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INTERVIEW TRANSCRIPTION

THE FUTURE OF NEUROTECH

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ERIN MATLOCK Hello everyone. Sorry about that! We're doing a little better tonight. My guests tonight.

We'll start with Cynde Margritz who is a neuro-feedback practitioner of ten years specializing in the use of neuro-technologies for attaining high performance. She is the co-founder of Peak Neurofitness, which serves Executives, entrepreneurs, creatives, athletes and students in the Washington DC area as well as global clients through their virtual training program. She is a frequent speaker on the topic of maximizing your brain potential. Cynde is a former NASA Scientist, so we're in good hands tonight. She has an MS in Biology and lives in Northern Virginia with her husband, Mark, and their two dogs. Hi, Cynde.

CYNDE MARGRITZ Thanks, Erin. Hi, everybody!

ERIN MATLOCK Welcome! Adam Goyer is managing partner at Blak Box Group in Santa Monica, California. He is a passionate entrepreneur, business development specialist and futurist technology evangelist. Adam works with sectors as diverse as neurotech and fashion to help them reach their next level of potential. Adam comes from a deep background in finance and industrial manufacturing. He has experience with companies at all stages, from Fortune 500 to the roller coaster of proper startups in search of a viable business model. His specialty is outsourcing the mundane and upcycling assets and capital. The leap from having an idea to having a product, or from having a product to having a business. Welcome, Adam Goyer!

ADAM GOYER Thank you, Erin! Good to be here!

ERIN MATLOCK I'm so happy you're here. And John Mekrut is owner of the Balanced Brain Neurofeedback Training Center in Los Angeles. After many years as a talent representative in Hollywood, he

ERIN MATLOCK transitioned into his current work with neurofeedback after seeing the transformative effect it had on his daughter, who has autism. Whether speaking at corporate events, schools, conferences, or advising corporate clients on promoting workforce cognitive improvement, or his work with private clients, John brings a variety of perspectives to the pursuit of mental, physical and spiritual health.

So I'm glad to have all of you with me. I'm going to pop in my headset really quick here. Or, my ear buds.

Let's start out with one of our questions that came in that is actually a pretty general question. What is neurotech, for anyone who doesn't know what we're talking about tonight?

CYNDE MARGRITZ Neurotechnology is the merger of science and technology. It's really any technology or science that advances our understanding of the brain and how it works, or advances our ability to visualize or see better what's happening in the brain, as well as any technologies that help us understand how to change how the brain works—anything that would tell us how to modulate brain activity.

ERIN MATLOCK Adam and John, do you want to add anything to that?

ADAM GOYER Yes. When I think of neurotech, I think of brain-computer interfaces. It's a subcategory of neurotechnology and it's the way humans interact with computers through their mind as opposed through their hands or something like that

ERIN MATLOCK I think that just about covers it.

JOHN MEKRUT It covers it!

ERIN MATLOCK Yes, it does! Let's talk a little bit about what industries could actually use neurotechnology and then I want to go right into how we might implement that in clinical practice.

ADAM GOYER I'll jump in on that. I was just having a conversation at Digital Hollywood earlier today with Dakari. Dakari is the company that ultimately purchased the company Melon. They're using it in health and safety environments and industrial applications. So they are basically building a wearable safety helmet that you might want to wear on an oil field or inside a factory. It has all these sensors built in and they're looking for indicators of stress or something going wrong with the actual worker themselves. They have EEG, heart rate and some other stress biomarkers on there.

ERIN MATLOCK I like that. There is a lot, too, within the sports industry. A lot of teens. There is actually a lot of money being put into implementing neurotech into the training of elite athletes. It's already going on. School would be a big market.

JOHN MEKRUT There are a couple of companies that specialize in that. There is a piece of software out there designed for basketball players. There is a piece designed for hockey players. The sports people have really grabbed on to this because performance metrics are crucial. Obviously the military. DARPA has been on neurotechnology for a number of years and probably have things that we don't even know about yet, paid for with our tax dollars. At some point, I'm sure that will make the transition into the consumer's base. That's an area of application that is highly sought after.

Obviously, as Adam mentioned and then there is the giant commercial market. Applications for neurotechnologies are popping up everywhere. Most people have seen at this point, the news headbands and the Melamine and things like that that people have been talking about for a while—just starting with the basics with your Fitbit. Market penetration has begun.

ERIN MATLOCK So I think, for people watching, let's take a break. A question came in from a consumer. They're talking specifically about neurofeedback. First, lets give just a general definition for those people who haven't heard of neurofeedback.

CYNDE MARGRITZ Neurofeedback is when you're giving back information about the brainwaves. The feedback part is that you get information about how your brain is performing in real-time as opposed to biomonitoring, where you've been collecting data and show it to you later. The Neurofeedback is a real-time process.

ERIN MATLOCK Okay. Great.

JOHN MEKRUT For consumers to know, there is a step-up dividing point about neurofeedback. There are a number of devices that people casually refer to as neurofeedback that are stimulatory technologies, which are not actually feeding back to the client. They are stimulatory in nature and quite effective. There are a number of different programs that utilize that technology, but that's kind of subtly different. For a consumer first entering into this conversation, that's a very specific question to ask of a provider. Is this a stimulatory type of technique or is this a feedback style of brain training.

ERIN MATLOCK Well, John, you're in your office right now. You're a neurofeedback provider. Can you show us your setup?

JOHN MEKRUT Can I show you a set-up?

ERIN MATLOCK Can you twist your computer and

JOHN MEKRUT I probably can.

ERIN MATLOCK For someone who's never been in an office to do neurofeedback and was wondering what does that even look like?

JOHN MEKRUT I'll grab my camera off the top here and lets see if we can make that happen.

ADAM GOYER This will end in tears. [*Laughter*]

JOHN MEKRUT So there is essentially a chair that the client sits in. You're unfortunately going to see just the back of it. They're witnessing a monitor screen in front of them. Wires that you can see dangling down are attached to their scalp and fed into an amplifier. Excuse my morning coffee still there. Then its fed into a computer program which then feeds back the signal in some fashion to give the brain some information on how it's performing and how it can change itself, essentially to perform better.

ERIN MATLOCK For someone who hasn't watched some of the sessions on neurofeedback, if someone is coming in, what types of challenges do people normally have when they come in to either see you or—Cynde's also a provider, too—who do you see?

JOHN MEKRUT I see the spectrum of folks from—I view brain performance as a continuum. People come in here challenged by sleep disorders or anxiety, depression cycles, focus and attention issues, ADD, what have you. There is a symptomatology that is present in that particular person that they want to remediate—all the way up to, as Cynde knows also—the performance people. People who are perfectly fine. They don't have anything really wrong with them, per se. They just want to be better. On a straight cognitive performance level, it runs that spectrum.

Then, on top of that, if someone wants to get more esoteric about it, there's the spiritual development aspect. I view neurofeedback as a technologically assisted meditation technique in some regards. There are ways to utilize some

JOHN MEKRUT of this technology to really expand your consciousness and really delve into who and what you actually are outside of raw cognitive performance. There is a lot of depth to be had. This is a 21st Century meditation technique in the purest sense of the word—that inner awareness of self.

CYNDE MARGRITZ We work a lot with focus and stress.

ERIN MATLOCK You do? Okay.

CYNDE MARGRITZ In our high octane brain program. I work with memory reaction times, focus. Stress and the ability to handle stress, to be resilient to stress, that we can oscillate from stress to refresh. That can get in the way of peak performance. We work a lot with stress. We're just starting our Zen-mind program, which really works on assisted mediation in something called the Mind-mirror.

ERIN MATLOCK What do you call it? Zen Mind?

CYNDE MARGRITZ Zen Mind program.

ERIN MATLOCK I want to come up there and do that.

Who is your target market for that? Someone who loves meditation or maybe someone who is having trouble getting in to a meditative state?

CYNDE MARGRITZ You can enter a program really at any stage. For people who've never meditated before who didn't know what centering yourself meant to advanced meditators who have meditated for 30 years who want to take it to the next level with gamma training. So there are multiple entry points depending on where you're starting.

JOHN MEKRUT Love the gamma training.

ADAM GOYER Yes. That's pretty cool.

ERIN MATLOCK I like that. We're all coming up, Cynde, tomorrow! Let's go to the reader question. Now that we know what neurofeedback is, can neurofeedback cause memories to be erased or any other intended negative consequences?

CYNDE MARGRITZ I think you mean unintended negative consequences!

