

## Bulletproof Radio #729

Announcer:

Bulletproof Radio, a state of high performance.

Dave Asprey:

You're listening to Bulletproof Radio with Dave Asprey. Today's episode is going to be a ton of fun because we're going to talk about psychedelics. We're going to talk about stress. We're going to talk about anxiety. And we're going to talk about vibrations. And no, I don't mean like having good vibes, although we'll probably talk about that too. I mean the kind of vibrations that physically affect your mitochondria, your cells, even your nervous system and things like that. Dr. Dave Rabin is a neuroscientist, board-certified psychiatrist, health tech entrepreneur, inventor, researcher, and a guy who's in clinical practice specialized in mental health disorders that are resistant to treatment, things like PTSD, things like substance abuse. And he's looked at chronic stress in humans for more than a decade and has some really good ideas on what we can do about it. So if you're ready to go deep, let's go.

Dr. Dave, welcome to the show,

Dr. David Rabin:

Thank you so much for having me, Dave. It's a pleasure to be here.

Dave Asprey:

Dave. You're a weird guy. You studied psychodynamic psychotherapy, cognitive behavioral therapy, interpersonal therapy, motivational interviewing, oh, and ketamine assisted psychotherapy, medication assisted psychotherapy and things like that. As well as, we're going to get into it later, the Apollo Neuro, the device that uses vibrations to hack the nervous system. It's pretty esoteric and pretty wide ranging.

David Rabin:

I think a lot of people don't see how all of these things, sort of what they have in common.

Dave Asprey:

It's pretty esoteric and pretty wide ranging.

David Rabin:

I think a lot of people don't see how all of these things, sort of what they have in common. And for me, it was all about what you mentioned earlier, which is treatment resistant illnesses have always fascinated me. Consciousness has always fascinated me and trying to understand how and why we think and do the things we do. And ultimately throughout my medical training, I worked with a lot of people who ... We were told, by the book prescribe this, follow this path of treatment and this will work for your patient this percentage of the time. And it turns out that maybe some of those percentages of the time are a bit inflated. And then, a lot of Western treatments do work in very specific groups of patients, but there are a lot of patients, for example, in cases of post-traumatic stress disorder and addiction, where over 50% of our patients are considered to be treatment resistant.

And so, all of these techniques that you mentioned that I've learned and use with my patients over the years, I really wanted to learn and master so that I could have a whole box of tools that I could

use with anyone that came to me and not just say, "Well, we're just going to do this by the book," because we're humans. We don't have a by the book. There's no book on this is how you treat a human's illness. There are lots of books that talk about little different angles for approach, but ultimately the more tools we have in our toolbox, the better can deliver care to people. And so for me, it was really about exploring all the angles of consciousness. Some of that is Freudian in the psychodynamic, psychoanalytic side. Some of it is Jungian with dream analysis. Some of it is more empathic based with empathy and connecting with your patients eye to eye in the case of cognitive behavioral therapy and motivational interviewing and interpersonal therapy and psychedelic therapy.

And so, bringing all of these together really helped me to understand that when my patients, my clients don't respond to one thing or another, that I have something else I can draw on that can really customize and curate treatment for people. And it works a lot better, and I have great results in my practice as a result.

Dave Asprey:

All right, so that means that either you had treatment resistance stuff in you or your family, or you have no idea why you do what you do and it pissed you off so much, you had to figure it out, or someone around you did a bunch of stuff you couldn't understand you had to figure it out. Which one of those three was it?

David Rabin:

Perhaps all three. Just to be blunt, one of the things that really drives me was the opioid crisis. I think very few of us have been untouched by the opioid crisis. I have had friends accidentally overdose in my own home. I have had ...

Dave Asprey:

At parties? How'd you accidentally overdose in your own home?

David Rabin:

They were people who didn't understand which medicines were not supposed to be mixed, so they were prescribed multiple medicines like benzodiazepines and opioids and they accidentally mixed them together. And of course, what happens, you get this dramatic synergy of sedating effect which suppresses breathing. And so, many people don't realize that when you're in pain, that you can actually harm yourself by mixing medications in a way the body is not quite ready or able to deal with. And having been touched by this in many ways throughout my life and seeing the struggle that others have gone through, and also having different forms of pain in my life from emotional strife and difficulty all the way through physical pain, which more recently was in the form of a tooth infection that was so painful that I literally could not think. It was the worst pain, Dave, I've ever had in my life.

