Neurogenesis and Brain Repair—What Science Says About Red Light Therapy Transcript

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Introduction to the Alzheimeru2019s Summit Interview

Hello everyone, and welcome to a very inspiring interview for the Alzheimer's Summit. I am your summit co-host, Doctor Kristine Burke, and over the last decade I've helped many patients reverse their cognitive decline.

And in this summit, I am bringing you interviews with thought leaders who can help you understand how you can prevent and reverse cognitive decline and Alzheimer's for yourself and your loved ones.

I am pleased to introduce you today to Doctor Ramona Von Leden, who is the Scientific Affairs Advisor at Neuro and Neurotechnology Company, developing near infrared light therapy devices to support brain health and cognitive function.

Today, she's going to be talking with us about how light therapy supports healthy aging. Doctor Von Leden is a neuroscientist and scientific strategist with deep experience at the intersection of neuroscience, rehabilitation, and emerging health technologies.

She earned her bachelor's in psychology from Brown University, her PhD in neuroscience from the Uniformed Services University, where her research focused on the modulation of inflammation following neurotrauma, including publications on the impact of photo bias modulation.

That's the use of special wavelengths of light on micro glial activation. She completed a postdoctoral fellowship in the neurology department at University of Texas at Austin Dell Medical School.

Doctor Ramona is passionate about noninvasive therapies to help support healthy aging, especially in the brain. She currently serves as the scientific advisor working ironic, where she supports research efforts to demonstrate the efficacy of light therapy on cognitive function and on a variety of neurological conditions.

Doctor Ramona wow, I am so happy to have this opportunity to speak with you and share the exciting things you're doing at neuron. Welcome. Yeah, same.

Thank you so much for the lovely introduction. Very happy to be here. Very excited to be a guest. And also, a little bit of a fan of yours as well. So I think this should be a really fun conversation because I think we, we, we have a lot of synergy and a lot of our backgrounds, but just coming at it from slightly different, you know, aspects of the, of the field, right from the more clinical side and seeing patients.

Whereas most of mine has been on sort of the research side of things. Yeah, absolutely. We're like working on two sides of the same coin. Right? Yeah, absolutely. 100%.

So I thought I would start us off with, you know, this idea that we know that this disease process starts long before memory problems appear.

Early Brain Changes in Alzheimeru2019s

So what are the earliest biological changes happening in the brain that signal Alzheimer's may be developing? Yeah, absolutely. And I think, I think this is more becoming a more common terminology with Alzheimer's is that Alzheimer's is being understood as more of a brain energy and systems problem, rather than an individual protein accumulation problem.

Right. Like I think up until the last maybe five, ten years, really it was always the Tao and amyloid. And although

those are very important biomarkers and certainly something that we see as hallmarks of the disease, they're not the cause.

There's there's a lot more going on under the surface. I in kind of preparing for this talk today, as I thought through some of the things that I saw in my own research, and also I was, again, listen to some of the podcast that you've been on and saw kind of where you thought on this journey.

A big one for me is, is really, hypo metabolism in the brain. So it's the especially glucose I think is a big sign of it. So one of the things we see a lot of is increasing insulin resistance in the brain and glucose hyper metabolism especially.

You can see that when detected with like your FTD, FPG, Pet scans. And what's really showing up is these early regions and the posterior cingulate, CUNY's temporal parietal cortex and the hippocampal network, which all belong to sort of in a layman's term, to the default mode network.

These are more connected to memories, self awareness, social cognition. And I think we often think of Alzheimer's as a memory disease, but we can probably start to track it a little bit earlier when we start looking at those other social impacts that it has on behavior.

Yeah, we see that a lot. You know, we'll see not just word finding difficulties, but we'll see changes in relationships or the, you know, that loss of executive functioning, some of the finer changes that we maybe don't pick up as when we're looking specifically just for memory change?

Absolutely. And I think this when we start looking at the biological level, this is where the energy metabolism and insulin neurons are extremely energy dependent.

Right. The brain takes up what about 20% of our energy consumption every day? But it's the weight of the brain is only 2% of our body weight, right? So we know the brain is already taxing on our energy.

But these regions that we just talked about, some of these, these regions that see the early impact of Alzheimer's, those are also like some of the highest energy dependent regions of the brain.

They require the most energy. So it's not really surprising that if you're seeing a change to metabolism in the brain, that those are going to be the regions that are impacted first.

Well, and I think, too, it's important to kind of link, you know, we use these terms metabolism and energy. But really they're linked through the production of ATP in the mitochondria right in the power plants of the cells.