JOHN MEKRUT Hopefully! [*Laughter*]

CYNDE MARGRITZ Neurofeedback is generally a gentle process. We're using the brain's own healing and autoregulatory capacities. We're not—we're planning on the brain to responding to more, as Kurt Othmer was talking about earlier in the week, it's more of an invitation of the brain to establish a new pattern and a new way to regulate. It's an invitation to the brain to engage it. Unintended consequences—you really would have to do something incorrectly multiple amounts of time. Neurofeedback technicians are constantly adjusting the protocol depending on how the brain responds, which is why you want to go to a professional.

JOHN MEKRUT Yes. Again, for the consumer, the kind of neurofeedback that Cynde and I employ—the Othmer technique—is an invitation. It's a suggestion. It's a reflection. What the person is witnessing in the chair is a reflection of their own inner state of being. We're not forcing the brain to change in any particular way or pushing it to conform to some preset idea of what might be normal. We're encouraging the brain to find it's own homeostatic point for it's own best performance as it probably was years and years ago before whatever is currently bothering them developed over time and those neuropathways became reinforced. We're suggesting to the brain, "Let's undo those. Work it backwards and get back to the point where you were in balance and in a healthy state.

ERIN MATLOCK I have a couple of questions that are coming on chat. I'm going to go to Adam—remind me— for a follow-up about non-provider based feedback.

I'm going to come to you in just a minute. But the first question on chat is, "Are the concepts of brain and mind being treated within the industry as being synonymous?"

ADAM GOYER Okay. Sure thing.

JOHN MEKRUT I'm not sure if I understand the question.

ERIN MATLOCK So, we look at the brain and mind as two different entities.

JOHN MEKRUT Oh, Cartesian dualism? [*Laughter*]

ADAM GOYER Are we looking at this from the undergraduate, graduate or the PH.D. level?

JOHN MEKRUT Are we talking Ken Wilber here? Where are we in this conversation?

ADAM GOYER Yeah, right?

JOHN MEKRUT Adam, you look enough like Ken. You can probably answer it! [*Laughter*]

ADAM GOYER I mean, I..

JOHN MEKRUT I didn't mean to throw it at you.

ERIN MATLOCK Let's shoot it...Adam, do you want to take it and then we'll go back to John?

ADAM GOYER Well, I mean, it really is—correct me if I'm wrong—it's the hard problem with consciousness, right? Where does consciousness emerge. If I poke you right here, does it stop? Does it start? Yes, I think the line between mind and body is subtle at best.

JOHN MEKRUT Yes.

ADAM GOYER I think that ultimately, the mind exists on top of the platform of the body. That's my personal take.

ERIN MATLOCK John?

JOHN MEKRUT Yes. That's probably true. Except that—I'm deep—I'm with Adam. I'm deep into this conversation because I love this stuff. It's a wonderful article, I think it was in the Atlantic a couple of days ago about the illusion of reality. I'm blanking on the author's name, but it's a fantastic read if you want to look it up. "The Illusion of Reality" in the *Atlantic Monthly*. It talks about quantum physics and what is consciousness and what is reality and are we here and how do we perceive ourselves? You can get very esoteric with some of this stuff about neurofeedback and how it works.

But I think probably the answer to the person's question directly, "no." The mind and the body are intimately connected, of course. It would have to be. Spinoza was right. Descartes was wrong. Can we just finally be done with it now and say, "yes, it's interconnected"? As you're hearing from Hyla Cass and any number of other speakers on the board and who've been on the program this week already. The intimate connection between how the gut operates and how the brain operates—the serotonin production in the gut. It actually exceeds that of the brain. These are new revelations in science that we're all coming to grips with.

The old-school thought of your mind is your mind and your body is your body—that split somewhere in there is totally inappropriate.

ERIN MATLOCK I also think, too, when we start working with the brain, then we express the mind, so both are going to be affected.

JOHN MEKRUT Exactly.

ERIN MATLOCK I'm trying to put that article up. It's a great article that John mentioned in the chat. It's not letting me put a link up, but I'm going to figure out how to get the link to you guys who are watching because it's a fascinating article.

Some more questions have come in. Also, you mentioned something real quick, Adam. You and John are both part of a group called Consciousness Hacking.

ADAM GOYER Right. Yes.

ERIN MATLOCK Can you tell everyone? There might be some people watching who want to get involved in that group?

ADAM GOYER It's a global organization. It started with Mikey Siegel, who is an MIT engineer who went to India and had a profound experience and started applying his engineering expertise to trying to understand what it means to be awake. It kind of, this whole group of people sprung up around it. It started in San Francisco, and John and I co-organize the group here in Los Angeles, but you can find these little clusters of people all over the world. it's kind of a combination of the woo-woo aspects of consciousness—you know, what does it mean to be conscious—but also taking an engineering approach or a technologist approach both on observing it, observing us and also changing it and shifting it, causing subtle corrections in the way the world occurs to us. It's kind of a group that organizes around exploring that conversation.

CYNDE MARGRITZ I was just going to say, there are a number of meet-up groups around the country that sort of sprung off that Mikey Siegel Consciousness Hacking group. We're trying to get one started here in D.C.

ADAM GOYER Oh, nice!

JOHN MEKRUT You'll make it happen! The essential ethical thesis of Mikey's argument is that Eastern spiritual traditions have their tools. They have the mandala and other tools that they use for their spiritual enlightenment and we have our tools. Why are we not

JOHN MEKRUT using our tools to the same purpose? I view what I do in neurofeedback as being a transformative technology. It certainly does clinically and emotionally and spiritually and a lot of other ways. We're just bringing to bear the fruits of knowledge in pursuit of changing and transforming people's lives. We're all on the same path.

ERIN MATLOCK We are. I want to return back to that but I want to get to some of these questions that are coming in to chat. First, "Can this help with TBIs—with brain injury?" And we talked a little bit about that last night with Dr. Stuart Silberman, who had an extremely bad brain injury as he was finishing his Ph.D. and used neurofeedback to recover. He came back, got the Ph.D. and is now in a hugely successful practice as a psychologist. Not everybody is going to have those results, but I'll leave it to you guys who do neurofeedback for therapeutic reasons that there are a lot of people who have had success who have been brain injured.

CYNDE MARGRITZ That's actually how I got into the field. I had a TBI as a kid, when I was five.

ERIN MATLOCK I did not know that!

JOHN MEKRUT I did not know that!

CYNDE MARGRITZ So I was always looking for an answer. I always felt like I did really well in school. but I had to work harder, I thought, than other people. Or I imagined how other people were working. So yes, I was looking for an answer. I took my first training class with Sue Othmer and this fog that I didn't ever realize I had lifted. I came back the next day and I said, "That was really cool." And she said, "That was the windshield effect." And I said, "May I have more, please!" [*Laughter*] That was the beginning. The effects can be subtle. It was never anything that I ever consciously attributed to my head injury as a kid. Although the year after the head injury, I developed anxiety and agoraphobia but no one ever connected it to the head injury at the time.

But we find many adults we work with have had head injuries at some point, but they never connect it to their current symptoms either. So we can always make things better.

ADAM GOYER When I—I started training recently with Dr. Gill who has a clinic here in Culver City. We did a QEEG. I thought I was going in mostly to treat some Tourette syndrome and a little bit of the surrounding symptoms for that. When we did the QEEG we found that I had a classic head injury pattern from what I presume to be either playing football in high school or a car accident I was in in college. We started treating it as a classic zigzag scar pattern, you know, right down the center of the brain. I was like, "huh!" So we started treating that and more focus and more attention and more bandwidth. It's been quite profound. That was pretty recently, actually.

JOHN MEKRUT I would also encourage people to turn in to Debbie Hampton's speech—her talk. I think she's on Friday?

ERIN MATLOCK She's on Friday and she has come back. She has done several different treatment forms to come back from something where she didn't even know who she was, that she was in existence. She couldn't talk. She is a brilliant science writer and a very popular brain blogger. So if you are watching and you know someone who's had a brain injury, her talk is free starting on Friday. I really encourage you. She is so inspirational for anyone who feels like life is over, because the circumstances that led up to the brain injury are just devastating. What she has overcome will give you hope that you can not only overcome these types of challenges in your life, but you can go on to have such a better life than you imagined.

ERIN MATLOCK Okay. We have more questions coming in so I want to go quickly. I want to say hello to Alex Doman who was a speaker on Day 1 from AdvancedBrain.com. Alex was my provider. We used neurotechnology called the listening program, which is music listening therapy. I actually have my bone conduction headset with the amp here, so Hi, Alex.

Alex had a question for you guys. Debbie is here. She says she's blushing!" [*Laughter*]

Debbie, we love you! I'm so glad this chat is enabled tonight so I can see you guys here. I apologize it wasn't last night. Alex's question: "What do the panelists believe will be necessary to occur in order for neurotechnology to be accepted as a mainstream solution for brain-related disorders?"

