

Dr David Rabin - Radical Remedy Podcast Transcript

0:00:01 - Dr Chloe

Hey guys, I hope everybody's doing well. It's Dr Chloe here and today's conversation is super exciting. I am talking to Dr Dave Rabin, who is the founder of Apollo Neuro, which is a really incredible company that has a wearable device that helps regulate your nervous system in so many different ways. Remy and I have been absolutely loving it, but beyond that, he's also an expert in psychedelics and using psychedelics for mental health care, and I really found this conversation so interesting. I was kind of blown away. I totally was fan-grilling over all of this information and the potential for what we can use.

Psychedelic sport in terms of the mental health field is just truly incredible. He has a podcast called the Psychedelic Report. I highly, highly recommend you guys check it out. He's so knowledgeable, his guests are so informative and the research coming out on this, as you will hear more in this podcast is absolutely tremendous. So it's super duper cool. Please go check it out and follow him. Dr Dave, thank you so much for joining me. It's such an honor to have you here. One of the things that I was most curious about is how you ended up on the path of studying psychedelics. What drew you to this line of field in your industry?

0:01:15 - Dr Dave

So when I was actually in medical school this is going back to 2012. Actually, before that, I was always interested in consciousness and meaning making and sort of this idea of like what drives us, what makes us sick and then what makes us really excel and reach our full potential human beings. Because we see that when we look at what people go through in their lives and the challenges that people face, oftentimes it's the same kinds of things that make us sick and that actually make us really really strong and help us to find our potential. It's, it's challenge, right, and if we're not challenged, and especially if we're not challenged, then we often don't grow. And one of the key factors that stood out to me in that was safety. If you're challenged in a safe environment, then you're much more likely to excel and actually develop and grow in a positive direction and constructive direction as to your full humanness that you can achieve in this life. And if you're challenged in unsafe or multiple unsafe environments without support, then we often don't and we get stifled or or squelch. Our potential really doesn't bloom, and so that always interested me. But I, you know, I was always just pursuing that and then I thought I was, I would always.

I've been studying chronic stress for as a as a physician and neuroscientist for probably the better part of 20 years, and I was really interested in this performance and recovery stuff and so I started studying dementia and age related disorders originally, so chronic stress with aging on the cellular and molecular level and I was planning to actually pursue neurology or ophthalmology vision science as my primary specialty, because that was most of the research I was doing, which was really fascinating to me. But then in 2012, I had a really great friend who I was spending a lot of time with a fellow medical student, who knew that she wanted to be a psychiatrist forever and she kept telling me over and over again whenever we'd hang out she's like Dave, you make a great psychiatrist. But at that time, in the field of medicine, psychiatry was really discouraged. It was looked down upon and of course it wasn't discouraged amongst the psychiatry folks, but a lot of the other medical field just kind of talked about psychiatry as guesswork medicine and that was not something that was particularly interesting to me. But in that year, my friend, I was about to finish medical school and choose my specialty, which at which point it's very hard to switch to another and you have to redo training and all that. And so I was kind of waiting because I was uncertain about what I wanted to do.

And then my friend sent me my medical school friend sent me 10 or 12 of the leading publications that had come out in psychedelic space over the last prior 15 years.

And as I was reading through these publications which I'd never seen before from people like Matt Johnson, Roland Griffiths, robin Carter, harris, these folks I saw the incredible, incredible science they were doing and it was like top tier science published in top tier scientific journals and it really highlighted this potential of paradigm shifting treatments that were entering into mental health, that were inducing long term healing health outcomes that were very significant. And there were very significant long term remission in some cases with people with severe mental illness who hadn't responded to anything else with just a few treatments and psychotherapy. And when I saw that it was just everything kind of coalesced together for me and it was like, okay, now I can fulfill my passion of studying consciousness and meaning making and resilience. And I'm not going to be in the context of the field of psychiatry, because the field of psychiatry is clearly transforming for my eyes and within 36 hours of reading those papers, I knew I was going to be a psychiatrist and I went that path and I started studying psychedelics.