And that's really what kind of brings in the work that you're doing at an ironic where, you know, researchers like you are increasingly exploring ways that we can support brain function using non-drug approaches, including things like neuromodulation.

Maybe you could explain what that is and how these approaches can influence brain health, both maybe at the cellular level and at that energetic metabolic level that we're just talking about.

Absolutely. I think, first of all, you already touched on this a little bit, but noninvasive technologies in my mind is it's where I've kind of focused my career.

And I think we now have some really amazing emerging technologies in the noninvasive space. So we're getting away from the pharmaceuticals, which often and I'm saying it this way to preface what we talk about with light therapy or photo via modulation is that these are things that our body is built to interact with.

We absorb light, right? We know that we absorb light vitamin. And we talk about getting outside to get your vitamin D. But in the same way our systems are developing circadian rhythms.

And this is tying this into our our near infrared light and sleep and how this all comes back to impact metabolism in the brain and in our circadian rhythms, our bodies are meant to get outside in the morning, get some sunlight.

As we wind down in the evenings, you get more darkness. And frankly, most of us aren't really necessarily living that perfect light life anymore, right? Maybe.

Maybe you have a job. It's a shift worker and you're working nights and you're in fluorescent lighting, and then when you're actually outside, it's actually dark out.

Or maybe you just have early meetings or you just can't get outside it. You know, there's a variety of reasons why that may occur. And then at night, maybe you you're staying up late to work on something and you have your, your, lights on in the house.

And so that can kind of disrupt that circadian rhythm. And, and the natural consumption of light that we, our bodies crave. So photo bio modulation uses different light wavelengths to essentially stimulate or charge up mitochondria.

So the way I like to think about it, mitochondria being the powerhouse of the cell. Right. You just mentioned s and mitochondria. It needs that energy charge so that it can produce ATP so that our bodies have the energy they need.

Photo by modulation.

How Photobiomodulation Supports Brain Energy

Kind of all wavelengths of photo bio modulation do generally target sort of the cytochrome c oxidase, which is a specific enzyme in the brain and in the body.

But depending on what wavelength of light, you're going to see it impacting different parts of the body, different tissues, different penetrations. But across the board, increasing ATP production, improving the efficiency of the mitochondria, improving blood flow.

And especially when we talk about that in the context of the brain, that becomes really vital. Also nitric oxide signaling, which for a layperson, you've probably heard the term anti-inflammatory, excuse me, antioxidants and oxidative stress.

Nitric oxide signaling is part of that pathway. And the more that we can decrease your oxidative stress, the better. And all of that leads to reduced and zero inflammation.

And I am a little biased because I did do my PhD on neuroinflammation. But inflammation is often the byproduct. But kind of it starts to lead into more problems.

And you see chronic inflammation that causes even worse problems down the stream. So anything that can help to modulate neuroinflammation and keep the system in the homeostasis is going to have a positive impact.

And the nice thing is, and we're talking about light therapy, we are essentially creating that light that your body would naturally want to get by being outside.

And then you can also utilize the way that the brain responds to different light wavelengths, right? To specifically adjust how that light is being applied to someone's brain disorders typically targeting certain areas.

Right. You. Yes. Sort of. So the the most common wavelengths of light that are used on the brain are typically in the 800, to essentially 1100 nanometers range.

And for the average person, that's not going to need much. But let's say the 800 range is red light and then the 1100 range, 1000 range is going to be near-infrared.

So it's not invisible to the human eye. The difference between those wavelengths has to do with penetration and scatter. So how broad of that light will shine around the brain or around the skull, depending on where you put the light on or how deep it will penetrate.

So and ironic. We have a photo by modulation helmet that uses a 1070 wavelength nanometer of light that is near-infrared. It's not invisible to the eye, but it does have a deeper penetration than some of the other brands which are or other products out there which are in the eight tens ish range.

Not. And saying that those aren't very effective, they just hit different structures. So for us, one of the big, you know, one of our goals as a company, one of our goals in terms of what our product is doing, is supporting brain health for cognition.

That's why I'm on this podcast today. And so we're really looking to use a wavelength that's going to target some of those deeper tissues. And because it gets a scatter, you'll see it actually penetrating a little bit broader of a spectrum along the skull.

The 1070 has a nice, has a nice ability to get a bit deeper. Yeah. And I think that is one of the important things, right, is that we need to be able to get it to penetrate beyond the scalp, to be able to stimulate the mitochondria, which, like you said earlier, is really what our ultimate goal is.

Yeah. And there's similarly different wavelengths will have different absorption by water by tissue in the body. But in this kind of factors and to which one's going to go deeper.