JOHN MEKRUT Wow. I think, actually, what partly was what the first prior caller was talking about. When you talk about brain injury, I think most people in our culture think that's a death sentence. When you have a stroke, a neurologist, they still say at this point, "The gains you make in the first six months, that's all you're going to get." It's nonsense. That way of thinking is nonsense. I'll say it flat-out. Neurologists and the medical profession have to understand—I can't fathom why they don't at this point. It's been 50 years of research. The brain is possibly—from our viewpoint—one of the most malleable, flexible, repairable organs that we've got going on. I just lost Erin. I don't know what happened to her. Hopefully you can all still see me!

ADAM GOYER I can see you, John. You're real!

JOHN MEKRUT The recuperative properties that exist inside your head are beyond question and they are remarkable. Anybody who's out there struggling with the effects of whatever it might be: addictions or brain injuries or stroke or any number of things. Your brain can repair itself. You can get a life back again. These people are not an anomaly. The people like Debbie Hampton. Present company included, Erin. People who've come back and worked through deep, deep struggles. The possibilities are there. The brain is incredibly trainable. It just needs information. It's desperate for it. It's sitting there alone in the dark and all we have to do is provide it with good information. Alex's program provides it auditory. Cynde's and mine provides it visually. There are any number of ways to do it. Just get out and do it. Health is at hand.

CYNDE MARGRITZ I think the research that is coming along. There is a ton of research now on neurofeedback. It's going to make a difference. It's really a paradigm shift. I think the research is going to show how effective neurofeedback is and the imaging research is actually validating the changes the research has shown about neurofeedback.

JOHN MEKRUT Exactly. FMRI Research—

CYNDE MARGRITZ The technology is going to help itself.

JOHN MEKRUT Yes. The fMRI research that's coming out is actually shedding the light on what you and I have known for a long time. The bio-electrics of the brain are changeable. What a surprise! But what Alex is getting to is, it's going to have to be about you—the

JOHN MEKRUT

person viewing this, taking charge of your own health and if you're not getting the answer that you don't feel is satisfactory, find somebody that will give you another answer. Keep looking. Keep finding and keep pushing and ask all the questions. The Internet is an invaluable tool. It's out there. Not that you should memorize WebMD, but be proactive about your own health. That's the quantum shift that I see happening in our culture right now. Personalized medicine that is patient-centric. That's what's going to get people healthy.

ERIN MATLOCK

I'm going to jump in here, too. I think it's very important. I remember how Hyla Cass and I were speaking about how certain organizations find that consumers are dim. We are not smart enough to do our own research and make our own decisions and it's just not true. I think what has to happen for neurotechnology to be mainstream is that consumers have to wise up. You have to go to your doctor. You have to go to your psychologist. You have to go to your therapist and you have to constantly ask them about these things. Understand on the first try, if you have a doctor who is more traditional, they may not be open to it.

But the more of us who go in and start talking about these methods of treatment or these solutions, then the more doctors start to take notice. This is kind of what happened with the functional medicine movement. We have so many people learning that they want a functional medicine doctor. They want to treat from within to be well instead of just treating symptoms—throwing things at the symptoms. What happens is, more and more doctors are saying, "Now there's a nutrition connection to the brain. There is a nutrition connection to our longevity" and Alzheimer's and they're going to get help. We had Dr. Drew Ramsey talk on day one. He's a psychiatrist. He specializes in nutrition for his patients. So we've gotten more and more. He says when he gives talks to psychiatrists, he has standing room only. They're hungry now for this information.

ERIN MATLOCK

The same thing has to happen that happened in the health world and the functional medicine for neurotechnology. Those people who got help need to talk about it. I talk about it with my doctors—what helped me. Those people who want help need to ask their doctor, "Have you heard about neurofeedback? Have

ERIN MATLOCK you heard about music listening therapy? Have you heard about some of these modalities." The more these doctors and the people who make—I don't know how to put it—but are that gateway to the insurance companies making money. That's their business model. It's fine. The more the doctors speak out and say, "We want this. We want this covered. We want to get people help and we want to have them get help at a price they can afford." Then we'll see that tide turn. I think it's going to be, too, in the next few years, in the next five years.

JOHN MEKRUT Let me just throw in a small piece. I think of the people attending tonight. If you have a child, a loved one with ADD, especially a child, the American Academy of Pediatrics recommends neurofeedback as being equally potent in efficacy to medications. I would hazard that your pediatrician probably hasn't told you that.

ADAM GOYER One thing that will help the adoption of this at a more institutional level will be more standards across clinicians. There are a lot of clinicians out there that are kind of running and gunning—maybe don't have the level of training that the rest of the medical establishment might. Then there is not as much quantification on the front and back end. So as far as getting the medical establishment to adopt it, that's what it's going to take. They're approaching it from a kind of science mind, so it needs to live up to standards for that hierarchy to take and adopt it into their model.

ERIN MATLOCK Excellent. I'm sorry to jump in. Go ahead. Finish.

ADAM GOYER No, I was going to say, if you want, I can lead that right into non-provider based neurofeedback, because I have a connection there.

ERIN MATLOCK I want to talk about that, right after you—there is a comment from Matthew. Thank you, Matthew for being here tonight—that goes along with that. He says, "Why don't neurologists trust neurofeedback more? The answer is, most neurofeedback practitioners suck at publishing their findings so the uninitiated remain unconvinced." This is what you said, Adam, is that we need more clinical data and we need it to be, I guess, approached in a little bit of a different matter to where the doctors feel comfortable with it.

ADAM GOYER There is a kind of a—John, I know what you're going to say! There is a little bit of infighting with the industry as well, which makes the whole industry not look as professional as it might otherwise occur to outsiders. John is going to say that it's subjective experience and doesn't need quantification.

JOHN MEKRUT [*Laughter*] Well, yes, I'll go down that road at some point during this. No, I mean, there are any number of people in the neurofeedback world, and yes it is vulcanized and yes, there is competition and internecine fighting and all of that. We hate to air our dirty laundry, but here we are on a public Internet, doing it. I guess my point is that there are any number of people who—and I'll be one of them. I don't really care if the medical industry understands what I do.

I'm not looking for insurance necessarily to buy into this. I'm not interested, particularly, in double-blind placebo controlled trial studies. A, I don't think they're possible. I think it's an outmoded way of thinking about what it is we do. We are doing something that is not medicine. It really isn't. this is a self-awareness training program. This is about self-healing, which frankly is all healing.

JOHN MEKRUT A doctor is there to provide you with setting a bone or giving you a medication—an antibiotic that is going to help your body heal. That is, frankly, probably the limit of what they actually do. You are healing yourself. this is no different. You're coming to me, you're coming to Cynde, you're coming to a provider to try to get your brain to understand how it works. I'm not sure if that is going to fit into an insurance model. I 'must be honest. Unless we completely turn, what I perceive to be a sickness model, anyway. I don't think it's a healthcare industry. I think it's a sickness industry. If we turn it upside down, maybe we can get that to happen.

I get so tired of people saying, "Where are the studies? Where are the—?" I don't care anymore. I know what I can do. I know how effective it is and I don't think, frankly, it can be measured in those ways. I just don't. I think we'll be waiting a really long time to get qualified studies that are going to be accepted by the Journal of—*New England Journal of Medicine*. I don't see it.

ADAM GOYER John and I have a subtle distinction on this. We're slightly different. We have slightly different approaches.

JOHN MEKRUT We can get on the quantitative side later! [*Laughter*]

ADAM GOYER That's fine! [*32:44 CROSSTALK*]

JOHN MEKRUT Cynde's trying to get in there.

CYNDE MARGRITZ I was going to say, I actually agree with both of you! [*Laughter*] I think neurofeedback is a tool. I think the research is emerging. Much of it is there already. But it's a tool that can be used in multiple ways. I think it can be used clinically as a clinical treatment for something. It can also be used for consciousness awareness and consciousness expansion. So, one tool, multiple applications. I don't think we have to fit the tool into all of the same box.

JOHN MEKRUT I can agree with that. But you can see how difficult that makes it to "test" it in a scientific methodology. How do you wrap your brain around a tool that does that many things. It's not like a drug. It's not like a drug.

CYNDE MARGRITZ Well, you pick one of the things it does to do the research on.

JOHN MEKRUT Alright!

ERIN MATLOCK Just to interject real quick and then I want to move on to Adam and non-provider based, since we had Alex Doman on with us tonight. They've received approval from Tricare. So for active military families who have children who are dealing with challenges, they can get that neurotechnology completely covered. They also have a veteran program, I think.