Dave Asprey:

It's brutal.

David Rabin:

It was so painful. It was literally humbling me to the point where it made me realize for the very first time what my patients with chronic pain were going through, where I could not think about anything in my life except how to not be in pain. I would have done anything to make that pain go away. When

you're in that situation, it's very clear why people seek some of these medicines like opioids when they're prescribed because if a doctor would have had to be in that moment a Vicodin or hydrocodone and said, "It's okay to take this. It will make you feel better," and it does, why would I not take it?

Dave Asprey:

Did you take it?

David Rabin:

I did because I needed to.

Dave Asprey:

Good move.

David Rabin:

But I only took it for a week and then I had my procedure and it was over, and I knew the risks going into it because I use these medicines in my practice occasionally and I work with people who use them all the time. So again, knowing the risks helped me guide my own treatment but nobody warned me and said, "These are addictive. These could harm you." I only knew that from my own practice, so I think seeing the outcomes of the lack of education in this area, the lack of education even of doctors to understand how to treat people adequately with these medicines, and that we also have a huge wealth of other medicine like ketamine, like MDMA, which is around the corner, like [inaudible 00:06:37], which is around the corner and then technology like [inaudible 00:06:40], Apollo, and these different technologies that can help facilitate increased quality of life. For me, it's about really going back to the origins of the Hippocratic Oath in terms of harm reduction and how can we give you the greatest benefit for the least possible risk?

Dave Asprey:

I thought the Hippocratic Oath was first do no harm, not reduce risk.

David Rabin:

Well, right. First do no harm.

Dave Asprey:

Doesn't that mean then that you basically can't be a doctor because you're always taking risks.

David Rabin:

I think we have to take some degree of risk, but I think that there are ways to provide medical care, for instance, that take less risks to start.

Dave Asprey:

There you go.

David Rabin:

So for example, starting with psychotherapy with someone with depression always generally works better as long as the therapist has a good relationship with the patient and you have a good therapist than prescribing an antidepressant right off the bat. That's just one example, CBD, cannabidiol, if it's the proper medicine that's made in the proper way without contaminants like herbicides or pesticides also has incredible results for mood stabilization and energy balance and even GI and chronic pain type thing. So having options that we know about like things such as CBD or SIT therapy or technology that don't have side effects or addiction risk are always better to start with, which is why I think that first do no harm, *primum non nocere* in Latin is so critical for us to remember.

Dave Asprey:

It seems like that's held back a lot of medicine. You get these situations where, "Well, you're probably going to die in two years. And I can do this thing now and has a 20% chance of harming you and an 80% chance of dramatically improving your quality of life." But you're like, "If I follow the Hippocratic Oath, I am not allowed to give you the thing that's going to either give you relief or maybe give you another 20 years of life." And it's that inherent contradiction in medical treatment that has prevented some of the most impactful therapies from coming out there. For instance, you mentioned CBD. Okay, well maybe it's harmful. We haven't seen enough studies yet, so here have some antidepressants. It's that fear of doing harm. Do you think that Hippocratic Oath is right or should it say, "Do for your patients what you would do for your dad"?

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David Rabin:

I think the do for your patients what you would do for your father or your mother and do no harm are actually one in the same. I think our society confuses them a little bit. Thinking about antidepressants is a great example. Antidepressants are FDA approved for better or for worse for depression and anxiety, and also things like OCD and some antidepressants are even approved for PTSD. However, what we forget is that when you look at the statistics that matter, which are number one, number needed to treat, which is how many people do I need to prescribe this treatment for, for them to experience a symptom relief that's anything significant versus how many people do I need to prescribe this medicine or this treatment for that could give some kind of side effect or harm, which is called the number needed to harm.

It turns out that we always want, as you might imagine, the number needed to treat to be lower than the number needed to harm. We want the medicine to have a greater likelihood of reducing symptoms than of causing harm or side effects. And when you look at medicines that are approved, like antidepressants and anti-psychotics actually for that matter, what we actually see is that there is a greater number needed to treat the number needed to harm. So the numbers are reversed in the direction that's opposite of what we want. There's actually a greater chance of receiving side effects or the patient experiencing side effects from the medicine than there is of actually experiencing sufficient, significant symptom remission or relief. Those are the statistics that really matter. When you look at something like CBD, sure maybe we don't have the same degree of clinical trials behind it, but CBD and hemp and cannabis in general has been used for thousands of years safely prior to 1920.