0:05:12 - Dr Chloe

And that's amazing. I love that. It's always so funny. I mean, with Chinese medicine, one of my teachers would always say like it's, you know, it absolutely has to be a calling, otherwise it's just never going to work because it's so hard. And I feel like something like this like comes along and like, once you know it's right, you just have to jump into it and you're like this is it?

I also think that you know one of the reasons I'm doing the podcast is looking to find ways that we can be more resilient and also looking at the ways in which you know the reasons in that we are having such massive health crises in our society and what we can do, you know, on an individual level, and particularly in our homes and particularly with our children, in order to start shifting that dynamic and then start making change outwards, as opposed to looking for the powers at the to change. This does not seem very likely at this juncture. I love what you're doing, so tell me a little bit about. So. One of the things I'm pretty obsessed with is this idea of building mental health and mental resilience. How are you seeing these psychedelics work within the brain? And obviously each of them has different pathways. But what are you? What are you working with the most? Is there one psychedelic that you're exploring the most, or how's that looking?

0:06:29 - Dr Dave

Yes. So psychedelics are a complicated study right now from a legal perspective, because the only legal psychedelic medicine that's available to us as licensed clinicians in practice is ketamine, and ketamine is one of the most unusual psychedelics of all of them. It was originally discovered for anesthetic purposes or pain relief purposes and it was found to be a very gentle but extremely effective and quick acting anesthetic that was used. Most people think it was first used with animals, but it was actually used to evacuate wounded soldiers from war and the battlefield to reduce shock, because if you start thinking about how you've just been shot when you're shot, then you'll bleed out really quick and your chances of survival decrease dramatically. But if you get a shot of ketamine and you go and you dissociate from your pain and the fact that you've been shot, then you actually have a chance of getting picked up and dragged to survival and to a medic and to be saved. So that was a huge way that ketamine was used. And then it was also used in the OR for anesthesia, and this is both at much higher doses than we use with people for mental health issues.

I think it was first observed to have mental health implications in the late 80s and 90s but wasn't actually used on mass for depression and PTSD until more recently in the last 15 or 20 years. So ketamine is the main focus and I am a ketamine assisted psychotherapy trained practitioner. That's a big part of my clinical practice and I also train other clinicians to do that

work. But I'm also trained in the MAPS MDMA therapy protocol and while we can't yet administer MDMA in the clinic to our patients for PTSD, MDMA just completed phase three trials, which is very exciting, and we just did an expose on that called your Brain Explained, which you could find also on Spotify and Apple Music, and it really breaks down what it means and how MDMA works to induce these rapidly and radically transformative healing experiences for people who have never responded to any other treatment. And they work in different ways and do you want me to dive into more deeply into the mechanism?

0:08:50 - Dr Chloe

Oh, I definitely want to hear about the mechanism.

0:08:54 - Dr Dave

So interestingly, these are both what many ketamine and MDMA are, both what many people would call atypical psychedelics.

MDMA stands for 3,4-Methylenedioxymethamphetamine .

It is very much a methamphetamine analog, but like a methamphetamine it induces release of neurotransmitters like serotonin, norepinephrine and many others in the brain rapidly.

And MDMA is different than standard amphetamines like Adderall or Ritalin or methamphetamine or crystal meth, because it induces that burst release of serotonin and other neurotransmitters specifically in the emotional cortex of the brain, which rapidly increases feelings of safety, empathy, introspection, self-reflection, looking inside ourselves and another term that we don't commonly use in our day-to-day lives, but it's very important and it's called interoception, the awareness of our bodies. And so MDMA has become a very interesting tool because people who have very severe trauma and severe PTSD, like the folks in the maps MDMA FDA trials with 17.6 years of untreatable PTSD, are responding with like an 88% response rate. 67% are no longer meeting diagnostic criteria for PTSD after just three doses of MDMA in 12 weeks of therapy in the most recent phase three trial, which is astounding, and I just want to reiterate that you said 77% with three doses 67% no longer meet diagnostic criteria after three doses and 42 hours of psychotherapy over 12 weeks.

That's the most. That's the most. That's the most. That's the most I mean, like intractable cases also right, the most part yes. Yeah.

0:10:51 - Dr Chloe

Pretty astounding.