Alex, you might want to correct me, but I know the Tricare. They've gone through and listening program and, In Time, which is another technology they have, do the same thing neurofeedback does. They help a wide range—a lot of different things. Some things it's based on how you feel, and yes, that's hard to measure. But they have done—Alex has been very meticulous, I think, in getting case studies and trying to get studies involving his solutions so that they can go that route and get families help to get payment. Because, let's face it—not everyone can afford to pay out of pocket for neurofeedback for the Listening program or any of these other wonderful thingsthat are on the horizon. So we need to look at how do we help these technologies get covered so that more people can get the help.

ERIN MATLOCK Okay. Let's move to Adam, because we have a lot of questions that came in and I want to go. But I want to hear your thoughts on direct-to-consumer model of neurofeedback.

ADAM GOYER Yes. The current wave of neurotechnology, the main consumer companies are Muse vs.—who are the other—Emotive. These are kind of the first wave of consumer-based neurofeedback or neurotechnology companies, right—Brainfeed interfaces. They have their place. There are strengths and limitations. There is only so much you can do at a $300 price point. They're dry sensors, so, you know there are limitations there just on the physics of gathering that signal.

I think what would be helpful is to bridge the gap culturally is first to have a clinician model, where you go in and you see the clinic. You do the heavy lifting in the clinic and they send you home with a consumer-basing device that helps you practice the rest of the week. Then we need the technology and the infrastructure of the technological level for the clinician just to be able to monitor and make adjustments and recommendations for that homework. But also to pull in, you know, "why is my sleep-tracker not pulling in data to my neurofeedback clinician?"

ADAM GOYER Sleep has a profound effect on every aspect of our health. Neurofeedback is massively affected positively and negatively by neurofeedback. If it's bad neurofeedback, your sleep will get worse. If it's good neurofeedback, it presumably should get better. That data should be pulled back into a kind of a holistic platform that is seeing that stuff. that's where I see the next wave of neurotechnology unfolding. Once we've got a kind of clinician and home use model established with a pretty wide level of adoption, the technology and user adoption and the cost curve will have moved forward.

The user interface will be streamline a little bit and kind of this big data of squiggly sine wave that we can then apply machine learning on top of it and pull out the relevant stuff and then that's when we really see the consumer basing stuff—the dream of neurofeedback, where I'm sitting at my desk. I'm justa regular guy, totally not clicked into this kind of seminar at all, but I've got the jawbone in my ear that's pulling in a little bit of EEG signals or pulling in some data from my glasses saying,

ADAM GOYER "Hey, Adam. You're not on point right now. How about you go for a walk?" Or something. Right? Whatever the dream of this technology ultimately is.

JOHN MEKRUT Exactly.

ADAM GOYER That's still some years away, but it's coming quickly. The more the different neurotechnology companies collaborate, I think the faster we'll see it get here.

CYNDE MARGRITZ So talking about the first phase of what you're talking about, we provide through our virtual neurofeedback program, where we do the heavy lifting at the office and then clients take their remote unit home to train during the week.

ADAM GOYER Nice.

CYNDE MARGRITZ So that's available now, but the technology could certainly evolve to make that easier and better and integrate with other data sources.

ADAM GOYER Right.

CYNDE MARGRITZ I'd love to have more data about how my client's sleep is during the week.

JOHN MEKRUT You're right. The sleep one is vital. That seems to be on the horizon. I know Signet, the platform that Cynde and I have used is starting to add on new biometric inputs into the program itself. It's really very, very close. Cynde, I know you're a home user. Are you using paste and sensors—the traditional paste and sensors? Or are you using some kind of headset?

CYNDE MARGRITZ We use—that's an option. We also use saline and a headband.

JOHN MEKRUT Okay.

CYNDE MARGRITZ We have the low tech [*38:54 CROSSTALK*]

JOHN MEKRUT We're still sort of stuck at a technological hole. We need one more device. Wouldn't it be great to have just a nice, simple, relatively inexpensive headset that they can just feed this data in? We're so close! Please, Adam! Work on your friends! Get a new headset out there!

ADAM GOYER Yeah. In all my free time. Let me just get on that for you. [*Laughter*]

ERIN MATLOCK Okay. I'm going to keep moving us along. We have a lot of questions in chat. Thank you guys, in chat. We're going to get to all of these. I'm going to skip through. I saw one. this is from Brainstorm. "How is neurotech related to branding?"

ADAM GOYER Like a neuromarketing. Is that like neuromarketing? I think every major advertising company in the world right now has some sort of neuroimaging. I think the first time I ever heard about it was the mini Cooper. They designed it to evoke a similar response to when you look at a baby. So you have these really happy, positive responses when you looked at it. They kept tweaking the design until we look at a baby, and you look at a mini cooper and you have a similar response, right?

If you look at who owns the majority—the company that owns more neurotechnology patents—and this is from Sharp Brains, this is a reference—it's one of the advertising agencies. They own more neurotechnology patents than anyone else.

JOHN MEKRUT Yes.

ADAM GOYER So marketers are really trying to crack this nugget as well. How do we get another layer of what—you know, if I look at something and I have a physiological response or I have a striking neuroresponse, what does that—here's where it gets into the voodoo of it, right? It's kind of an art. it's hard to make a correlation between a squiggly line—a sine wave in your brain wave and how someone actually feels about a thing. It's not a clear connection. There is some voodoo in there, but there are a lot of people researching it and there is a lot of money going into it.

ERIN MATLOCK Anything to add?

JOHN MEKRUT The only thing is, that's really a—he's put together an amazing document on—I know the one he's talking about, of who owns the patents. It's really eye opening when you start seeing who is really in this base, really putting in time and energy and money.

ERIN MATLOCK This question is for Adam. "How do we market these technologies with integrity so that the consumer is better informed about their choice?"

ADAM GOYER That is a tricky wicket, isn't it? [*Laughter*]

ERIN MATLOCK You have a puppy dog?

ADAM GOYER Yeah, the dog just walked up on me.

JOHN MEKRUT We could just go back to Adam Smith and let the market decide.

ADAM GOYER I mean, ultimately it's all marketing. All marketing, you have to have integrity. You have to say what's true and you have to say what's honest and you have to set up expectations for the consumer that are appropriate. If you tell someone they're going to put on a headband and they're going to achieve enlightenment, they'd better achieve enlightenment. If they're not going to have a profound spiritual experience when they put it on, don't tell them they will. That's kind of a novel approach to marketing , but it's worked for our firm. [*Laughter*]

JOHN MEKRUT Adam, I'll crosstalk for a moment. Do you think that most of the manufacturers out there are being a little grand in some of their statements about what some of these devices might actually achieve?

ADAM GOYER There is no circumstance where I'm going to answer that public question—answer that question publicly.

JOHN MEKRUT [*Laughter*] E-mail me privately.

ERIN MATLOCK So, let me go through some of these questions. I have some questions for you guys, but I want to make sure that those people that came tonight have their questions answered. This is for Cynde. "The Brain fog, having to work harder at school describes my son after surgery and a bash to the head when he was ten. He's 14 now. How did you lift that fog?"

CYNDE MARGRITZ I lifted that fog with some Othmer-based neurofeedback, which really looked for the resonant frequency that my brain operated best at and when we reached that resonant frequency, I kind of woke up, so to speak. There are different methods of training neurofeedback. The Othmer method is one. We use QEEG or brain mapping in our office as well. That can look for, as Adam mentioned, different patterns that are typical of a concussion.

What we're really looking for are those areas that are underperforming. We can't really work back diagnostically and say it's de to a concussion because obviously we didn't have the map from before. But we can say these are typical and we really don't even need to make that diagnosis or make that call. We just say these are underperforming areas. Typically with a head injury, it's excess slow waves and we just create a protocal to teach the brain to make the brain to make more fast waves. Then in the process, it wants to regulate itself better and regulate those slow waves. That's a fairly amazing process.

ERIN MATLOCK Thank you, Cynde. Here's a question. "Are there any breakthroughs around Alzheimer's? My mother passed of Lewy body dementia." Nancy, I'm sorry. So let's talk about Alzheimer's.

ADAM GOYER Neurofeedback can slow the symptoms.

ERIN MATLOCK Yes.

ADAM GOYER Ultimately, the tissue is still degenerating at the cellular level, but we can, with our current technology page, we can slow the symptoms. So with a series of therapies, you know, this technology and others, you might be able to move the needle a bit, but there is still a decay that's happening at the cellular level that we don't have great tools for amending.

ADAM GOYER Yes.

JOHN MEKRUT It's a testament to the brain's flexibility again, it's constant recalculation of it's own performance that as certain parts of the brain are degenerating, other parts will come into play and take up some of that function. It's dramatically slowing what is clearly a progressive degenerative disease, but it's slowing the trajectory over time. It's keeping and maintaining performance at a much higher level than one might expect without doing things like neurofeedback. It's going to provide a quality of life over a much longer period of time than a person who isn't doing it would enjoy.