Cannabis was a mainstay of treatment for many different illnesses and you can't kill yourself, and the side effects are relatively low. When you think about overdosing on an antidepressant, many antidepressants for many years actually could kill you, things like tricyclic antidepressants, MAOIs, anti-psychotics can kill you if you take too much, it's rare but it can happen. The number needed to kill with

cannabis is basically unheard of. It's negligible, so I think when we talk about what the Hippocratic Oath really means, it's really about these two statistics and prioritizing treatments that have a very good chance of giving you relief, but that have a very low chance of causing harm.

I think the reason why that's important is because of something that you're very interested in, which is innovative treatments in the biohacking space, innovative treatments in the psychedelic space. Many of these interventions, many of the interventions you talk about are very interesting because they actually have a very low chance of causing harm and they're not going to help everyone, but they could help a lot of people. And so, having that education about what statistics really matter, which unfortunately is few and far between and it's not even taught that well in medical school, to be honest, is something that can help guide us to really understand what the Hippocratic oath was trying to say. Hippocrates, for example, I think would be greatly in favor of a lot of the treatments you recommend. Food as medicine was one of the things that he prioritized in his life. That is something that if we can ... And also, I think the idea of can we teach our patients how to heal themselves rather than making them dependent on a health system to give them wellness and give them wellbeing, right?

Dave Asprey:

Yeah. Okay. I accept that. It's one of those things where when you're dealing with the mushy stuff, it always seems so double-edged. My wife, by the way, was a drug and alcohol addiction emergency room doctor in Stockholm, so we've had these conversations over dinner and all. And even with the painkillers that can be addictive, addiction could be some harm, but reduction of pain is so ...

Dave Asprey:

Addiction could be some harm, but reduction of pain is so important. I remember when I was a raw vegan, I shattered a tooth, which is actually very common from plant-based diets. Sorry, vegans, if you're listening. I'm not trying to offend you. This happened to me. So that pain-

David Rabin:

Very painful.

Dave Asprey:

I had a really big meeting at work and it was a pretty intense time of my career. And I remember calling in and telling my senior VP, "Hey, I'm not coming to the meeting this morning. I have a dental emergency." And he was like, "What the hell?" And I'm like, it's probably those big green drinks I'm drinking. And yeah, it was disabling. I could barely drive. And so what I used to do though is I'd say, look, I am logical. I can deal with pain. I am not going to take a painkiller because that's a sign of weakness. What was wrong with that mindset?

David Rabin:

So I think that that mindset is part of this suck it up mindset that we have propagated in our world, particularly in the United States, particularly in Western culture in general. We see it in medicine. Doctors have this huge rate of burnout. Why? Because we are not encouraged to seek mental health care for ourselves. We're encouraged to literally work ourselves into the ground to provide care for others while neglecting our own self-care and our families and our wellbeing. And Dr. Joe Maroon, who is a neurosurgeon who experienced his own burnout and wrote a book on it called Square One, talks about this extraordinarily eloquently and talks about going back to the square one, which is on one line,

it's your work, your emotional life, your spiritual life and your physical life, and they should all be in balance.

And if they're not in balance, then that is a sign that it's time to change your priorities up a little bit in our lives. And one of those is how we deal with pain, right? So going back to what you mentioned earlier, using a pain killer like an opioid narcotic... Opioid narcotics are a brilliant invention. I mean, they are incredibly useful for acute short term pain. If you have a toothache, if you have broken bone, if you're going into surgery, if you need something like that to help you with pain in the short term, fantastic medicine. The problem is when they start getting prescribed for long-term use, which unfortunately is when they're actually not indicated and they get used off label frequently, which is what results in addiction.

Dave Asprey:

That's when you make the most money though, isn't it?

David Rabin:

I mean, that's when unfortunately some people do. I would hope that there's less and less of those people around now that Purdue declared bankruptcy.

