Photobiomodulation As The Easy Potential Option For Alzheimer Transcript

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Introduction to Dr. Lou Lynn and V Light

Welcome back to the reverse Alzheimer's Summit. I'm your host, Dr. Heather Sanderson, and I'm so delighted to introduce you today to Dr. Lou Lynn. He's the founder and CEO of The Light.

And we use V Light every day at Marama for our residents there. And I can't wait for him to answer some of my burning questions about the blight. And also to answer yours, of course.

So, Doctor, Dr. REM, I would love for you to just describe a little bit about how you got into this space, how you discovered the light and red light therapy, and what made you think to put this into a cap that people can wear on their head for brain optimization?

Yeah, well, thank you for asking. This actually goes back to in the mid-nineties. I'm now in Toronto, but at that time I was in California in you know, in the Bay Area.

And we were doing some technology work of ladies flat panel displays for, you know, for for four, four, seven to a relatively very early experimenters at a time.

But what I found was with lasers, it produced some really interesting things to the body. But actually, when I actually looked at what was not really published in English literature, but in the Russian language at the time, a lot of the laser work was done by the Soviet bloc at that time.

A lot of Moscow in Estonia was part of Russia at that time. There was quite a lot of activity. So what they were doing then was experimenting with injecting light, red light specifically into the blood circulatory system. And they were saying things like, you know, is actually improve the student outcomes like your recovery from diseases or immune system repair and you know, post-operation is better and stuff like that.

But actually the first discovery published was in the mid-sixties in Hungary.

Origins of Red Light Therapy and Early Experiments

But it led to this led to quite a lot of interest in that particular part of the war. And and eventually the bit about physics and biology. And I began to ask the question of why do we need to inject like into the vein when you actually read light in infrared can penetrate through the skin.

So that is a lot of, you know, removal of intrusions, right. You know. So I tried that and, you know, asked the question, if you were to try to you were to try to do it in an effective manner.

You want to see where the membrane just thin and light able to penetrate. One of the areas there's convenience, actually, the nasal membrane. So maybe it can penetrate the skin in the hand or whatever.

But neither membrane could possibly take a very safe, low level, a level of energy. And then try that and look through the microscope and see what's happening to blood samples.

And they actually improved to cut it short. So, okay, that's a really good way to do that. But the technology wasn't available and it at a time to make a simple, uh, you know, device that can be used conveniently by the everyday folks.

So we had to wait to do experiments going on was doing a number of other things, but it was actually in 2000 we the solid state technology was good enough for me and my engineers to produce something and we continued to do that and we actually released pretty much under the radar intranasal devices and achieved the same thing.

So we slowly you know, formed the light and marketed it to the world. Wow. So I just want everybody to know what it is that we're talking about. So there's a cap that you put on your head and then there's an intranasal clip.

So you put it up, you put the light into your nose, and then there's a clip on the outside so it stays put. And then you turn this light on for about 20 minutes.

And what we see is that there are potentially benefits for Alzheimer's and dementia. And so we have the privilege of talking with you today to understand all of the details about how that might be working, why we would expect that to work, what might be going on, what the mechanisms might be, and then also some of the research.

So you describe some of the early research, which was in lasers that were very, very expensive. From what I understand, in the 19. You couldn't get a lot of light.

You couldn't get a lot of lasers. They were just so expensive and many of them were hot. I guess they were also called lasers, but we're talking about a pretty specific part of the spectrum of of the light spectrum, and not all of it is visible even.

So they'd say, let's dove into some of these pieces. So why why the CPAP? Why the why on the head and the nose? So you describe the the mucosal surfaces.

Now, if any of that light actually penetrating into the brain through the nose. Yeah. You know, we we actually had our first case around 2011, 2012 of with a Dutch immigrants who who lived in Vancouver, British Columbia.

And his family was, you know, involved like clockwork. The siblings were all getting Alzheimer's at a certain age. So he was due to have it. He was actually facing mental decline and diagnosed Alzheimer's disease.

So at that time, we only had the intranasal and actually presented that particular case, but we didn't publish it because it's just one case, you know, and but so we we measured his of his cognitive performance.

He actually improved because one case, you can dismiss it, we'll give you a placebo or something else happening. But it was real solid case. Today he's using a mate eighties is still doing well but he's progressed from the intranasal only to all his that you're familiar with now and then we did another small study that in court, as you know, included Michael Hammond in Harvard at a time, and he's from Boston University or on a few cases of people diagnosed with dementia.