ERIN MATLOCK Thanks, guys. I want to say hi to Dana. She's listening from Australia. The first time at this Technology-loving summit. She's blown away. thank you! Cynde, the person who just asked that question to you said, "Thank you" for your answer.

CYNDE MARGRITZ Oh, you're welcome.

ERIN MATLOCK I found one here, it's again from Matthew. We're good to go. "Neurofeedback is likely an effective primary treatment prevention strategy for anxiety regulation. If neurofeedback treatment caused less abstract thinking and creativity, how would we know?"

CYNDE MARGRITZ Less Abstract thinking and creativity? My take on neurofeedback is, we're always enhancing what's there. We're generally not taking things away. We're giving the brain the skill to choose other things in addition to what's there. Usually

CYNDE MARGRITZ we're enhancing creativity and abstract thinking. The brain can shift out of anxiety and into a calmer state, those types of capabilities and those talents and those abilities will naturally emerge.

JOHN MEKRUT It's a self-regulation and training methodology. if you're training the brain to be more responsible for it's activities and work at a reduced level of energy expenditure, lets say using that frame, the extra time and resources that it has can be expanded into other things that you like to do so that your memory will be enhanced. It's not so focused on the maintenance task at hand, but it has a lot more flexibility. My expectation and what I've seen clinically is that, yes, people become more creative and have better memory and better focus and attention skills because their resources are more available.

ERIN MATLOCK I just passed a question from Jane. Hi, Jane! "From what age can neurotechnologies be safely used in children?" I know in neurofeedback, straight from Kurt Othmer, who spoke, he said six months. Right, John?

JOHN MEKRUT Yes. The ability to attend to a screen. The ability to focus on the outside world and gathering data. It's what the human brain does.

ERIN MATLOCK I think if you haven't listened to Kurt's talk, it's really wonderful because Kurt is so passionate. His mother, Sue, and his father is Siegfried Othmer. Kurt's grown up with this and he really explains it in a way that, for me, it took a long time to understand. We're not actually doing anything that is really changing us as humans. We're showing our brain what it's doing and then our brain is saying, "Oh! I'm going to learn how to actually operate in the way that I was made to, to the best of my ability, barring any severe physical challenges, or things like that."

It's not actually turning us into anyone different. It's not doing anything negative in that way. So for children, it is safe, because it is, again, it's showing them their own brain activity. Cynde, do you want to add to that and to help people understand? It took me a long time to understand it wasn't actually changing—we all think it's changing our brainwaves, but we're doing that, correct?

CYNDE MARGRITZ You're doing it. What most people say is, "I feel more myself. I feel more capable. I feel more competent." We just have this wonderful quote from a client who said, "Before neurofeedback, they felt like they were primal, that they were living in pictures. Now they felt alive." They feel in their body and alive. That's the kind of thing that happens with neurofeedback.

ERIN MATLOCK Okay. Here's another one. "Does it help with chronic pain and chronic fatigue?"

CYNDE MARGRITZ Yes. Cindy Perlin is a good resource. She's written a book about chronic pain and neurofeedback for chronic pain. Neurofeedback and other modalities including some biofeedback.

ERIN MATLOCK Do you know how to spell that?

CYNDE MARGRITZ PERLIN. She's just written a book about it.

ERIN MATLOCK Say it again, because I am …

JOHN MEKRUT Cindy is CINDY PERLIN. She's awesome. She's been working the chronic pain area for 25 years, I think.

CYNDE MARGRITZ Yes. Neurofeedback can be quite effective for chronic pain as well as headaches and migraines.

ERIN MATLOCK I think also, too, if you're looking at chronic fatigue, sometimes it's incredibly difficult to treat. One of our sessions that is still going on right now, it's free, it's Dr. David Haase. He goes into this. He uses neurofeedback along with a lot of different things in his clinic in Tennessee. He trains functional medicine practitioners. He believes in creating wellness. I think he talked about having a 45-page booklet that each patient fills out before they come in to meet with him.

This is an in-depth work-up because sometimes we go to the doctor and 15 minutes we're out and we're like, "Well, we have chronic fatigue, or we have fibromyalgia. We have these things that won't go away. We're hurting." We might get a prescription or we might not, but we're not getting better. Dr. David Haase. Look at his session. Also, Hyla Cass, Trudy Scott. They talk about this, too. Hyla Cass is a great physician when you're looking at fatigue, too, because sometimes there isn't just one avenue. Sometimes it might take multiple avenues, especially if something has been going on for a while.

Let me go…"Can neurotech help children with epilepsy?"

JOHN MEKRUT Actually, neurofeedback, that's how it was discovered. Back in the early 1960's, Barry Sternman in a quiet lab at UCLA discovered that neurofeedback trained cats could keep out of seizure. That's probably its first application. The second was ADD. This has been going on a really long time. So, yes. It can absolutely help with seizure. Sorry Cynde.

CYNDE MARGRITZ That was in the 60s!

JOHN MEKRUT Yes. Late 60s.

ADAM GOYER So neurofeedback and Cannabis. That's the best practices, right? [*Laughter*] That you'll promote, but you won't give me an answer on marketing?

I'm from California. I can come up with this.

ERIN MATLOCK I also wanted to mention, too, even though we don't have someone here representing them, is the Fisher-Wallace Stimulator. You can go to FisherWallace.com. I'll put it in the chat. But this is something that you need a prescription from your doctor. It's a device and it works with depression and anxiety, but it's also working with insomnia, chronic pain, fibromyalgia and there are a number of other things. It stimulates the brain to produce serotonin and other neurochemicals.

JOHN MEKRUT A Brief sidebar on something like that, you need a prescription in the united states, but everywhere else on the planet, you can buy it in a pharmacy.

ERIN MATLOCK Okay. Good to know, because that's right. We have a global audience. Thank you for that.

JOHN MEKRUT Yes, but it tells you the state of some of this technology. There is a bottleneck here. These are well-researched, extremely safe devices. The Fisher Wallace device has been around for 15-20 years. The Alpha-Stim has been around for 20-25 years. I can't foresee an earthly reason why you can't go buy this at your local CVS. These are very powerful, very wonderful devices.

ERIN MATLOCK Let's talk about that in a minute. You just said something about Alpha-Stim. Can you guys explain what Alpha-Stim is to everybody and what it can help?

JOHN MEKRUT It's very similar to—it's similar in intent to the Fisher-Wallace product. This is a stimulatory device that involves alpha wave

JOHN MEKRUT activity in the brain. You put ear-clips on your ears. It's very easy to use—simple. It promotes that 10hz alpha wave stage that you get when you meditate. It's great for sleep, anxiety and depression. It smooths out the anxiety and depression cycles and promotes a good healthy calmness, which is prompting a sleep state later in the evening. Very good device.

ADAM GOYER We should probably give a shout-out to Thync for going through stimulators as well.

JOHN MEKRUT Say it again?

ADAM GOYER We should probably give a shout-out to Thync if we're going to be calling out stimulators.

JOHN MEKRUT Good point.

ERIN MATLOCK Thync is not therapeutic, so let's remember this is, it's like Muse—the current version of Muse and that type of thing. So it's not meant to treat depression, to treat epilepsy and these types of things. It's simply meant to either give you a burst of energy or to calm. That would be more towards what Adam and I were talking about, this consumer-based direct to consumer based model that works to a certain extent that maybe then we could take what Think does, pull it out and use a provider.

JOHN MEKRUT They are different technologies, to be fair. Thync is transcranial direct-current stimulation and/or Tens. some people are familiar with Tens and have been to a chiropractor. Alpha-Stim and Fisher-Wallace is a different technology. It's more vagus nerve stimulation. It's different. Similar in intent—promoting calm states of mind. Yes. I use the listening program. Obviously Alpha-Stim. I use Heart-Math I think is another wonderful product. Again, it's been around for decades—an easy to use home-training device using yogic breath control, frankly. It's regulating your breath for your parasympathetic and sympathetic nervous systems. It's a delightful device and quite easy to use. Then we can get off into the more esoteric EMF devices if we'd like.

ERIN MATLOCK In fact, while we're on that, I just want to put those URLs up there. Debbie Hampton had a question that ties into that, so let me move to that question really quick. Do you guys trust the do-it-yourself at-home neurofeedback?

JOHN MEKRUT [*Laughter*]

CYNDE MARGRITZ Why does that amuse?

JOHN MEKRUT I'm not strapping a 9-volt battery to my head if that's the question on the table! I'm not doing that. I value my brain state and I'm perhaps a little more conservative than some. But I fault nobody if they're struggling with something for trying all sorts of things.