Dave Asprey:

Yeah, exactly. Thankfully, that happened. So there's an economic incentive that perversely combines with human behavioral and things like that. And that's when we oftentimes get in trouble. All right. So if pain is a stressor, we're dealing with chronic stress though and there's different kinds of pain. But since you're an expert in chronic stress, talk to me about the other things besides pain, at least besides physical pain, that are stressors and how that's driving people right now.

David Rabin:

That's a great question. And I think the reason is because we have not sufficiently, and as part of the medical community, the medical community has really struggled explaining this to the general population in a much more understandable, logical way. And what's really fascinating is a paper that was published by Tor Wager in a collaboration with the University of Pittsburgh several years ago. Might've been over a decade now, where they actually looked at emotional pain versus physical pain on fMRI. And what's really fascinating, functional magnetic resonance imaging is a really incredible form of live brain imaging that doesn't involve radiation. And so what's really incredible about what they found is that emotional pain and physical pain are virtually indistinguishable in the brain.

So if you're looking at the brain signature of these forms of pain, they look the same. You can't really tell the difference unless you talk to the person. And so what does that mean? Well, we know as physicians and just from common sense in our day to day lives, when we're stressed out emotionally or mentally and we have something that causes us pain, it typically worsens the pain. And when we have pain, it typically worsens our emotional and mental stress. And so it creates this positive feedback loop of information, which is rooted in the autonomic nervous system. So I think you talk about this quite a bit, this balance between the sympathetic and parasympathetic systems, which the sympathetic system is commonly known as the fight or flight or freeze response system, and this is involved in effectively maintaining survival in the face of acute threat.

So if we're running from a bear, we're out of water, we're running out of air, we're running out of food, we're running out of shelter, our family's in danger right then and there, that is when we want that system to kick in and send all our blood and resources to our lungs, heart, motor cortex of our

brains, and our perceptive cortexes to be able to understand the environment and get out of that situation as quickly as possible to safety.

Dave Asprey:

That's when it's time to basically kick ass and it's all the energy to do that. Okay.

David Rabin:

Right. However, that system, when activated all the time, ends up taking resources away from the parasympathetic system, which is essential for recovery. So the parasympathetic system is what's often referred to as the rest and digest system. And this system is involved in not just rest and digesting, but also sexual reproduction, creativity, all of gastroenterologist functioning of the gut. Absorption of food, being able to meditate and to fall asleep and get restful sleep. And that system is triggered by safety. So when we're running from a lion or in an acute stress response, that our sympathetic system, the stress response system is very high and active, it drops activity and takes resources away from the parasympathetic system because we're not safe, and the lack of safety has been identified in the body in that moment.

However, when we get into a safe situation, we want that to completely reverse and we want the safety to trigger our recovery system to turn on so that the next time a threat comes, we're ready to respond right away. The problem is those of us who are in this current day to day life with constant emails that we can't shut down and we can't ignore, our kids screaming all the time because they're trapped at home with us, the pandemic and the threat of getting sick, traffic, work responsibilities, add on every little thing, making sure we take our supplements or our medicines every day and at the right time. All of these things add little stressors to our lives and it tricks our bodies and our minds into thinking that we're in a fight or flight survival situation all the time, which literally shuts our recovery system down.

So focusing on a lot of the techniques that we do in psychology and psychiatry and where psychology and psychiatry is going in terms of the future of mental health is helping to teach our clients how to stimulate that safety response system, using techniques like deep breathing, meditation, yoga, nutrition, good levels of exercise that are healthy, not over-training, but healthy levels of exercise. And then techniques like Apollo, soothing touch massage. All of these things form this ecosystem of safety enhancing therapy.

Dave Asprey:

So let's talk about Apollo for a minute. You mentioned it a few times, I mentioned it a few times. It's a little watch like thing that vibrates. Now, you can say, hey, my Apple watch vibrates, except that... Okay guys, I'm going to assume that most of you have read at least one of my books, but if you read the Bullet Proof Diet or you read Head Strong and probably also my most recent one, superhuman. I talk about how there's signals from the environment that goes in and talks to yourselves, and whole body vibration is a technique that I've used for almost 10 years. And they've just found out that shaking the body up and down changes cell membranes. Actually, I've known that for a while through a piezoelectric effect. And we know that it talks to mitochondria and they just found out that it affects your gut biome, actually. That shaking changes your gut bacteria.