And to be completely honest, the research on penetration, on dosage, on depth of tissue is really quite early and there's a lot to understand there. And part of the reason is that there's been a lot of studies in this area, but they all use a different protocol.

They all use a different wave like. Right. So we know that pretty much across the board we're seeing really positive results. But can you say this particular wavelength with certainty.

Not yet. But we have some good ideas of what like a 1070 would be more absorbed by water, whereas like the 810 is more absorbed by different tissues. So generally speaking, we can assume you're going to see different penetration ranges.

Yeah. I imagine much like in our precision medicine approach to reverse and cognitive decline, there's still so much research to be done to really hone in on which things move the needle the most.

And you know which ones we want to target and what order, because right now we just know that we have to do all of these things, and then many people can get improvement, but we don't know which ones are really the heavyweights yet.

Yeah, that's that's such a good analogy. And I think as I said, I was listening to one of your interviews recently where you were talking about what kind of changed your approach on medicine, being that you saw these patients coming in and, you know, in your traditional training, there's one way that you would treat them, but they were perhaps trying something more, you know, novel, innovative.

And you're like, man, they're really getting great outcomes. And I'm looking at these two groups of people and it's like very clear that it's it's a systems approach.

It's it's more full body. It's more how do the hormones how do your energy levels, how does your what you're eating and sleeping and what you're doing every day all over impact health?

And I think for this space, this is where it's really cool is light therapy in general. As I said, we're talking right now very specifically about light on the brain.

But what we see in the research that has come out is that whether you do the light therapy on the brain or whether you do it on your body, there is a systemic effect.

So we are getting positive impact, kind of no matter where you're actually stimulating or actually using the light therapy. That's really fascinating.

Yeah, yeah, it's pretty cool that you'll see it like basically if you were to use just so we did a pilot where we had essentially we wanted to know, like we're using this as a helmet.

We're doing this on the brain only. What if you did that compared to someone who was using like a full body light panel, and we were seeing the same systemic markers, whether it was full body light panel or whether it was the helmet.

So that was pretty exciting for us because we're like, okay, great, you can do it with this. You know, more targeted approach, but you're still seeing those downstream effects on the body as well.

Well that is really interesting. It's going to be so fascinating as we start to really dive into, you know, teasing all of these different pieces apart and understanding it at a deeper level.

It's exciting time to be doing the kind of research that you're in. Yeah, absolutely. It is. It is exactly that. It's very exciting. So you know, you touched on circadian rhythm.

And I know that sleep problems often show up early in Alzheimer's. Can you maybe walk us through how sleep helps the brain clear waste the, you know, through the lymphatic system, why healthy sleep can really be a significant factor in protecting long term brain function.

Light Wavelengths, Penetration, and Targeting

And then maybe you can tie in how the photo bio modulation or the light therapies can impact that too. Yeah, absolutely. So you've already said it, but this is one of the early markers for Alzheimer's is sleep disruption appears years before diagnosis.

And I think we can say that across the board with many different kinds of cognitive decline or even other physical ailments, sleep is often the first thing that you see being impacted, right?

So what happens in a normal situation when you get a good night of sleep and you have that sleep cycle and deep sleep during deep sleep, your neurons will shrink a little bit.

And that actually makes space for your cerebrospinal fluid to move through the brain a little bit faster and a little bit more thoroughly than it does during the day.

And the cerebral spinal fluid is kind of what we talk about when we speak of the game paddock system being this, I've actually explained this to my mom last night, as most people are familiar with the idea of the lymph and like, draining lymph.

Right? And that's the idea that we're getting the toxic, you know, product from your body. Your body is moving it through and it comes out through the lymph system.

Same idea here. It's just in the brain. So it's all kind of contained to the cerebral spinal fluid. But essentially this process of the neuron shrinking down is the metabolic waste clearing.

And I actually said this this was my analogy to my mother was I said during the day, your brain is sitting in a bath right at night, we pull the plug in that bath, right.

The bath water is is moving fast and moving out. So it's been sitting. It's been collecting all the waste throughout

the day. And now we can actually flush it out throughout the night.

So this is a super, super important part of keeping our brains healthy is that opportunity to sort of, put them through the dishwasher at night. And then and when it how that pertains to Alzheimer's is things like your beta amyloid plaques, the proteins that we see that sort of accumulate in someone who has Alzheimer's, those get removed during that go wash cycle.

So those are super important. And again, you see that it's like gets disrupted. That process doesn't happen as efficiently. It doesn't happen for enough time.