ADAM GOYER If you use one of the professional Transcranial direct-current devices, the amount of radiation that you're putting in your brain is less than holding a cell-phone up to your ear. But you need to make sure that you're using one that—if you put 9-volts across your brain, you're going to have a really bad day, so you need to know that you have a hard break in the transistor. It's functionally impossible at the circuitry-level to make sure that you over-stim or something like that. There are a lot of safety considerations to take into account when you put electricity across your brain. That should be self-evident.

JOHN MEKRUT As I was saying, there are people out there, their entire blog site is devoted to this. of course, the names are escaping me at the moment. Do a modest Google search. You can gather a bunch of information and really do this. It's not for me, but you can do it in a pretty safe way. But don't go out and just try to cobble together your own device because you think you can in the garage. Take advice from people who have been down this road before about what's gone right and what's gone wrong. But I'm sort of interested in the DIY crowd because they are pushing the envelope where things can go. So we have to give them a nod at least that there are experimenters out there.

ERIN MATLOCK [*59:14 CROSSTALK*] So Debbie…go ahead, Adam. I'm sorry.

ADAM GOYER Talk to your doctor, as my lawyer would require me to say right now, right?

ERIN MATLOCK That's what I think we need to be really important, because Debbie followed up. "I have a brain injury. Could I do harm?" this is where it is so important that we do take responsibility. We do have to speak to a medical professional at times, because especially the do-it-yourself type things that are happening that we don't know the extent, but I think that—move forward with caution.

JOHN MEKRUT Yes.

ERIN MATLOCK Okay. So, Matthew. Well, this makes more sense. Matthew is a neurologist who has searched for reliable neurofeedback methods for epilepsy. Please help. All treatments need dosage, method and outcome. Are all neurofeedback treatments equally effective and what kind?

JOHN MEKRUT There's the million-dollar question. Matthew, no one's ever done a side-by-side analysis of all the different methodologies done in neurofeedback. They're probably, Cynde, four or five, would you think? Othmer, QEEG-based and all it's varieties, Lens—there are a number of techniques out there to do neurofeedback. One can argue whether Lens is neurofeedback. I won't go down those roads. But I think the QEEG has been around, up-down training has been around for decades.

I think it's success and validation—I think if you go on PubMed, you'll find any number of studies that have been done on the use of neurofeedback for seizure control. This is not new territory. It's not something that just popped up last week. So yes, there are technologies available and just look past the abstract and go to what is methodology used in that particular study for seizure control and you'll find the one that you're seeking if you're looking to advise a patient on this. But yes, it's extremely effective for seizure control.

CYNDE MARGRITZ Yes, if you want to give Erin your e-mail, I can give you contact information. There is someone in the Southeast who is a neurologist who is actively pursuing using neurofeedback for epilepsy for his patients. He's really beginning to advocate for the use of neurofeedback for epilepsy. Many folks just don't know it's an available option that could either supplement medications or in some cases substitute for it.

ERIN MATLOCK Absolutely. Matthew, send me an e-mail, because that was going to be my advice, too. My advice is to be, let's contact Kurt Othmer and lets get him a doctor to talk to, but if you know someone—a neurologist who's already pursuing this route, sometimes that's the best thing for a neurologist to talk to a neurologist because they speak the same language.

JOHN MEKRUT The Othmers are in this industry because of their son who suffered from epilepsy.

ERIN MATLOCK Yes.

JOHN MEKRUT That was what they discovered was effective for him. This is almost 30 years ago. They work with Margaret Ayers.

ERIN MATLOCK Okay. So let's move to a question, "There are audio and visual technologies. Adam, can you comment on connecting people through digital touch. For example, Emerge, and how does this work?"

ADAM GOYER I'm not familiar with Emerge, either. I feel like I've heard of it, but I'd have to look it up first before I spoke to it.

ERIN MATLOCK Jane, if you are still here, can you follow up with that so we can look…

ADAM GOYER Oh! I know. I bet I know who asked the question. I think Emerge is, let's say…

ERIN MATLOCK I know. I'm trying to look it up real quick, too. If anyone knows, let us know so that we can kind of look at it. While we're doing that…

ADAM GOYER Yeah, I got it. So, Hi! Good that—thanks for being on the call. I'm pretty sure this person came in off my mailing list. So, Emerge is a technology out of Macon LA, which is an incubator here in Los Angeles. You basically put it on the back of your cell-phone so that you could—like if I touch the back of my cell-phone, someone who had a paired cell-phone would feel that experience. It's a haptic technology for communicating around the world. So the more—it's kind of the first generation technology that's trying to help us project our physical presence to another location digitally.

JOHN MEKRUT Digitally. Very cool.

ERIN MATLOCK So the question was, So what is it? When you say, haptic technologies, for anyone who's watching?

ADAM GOYER Force Feedback. Yes. it's like if you wore a glove or something and it would communicate that maybe if there is a sense there. It's like there's visual, there's audio and haptic is like touch—touch feedback.

ERIN MATLOCK Was this the same as that sweatshirt that came out that you put on the sweatshirt and someone from across the country can signal it to give you a hug?

ADAM GOYER Yes. There are a lot of people trying to crack this code open right now.

ERIN MATLOCK

I love this for our children with autism, but also our shy children at school that might need to connect with mom, and also our elderly who are isolated. I always think of when I was dealing with mental illness, too, and so isolated that this haptic technology and what that can do—what we can do to connect with each other.

Okay. let's keep going. Adam, this is a good time. Let's talk about funding. This is what you do. You help people at different stages get funding to either get their business off the ground or keep it going. Can you talk a little bit about what that looks like, and what the landscape looks like?

ADAM GOYER

Yes. Absolutely. When I left my previous company that I was at last year, which was a neurotechnology software company, I came to Blak Box, which is a marketing agency in Santa Monica, partly because one of the things I realized was within the neurotechnology community, there was a lot of people that didn't know how to talk about marketing and how to—there was no agency that had a bunch of copywriters and people that are already familiar with neurotechnologies. And it's a hard subject. There are all these rules and regulations and all this specific terminology.

Then beyond that, Blak Box's specialization is to help people who need to raise money. So we'll either—we started with Indigogo and KickStarter and actually running KickStarter campaigns for people as an agency. Then now we're moving in to more equity crowd funding where we actually help companies exchange stock, partner with a broker-dealer or an investment bank to raise money from their customers and that kind of thing. We found it's really important in neurofeedback. I was actually—I've been in dialogues with some research studies right now.

ADAM GOYER

We're trying to get funding for the research and the neurotechnology and meditation research. The people that are passionate about this stuff are familiar with it. They want to be engaged. They want to own a piece of the success of the companies they support. In a lot of ways, this stuff is very community driven. Previously, up until some changes in the rules that are really unfolding this May and June, only companies—you have to be in the top one percent—an

ADAM GOYER accredited investor—to invest in Verses or Muse or any of these private placement companies. so the laws have now changed for Title 3 and basically I'm positioned our firm to help get some of this next-generation technology to market, get it funded and move, hopefully, all of humanity forward.

I know my original tagline for most of last year was "enlightenment is a fundamental human right." How do we all be happier and more content? There is an internal subjective aspect of that, but there is also a third person, external experience that can be amended and adjusted. That's kind of what our firm does.

ERIN MATLOCK So that has passed? The last time we got to Skype was a little bit—a while ago and you were waiting for it to pass.

ADAM GOYER Yes. Title 3 gets implemented in May. It's passed. The law is written. It's passed and implements in May and really we'll see the first crowd-funding campaigns go live in June. I'm looking for a lucid-dreaming technology if anyone knows some good ones. I'd like to see some of that. I think there is a good hypothetical case to be made that it can be induced and I think there is an established market for it, so I'm on the search.

ERIN MATLOCK I think there is a market for it, too. In fact, that was the next thing on my list to talk about. Let's talk about lucid dreaming technology. For someone who doesn't know what lucid dreaming is, can you give a brief explanation.

ADAM GOYER Sure. Do you remember when you were a child and you had a dream you could fly or something? You knew you were in a dream, but you didn't wake up? most people grow out of that experience. But some people don't or some people train themselves to be able to get back into it. So you're asleep, you're in a dream, you know you're in a dream, and you can adjust the dream. I have a friend that, he dreams in Final Cut Pro. [*Laughter*] He's an editor, so when he has a dream, he realizes he's in a dream, he can rewind it, fast-forward it, he can go back and forth within the dream like he's an editor. So that's a lucid dream.

There has been some research around it, that basically the synaptic networks that run higher-order consciousness: memory recall, self-awareness—these probably run on the 40hz in the brain. I guess it's 19 and 40 Hz. There are two

ADAM GOYER frequencies. I forget what the second one is. So there is—maybe if we induce those. We lead the brain to turn those networks on while your sleeping or you're in a REM state, maybe you would become lucid.