Intranasal and Headset Design for Brain Targeting

And this was very we didn't filter them with levels. And we found at that time you only had the neural alpha that the first the first time the pulse, then so and you were really try kind of okay let's aim at a default mode thought about it later with the intranasal and see what happened.

Actually the number of subjects, five of them, they actually improved. We did. We should remember as he scored actually improved significantly. So it seems to be working again, you know, small numbers.

And then and then I thought, okay, when you study the how memories was encoded, Gamma begins to feature more prominent prominently around that time. So we're talking about 2015, 2016, someone was coming out of UCSF and stuff.

So, uh, so we, we didn't case again in wasn't published, but we did a presentation on another case in 40 years. He was a professional opera singer who was diagnosed with Alzheimer's disease, and he improved.

But this time we also did a measures on EEG reading and we found that his camera actually went up. Oh, no. Incidentally, at the same time, towards the end of 2016 and MIT published this pretty well known even in that field, again, a study when the director flickering light flicked flickering at 40 hertz, which is 40 times a second in in an animal study, you know, in a red model with of bread, with symptoms of Alzheimer's disease.

Uh, the, the animals improve, they measure it found a reduction in markers of barium, a light and stuff like that. So that was okay. Okay. Seem to converge with the other things I'm doing.

I'm already developing the, the gamma and tested on this particular person so that was that was that was a you know that's quite enlightening. And I think from there we kind of establish okay everybody is thing for you this now we're doing more more experiments we are actually doing what's happening to components of the brain like microtubules and stuff.

Life cells deposit different frequencies. We working with universal Alberta this is like involve quantum biologists physicists and you know biophysicist and people like that.

We are finding some really interesting thing I'm beginning the beginning to understand more and life what is for you interesting and maybe even higher you know.

I want everybody to understand when you say alpha and gamma, what do you mean? What is the difference between those two settings? So it marama we have the neuro duo and neuro for brain.

So it's the cat for the brain. It includes the nasal piece and then it's the duo. So the duo means there's two, right? And you can go back and forth between alpha and gamma.

So I want everyone to understand, like, why would you use Alpha? Why would you use Gamma? And then how? How do you do it? Okay, though, before we do that, let me just briefly go through why these various components not introduce is important.

We use near-infrared so it penetrates deeper inherent kind of meet us. Now the old factory is actually part of the brain. It has direct projection to the hippocampus which is a memory area.

So the amygdala, which is an emotional area, and importantly the thalamus, which is kind of like, you know, it does this, uh, redirecting of signals to other parts of the brain.

So the nasal is important in the, the other components are on the north of the default motor network. Now by default network is an M1 network. When you are resting, are not doing performing at task, you're there's some introspection.

You get in closer eyes who get into that. And that's when your default mode network comes in. When the default network is healthy, it usually leads to a healthier brain and Alzheimer's disease, something related to that health of it.

We found one network, depression and a bunch of other conditions, including Parkinson's disease and so on. So that's now when you rest, get into it, you know, the your default mode network coming into play actually when you post and this is actually now because can cause is also the same kind of mode as when you get a default mode network you in the Alpha State is also similar when it goes close to eyes, it does nothing.

You're in an awful state too so that helps and and there was early and a study done at Harvard on on animals that were simulated with, you know, promoting brain injury.

Alpha vs Gamma Frequencies and Brain Effects

And it's quite different frequencies and found that you didn't ask for your host but they did elsewhere attenders and found that that particular false frequency produced the best outcomes in terms of recovery from the from an injured brain.

So that led to that, you know, ten hertz. No, no, 40 hertz is not what I'm learning is not published. But I'm hypothesizing here for model what we're doing there seems to be a switch around that in mind for that kind of medium move when you are activating and most of the default mode, you may be moving away from it and

activating some other network that actually makes you think better, get more alert, you know, like the status network, there's also so it gets into do that.

And in the meantime, what the MIT study did was it activated the same brain cells called the microglia which which is precisely to remove this unwanted debris.

The brain stuff is active when you're sleeping and you know your active lymphatic system the clean this stuff what we figure in the microglia can be talk for doxing.

The wave is over activated because it causes inflammatory calls. The ring. But in this one we are in the research field. We are believing that what a by modulation is probably activating the non inflammatory subtype calling them too.