So vibration is a signal from the environment, the definition of biohacking. It's amazing. It changes the environment around you and inside of you so that you have control of your own biology. So targeted vibrations, physical vibrations, over acupressure points. Gee, could they have an effect? Yes. Do they? Well, I don't know. Is that why in Tibetan medicine and Chinese medicine they'll actually tap

certain regions? Of course that's why. So Dr. Dave went deep into science and came up with a device that does it. And it's cool and it's totally in line with biohacking. So now that I described for people who are like, vibrations, that sounds stupid. No, it doesn't sound stupid. It actually sounds smart. And it sounds like it's tied in with ancient knowledge, but it's got data. So there's your framing. So you can now tell people what you actually did since now their disbelief has been dissipated.

David Rabin:

Thanks, Dave. And I appreciate you taking the time to try it out. It's been a huge game changer for us, especially in the time of pandemic. I use it every day just to help keep me in zone effectively. And that's really what we developed it for, originally was to help boost safety signals in the brain that help people who have experienced trauma. And now I think it's easy for us to say that there's not a single person on the face of this earth who has not experienced some degree of trauma, which trauma by nature is one or multiple intense, meaningful events that are considered to be negative by us that leave us feeling stressed or afraid or fearful. And so what's interesting is that when I was doing my research at the University of Pittsburgh, I was working with a lot of people with PTSD, severe trauma that was untreatable by anything else.

These people would come to me, they'd be on five to 10 different medicines for years and not having any significant relief, and going to psychotherapy. And so I started to recognize that through talking to them and through working with them for years, that their stress response system and their sympathetic and parasympathetic balance was totally out of whack. Through talking to them and through working with them for years, that their stress response system and their sympathetic and parasympathetic balance was totally out of whack. They were always in this high sympathetic state and their body showed it. They would shake, they would sweat easily, their heart rate was always faster, their heart rate variability, a sign of resilience was always very low and they were terrible at adapting to change in their lives. Change itself was so scary to them that they even had trouble embracing the changes involved in the healing process.

And so we started to look at, well, I can help these people through empathic listening and all these psychotherapy techniques, feel safe with me in the office, but what about when they leave? They don't have me there, there's no therapist there with them all the time. They can't always be in their cognitive behavioral therapy exposure mode, where they have a therapist with them guiding them through their lives. So how can we sort of hack in or tap into the nervous system in a way that helps to provide safety signals to the brain that remind us that we're actually safe and not threatened in our day to day lives. People who have PTSD and trauma and addiction, they often feel afraid and threatened every moment of every day. So what do we do? We teach them deep breathing, meditation, yoga, but these are really hard and they take a lot of time.

Dave Asprey:

There's something that's worth noting there. So people who have PTSD, the vast majority of them don't know they feel afraid all the time. And I say this from personal experience. I'm not afraid, there's nothing to be afraid of. Are you kidding? I'll just kick your ass. I'm going to succeed and I'll win and whatever. But at least in my case, until I saw data on an EEG like, oh, a phone rings and just my fight or flight is through the roof. And all of a sudden, I'm like, wow, my body is totally responding. So you could be listening to this going, yeah, whatever. That's not me. But most people have some trauma and a lot of people have some PTSD and some people have a ton of PTSD. I had a ton and it was very, very early childhood stuff like birth related things. And then others have bullying experiences and whatever else.



So it's just a bigger thing than people would think. So I don't want listeners to say, oh, this doesn't apply to me, because the bottom line is we all have some chronic stress, some more than others. And a huge percentage of people have some PTSD like stuff some of the time, and some people have none. But you probably don't know if you have it, unless you've actually focused on learning it. That was a little bit of a PSA there.

David Rabin:

Yeah. I really appreciate that because trauma is very much stigmatized in our society, but it's really forgetting about the word trauma. What we're really talking about is one or multiple negative, meaningful events over time. We've all had these experiences and they all impact our-

David Rabin:

Time.

Dave Asprey:

Yeah.

David Rabin:

We've all had these experiences and they all impact our lives and it may impact the way we see ourselves and the way we see the world around us. It could be like the first time you watched a war movie to some first time you've had a terrible nightmare, or the first time that somebody bullied you in school, as you said. These things are dramatically impactful to us. And until we take the time to look at ourselves and try to understand what makes us who we are, you... sometimes they evade us, right? And they elude us to the point where we don't realize that we act in ways that are reflective of these things that have happened to us.