There is some research that suggests this. Maybe there are also chemical ways to induce lucid dreaming through tropics or something. So there is probably a way we can do it, but we haven't cracked that nut, yet. But I actually think it could be a big move forward for subjective health. There is all the PTSD trauma resolution. Those can be significantly impacted by lucid dreaming. But also, there is also this thing. When you wake up from a ream, you're in a dream world and you realize the whole dream is being manufactured inside of your brain. Then you wake up from that and you're in this world and it kind of creates this very profound experience like, "huh! I just woke up from a world that was totally illusionary. Where are we now? This world is stable, but how stable?" That gets into the woo woo side of lucid dreaming. I'm going to cut myself off, there.

ERIN MATLOCK No. I like that. I had a follow-up question. Do you believe in wilds awake lucid dreaming.

ADAM GOYER So, mushrooms? I don't...I don't...I'm not familiar. It's a topic out of my perspective.

ERIN MATLOCK Lauren, give us a follow-up as to what you mean by wilds. Okay. Then, while we're waiting on that, this is a topic I want to cover, especially before we end I want to make sure we get to it. For clinicians—let's say therapists, occupational therapists, counselors, coaches, physicians, neurologists—who want to add technologies to their practice, we're going to look at how might they layer it in ?How might they use t and what are some of the drawbacks? What are some of the things that need to happen? Maybe what would you suggest, because I know we're going to have people say neurofeedback. But let's look at a lot of different things and I think what I discussed with you, Adam, the other night is data and monitoring.

ADAM GOYER Yes. The clinician needs a dashboard where they can see all this information. Nutrition affects this, right? If we can figure out a—nutrition is hard because it's so hard to track. But nutrition, sleep, some supplements. These are all really easy ways to affect the overall health of the individual at the brain, body,

ADAM GOYER gut connection level. For a clinician to really integrate this technology into their practice, they either have to become very familiar with each individual piece of technology or they're going to have to wait a little bit until there is a dashboard that emerges that brings all this technology together.

ERIN MATLOCK I think that's important, too. I want the data. I know that, John, you have something to say about this, and so do you, Cynde. We have argued about all of this before, but when I look at patient and client compliance, it is so much easier.

ADAM GOYER Yes. So low.

ERIN MATLOCK Yes. So how do we get the reward system built in? That reward comes from our data. It's gotta synch to the phone. It's got to connect to the phone. Everyone has a phone with them all day. The devices have to sync to the phone, the phone has to sync to the server, and the server has to serve up the information to the clinician. I really think that's the path technology has to go through. Anything less than that is the clinician building the system themselves, which is actually really great, right?

If you're a neurologist, there are technologies you can put on the shelf in the waiting room that the client can take home and it will categorically improve the quality of life. Right? You could have a prescription to TruBrain, the nootropics company. If every one of your VIP clients or if you're doing concierge medicine or something, every client gets a subscription to TruBrain, you're going to have better alpha signals than if they're not on it. TruBrain is doing a bunch of research. They're publishing white papers for this, right? Well, go ahead. I want you guys to jump in.

ERIN MATLOCK However, TruBrain. Does a neurologist, does a physician want to recommend—if you look at the ingredients. Le's talk about the ingredients of TruBrain.

ADAM GOYER I think TruBrain is built to be pretty safe. As far as nootropics go, TruBrain is specifically designed to be consumer facing. The stuff that's in TruBrain is built to—its funded by a venture capital company. They're not going to expose themselves to anything that is dangerous and bad. There are a lot of nootropics companies out there that get into the weeds of things that are not regulated but maybe should be. There are supplements that start to bleed toward what a pharmaceutical would do and stuff like that.

ADAM GOYER When you start having powerful effects on the brain, a lot of neurologists think it's a close-loop system or, if you're causing certain receptors to fire, that's taxing something else. Nootropics are a balancing act. One needs to be educated about it, I guess. But I think if you're working with a doctor, if you're working with a neurologist, that's the kind of thing a neurologist could implement into their practice, to expand their profits and their depth of service to their clients.

ERIN MATLOCK Yes. Because then you're not dealing with just a sick population, which, neurologists are pretty busy. I know mine is. But we're looking at peak performance—cognitive enhancement, life fulfillment. John, you and I have spoken a lot about Heart-Math and layering that into a practice.

JOHN MEKRUT That's one of the, to me, one of the easiest ones. We all breathe. None of us breathe very well. It's a very simple, very inexpensive, easy to use, take-home device that you can monitor from your desktop. If you have a pro version, you can do it in the office and cloud based. You can monitor the client from home doing their practice whenever they do it. It's just an easy one to lay in. I would recommend that to any practitioner. A half an hour, you're done and off they go. I don't think anyone can doubt the benefits of proper breath control. It's been around for thousands of years.

ADAM GOYER I had a guy in my office. He goes, "what, so you don't know how to breathe?" I'm like, "yes. It turns out that most of us have forgotten how to breathe properly." [*Laughter*] You're supposed to breathe out—you're stomach is supposed to go out when you breathe. Breathe in, stomach out and vice versa. Right? Most of us, unless you've done a lot of yoga, that's reversed. So, anyway. [*01:16:58 CROSSTALK*]

JOHN MEKRUT When you get—when somebody's nervous, they say, "Take a deep breath!" It's entirely a 180 from what you should do! It's just kind of remarkable in a way. It's not about taking in a deep breath. It's about taking in a slow breath and exhaling it powerfully. That's what's going to calm you down. We've got it backwards. So, yes. We've forgotten how to breathe.

ERIN MATLOCK We talked about this with the Ask The Psychologist Panel too, because one thing we know and I don't know why I can't get the world right. John, you're always my person. It's pranayama breathing.

JOHN MEKRUT Yes.

ERIN MATLOCK So what we want to do is stimulate that vagus nerve, right? And the way we do that is, you just said, we breathe properly with the longer exhale and as the wonderful Steven Porges has taught us that it needs to blow out. It needs to be longer. Then even the movement of the facial muscles have a connection to—they kind of talk to that vagus nerve. So we increase vagal tone, which then, again, helps us to regulate that parasympathetic activity—that way that we just exist in that chill-out state. Heart-math—EM-wave is what it's called—is one-way. There are others, but one device you can do and you can get certified from them as a heart-math coach and you can layer that into your practice or your business very easily.

JOHN MEKRUT Almost any business, if you think about it, from neurologists to chiropractors, to hypnotherapists. Whatever it may be. Think about coaching—sports coaching, too. I know I'm a Texas girl. I'm from Texas where sports is religion. So parents invest a lot of money from when the kids are really young into getting private coaching for these kids. There is a lot of neurotechnology that can be layered in there.

Can I do my five-minute rant on kids football?

ERIN MATLOCK We're going to leave football out so we have time to get everything in today. [*Laughter*] And then the other thing, Alex Doman is here too. The listening program that I went through, I became a provider. That is a nice technology that you can send the person home. When I took people through as a provider, and this is something I told Alex privately, what I liked is I do mindset coaching, but if I don't see the people for a week, that's a long time for them to fall back and to procrastinate, to fall back into old patterns.

JOHN MEKRUT To their bad ways!

ERIN MATLOCK Yes! We're human. We all do that. With the TLP, the Listening Program, what I noticed is, it prevented them from falling back. It kept them in a forward motion. That is a nice thing that people can layer in to their practice or their business. Then of course, neurofeedback.

CYNDE MARGRITZ We just layered in something new for us, is called the mind-mirror.

ERIN MATLOCK What's that?

CYNDE MARGRITZ The mind-mirror. It's based on Anna Wise's work—thirty years of brain wave profiling. But the nice thing is, you can use it in a bio-monitoring mode. It's been really enlightening for clients to see—you can look at their brainwave profile while they're meditating. You can look at their brain-wave profile while they're attempting to relax. You can introduce a stressor to see how their brainwaves respond to a stressor. Just from the perspective of giving people information back about this is how your body responds.

Actually, the system has the ability to look at thermal. So looking at finger temperature, look at skin conductants and look at heart rate. We can also use that as an assessment tool so we can see would breath work benefit this client? Which type of biofeedback would be the mot useful. It's a really great tool. It can also be used in—it can also do neurofeedback to actually train that awakened mind pattern that Anna Wise researched when she saw this common pattern among all these high performers and gurus and healers and even political leaders that she researched over thirty years. So it's got a good scientific basis.

ERIN MATLOCK Okay. I just put that URL up for everyone to look at, because it sounds pretty interesting.

CYNDE MARGRITZ If people are interested in the mind-mirror, it's the mind-mirror.com.

ERIN MATLOCK I think it.