So so these could be doing that and it actually helps the micro glia to help remove this you know the unwanted debris in a print if includes the beta amyloid deposits plaques and how so so that's why some we often recommend use the gamma when you're taking a nap or when you're sleeping you actually helps it helps it a bit more.

So that's very briefly. So Gamma is the 40 hertz and then alpha is the ten hertz is that rate and nature pulses of light per second. So ten. Okay, so there's ten pulses of light per second with Alpha.

And is that a do I understand correctly that it's amplifying your alpha wave? Does it associated with the brainwaves, alpha and gamma. Yeah, it's, it's, it's interesting.

We published a paper in 2017 and show what happens when we do that gamma 40 hertz on the healthy brain and found that it actually elevated the power of the faster waves like alpha beta, gamma and reduce the delta theta.

Now, this is interesting because in the world of neurofeedback your image, many you're looking at something like this, like when you have ADHD, even some evidence regarding schizophrenia and so on know this so and also this disease also can be correlated with too much of the slow waves.

You know, that's why you're behaving like that and not enough of the faster waves. So so that, you know, we're able to change the wave forms, too, with remedies like gamma, even in healthy brains.

So now with with ten hertz, based on the animal study done, of course, there are a lot of experiments that can be done. We just use what's available with population.

What we know may accelerate, you know, a brain that's been through physical trauma like traumatic brain injury, concussion from other sports from from blast explosions.

So that so you may it may accelerate healing based on animal study done have Harvard so so that's why you know this is some of the rational and generally some people report in know 40 years the brain is too active too busy and whereas we don't really get anything like that from ten hertz.

So generally speaking, the default, you know, the go to frequency is probably ten hertz. And if you want a higher functioning and and you have to clearly when your brain is going through some degeneration of 40 hertz is probably, you know, the device to go to.

So so that's the gamma so the gamma 40 hertz if that's more associate with help for Alzheimer's and dementia. Now we are really excited to have the Alpha as well at Miramar because anxiety is something that often comes with dementia.

So many of our residents, they suffer, especially at the beginning when they're transitioning and getting into the routine at Miramar. And so we find it very, very helpful to have that alpha mode, to help to calm people down.

So I'm wondering if you guys have seen the same thing and if that's in the research as well, that using that alpha

state, that ten hertz is helpful for kind of other things?

No, it's a is very interesting. It's actually I get feedback, no word. We're from neurofeedback practitioners who often say that they prime their patients with a ten hertz.

So before getting you if you're going to get better results so so you may be you know it's establishing your brain to be in a better state and become more receptive to sort other treatments when so it is stuff we we we are seeing.

Now I have to say that we you know, I can't go and say, okay, for sure we're going to treat no, that was disease with any of these devices. That's why we're doing a large clinical trial that's been stymied by the pandemic for 2 to 3 years.

So we restarted again and and try to prove it. So for now, you know, we say we just helping helping the brain to function better as a general statement.

Okay. So let's talk about those mechanisms. My understanding of the Hamlin work, you mentioned Michael Hamlin. He published with you. He was extremely prolific in publishing papers and data around red light therapy, the use of red light therapies and some of the mechanisms.

And so my understanding of those is that there's a few mechanisms that are proposed, but the one that's maybe best understood is, is the effect of red light therapy on activating the mitochondria and the production of ATP through is it the cytochrome C oxygenates enzyme?

And so what I understand about it is it essentially after using it multiple times, hopefully over time daily or six to 5 to 6 days a week, you're activating the mitochondria in a way that they are more efficient at producing ATP or the fuel that our brains and our cells run on.

And a lot of us, I'm a naturopathic doctor and I see patients and often when I think about mitochondria, I think I make more carnitine, more ribosomes, more riboflavin, more coke.

You ten.

Mechanisms: Mitochondria, Inflammation, and ATP

There was nutrients that are so important for mitochondrial function and there's the red light therapy. And how it works was just it kind of like my brain had to reshuffle, thinking about what was possible and what impacts the brain and all cell function.

So it speak to that a little bit and how I think I think it's kind of like zooming out, right. What are all of the things that impact cell help and that you know, we do the Bredeson protocol we think where all of the things that are going to impact brain health for better or worse and it's light is one of those things outside of kind of the typical box, right?