Positive things impact us in a similar way, but hopefully towards positive outcomes. So what's interesting is we try to interrupt this pathway. And one of the best ways that we've found that, going back into the evolutionary psychology field, was human touch and music. Human touch and music, it turns out, human touch being even older than music, of course, but these go back hundreds... or as long as humanity has been around, but also prehuman, especially with touch. And ancient mammals will nuzzle each other or hug each other to convey safety to their families, their loved ones, et cetera. And this is a very powerful hardwired neural pathway that exists from the skin to the brain that might go back as far as ancient Aplysia sea snails, which are 300 million years old and Eric Kandel's work who won the Nobel Prize in 2000 for the [crosstalk 00:27:30]-

Dave Asprey:

He's been on the show. He's great.

David Rabin:

He's incredible. I mean, just an incredible scientist and human being who's delivered some of the best findings of... about learning and memory to our civilization.

What we can really understand from that is that as we learn negative situations or have negative associations with things around our lives, we build stronger neural pathways to those negative things, like stress. And as we learn positive associations, we build stronger positive pathways. So Apollo was created based on the fact that we mapped out human touch and we mapped out the pathways

from the skin to the brain and said, if human touch, like getting a hug on a bad day or somebody holding your hand, can send a signal to the brain instantly that says, "If I have time to pay attention to this feeling right now, this person holding my hand or hugging me, I can't possibly be running from a lion in this moment," right? Similar with a deep breath. If I have time to pay attention to this deep breath coming into my nose and mouth and lungs, then I can't possibly be running from a lion in this moment.

And so that instant, and mostly subconscious feedback loop, we thought we could tap into using technology that delivered these very gentle vibrations to the skin that feel like somebody holding your hand or feel like an ocean wave. And it turns out from our double-blind randomized placebo-controlled trials at the University of Pittsburgh, that this is exactly the effect that we were able to induce.

Dave Asprey:

So you have data that says vibrations on the wrists could work. Do other doctors make fun of you?

David Rabin:

No, actually people are very interested in it. That's a funny question. I would say we get more criticism from non-scientists, because many scientists... There's this really interesting overlap between people who go into medicine and science and music. A lot of us are musicians. Our whole original research team were all musicians. So when we came at this originally in the lab, we found that a lot of the information, the background that guided us were studies of the neuroscience of music. And so I started to look at the way that music was interpreted through the ears and by the emotional brain. And what's really interesting about touch and music is they activate the emotional cortex in the brain, which is similar to taste as well, does this, and smell, they activate the emotional cortex before the somatosensory cortex.

So what that means is that we interpret safety versus fear before we interpret what does this feel or taste or sound like or smell like, if that makes sense. So by using something like Apollo, we thought, well, if we can go from the bottom up from the skin first to the emotional brain, then we can send a signal that says, "I'm safe" before I realize what that safety feels like. And then by the time I realize what it feels like, I realize I can actually do it on my own and the wearable is just Apollo is helping nudge me into that state.

Dave Asprey:

I love the way you describe that, because the sensation always happen before the thoughts, right? And then you generally will change the thoughts to match the reality of the sensation, even if the thoughts are wrong. That's what I see, because I do have a neuroscience company, 40 Years of Zen, so I actually get to see my own data quite a lot.

And if you look back into the womb, right, what did you get? You got slow, wave-like vibrations, it's called heartbeats. It's the swishing sound of your mother's blood and breathing and things like that. Those are calming sounds. They are for all humans, right? You hit the right frequencies, the right wavelengths and all that.

And so when you're mimicking things like that even, it's just going to drop you into a peaceful time. And like you said, it's a nudge. And I definitely notice a difference. You can see it on your sleep score, if you're using an Oura Ring or something like that and you do it before bed and you just go a little bit deeper, which is surprising actually, but it works. And I don't think I walk around with a lot of trauma, like to the point where I can feel when there's a little bit of resistance, I'm like, "That's weird." But they're all like super small things like, "Oh, why would taking this kind of a breath or doing this sort of a thing, just have a little tweak," and just to be observing rather than reacting to it. So I'm happy with the progress I've made.