0:10:54 - Dr Dave

Yeah, it's astounding. I mean just to put that in perspective. This is the most effective treatment for any psychiatric disorder with the highest response rates of any treatment we have ever seen in the history of psychiatry. So that's a real big deal, and the fact that it's just three doses separated over two weeks apart, over 12 weeks, with a whole bunch of therapy involved, really speaks to. And the fact that people get better after the treatment has stopped and more people continue to get better, which has also never been seen before in psychiatry, is really paradigm shifting and I think it really helps us to understand what the ancient forefathers of Western medicine and Eastern and tribal medicine have been talking about for thousands of years.

Hypocrisies and mymonities were two of the Western medicine forefathers. And then, going back to Eastern and tribal culture, they all have talked about this and what they talk about is that the source of healing for any illness, especially chronic illnesses, must come from the person seeking to be healed. Right. We have to look inward to heal ourselves and that's where

the source of our healing comes from. It doesn't come from out here. Out here is where we have tools and we have help and guides and people who help, steer and facilitate and get us on track.

But the actual healing part comes from within us and the current medical paradigm with medications like SSRIs and antipsychotics and methamphetamine drugs and other things that you take one or multiple times a day every day, do help some people, there's no doubt about that but there's a lot of side effects oftentimes and they do something psychologically to the patient that is very complicated to treat, which is it creates an association between me needing something outside of myself that I must rely on every day to get, achieve and maintain my treatment outcomes.

And even the studies show that if you stop taking your SSRIs with depression, chances are you're going to relapse and you're going to continue to relapse even more. Every time you relapse again and every time you stop taking your medicine, your relapses can get worse and become more frequent. And that's a really discouraging statistic for people and it's not really the goal, because the goal of our treatment is to facilitate people healing themselves and getting better long-term, not making them reliant on stabilization medication, which is effectively what the field has been focused on since the advent of biological psychiatry in the 70s and 80s. So that is really the paradigm shift that we're facing right now, which is extremely exciting.

0:13:38 - Dr Chloe

It's amazing. I mean, what you're talking about in terms of the efficacy and the safety is just mind-blowing. And then, to add to what you're saying, I completely agree in terms of empowering patients to take control of their health and be aware that their bodies have the capacity to heal instead of relying on an outward drug if they're farcical or even doctor long-term. That's one of the things I always say to my patients. They're always like so you want me to come back every week? I'm like I don't want to see you. Look, I love you. Get the fuck out, go and enjoy your life. I want you to do well, check back in, let's see how you're doing and make sure you're still on the path towards healing. But I want you to take accountability for your health through the actions that you take day by day, and I think that you recognize that you're like the.

0:14:26 - Dr Dave

You're like the featured act, right You're. If the healing is a is the show of our lives for many of us, right, you're the. You're the, the leading performer, the leading actor in it, right, and that's. And you're the driver. We want you to feel, empowered, at the center of that experience.

And going back to what I kind of touched on just briefly earlier that you really wanted to hear about, which is the mechanism, almost all studies of psychedelics have looked at how they're all different and they are different molecularly speaking, but what's really interesting about them is their similarities. Their similarities are much more interesting than their differences, and the similarities are what I just mentioned earlier, which is they all help in. Seemingly, regardless of their different molecular appearance and the way they act on the brain, they all seem to induce a state of consciousness when delivered. In this safe relationship that we have with our doctor patient relationship, or our clinician therapist patient relationship, or even with a lineage trained shaman, they have this incredible power to restore agency and autonomy to the individual in their own healing experience, and that's regardless of the molecular composition of the medicine. It's still amplifying the therapy experience by amplifying the safety pathways in the brain making us effectively feel and remember that we're safe enough to heal, and allow that process to jumpstart on its own.