And so when we tie this into light therapy, how that can help is one of the things it does, as I mentioned, is it increases your cerebral blood flow. So essentially that is helping to support that process of moving that, fluid through that to help clean out the waste.

Well, and that process of cleaning out the waste is pretty energy dependent as well. Right? So you need to have the energy to fuel that process as well as the time you provide sleep and deep sleep.

Right? Yeah. That's absolutely another way that neuro or that photo bio modulation in particular can help with that process. Because now you're saying not only do you have the time to do this task, but here's the, you know, here's your plug in, here's your here's your generator to get that process going.

Right? Absolutely. Yeah. I mean, a friend of mine recently who works in sort of the bio health and biohacking space and was like, man, I'm getting tired of it.

Everybody was saying, it's mitochondria, it's always mitochondria. But in reality it is right. Mitochondria is what keeps us going is what keeps our body going.

And on the flip side, if you don't have the things to support your mitochondria to, to function healthily, then you by proxy will also not function. It's kind of a, a negative feedback loop.

Yeah, absolutely. It's just like if you didn't have if there was no power being generated and coming to your home, whatever it is that you were trying to do, whether you were doing laundry, whether you're washing dishes, whether you had an electrician here trying to work on it, you know, you had a plumber, like everybody's tools are not going to work.

And so nothing is going to work as well. If we don't have the energetics, there. Absolutely. And there's a lot of different ways to support the energetics and this being one of them.

But it's it's things like the exposure to light also creating good sleep habits. Eating well so that the, the, you know, nutrients that your body is processing can really provide the best possible fuel that can be processed by the cells. It's activity daily.

Same thing. All of these different systems working together. And they each support and if you can. But if you start sort of in my mind, sleep being one of the most important, that if you start with sleep and you support the sleep, then you're going to have more energy throughout the day that allows you to do all those other things that are so crucial and important.

And I do I think I've been thinking a lot about the specifically the insulin and the glucose metabolism use of this, partially because that was some of the work that I did in my research, and one of the most interesting treatments that's not yet on the market that I think is out there for treating symptoms of Alzheimer's, is the intranasal insulin.

I'm sure you maybe read about it or more familiar with it, but knowing that you have this decrease in and or you have an increase in insulin resistance and this decrease in glucose processing and makes sense that something like insulin taken up into the brain can help to sort of those cells take up the nutrients that they need to be healthier.

And I think that ties back to what we're talking about here with our photo photodiode modulation, and that you're all of these different pieces that are sort of supporting the cells to be sort of without a better way to say it, like plump, healthy, happy, hydrated.

So exactly. Yeah, efficient. And right.

Sleep, Glymphatic Clearance, and Brain Waste Removal

Like all the things that are going to make the cell more capable of doing all of the jobs that it needs to do, whether that's internally with its own, you know, machinery inside the cell or the way that it's interacting with other cells or the way that it's moving things through the tissue, like you were talking about the amyloid and trying to get the, you know, the amyloid out of the brain, because amyloid, as you and I know.

But just to remind our viewers, is initially it's a it's a repair substance. It's it's anti-microbial. It's helping the body to deal with either an area of injury or an invader that's come in.

But over time, too much of that accumulating then can disrupt the way that the neurons can communicate with each other. So it's more like it's something that's getting in the way, but it's all these processes that are driving it that make that happen.

It's not the it's not the original sin. The original sin is something else, right? That's creating claymation or the oxidative stress, as you mentioned in the body, maybe.

I don't know if you want to touch on this at all, but how like, how specifically bringing in this type of light therapy is maybe different for how the body responds than, say, just, you know, going out and getting some sunlight.

Yeah. Well, yes, we can we can certainly touch on that. I think the first one being, as you mentioned, right. If we're getting any kind of light penetration, it's having to go into the skull and the skull is obviously crack.

We know that. So whatever light we're getting exposure to, it has only a percentage of that. It's going to get through the skull. So using equipment like for the a modulation helmet, that is a lot of targeted light in your you're going to get a higher percentage just overall so that you're getting a bit more penetration over time and a bit more exposure to that light.

That means that it's there. They're both very valuable for different reasons. And one of the most important things that you can do for your circadian rhythms is getting outside in the morning, getting natural sunlight.

Vitamin D is not something that your near-infrared helmet is going to give you. That's something you need to get from the sun, which also is, you know, supporting other aspects of your body.

But that's a big one, right? We just that's kind of where technology can do something that the environment around us can't. We can we can do more, which can provide more light.

We can provide it at a larger capacity and a larger dose. That actually reminds me of a piece of this in terms of quality sleep, that with our our different light helmets and different light dosages, you can actually alter the amount of intensity as well as the pulse duration or pulse pattern to shift brain stages or brain waves in the body.

