the world.

And so and so, I don't think it's it's crucial for that part of the quantitative to be in there I think it's nice to have is definitely not a need to have very simple like you know pay attention to your symptoms work with your doctors, ask

if your family tells you that you start reading.

Practical Brain Health Takeaways

And I read kind of funny where you can hear you grinding like this, then that's a big thing to take care of, like, right off the bat, if you have a had really poor dental health, we have bleeding gums, or if your dentists say that you have gum lines or things like that's that's been degraded over a long period of time, despite good hygiene, those are really telltale signs that something needs to be done and then work on getting sleep studies to make sure you don't have sleep apnea.

And even the sleep studies that's done on home is not a sensitive sometimes people need in lab sleep studies to do. So all those things that I'm saying are far more available and far more practical from the joy of the population and the highly suggest looking at those factors.

Okay, my friend. Now, if we're going to have people focus in on what is the one take home message, you want everyone who's listening to hear and act on.

Yeah. So let's talk about the take home message that I really want to share with people is that you don't need a really robust access to health care to improve your brain health.

Right? Doing the small things make a big difference, like getting your sleep, getting your sleep quality as good as possible. And that may mean, you know, restricting your eating window to your last meal 3 hours before bedtime or hydration or not having too much screen time at nighttime.

That's a big one, especially for kids. Those are things that make a dramatic, dramatic improvement over time, dietary change, hydration, stuff like that.

There are a lot of things that you can actually do to improve your brain health. That's that's four that's far more accessible. Exercise is another component, which I think is really big as well.

And so let's call these modifiable lifestyle factors. But I also know that a lot of listeners right now have a lot of pain. Okay? So if you have pain, you've got to have a support system around you so that you can not only deal with the pain, but also get people to really assist you.

Because pain is a big factor in getting terrible quality sleep and in just getting medical services in the first place and movements in hydration and eating the right things.

So I wish everyone could, you know, dedicate time to themselves, which they are. They're listening to this that, thank goodness. So it doesn't take a whole lot to make a big difference.

But, you know, affecting the way that you live is absolutely crucial. Well, Chang, this has been wonderful. Everyone listening. I think the EEG, great technology, if you can access it, wonderful.

Clinic Information and Closing

If you can't be sure, think about do need a sleep evaluation, get regular dental care so that if you have plaque bleeding gums, you get that addressed and a biologic dentist, if you have more problems with a jaw pain and grinding your teeth.

Absolutely. Now, Chang, where where do people find you and can they come to you if they want? Yeah. So I have an entire team at Texas Center for Lifestyle Medicine that's dedicated to getting to the root cause of illness and diseases.

And they can come see me, but I am definitely not even the smart, smartest one in the practice. We have entire team that's dedicated to solving really complex problems.

For those people who are wondering, yes, we're one of the few functional medicine places in the country that actually takes insurance and Medicare, and that's one of our core values that we have.

We're always in the work beat, working within the insurance space. And where you can find me is at Texas Center for Lifestyle Medicine. But feel free to follow me.

Facebook, Instagram, Twitter. They're all the same handle, which is my name C, H, E and G. Are you an M. D.? Simran, M. D. and and follow me on there as well.

Okay, now, let's get the name of your clinic. Is it Texas Lifestyle Medicine? This Texas Center for Lifestyle Medicine. Texas Center for Lifestyle Medicine.

Yes. Great. Thank you, Cheng Ruan. This has been wonderful. Thank you so much. I appreciate you.