But still at that level for there to be a difference from the Apollo on my wrist is cool. And by the way, I should say this because some people listening are just, I heard, biohackers, like a lot of people are. So [apolloneuro.com/daveasprey](http://apolloneuro.com/daveasprey), and Dave has been kind enough to offer you 15% off if you want to pick one of these things up. This is not meant to be an infomercial. It's just that, hey, this is cool stuff. And I talk about cool stuff. And if I can save you some money during a pandemic, I'll do it. So thank you for that for our listeners.

David Rabin:

Oh, yeah. And thank you. And I think what's really fascinating, just to tap into something that you mentioned a second ago, is what's so unique about Apollo is that Apollo is not a wearable tracker, really. It's more of a wearable intervention. It's a wearable therapeutic. So what's really neat about this is it's sort of the first of a third generation of wearables, right? The first generation being basic step counters and things of that nature that don't really give you many insights. They just give you how much did I do. How much did I sleep? And then there's the second generation, which is like Apple Watch, Oura Ring, WHOOP, they actually give us insights based on that complex data and say, "This is how you can change your life based on your data." And then the third generation is things that actually change your body for you to optimize the experience and they're measurable outcomes.

So what's really interesting is when people, for all the biohackers out there, I think what's really fascinating, and fascinating for us in particular, is that this is a self-validating experiment. If you use Apollo as recommended, you can see, as you just said, Dave, that you see changes in your sleep as tracked by Oura Ring. We see people falling asleep 50% faster. Within two weeks, we see 30 to 50% increases in deep sleep and REM sleep within two weeks as measured by the Oura Ring. We see resting heart rate, within two weeks, drop by 10 points.

Think about how much stress you have to have in our psychological brains, because we're racing about work, we're racing about what we have to do the next day, or what happened the day before. And then you just bring the body, the mind centered back into the present body. And all of a sudden, your resting heart rate drops by 10 points? That's incredible, but that's all showing us something that we can achieve on our own, and that technology is really the facilitator of these improved states of health and wellbeing.

Dave Asprey:

You said something really cool about the state of these trackers. I was CTO and co-founder of a company called Basis. It was the first wristband that could get heart rate off the wrist. And I joined that, because really I wanted heart rate variability from the wrist, which we ended up not doing before Intel ended up buying the company. So I guess it was great. Intel ended up shutting it down. Thanks, Intel.

David Rabin:

It's very tricky, very tricky to do the HRV from the wrist actively.

Dave Asprey:

It is. You'd have to hold still and all that. And it's possible, but... So I look at that and I gave a talk at the early Quantified Self, I think in 2011, and Quantified Self is a group, for listeners, where people are doing early health tracking got together. And my talk was like, look, why do you want to track it if you don't want to hack it? And I talked to people, they're saying, "Look, I've recorded all this data." "And then what do you do with it?" "I don't know. I just have the data. It's cool." They're like stamp collectors.

I have some good friends who just, they love collecting their data, but until you can analyze it and do something, I ended up starting Upgrade Labs, which is a company [inaudible 00:35:00] where, what are the interventions we can do that cause the body to recover faster than mother nature wants it to? Because I'm so fascinated by it and the idea that, oh, let me throw an Apollo Neuro on my wrist and look at what it does. And like I said, either it works or it doesn't. And if a separate tracking system, like the Oura Ring, shows you the changes in your sleep, it's pretty hard to say, "Oh, that was just placebo." Because if so, then keep doing it, placebo's useful, but it's not because you did a double-blind clinical...

David Rabin:

Sure.

Dave Asprey:

Double-blind-

David Rabin:

Randomized placebo-controlled [crosstalk 00:35:32]...

Dave Asprey:

Thank you. Randomized. That's the part of it I was forgetting. Yeah, the not caffeinated enough part obviously.

David Rabin:

Yeah. I'm with you there. Placebo is an interesting concept though, to think about, because placebo is the Western medical term to demean the biology of belief, right? So when we think about belief and placebo, when we look at... And also placebo is fascinating, right? This is an idea that has been totally neglected and demeaned in Western medicine. But what it really means is that if you believe that a treatment will work for you, a treatment of any kind, red pill versus blue pill, both sugar pills, the red pill always works better. How does that make sense? Because, just the power of belief alone accounts for 30 to 50% of the outcomes of our treatments. And similarly, there's a term called nocebo, which is the power, the belief that something will not work for us. And that's even stronger in a lot of cases than the placebo effect.