So on the nano helmet, we have a couple of different protocol calls. One that's called peace, and that one's specifically designed to help the brain down regulate movement more towards rest.

But it's not just kind of like the that theory of that. It is that we're using a Hertz, or a, you know, wavelength amount and a pulse duration or a number of pulses that actually works with the body to try to encourage the brain to move into your alpha, your delta waves, your sleep waves.

And then we have other protocols that are doing the opposite. So maybe in the morning you're using a protocol

where you're trying to encourage more gamma waves, more awake alert waves.

So that's something that light therapy helmets can do. That fun like kind of by itself is not going to do. You. Yeah. Yeah. Those are some really good examples.

And you know, just trying to help people understand like why this would be different than, you know, just going out and getting morning sunlight. And I think you're you laid that out really beautifully.

It's just it's a more targeted tool that can create specific change that we're looking for that I, I was on a podcast recently where it's a sleep podcast.

It's called sleep is a skill, fantastic podcast. But, the host of it, she was saying that what she does is she actually wears her helmet. She goes outside and, like, puts on her makeup outside.

So she's getting her natural sunlight. She's getting her near infrared at the same time, like she stacks the light all on top of each other for sort of maximum benefit.

That's awesome. That's definitely a multitasking. I know I should I know that seems complicated, but I get it. And I think this is where, you know, that's why I say, you know, I've said this a couple of times, but all the different wavelengths of light have their purpose.

And it's pretty amazing when you think about how much our bodies respond and interact with the energy of light. Right? This is this speaks again to how much our bodies are in tune with the environment and the earth around us that we, you know, whether it's red light, whether it's sunlight, whether it's a near infrared light, all of these different wavelengths of light our body responds to in positive ways.

Yeah. Yeah. Well, there's so much research also going on just around the bio photon communication within this system, within the body and within biology.

And this really plays into that as well. Yeah, absolutely. I'm less familiar with that part. Yeah. But yeah I'll let you I'll let you take the wheel on that one.

Yeah. Just the way that, bio photons can be used to travel through the, connective tissue layers to send signals that are non-chemical, and we really focus, you know, so much of medicine has been focused on the chemistry and the biochemistry of medication of of medicine itself.

And now we and and then we use that in medications. And now we're really getting more into the physics of medicine and how we utilize these other, you know, these other tools to be able to help patients beyond just the chemistry and the medications.

Yeah. I'd be curious from your experience, since obviously you've been sort of trained in Western medicine, you're taking a little bit unorthodox approach, which I love that.

How do you balance those things? So if you were to see someone who started experiencing cognitive decline, where is that? You know, what? What tools are you using that are somewhat more traditional, maybe pharmacologic and how do you pair that with noninvasive or sort of more natural processes around?

Yeah, it's a really excellent question really, is comes to the root of what integrative medicine is, right. Integrating the the best of the tools that we have available to us.

But, you know, at our center we always say first do good medicine. So the first thing we have to do is we have to make sure that our diagnostics are are solid and thorough and clean and that we understand what's going on.

And then we utilize medications where we need, you know, maybe a harder push or somebody needs a significant amount of support because their risk is high.

So it's all about kind of balancing what the physiologic state is, what that person's needs are and what their risks are. Yep. That's why it ends up being, you know, precision because you're really individualizing what each person's body needs all the way down to medication selection.

Right. Wow. I'm. Yeah, it is amazing. Hard work and complicated like around statins. You know, there's so much controversy about that. But they do they do have benefit in reducing vascular inflammation long term.

They do reduce some risk. But we leave a lot of residual risk on the table. So if we use those tools that's not it. And that's unfortunately what I think we've done in conventional medicine is we've said, oh well we have this medication tool for this problem and that's all you do.

That leaves a significant amount of event risk on the table if that's the only tool that we're using.

Integrative Medicine and Root-Cause Treatment

But when we do all of these lifestyle things, all the things that you and I have been talking about and that we've talked about throughout the summit, then we can really impact the risk on a much greater level.

Yeah, I definitely agree with that. And I think that's so that's such a powerful statement. Yeah. To look at all those pieces. The systems approach has just changed the game for sure.

Do you think in your in your practice with how over let's say the last decade or you know, so would you say that changes. How have you had someone who was coming in who was early on in their potentially Alzheimer's diagnosis.

They're starting to show some cognitive decline. Where do you start? Well, we start by doing a comprehensive assessment so that we can understand what's in balance and what's out of balance in their physiology.