The medical model of adding nutrients or pharmaceuticals or something. So I digress. Please tell us how this works. Yeah, actually the most go to explanation for mechanism behind for the by modulation is the activation of the mitochondria and actually what's happening is the the mitochondria becomes more receptive to follow by modulation when it is performing optimally.

And Photodiode modulation equals v light. It equals this red light therapy. Right. That they're synonymous. With. Right, right. Yeah. So follow by modulation mos mainly I say new again experimented with light, but is is the effect of lights on when the body in the cells and so on now is usually red to the infra red because the the mitochondria is actually receptive to this window of wavelengths of light.

So the theory is that it activates the cytochrome c oxidase, a cytochrome C oxidase enzyme in the last terminal of the electron transport thing. Now what's happening is multi-factorial.

It's not just the increased production of ATP, ATP, it creates energy. And you know, there's some other things too. But one important thing and does is, you know, often the mitochondria is performing suboptimal because nitric oxide is somehow stuck.

You know, it's stuck in the in the electron transport chain. So with the when it absorbs this red light, it releases this nitric oxide. And that's what I say is that this mortality, that's because reduces your body.

It does a bunch of other things too. But it is well known for helping the blood vessel walls to relax so you get better blood circulation. Now, what it also does is the evidence of other transcription factors, you know, these factors that can alter the proteins or alter genes for good and bad reasons, but it's sort of by a modulation is usually good because it helps release things like, you know, gdnf, which is, you know, bring your own neurotrophic factor which helps your brain to regrow.

It has to controls toxicity on brain. When your brain is like when your brain does anything, it does the byproduct is some toxicity. So it helps to, you know, neutralize that it you know, it does to improve the integrity of the cell walls and in a bunch of other things.

So so it's a collective thing. And what it also does is we and this is important for the work we do is it seems to reduce the markers for inflammation.

Now, you know, as in your practice, to see too much inflammation is not a good thing. Inflammation in the body is trying to to heal something to do with the immune system, dealing with allergens, invading your body and stuff like that.

But you see inflammation actually just to summarize first and then go into details, Alzheimer's disease other than the the other like cascade hypothesis, which is, you know, for which the drug companies are really going on.

And the recent drug that has been showing good data, a candidate is focusing on the on the positive clearing. It is got some serious side effects. But generally what is slow down the decline due to Alzheimer's disease.

But the other major hypothesis is one is the health of the mitochondria, because it does so much other than energy and also inflammation. There's increased recognition that Alzheimer's disease is a disease of it could be of your immune system.

And there is there's evidence that it could do auto immune. And this is discovered in just thinking, interestingly enough, over the research done for COVID 19.

You know, the brain is is being seemed to be for COVID. You know, the the federal brain seem to be quite similar to Alzheimer's disease. So very similar presentations.

And it did this in a lot of market studies and so on. And what is quite common is that to be an increased level of cytokine secretion or inflammatory factors.

So this inflammation going on, there is there is evidence of it being an autoimmune problem. It could be because, you know, in in COVID 19, we we're doing a big clinical trial of COVID 19 by which if we finish one and we're going to a local study so we understand the mechanisms here is not is not completely understood what's happening.

But say Long-Covid, for example, the damage to, you know, to the the device closest in a microvascular system, it seems to be creating this response from the body and when is chronic is seems to be lingering on and you know this level of inflammation is all over time and it seems to be also affecting the brain and then the the the manage to compare the markers with Alzheimer's disease the presentation of similar.

So it could be you know, it could be a inflammatory disease. So so there's more research actually. A lot of this is coming out of in Canada, you know, at a University of Toronto.

If I trying to find a cure the risk by looking at the inflammatory factors so but now if you look at what by moderation as a matter as a science and honest mechanisms, there's quite a lot of discussion about how for to by moderation obviously mitochondria by good conductivity and also helping with reducing this to high levels of inflammation.

So that's you know, that is how do you. Sustain and for me, I always wonder when someone is talking about inflammation of the Vila is helping to clear it out.

But I also wonder if it's helping at a level to prevent inflammation because when there's inflammation, it's usually in response to something. So my question is always, well, why if the inflammation, what triggered that?

And certainly in the case of COVID 19, we can say, oh, but the virus and I think in Alzheimer's, we can point to things like herpes is associated with it, with the production of beta amyloid plaques and other inflammatory markers that are associated with cognitive decline.