JOHN MEKRUT I think...

ERIN MATLOCK Hold on. Is it—I found MindMirrorEEG.com.

CYNDE MARGRITZ There are a couple of different websites. I think the most informative is just the mindmirror.com.

ERIN MATLOCK Okay. Alright. Thank you. I lost the video for you. There you are.

JOHN MEKRUT Hopefully what your listeners are gathering out of all this conversation is that these are all self-empowering things. Neurofeedback, Heart-Math, Listening Program—they're about people paying attention to themselves. If you're putting on headphones and you're listening to the Listening Program twice a day, you're taking are of yourself. It's partly, you're involved.

JOHN MEKRUT I mean, yes, there is a process going on, but the very physical act of putting them on is taking charge of your own health. Going to a provider to get some neurofeedback is taking care of your own health. Using Heart-math. You're taking care of your own body and mind. It's all about involving the client in this conversation. They're at the center of this. It's not near my skills at my center. It's the person.

CYNDE MARGRITZ But let's keep facilitators.

ERIN MATLOCK Cynde, Jill says, "I attended a mind-mirroring workshop in the Netherlands. Is it now possible for a private person to buy the hardware?"

CYNDE MARGRITZ Yes. It is. There is a new version of the Mind-Mirror that just came out in the last two years.

ERIN MATLOCK Okay. Great. John, Alex Doman said, "Well put, John." Then, let's circle back to this lucid dreaming, here. We've had a little bit of a discussion in the chat while we were talking. Okay. So Lauren came back and then Sandy I'm coming to you. She says, "Your body thinks you're asleep so you can't move or do any actions but your mind is still awake and functioning." Then she said, "It's a lucid dream you induce directly from your normal waking state. You can move directly from being awake to being lucid within a dream environment. It stems from an ancient technique monks used for a calming and awareness technique.

ADAM GOYER I've heard of people with narcolepsy being able to do that. It's one of the ways. It's the only advantage of having narcolepsy is that you can drop from being awake right into lucid dreaming.

JOHN MEKRUT Wow.

CYNDE MARGRITZ Part of the goal of neurofeedback training or the biomonitoring and seeing what your brainwaves are doing is to be able to have the agility to go in and out of different states, so I would think there is a possibility of neurofeedback to help in that arena because you're going to have a flexibility of state shift and maintenance of state. If you can find out what state you're in for lucid dreaming, Just an idea.

JOHN MEKRUT It's usually California.

ERIN MATLOCK [*Laughter*] There are some others now. Nacho Arimany is here. Hi, Nacho! Co-creator of In Time over at Advanced Brain. John, he also says he appreciates that last comment from you.

ERIN MATLOCK Okay, so as we're kind of finishing up. go ahead. Sorry, John.

JOHN MEKRUT No, no. I was just saying thanks.

ERIN MATLOCK I'm going to just check for the last few questions so we can get everyone. From Sandy, "Can neurofeedback stimulate the vagus nerve to increase the parasympathetic system?" She has unknown gut issues and she might be referring to the fact that the vagus nerve travels all the way from here down into our gut and back.

ADAM GOYER I think you're better off—you'd be more likely to hit that with heart-math than with core, with central neurofeedback. Right? What do you two think?

CYNDE MARGRITZ I think you could do both at the same time.

JOHN MEKRUT Yes.

CYNDE MARGRITZ There is research showing that the synergy of the two. The Thompsons in Canada have been looking at using top-down and bottom up at the same time. There is this synergy of doing the heart-math with neurofeedback. The two of them are nice compliments of each other.

ERIN MATLOCK I'm also going to say, too, as a provider of the Listening Program of bone conduction. It works and then you're stimulating. You're working with that vagus nerve. Okay. I need to go back and catch a couple comments. "How long should providers take to address biochemistry first? Example, with nutrition, to maximize neurofeedback or other therapies?"

JOHN MEKRUT That's one of the first conversations I have with people. I'm not a nutritionist, so I would refer them to somebody, but I have very direct conversations about what do you eat? What is your diet like? Tell me what you eat on a daily or weekly basis. If I see red flags going up, I'm going to send them to somebody that can give them some serious advice. You cannot properly train your brain if you're eating junk food every day. I can work really hard. Cynde can work really hard at this. You're not giving yourself any advantage by putting garbage into your face.

CYNDE MARGRITZ We've seen clients who did the neurofeedback and didn't feel like it was taking hold, stopped after a block of sessions, changed their nutrition, and then the neurofeedback. Its as if the brain had done the rewiring but couldn't implement it. It didn't have the right chemical or nutritional components.

CYNDE MARGRITZ After they changed their diet, and changed their nutrition, it all kicked in afterwards. Very interesting. Nutrition is the key—a key part. How long should a person take is really going to be really individual. We send our clients out for a hair analysis to look at what's going on also with heavy metals. If there is some detox they could benefit from.

ADAM GOYER One of my doctor friends just texted me about wilds and I am going to see—He did a presentation on it. I'm going to see if I can get a link to it.

ERIN MATLOCK Oh, great!

ADAM GOYER Yes.

ERIN MATLOCK That's very interesting. Lauren said thank you, by the way. She's the one who brought it up. Okay. That brings us back to Ruth. Hi, Ruth! "Does neurofeedback help eliminate brain toxins?"

CYNDE MARGRITZ I think the general client experience is yes. We've had clients actually—we've worked with a number of chemically sensitive clients and they've actually feel like they're having a release of chemicals because they'll taste it in their mouth or something during a neurofeedback session. This is purely anecdotal evidence, but it makes sense if the brain is going into a self-healing mode that it would have the possibility of that.

JOHN MEKRUT Also, if you're helping to stabilize sleep state, we all know at this point how crucial good sleep hygiene is for brain health in that when you're asleep is when your brain is purging itself of the built up toxins during the day. Forming memories certainly part of its function, but it's also the macrofacias are out cleaning up the stuff that's been produced by cellular activity during the day. So shorting yourself of sleep is one of the most dangerous things you can do for cognitive health. So I would suspect that by regulating sleep state you probably have a—gain an advantage in purifying your brain tissues from toxins. That would make sense to me.

ADAM GOYER Erin, I have a 7pm meeting that I have to get across the city for.

ERIN MATLOCK Yes, go. We are going to wrap up. Let's do, I think one more that's on here, that's from Regina. "I have mercury in my brain. Wouldn't this affect how well neurofeedback works?"

CYNDE MARGRITZ Yes. Similar to the discussion we were just having.

JOHN MEKRUT Yes.

ERIN MATLOCK Yes. I like what John said...

CYNDE MARGRITZ [1:29:13 CROSSTALK] benefits you're able to slowly and safely detox the mercury under a physician's supervision.

JOHN MEKRUT Yes.

ERIN MATLOCK Yes. That's important. Work with your physician. Okay, everyone. We're at 6:30 my time, which is 9:30 on the East Coast. It's very late or early around the world, so I want to thank everyone for showing up and being in the chat and asking questions. One again, Adam Goyer is from Blak Box Group and it's BlakBoxGroup.com.

ADAM GOYER Spelled BlakBoxGroup.com.

ERIN MATLOCK Okay. Then I think John, is yours in your—John Mekrut is TheBalancedBrain.com.

JOHN MEKRUT Los Angeles, California!

ERIN MATLOCK Then, Cynde Margritz is PeakNeurofitness.com

CYNDE MARGRITZ Alexandria, Virginia.

ERIN MATLOCK Then you also do globally, too.

CYNDE MARGRITZ Yes. We do.

ERIN MATLOCK Alright everyone. tomorrow is day four of brain summit. Then Friday we finish up. So again, everybody is coming in saying thank you. "Thank you guys for spending the evening with us." I think we have multiple physicians on with us tonight. I would love to talk more with the physicians. I would love to have a panel between you guys and the doctors so that we could [*1:30:41 CROSSTALK*]

ADAM GOYER I hope I didn't say to [*1:30:43 CROSSTALK*]

JOHN MEKRUT [*Laughter*] I was just going to say, I kind of stepped over a couple of lines! I apologize to the physicians on the call!

ERIN MATLOCK No. I think it's great because if they're here, they want more for their clients.

JOHN MEKRUT They want more. Exactly. Exactly.

ERIN MATLOCK Yes.

JOHN MEKRUT I appreciate it. Thank you, audience, for being here. All of you folks tuning in to this. This speaks of a thirst for knowledge about this and how it can help you, so thank you all for being here.

ERIN MATLOCK Thank you, thank you, thank you for spending your evening with us talking about neurotechnology. I am Erin Matlock and we're going to go ahead and end the broadcast. Good night everyone.

CYNDE MARGRITZ Good night.

ADAM GOYER Ciao. Thank you.