In all of the six subsets of root cause that are where we put our focus. So in our metabolic dysfunction, in our nutrients and mitochondria, in our vascular health, in our hormonal balance, in the biologic toxins, and then in the chemical toxins.

And then there's a, you know, another layer, multiple layers beyond those in each of those different, you know, specific subsets. So we really want to understand in each of those areas what are the things that are driving their persistent energy deficit, their mitochondrial dysfunction, their chronic inflammation, their oxidative stress.

Because those are the things that drive neurodegenerative disease. They're actually the things that drive a lot of chronic disease. And that's one of the reasons, right.

That's one of the reasons that we can we can address so many different things. At our center is while there's an almost infinite array of diagnoses that can become expressed in each person, somebody may get hypertension, somebody has a heart attack, you know, somebody develops an autoimmune disease.

When you look upstream, so many of those illnesses are related to the same root causes and just in different combinations, and in people with different genetics who come equipped to deal with those stressors differently.

So it's it is it's really fascinating how much I don't want to say control because I don't feel like I have control, but just how much information we can glean from someone's physiology that can help us to understand how we can unravel these complex chronic illnesses and Alzheimer's and cognitive decline being the one we're focusing on here.

Right? Right. Yeah. It's actually so, my PhD research focused on how age changes are the body's response to a trauma, but essentially how the inflammatory system does that.

And this speaks right back to what you just spoke about with reactive oxygen species and oxidative stress, that it's

you know, we think of these we always say these words as if they're bad.

But the reality is like it's a natural part of the aging process. Our cells require more support because they're getting older. They're taking they're detoxing.

They have mutations that, you know, starting in your mid 40s or so. And these are the pieces that I think are can be so valuable for focusing on. We're noninvasive therapies with, supplementation with sort of the approach to how you support the body.

I mean, as simple as your antioxidants, like eating your blueberries and, but ways that you can help with those cells that essentially, you know, we they're not nonfunctional.

They just need a little bit more support. They just need a little bit more help. And these external processes, it doesn't have to be a pharmaceutical intervention right away, because there's a lot of things that we can be doing to support our bodies that are available to us, right around us.

Exactly, exactly. And one of the interesting things that, you know, we've discovered in the neurodegenerative process is that many of the neurons just shrink and atrophy.

They don't necessarily completely die. And that's one of the reasons that we have so much opportunity with this disease and so much opportunity with an intervention like photo bio modulation, right, where we can basically resuscitate that cell to be able that neuron to be able to be functional again and to and to do its job of transmitting information in the brain.

Yeah. 100%. Again, charge those cells back up. Yeah. I've been encouraging. And, when we talk about sort of my modulation, I think of it last as less, stimulating the cells and more of charging them, really giving them a little bit of power so that they can go out and do their job.

Yeah, I really like that framing because it is. Well, it also sounds a little less scary, right? Yeah, yeah, yeah. So it's good, but it's but it really is true.

Right? You're charging them up so that they can so that they can do their job. It's really a great perspective. So for clinicians, let's say who are interested in using emerging neuro, you know, modulation tools like photo bio modulation in their practice.

What should they consider when it comes to things like safety, proper dosing, maybe choosing the right patients for this therapy? What are your thoughts there?

Yeah, there's a couple of things I think are valuable to consider. The first being luckily with something like light therapy, they're really across the board.

And all the research studies, very few side effects that are really negative. You can overdose on light therapy as you can overdose on anything, right?

Everything in moderation. But generally speaking, you're not looking at sort of some terrible, crazy side effects. So you can be a little bit more flexible and try some things out.

I think almost any patient would try light therapy. Everybody's sensitivities are different. As you've sort of spoken to. I've seen people who they put on the helmet and they're like, I can feel it.

I'm feeling it warm or I feel a tingle. A good friend of mine who says it, he feels a tingle. I don't feel that. But I do see benefits in my sleep. I've seen a that's been the most marking change that I've seen, and so I know that it's doing something.

I know that it's working, but I don't feel those tests right. For a clinician who maybe wants to try integrating this into

their patients care, you start small, right?

We never encourage someone to go for like a very long protocol to begin with. Just like anything you can build up that a tolerance, but just build up an adjustment and get used to being exposed to that intense, amount of light.

So, that would be the first one. And again, it's thinking about what kind of charging do we want for this person. Interestingly, I mentioned that we have these two different protocols that use different dosing to sort of encourage sleep or something else, or a weight or a wakefulness, more focus.

But even if they were to just use like we have what's called our glow protocol, which is just stimulation, 100% intensity, no pulses. And that's to encourage cellular health.