And so it's interesting to start connecting those dots and say, well, Vila is going to help no matter what the cause of the inflammation is. Right? We're going to reduce some of that by getting it out, by helping the mitochondria produce more energy and working in all of the ways that they work so that there's just more efficient metabolism and processing in the brain at the at the level of the mitochondria and then at the cell.

So very exciting stuff. And when we talk about, you know, certainly part of the reason why I was very quick to bring the light into Marama is because the risk is so low.

It's essentially it's cost and time, right? And at Marama, we have the luxury of being able to spread the costs over over the 12 people who live there.

And so we can we can diffuse some of that. We get set and then but the risk is so low, really, compared to so many of the other things that are typically available, available for people.

And then also what we see is, you know, of course, we know that exercise is one of these modifiable risk factors, that diet is a modifiable risk factors, sleep.

There are lots of things. And as people progress through the process and the degeneration associated with Alzheimer's, it's harder and harder to get them to engage in those behavior changes that would be so beneficial.

And the V light is something that we can just put on. It's very passive, right? And so we have had residents and participants in the clinical trial at my office who use the V light.

And even when they're in those later stages, we certainly anecdotally notice a benefit and even even in that day, right, I mentioned the reduction in anxiety with the alpha.

And so that's part of why we've we've incorporated so incorporating it so quickly in our program.

Safety, Dosing, and Circadian Rhythm

Also, of course, the research that you've been pointing to that it is very much evidence based. So I'm curious, are there any side effects or any risks that maybe I'm overlooking?

Well, we've got tens of thousands of devices around the world. We hardly hear of any serious side effects. So some people, when they use the, you know, of you like device, the they experience a multitude in the beginning maybe there's some adjustment happening but after the first treatment is not there anymore.

So you know, that's that's a good thing. Now one thing about trying to understand why, you know, about treatment and the level of energy you're supposed to deliver, why do we often say, okay, for a normal, healthy person, you don't need to use it more than once every two days or so.

If you have if you have if you have a condition, you can use it every day. Try to take one day off for treatment. Now, the reason is. That, yeah, okay.

Now one of the things, one of the markers that's produced by moderation is just like everything at once, you do have some activity, you produce some level of reactive oxygen species, which is a pretty radical.

And you can imagine if you keep pumping, well, the free radicals is good at a low level. It stimulate an immune response. You know, if you give doing it too much, there is a danger of coming to a threshold where the effect plateaus off and you keep doing it.

It might get into a negative effect. So this is the by biphasic response in sort of by a modulation that so is also discussed. So you want to do it, you have to write energy, but not too much of it.

So that is we haven't seen people using a lot and getting this getting this problem, but we want to prevent it. If possible. So that that is why, you know, it's also convenient because, okay, all you need to do is you have a condition.

You want to do it once a day, it up automatically. After 20 minutes. You can do all your activity. I use it when I go to sleep. I just put it on it. Just go off and just slumber off people.

Different people do it differently. If you do it while they're meditating. Oh yeah, I can of meditation because there's a lot of stories behind it, you know.

Yeah, it just does that and that's it, you know. So I don't know. People really keep doing it continuously. I say there is a possible risk in trying to do that.

All you need is just a certain amount of energy and that's that's it. So it also helps with circadian rhythm. Do I understand that correctly? Because red light, I always think back to our hunter gatherer ancestors.

They were exposed to that red red spectrum in the morning during sunrise and then at sunset. And is there some degree like does that make sense to you that we're sort of approximate doing that?

And would it be helpful to use the light more in the morning or more in the evening, like around sunrise or sunset, to help with that circadian rhythm?

Yeah, we've had other be interested in doing sleep study, but we've had reports of people using the red light converts in the evening. It actually helps to go to sleep.

There is evidence that actually there's probably quite a number of years ago when this athlete in China were exposed to red, they actually increase the level of melatonin which which is a sleep hormone.

Yeah, that's that could be helpful. But some people put a gamma especially in the beginning I'm just my mice to alert to that didn't help me sleep so but I tried for years and I still went to bed.

So what might be different than night? Yeah. Maybe gamma in the morning and alpha in the evenings. Yeah. Yeah. But mostly just used once. Once a day is enough for most people or once every two days.

Okay. You don't either. When. Okay. So not using them both in the same day using one or the other. But but you can experiment is not going to harm you too much and see how you feel of it.

So you might find it if you keep doing that you, you, you know, you're always going to be like it might experience a little bit of fogginess or something.