0:15:51 - Dr Chloe

I love that. That's one of the things I even say about CBD and I know you study cannabis a lot as well. But CBD, I always tell people it's like it gives you some space in order to heal and in order to start enacting some of these positive activities towards health and towards mindfulness. It's not like an overnight game changer, it's not a one size fits all or whatever. I'm curious to you guys what kind of psychotherapy are you doing? I've been in EMDR for a while and I love that. I'm obviously an acupuncturist and doctor of Chinese medicine. I know a lot of practitioners who were looking into getting licensed and looking into the regulations in terms of how we could potentially use psychedelics to support our treatments, and I think there's some beautiful synergy there in terms of, obviously, the knowledge that Chinese medicine has about the body and the body's storing trauma and how it all integrates together and how we can move things through the body through energy work or needles or whatever. But I'm curious how you guys are stacking it suffered with the therapy and how that's working.

0:16:59 - Dr Dave

Yeah, I'm more trained in traditional western psychotherapy techniques but I have studied South American tribal medicine techniques and so I pull a lot of indigenous shippebo practices into my practice because I find them to be. They're all. When I went down, when I went and studied with them, everything was about repairing and rebuilding self-trust as a way to heal trauma, and that just really resonated with me and their techniques are so simple. It's they. Basically, when I went, when I went down there, the thing that stuck with me the most is they have these four practices that have now become central to our practice, which is what they call the four pillars. We call them the four pillars of self-trust, which are self-gratitude, self-forgiveness, self-compassion and self-love. And if you practice those things every day, even just saying them to yourself or writing those words down, you don't have to do anything else but just saying those things and writing those words down, it puts them into our consciousness and helps us focus on them as a priority. And once you start doing that regularly, number one, it makes us realize how little we do that and number two, it actually repairs and rebuilds and strengthens our foundation of self-trust, which is the foundation of healing. So that is a really great tool that I love to use. And then then of course I do bring in a lot of techniques from Eastern and Ayurvedic and yogic practices and breath work techniques and those practices, but I'm not trained in Chinese medicine or acupuncture or anything like that, so I don't do that kind of work for good reason. But I think it's very effective and bodywork in general, like shiatsu and acupressure techniques, I think, can be really powerful to help release tension and trauma that's stored in the body before, during and after psychedelic experiences. And even in the MAPS trial they teach consensual, gentle bodywork techniques that can be used with MDMA therapy that are very effective and very useful.

My practices are mainly about how do I motivate you to want to heal and participate in your own experience? And then, once you're which is called motivational interviewing. And number two, how do I which is really it's a really cool technique Maybe we can talk about later and then number two is once you're motivated to do this work because it's not, it's not always easy and it's often not easy then, once you're motivated, how do I give you a framework of understanding, feeling and behavior that helps you to have like a complete view of where you're going, like where is the path and how is it sustained for you? Because we all have these different paths, like life is like. There's like the same path we always walk, which we could call our habits, and then there's every other path you could take and there's like infinite paths. So how do you know that you're on that path that's leading you to healing? Well, you give people an understanding of what that path looks like and then you give them an understanding of what it feels like safety, and then you give them an understanding of what techniques to do, which are mainly cognitive, behavioral therapy techniques that work really well and are tried and true for p- everything from PTSD to anxiety and OCD and depression and insomnia, and we when p-, but those require a little bit more effort. So we usually start with the feeling and the understanding and then, when people are asking for, they're saying hey, what can I do? What can I do already, doc? And then we're like, oh well, by the way, I have all these

techniques that you can do, and these techniques on a daily basis, which take no more than five minutes a day, just help you stay on that path and retrain and rewire your brain to reinforce what you're learning from these experiences and prepare you to go in so your body's like more ready for the process.

That happens with healing, which, again, just like just like fixing a broken leg or a bad cut in the ER it always hurts before it feels better. Right Like Mike and Annie Minhoffer have a great the some of the leading trainers at MDMA therapy for maps they, mike, used to be a ER doc. It always hurts when you're cleaning the wound and when you're sewing it up before it feels better. So we do everything we can as a therapist to help decrease that pain and discomfort. But you have to expect there's going to be some of that because you're opening, you're reopening a wound.

So it's really, you know, making sure that people understand this is treating mental and emotional injuries no different than treating physical injury. It's the exact same thing. It's just we're doing psychosurgery, they're doing physical surgery and we have to, you know, not ignore the fact that there's an exposed and possibly festering gangrenous wound down here in your emotional body that hasn't been addressed. And we're going to address it, we're going to get to the bottom of it and we're going to get you standing through. I love it.