Basically, we're just supporting the cells. We're not trying to change anything that the brain is doing on its own. Even with that alone, people report better sleep.

So you're seeing an impact no matter what. It's a great place to start. It's like, let's just get people adjusted to this, see how it impacts their sleep.

And then over time, if you want to start playing with like, oh, do we want to help encourage more focus or do we want to help encourage more sleep waves? Like you can kind of play with that.

After I spoke with a clinic that is using this for patients that are dealing with memory loss, things like that, something they told me was very interesting is kind of this idea.

They say they start them the first month just with this glow protocol. They're not worried too much about anything else. And after that first month, generally speaking, across the board, their patients are saying, I feel like my sleep is better, I'm getting more restful sleep.

And then what was really cool is in the second month, they start to maybe add a second dosage, right? You build up the tolerance over time, and in the second month the patients don't see this so much, but their caregivers will report seeing a change like maybe their word recalls a little bit better.

Maybe they seem like they're able to capture things that they weren't able to remember. And then by the third month, the patients are also seeing it. So it's it is definitely something you're, you're you have to give it some time.

Just like any treatment, just like any good therapy, it's building up that tolerance over time. But starting small and building up I think is a big one.

I would, and essentially encouraging people to start with just exposure to light. And then you can start to toy and play. We can you can personalize protocols.

You kind of do a deep dive in the research and see if you want to try like a certain pulse duration or certain width. But this in general is a great place to start.

Also for clinicians, if you're using a helmet like this, there's different helmets on the market, there's different products. Some are going to actually target different regions of the brain, which maybe that's something you want to do.

Maybe you're like, I really want to focus on the prefrontal cortex. Like I'm seeing a lot of patients with, you know, perhaps temporal patient, temporal parietal dementia or something that is more sort of personality impact then you might play with that.

You might see if that's giving you the impact. But knowing what we know, even if you just use a helmet or a light source that is more generalized, you're going to see a systemic effect.

So everything's just a little bit of an impact. Everything's going to be beneficial. Yeah. That makes it less less challenging to implement. Just knowing that you're going to get benefit just from simply using that photo bio modulation.

Is there any training that clinicians need to go through to be able to utilize, the neuron, a helmet, appropriately? No. For the neurotic helmet, it's pretty straightforward.

It's it's all controlled by an app. It's very user friendly. We do have on our website, we've created masterclasses to kind of get into the history, the understanding, the science behind photo bio modulation.

So for a clinician who maybe wanted to start playing with protocols and create something a little bit more customized, that could be a great way to learn about it.

Also, for a clinician who's using these type of tools, it's not just light therapy, but anything that is impacting the brain. They might look into measurement tools.

EEGs, you know, you might be using neurofeedback, other sources that are that you would maybe need some training in order to understand how to interpret the results.

Using Light Therapy in Clinical Practice

I think that's probably the biggest challenge in my mind with anything like this, because it is something they can't see because it is so simple. You want to be able to show your patient something a little bit more robust or objective.

And so EEG measurements, things like that can become the way to do that. But that certainly comes with that sharp training. Yeah. Exactly. Well it's nice that it sounds like there's kind of layers and levels that we as clinicians can start implementing this and that.

There isn't a big barrier to being able to get it started for, for clinicians or for patients. Really? Yeah, absolutely. The nice thing. So the ironic helmet is it is a FDA registered medical device.

It is not cleared for any specific indications. So meaning we are basically advertising it and promoting it as it supports your health and wellness and your cognitive health and wellness.

But that also means it's a lower barrier of entry for the clinician as well. There's not any sort of specific clinical degree you need or clinical training to be able to use it.

As I said, I think it's very worthwhile to to get into like I said, we put together a master class with the goal of being education on photo via modulation.

Not just what we're doing, but what everyone is doing, because there's quite a lot of data out there and sort of sifting through the weeds and understanding it in the context of your patients can be challenging.

As I mentioned earlier, when I was in grad school over ten years ago, the first project I did on was on photo by a modulation of microglia, and it was using a certain wavelength of light and seeing how you could modulate your microbial activation with light.

And then we would go to these conferences and there's every possible use case under the sun. All of these conferences and everybody's using a different protocol.

Everybody's using a different dosage. And that over time we're starting to see it getting a little bit more precise. And I think that's kind of the trend right now is like is actually trying to understand better what the right dosages are for whatever it is that you are trying to accomplish.

And that's super exciting. I think that's that's the direction the field is heading, and that's going to really change the

game and how people treat. But for now, it's a little bit of trial and error.

It's definitely like we know that there's used to it, but the right one for that patient, the right one for your patients can take a little bit of playing around.