I've no idea. But maybe. Two months. Yeah. Interesting. So you had mentioned before we started recording something really interesting, I'm so excited to learn is that the the position ends of each of the lights on the cap, on

the, on the helmet kind of device.

It's not a full helmet. I don't want to give anybody the idea that it's a full helmet, but it's this device that you wear almost like a hat and then plus the nose clip that each of these fights are very intentional, very thoughtful and important about where they are and why.

And you were talking about the default mode network. And and then also that the the nasal one is going into the amygdala, the hippocampus, in the thalamus.

Now, are there other parts of the brain, like parts of the cortex that are associated with vision or any or sensation or anything like that that you're targeting?

Or is it is it just this default mode network? Yeah, we first of all, we try to make it simple and comfortable. Yeah. No, there's one very important thing that we try to do.

We may not, you know, at this moments or it may not be perfect for everybody, but we tried to have contact on those particular spot or while they make it convenient.

No, we we measure everything, you know, we measure what you know, what is what what energy, what power we want to deliver over what period of time. So it's a matter of dose.

Not to be predictable is when your contact and when you are. That's why we don't do it is like in such a way where it's no one for the moment because everybody's head is different.

And if you try one of those fixed size helmet faults with those bigger heads, you actually not, you know, just a bear. And when you have small heads like children, you know, you wobble and stuff.

So it's not the most stable. Now, the big difference is this. If been able to have contact the you know, we can you know the amount of energy is the further you are away.

Actually, the attenuation is quite by the distance, but that's just physics. The, you know, the inverse square law. No, the problem with this fixed helmet is, first of all, there is, you know, this circuit board in there with the LEDs.

They got to keep away from contact. So there's a film from just to take it, not make it too hot. So there's quite a lot of distance.

Device Placement, Engineering, and Precision

We measured our, you know, what is landed on the scope you wanted to be like here is 7500, you know, but the noises it is is annoying when a99 milliwatts minus because your milliwatts are now first of all the LEDs to be used are customized for us. So so the manufacturer for LCD does this LCD just for us that you go to a very high and be able to control with a microsecond.

What there is is intelligent. There's mostly cables everywhere. No, I made to 100 because for safety reasons they go too much if people use it too much, it is.

It could be for some to be higher than the threshold for people. It's kind of like when you go to the price sometimes, but you know, we are evolved to be able to handle the double power in most.

Most companies are they can only get LEDs until recently about 23 milliwatts so is pretty low power imagine you're away from that hardly any power touches it.

I don't know what the number is. I say is very, very low. Okay. I'm just surprised it doesn't. You think so? We we. We are very careful about the engineering, the level of precision as much as we can.

So we are continuing to do the research and maybe improve the comfort and form factor. And this is the result. Okay. We do not have a lot of of LEDs and for reasons that we want to have maximum effect with comfort.

Right. I see. Okay. So it's not about covering the entire head. It's really about specific and targeted about where it's going and making sure that it is stable.

You only have enough energy to deliver. You have a lot of LEDs that's not that far away from, okay, there's not enough power to do anything. I Yeah, it's not going to penetrate into the brain where you want it to do the work.

Exactly. Right. Okay. So what's on the horizon for you here at Vee Light? And also just like the new discoveries and particularly as it pertains to Alzheimer's and dementia.

Well, we are going to restart of clinical trial, which is a big task. You know, we're looking to recruit about 220 patients and do a double blind study.

And this time we we might be revising a protocol to the design opportunities we got. We will stop, you know, for reasons beyond our control. Okay, let's find a good reason to restart.

So we are we're developing a new a new device, a new version, easy to do, a double blind study, add one more module to the head you know at the moment and neuro as an accessory this option optional the X plus to the head and to the back so that could be added into the clinical trial.

And we are we are going to do a like for like comparison with the drug that does getting a lot of publicity. This is our chance to say, okay, this drug is getting all these outcomes, side effects.

Let's see how we do right, follow the same protocol and see. Okay, you guys showed a slow down of decline, but 27% over 18 months. We have some early studies show maybe we could do some reversal, which is a totally, totally, you know, new level perspective, you know, for the whole thing.

So and I believe that there wouldn't be any side effects. You guys are micro swelling in the brain for them acting like small percentage swelling to be put down in a phase three study like 17% at micro bleeds.

So I think we don't have any of this stuff. So so I think it's a good chance for us to do a clinical study and like for like and see how we we compare.