0:22:06 - Dr Chloe

Yeah, it's really. It is a wild ride being a human. So I want to. I want to get to Apollo Narrow because I think that it's a really really fascinating device and something that people will be really interested in, especially parents who are dealing with stress, or even kids who are dealing with stress and irritation focus issues, which is so prominent right now. But just one last thing I would. I'm just curious what like what do you, where do you see the psychedelic sort of revolution headed and what would be your dream for the next five to 10 years in terms of where this research is going and what we might be able to see clinically and in our population?

0:22:46 - Dr Dave

So I think there's a lot happening and I can't summarize it all for you, but I can tell you what most excites me, which is that we just is it up until this point, we haven't had any understanding of of, in large part, how these medicines are inducing this long term improvement in people and how to measure that without just surveys. Right, all of these studies of people with psychedelics have just been survey based outcomes and that's fine, but we need objective measures. We need ways to actually actually track people on their healing journey. Where are they when they start, where are they along the way and are they moving in the direction we want them to? Or maybe not, because not everybody responds. Even though lots of people respond, not everybody responds the same and some people do better than others, and it's arguably a very expensive treatment. So we need better information about this and the insurance companies are demanding it to reimburse it so effectively. Insurance companies want to know, before we spend 10 to \$14,000 on your ketamine or your MDMA therapy experience, we want to know that there's a really good chance that you're going to respond and not be a not responder. Even if there's only 12% not responders, we want to know that there's a really good chance you're going to be in that 88% responder group.

So back in 2016, I started a study group with Rick Doblin's blessing, which is a collaboration between MAPS, yale, the Board of Medicine, our non-profit medical board, modern Spirit, joe Tuffwer's non-profit and USC and Arizona State University to evaluate some of these biological characteristics that were happening and might be changing with psychedelic treatment. And we started out working with MAPS because MAPS has the Multidisciplinary Association for Psychedelic Studies that's been pioneering and pushing MDMA through the FDA trials for PTSD. They have the most highly controlled environment for people to experience MDMA therapy. This three doses in 12 weeks and they're seeing these incredible response rates. And

so we thought well, if we know that MDMA is clinically reversing the symptoms of trauma in 67% of people within 12 weeks or so, and that number increases over time after treatment has stopped, which is very unusual, and we measure that by looking at the DNA Can we measure it by looking at what's happening to cortisol receptor genes as one example that we know are being modified with I don't want to get too complicated, but they're epigenetics with a code on top of the cortisol gene that tells it to turn up an expression, or turn down, an expression is being modified which is called methylation, and this happens in our genes all the time, every moment of every day.

But we know that this one specific gene, one specific cortisol receptor gets hyper methylated, which decreases its activity in people who have had PTSD.

So MAPS has all these PTSD participants who have had treatment, resistant PTSD for over a decade going through their trials in this highly controlled setting with just MDMA, and so we said can we collect some of their DNA samples from saliva, just have them spit into a cup before their treatment and spit into a cup after their 12 weeks and we'll see if the markings on their cortisol receptor genes that were caused by trauma are actually changing after the treatment because they're clinically getting better. So we should see something. And that study was just published in Frontiers and Psychiatry five years later in this past February, and we actually found it and we saw that MDMA Assisted Therapy over 12 weeks is not just clinically reversing trauma in these people short and long term had long term being a year but we're seeing that it's actually reversing the epigenetic markings that are on these cortisol receptor genes that are caused by trauma. And the kicker is the amount of change to that cortisol receptor is directly proportionate to the amount of clinical outcome.

0:27:15 - Dr Chloe
Wow, that's amazing.

0:27:18 - Dr Dave
So what that means is that we can start. This is the first study of its kind to look at this and actually show this kind of result, and it's just the first. There's going to be a lot more before we actually get to what we can do in five to 10 years, but what this means is that we have an objective biomarker that can be assessed by you spitting into a cup when you go into your psychiatrist's office. Then in five to 10 years, you'll go and you'll do. You'll say, hey, I'm not feeling good, doc. And they'll be like, okay, let's do the depression workup, do PTSD workup, ask you all the questions, and then they'll say, spit into this cup and then they'll run your epigenic code. They'll come back to you like two weeks later or whatever.