Yeah. So it's good for people to know that just so they know to be patient. And and like you said, it takes time. It takes time to effect these types of changes.

Is it something that requires a physician prescription or is it available directly to patients as well? It does not require a physician prescription. It is available to end users.

And so neurotic has two different helmets. And we have what's called the new radiant 1070, which was originally designed more for clinicians in mind. It has the ability to specify regions of the brain that you want to target.

However, that one, it's just a little more complicated. The second helmet the Neurotic has released, it's called the neurotic light. And I'll just, like, pull it up real quick because it's on my counter.

This is it, right here. It's very cute. And you can see the lights inside, but the neurotic light is controlled by an app. The, protocols that I mentioned are preset a really easy to use.

So again, for, for an end user who maybe wants to try it, they buy it, they can see the protocols. Yeah. What works for them if their clinician wants to use it with them, they can talk about what they do.

It's also a 90 day, 100% money money back guarantee. So for an end user who's like, I don't know if I'm going to use it that much, is it really worth me buy?

It's pretty low risk. Yeah. That's wonderful. And especially since you said, you know, one month you see these changes. Two months you, you know, one month you're showing sleep improvement.

Two months the family's seeing improvement by three months. The patient seeing improvement. So 90 days really covers that whole spectrum of change. Yeah.

And what I like for for family members who are maybe considering buying one or getting one for a family member that is having some trouble, it's something everyone in the family can use.

As we talked about already, whether or not you are the person who's showing the cognitive decline you can be supporting for brain health. So for the present, right.

So what's really great about it is you can have different profiles on the apps. Also it is so portable. It's run by a battery pack. So you can be sitting in your living room reading a book.

You can be doing your dishes, you can be brushing your teeth. It's just very, very, very user friendly. And that's by design. And anyone in the family can use it.

So, you know, it becomes it can becomes a fun tool. I mean, I have it I gave my mom one, I gave my dad one. Like I've got friends using it. It's just, it's fun.

Yeah. Yeah. That is that's really neat. So do you think there's anything else important that we've missed that you'd like to cover? Because this has been really great.

Informative is just going to ask you maybe you could share how people can find their way too neurotic to your website if it's something that they're interested in, interested in learning more about or potentially ordering for themselves or their family member.

Yeah, absolutely. Neurotics website is neurotic and you are. Oh, and I see that online, so it's not a.com. It's

neurotic dot online. And on there you'll find the devices I would encourage most people really the end or the light device is going to be the end user device is going to be more appropriate.

And even for clinicians, a lot of them find the lite device to be very user friendly and easy for them to integrate into their clinic as well. But that's the easiest way.

It's just go on to our website. As I said, we are deliveries pretty quick. It's we've got different warehouses in different countries. We're very international company.

We've got one warehouse in Canada, we've been warehouse in Germany. We've got people around the world. And then also for anyone who is interested, we do have consultations.

So for somebody just like, oh, I'm interested, how might I use this? Even after they buy the device, if they just want some help setting it up, understanding it better, or seeing how they can integrate it into their daily life based on what their lifestyle is, our consultants can help with that.

Now that's really useful to. Yeah, it's great to offer.

Accessing Neurotic Devices and Final Takeaways

Well, I'll tell you, this has been a really informative discussion and I am super grateful for your time and for sharing this with everyone on the Alzheimer Summit today.

I think, you know, my key takeaway is we really need to be taking a step back and thinking about these other modalities that we can use to help heal the brain that are beyond the lifestyle changes that we know about, beyond the chemistry and the medications, and really getting into where physics can be brought in to help people to heal.

Yeah, I agree, I think, frankly, brain health and overall health depends on so many factors, right? Metabolism, sleep, circulation, inflammation and how they all interact and how they all work together.

And these tools, these noninvasive technologies are frankly, in my mind, they're they're a support system that helps to rather than try to fix a problem, they help to increase your ability to handle it.

So they're very interesting because they support these fundamental biological systems so that you can actually, you know, be your best. Yeah. So every day yeah I love it's great.

Well my viewers, if you have enjoyed this discussion today please do join us for some of our other sessions where we continue to dive into my passion, the root causes of cognitive decline.

And thank you so much for joining me today. Doctor Von Leden, I think that you have really given people a lot to think about in terms of how photo bio modulation can be incorporated into their not just their care for cognitive decline, but really into prevention as well.

So I yeah, you very much for joining us. Thank you so much. It's been a pleasure. This is Kristine Burke helping you and your loved ones achieve vibrant cognitive health.

I'll see you next time. Bye.