So that's coming up for us. But we have a we have a mentioned we have a big long study plan we hope to start. A lot of this will probably start in the first quarter of next year.

We've got actually we have a bunch of results in waiting to be published. Um, I, you know, there is, there are some papers independently done for traumatic brain injury, athletic performance.

Clinical Trials and Future Research Directions

There was a paper published by, I can say now the Italian researchers for autism, some really good, interesting results using the dual actually you know alpha in the morning and gamma and evening.

Yeah we've got we're doing meditation study which is super, super interesting long term that is able to switch you know and it sort of frequency patient to an altered state a lot less like the latest that we would finger so so and you know it's active performance and you know kind of not a lot of things but we are also doing fundamental research.

Like I mentioned again. Well, maybe to you personally, the effect on microtubules, which is visual components of the brain and see how the various frequencies are affecting.

And I see that in the next couple of years we will be more and more able to customize treatment for for specific condition because we understand brain better.

So we have a a the new approach which is a very sophisticated version that does you can change parameters and there's a bunch of things but but you got to understand, you know, we have forms to appreciate, appreciate and use it better, but we're using that to experiment on meditators.

See if you can maybe elevate brain function. How many things. So you guys are focused not only on the mechanisms and the basic science of how is this working in describing that, but also very much on the outcomes of how are people doing?

What is what is their experience of life when they use this intervention, which is so much more important, at least in my opinion, than surrogate markers like how many plaques or tangles that are present.

But more on what are people experiencing and what is their the state of their disease and and how do they function in the world, whether it's autism or an infection like COVID or dementia and Alzheimer's.

So really, really exciting stuff and clearly helpful across all of them because it's supporting the cell function fundamentally or supporting cell function.

And so and in a in a way that is very safe. So I hope everyone can understand why we've incorporated this for all of our residents at Marama. And we'll certainly tweak it a little bit after this conversation.

And I with me learning more directly from the stories, it's such a privilege and pleasure to connect with you. Dr. Lim, thank you so much. I want to make sure everyone knows how to find out more about Vila.

Oh, well, go to the website. Veliko there is you know, I don't keep our own website, but I know that, you know, quite a lot of things being explained.

Maybe we tend to get a little bit too scientific, but, uh, but I guess, you know, I'm just read what and absorb whatever you can because we, we're just doing a lot more.

We have a lot of researchers and scientists in the team. I think they're more researchers than all the other tops in the company. And, uh, yeah, we, we collaborate with numerous universities.

We're talking about top universities and top, top people in this field. We also collaborating. People are not even in this field, only they do. You know, there are some other fields that we think we can use to understand this.

You know, this this modality. And really fun and exciting stuff. Yeah. So Vila is v i e allied to Yukon and if anyone's kind of confused and wondering what we're talking about because you can't see it, head straight to the website.

There's a picture of a woman wearing it right on the front page and it'll make perfect sense. Everything we've been describing when you see that and it's it's great.

And then 1/2, let me get my. Oh, yeah, I'm sure everyone it's very easy to use. You just put it on. And as Dr. Lim was describing, it's it's relatively comfortable. Yes.

And then there's the clip into the nose. And it turns out. To be. Your perfect. It turns off automatically. Right. You just turn it off and then it turns off automatically after 20 minutes.

So I was just pulling this. Around the ears. And then. An over the head, that. Is. So you press the button and comes out. And voila, it's on helping you hear.

It just automatically up to 20 minutes. Yeah. You don't even have to think about it. No, shut off. And it automatically you just have to remember to take it off.

And we love that people can multitask, they can meditate. So I somebody told me she talks vegetables while she's wearing it. So lots of things that you can get done at the same time.

And it's easy to do it very passive. So for people, you know, if you're struggling to get a loved one with dementia to exercise more or, you know, eat a ketogenic diet or whatever it is that other components of the Rennison protocol, this is one of those things that's pretty easy, relatively accessible for people to do.

So, again, Dr. Limb, it's just been an absolute pleasure having you here. Well, thank you for having me on. I'm hope people will understand this better.

And yeah, if you know, you can always write to inform someone so they don't have it all at this point can. I can speak from experience. I have I have emailed info every before and everyone has been so helpful and supportive.

And you guys, you really have a great team over there. Thank you. Thank You thank you for the work that you're doing. It's absolutely pleasure to be on this.