This is probably going to be in the five to 10 year range and rather than saying, you're now what they do for everybody, which is now, here's your SSRI or whatever you know, multiple drugs or psychotherapy for the next 10 years, yeah, for your whole life. Right, here's this drug you're probably going to have to take forever. Now, five to 10 years. We can envision a future where they're going to hand the doctor's going to hand you a prescription to remission, right. So they're going to say within 42, within 12 weeks, 42 hours psychotherapy and three doses of MDMA you have a 95% chance of no longer meeting diagnostic criteria for PTSD. Right, for depression could be.

You do their sample within 20 weeks and 12 doses of ketamine you had 95% chance to get to remission and nothing could be more hopeful for people than that, because that is really the paradigm shift, right, that goes from you're going to be sick for life, drugs for life, to you actually have a hope of curing this, and it starts to invite something that's controversial but important to talk about, which is like what we were talking about back in the 40s and 50s, right when antibiotics were invented and infections were terminal illnesses. Right Now, you know we that when antibiotics were invented, we're curing infections all of a sudden, right, people aren't

having syphilis for life. It's incredible. And now we can do that, and we're starting to do that with psychedelics and we can measure it, so people and the field as a whole can start to have hope around using the cure word for mental health and mental illness, and that is the thing that I am personally most excited about.

0:29:48 - Dr Chloe

It's truly mind blowing. I mean, I've had so many patients and friends who have struggled so severely with mental illness with you know, as you said, sometimes SSRIs and barb resuticals can be helpful. You know, I've seen much greater change when people are more empowered through Chinese medicine mind body medicine, you know, taking control of their health through their diet, exercise, lifestyle stuff. Obviously, that's going to what I see is a much more long term change that's much more sustainable. But I've also seen SSRIs absolutely demolish people whose mental health and cause severe suicidal ideations and then also really dangerous cocktails being prescribed to patients that are very terrifying as a practitioner and as a human, to see the impacts of these on society. So to think that some of these people who are dealing with these really severe cases I mean you know how many homeless veterans are on the street these days, you know dealing with PTSD we send these men and women off toward, you know, whatever your politics are, if you're going in order to do something that they believe is good, and they come back and they're traumatized and don't have any support system. So it's it's incredible to think of what this might be able to do for our society long term and it's really, really exciting. All right, we don't have a shine left, so let's get to Apollo.

So tell me about Apollo. Why did you make it? What does it do? Who is it good for? Let's get it.

0:31:18 - Dr Dave

It's a great segue that when you mentioned veterans, because Apollo is a wearable technology I'm wearing on my chest here, but you can wear it anywhere on your body and it well. It actually came from my work with veterans at the University of Pittsburgh in the Department of Psychiatry, and we were just seeing so many veterans not getting better with the treatments we were taught to use, and so we, like over 70% of people, were not getting better long term with our current treatments, and so it just forced me to look outside the box and try to, as a researcher and a clinician, try to figure out, well, what else is out there. Of course, that led me to everything under the sun like biofeedback and meditation, mindfulness and yoga and the Eastern Chinese practices and the tribal practices, but it also led me to MDMA therapy, and when I got trained in MDMA therapy in 2016, what I witnessed was effectively what the animal studies were showing, which is that MDMA seems to work by amplifying molecularly amplifying the safety pathways in the emotional brain, and that PTSD, in almost in its entirety, is a disorder of a dysregulated fear response in us. And so what heals? Overwhelming fear, safety, overwhelming safety, and that's what it seemed that MDMA was doing. So I went back to the lab after I did my training and I took that with me when we were all taught in our psychiatry and mental health training and even in medical school that the safe, trusting relationship which we call the clinician-patient alliance is the single foundation of healing for people. So that was already kind of seated within me. But when I saw MDMA working, I was like this is just, that's like this on steroids. It's like a super amplification of the therapy the safety of the therapy.

So I started asking the question and pulling on these threads of what else makes us feel safe. That's natural. That doesn't require you to really do anything to get the benefits. And the single thing that stood out were soothing music which you can just listen to and have on in the background, and most of our patients did that already. And the other one was soothing touch. And as I started to pull on that soothing touch thread, I realized that we're all not getting enough soothing touch, we're all not getting enough hugs, and our patients were even more so. And so what did they do? They got service animals and pets and they tried to spend more time with their families and things, but a lot of it was like pet based and we saw that how

powerful touch was at kind of restoring balance to their nervous system and boosting vagal tone and basically boosting activity in all the recovery response parts of the body and decreasing activity in the threat response parts of the body that were overactive in people who had had severe trauma.

And then in the lab we figured out okay, well, we know that soothing music does what it does. What if we could compose music for the skin or for the body, instead of the ears, that felt like a hug or felt like holding a purring cat or a dog or felt like somebody like holding your hand on a bad day? And when we experimented with that for a couple of years, we actually found it and it was possible. And not only was it possible, it was really effective. And it was effective and healthy people who had never been diagnosed with anything at improving heart rate variability. The first to Apollo is the first technology that just by putting it on it improves your heart rate variability within minutes and it can improve your cognitive performance, your physical performance and recovery. And in our early studies, which you can find some of the data on our website, we're seeing very promising results for everything from eight people who are struggling with ADHD and PTSD, and now we have much bigger trials going on at the VA and at Michigan State University and many other very, very you know world renowned research organizations that are running studies of this.

Because, number one, while psychedelics are great and have incredible potential to heal people, they are extremely time intensive for the clinicians and the patients.

That require a lot of effort. They're very expensive and the only one that's legal right now is ketamine, and it is also expensive and it's not in the ketamine therapy protocol. Where you do the psychotherapy with ketamine is actually are pretty hard to find, because only 5 or 10% of people nationwide who do ketamine therapy do it with the psychotherapy part, which is important, as we talked about earlier. So, to try to solve the access to care problem, we released this technology in January of 2020 as a wearable you can put anywhere in your body. It's used by children, it's used by adults, it's used by elderly folks, pregnant women, people who are struggling with post harm depression and, effectively, veterans tons of veterans and anybody who's not a good candidate for medicine can literally just buy this and they can get some of the same benefits that people get in terms of health safety in your body. That helps to jumpstart the healing process we were talking about earlier.

0:36:26 - Dr Chloe

Well, I think it's important to note that, even those who are on medicines, this is something that can be a great supplement and, as I was saying, with CBD, it can give you some space for additional healing, where you can start moving in that direction and taking a little bit more control about your health and making those decisions and saying you know I'm going to wear this and you know it's a small step. You know, like I mean, it's an important product but like in terms of like the self empowerment it's like this is something I'm doing every day for my health to, you know, take control of that instead of just looking outside of me. I mean, it's a device, but it's still something that you have to choose to do. I think it's. I think it's really fascinating. Especially, I've learned so much about just different frequencies and vibrations and how healing that they can be, and especially with children today, like that's that's pretty much my whole mission is.

I'm terrified at the direction of the health of our children and, as a quote unquote bio hacker, I always sort of get on my rant being like I don't really want to live to 180 if I'm going to have to watch the demise of our children's health. So you know, so many children today are struggling with attention disorders, anxiety. I think I saw earlier 30% of children from 18 to 25 have some sort of mental illness. One out of five people in America have some mental illness. I mean, it's just like having something at the ready that can help support you with your sleep, with your energy, with your focus. You know, it seems like such a versatile device that's really, really

effective. One of the things also interesting is leaving it here I got to send you, I'm going to send you some information on acupuncture points that are right here, because they're really powerful spiritual points also.

0:38:13 - Dr Dave

They are and that was actually a part of the original study was. You know, we realize it works anywhere, but there are certain parts of the body that actually work better than other parts, and the chest is one of them, the dense bony parts, the inside of the ankle, which is also a very important acupoint, and then the wrist the underside of the wrist is very important acupoint. And so there are certain parts of the body that work better. And I think what's really interesting about Apollo is it is a tool for that experiential learning and the control together. So it by itself, even in in double blind, randomized, placebo controlled trials people don't even know what vibrations are getting it still has an effect that's measurable in the lab within two to three minutes. So the effect is real. Even if you have no idea what frequency you're getting, what vibration, or whether it's placebo or active or no vibration. The effect is real. It's real on performance, it's real on your cardiovascular health, it's real on your sense of calm and that is unequivocal. We know that, and we know that with music too. So it's not, it's not foreign to us, it still is. This is sound waves, just like the sound you listen to. It's just at a base frequency that you feel more than you hear.

But what's even more interesting is that when you are, especially as a child, when you're struggling with anything, we feel out of control of the way we feel. And one of the single biggest things you can do for yourself that ancient traditions teach, is take control of your breath. Right In any moment. If you're feeling out of control, just focus on paying attention and to your breath and just feeling the air come into your nose, mouth and lungs when you choose to take a breath and then feel it leaving when you choose to exhale, and that single act, which seems so simple, literally instantly, almost instantly, grounds our minds back into our bodies and helps us to be present by reminding ourselves what we have control over. It's so simple.

Anxiety itself is really just spending our precious time thinking, which we only have so much of thinking about things we don't have control over. Then we feel out of control and then our anxiety goes through the roof. So if we just direct our attention to things we do have control over, which is like our breath and where all those body techniques come in, and these tribal and Eastern techniques and probably a lot of the stuff you do. That is so powerful in and of itself, and so, of course, you don't need to use something like this. But for those of us who have never learned these somatic body techniques, who have never learned how to breathe properly, then we often are breathing rapidly and fast and we're stressed out and overwhelmed a lot of the time in a lot of the things we were doing during the day.

So you could be out socializing with your friends and you start to realize you're feeling restless and anxious. You start thinking about what other people are thinking about you when you're supposed to be having fun and enjoying yourself and that's real and pleasant. Or, worse yet, when you're about to get on stage to give a talk or a presentation, and then all of a sudden, you just notice the vibration of your Apollo and it's like wait, I actually have the ability to feel calm in this moment. I don't even remember what that feels like. I can feel calm and in control in a situation that I only have associated with threat and anxiety in the past. And then, all of a sudden, experiential learning, your body's teaching our brains I can feel calm now. So that means I have the power, I can do it. That restores the healing right back to the center.

0:41:52 - Dr Chloe

Yeah, it's a choice. I was reading the other day there's just a statistic that said that a new neuro pathway takes 200 repetitions before you form that neuro pathway. But play will create the same pathway in 10 repetitions. So I feel like it's sort of similar when you're looking at that experiential learning, where you're to the play because you're sort of you're feeling that you're

engaging in it mind and body, and then you're able to get back to it and feel that pathway again and sort of probably wire that pathway in your brain a bunch faster.

0:42:26 - Dr Dave

Exactly, and that's all learning. We talk about it in fancy terms like neuroplasticity and that kind of thing, which is real, but neuroplasticity is learning and it happens every moment of every day. So every time we decide to do the same thing the way we always did it, we're reinforcing that pathway and making it stronger, and every time we choose to do it a new way, we're learning a new way and we're rewiring our brains at every moment. What could be more powerful? Right, and that recognition is like. We're just constant learning machines, and what we choose to allow in and to do with our allow in meaning what we choose to pay attention to and what we choose to do, which is what we put our intention on, where we output our human energy, is literally what dictates and manifests our reality. What could be more powerful than that to understand?

0:43:14 - Dr Chloe

It's amazing. I love it. Yeah, I think the Apollo has such profound effects and I think it's so helpful for adults and for kids and kids like my son, who is nonverbal and can't communicate a lot of things and sometimes he's frustrated and we don't know why. So I can put that on him and it's like it's like a blanket of calm. But I was just at a conference for his disorder and I was just watching all of the kids just eating junk food and so dysregulated and I've always just wanna grab them and hug them, which is part of what the Apollo actually does. But, all right, I think we're running out of time so I am going to call it here. But thank you so much. It's been so much fun talking to you. It's amazing how much you have accomplished and how many different pathways you're going, and it's really, really been a fun conversation. So thank you so much for your time.

0:44:11 - Dr Dave

That's my pleasure. Thanks so much for having me,

Dr Chloe

Of course.