So when you think about shutting treatments down, because we don't give them a chance, that's a real thing that we see in our patients all the time. So it's really important not to rely on placebo or belief alone, but to really align our intention to heal with the belief that we can heal.

Dave Asprey:

You can literally amplify the effect of your supplements in the morning by looking at them and telling them what they're going to do and taking it. You know who'll tell you that? A shaman, the same shaman will say, "Dave, before you take the mushrooms, you should talk to them and tell them what you want." Maybe they're listening, right, or maybe your brain is listening. But it gets weirder, too.

One of the studies I wrote about, I think in the Bulletproof Diet, when I was talking about the effect of mold toxins on your biology, which by the way are a major cause of chronic stress. If you're in a moldy environment, you probably just know what's trying to kill you, but something's messing with your cells.

David Rabin:

Right.

Dave Asprey:

There's a cellular level of placebo effect that Oxford did, or at least a study came out of Oxford. And what they did is they took a bunch of 20 something year old college students, probably all White British ones, all male, probably, given that that's how it's been in a lot of medical research, but it doesn't matter for this effect. They gave them a weird-tasting, slimy green drink and said they wanted to just have them taste it and just see what they thought about it. And they put cyclosporine and immunosuppressant in it. And then they measured the immune fall that happens afterwards 24 hours later with blood tests.

They come in two weeks later and they give them the same drink without the cyclosporine. They drink it. And they also have the immune suppression over the next 24 hours. The body learned, without them ever knowing that immunity was even involved.

So there's a training effect. That's kind of ridiculous there. And I think that that goes into a lot of our other stress responses. If your body mismatches an environmental stimulus with a stress response you're feeling, then all kinds of weird stuff can happen. And that may even, I think, and I want to get your take on this, it may even be behind some of what's going on with EMF sensitivity or with strange allergy things and really strong reactions and things like that. Is there a validity to that line of thinking where the body mismatches stressors and states?

David Rabin:

Absolutely. I'm really glad you brought that up. And that goes back to Eric Kandel's work, right, which is on classical conditioning, habituation and sensitization, which is the classical conditioning being the one of interest here, which is if we learn consciously or our bodies learn to associate a new...

David Rabin:

... consciously or our bodies learn to associate a neutral stimulus, something like a soda or a drink that has no positive or negative impact one way or the other. And then we associate that with something that disrupts our internal environment or our conscious thinking, or the way that we consciously feel, then we learn to associate those things in our neural networks. Our neural networks literally get stronger in terms of the way they associate these experiences between one and the other.

So you're absolutely right. I mean, I think that there are more studies, of course, that need to be done in this department, but the fundamental understanding, thanks to Eric Kendall and all of the people who came before him, put into the mechanism of learning and memory are showing this without a doubt. And getting into something that I know you're interested in, this may even have an impact epigenetically, which we're starting to find out now. And there could be ways to modify the way that our genes are expressed on a much broader level and actually impact not only ourselves in a way we feel on a longer term basis, which may very well be the way that psychedelic medicines work, but also impacting the health and wellbeing of our offspring, which is very, very interesting.

Dave Asprey:

All right, let's go deeper in psychedelics. One of the things that you did that I found really impressive was you're the co-founder and Executive Director of the Board of Medicine. And you guys established the first peer reviewed evidence based clinical guidelines for making, selling, and using unregulated medicines. Okay. I'm so happy about that. Tell me how you can do that, because there's a bunch of

unregulated medicines I either do use or would like to use. And I don't necessarily mean illegal ones, I just mean unregulated. So talk to me about that.

David Rabin:

So, going back to what we were talking about earlier about the Hippocratic Oath, I think we really prioritize giving our patients and our clients who are seeking care and also ourselves who, as physicians, we need good health too, opportunities to use whatever medicines might be available to us. Ideally, starting with the techniques, and it doesn't have to be medicine, it could be medicine or therapy or breath work or meditation. But starting with things that have the least likelihood of causing harm and the greatest likelihood of causing benefit and then working our way up as needed. So what we've noticed, the group of board members at the board of medicine has noticed, that over the years this has kind of been forgotten about, and we all too frequently rely on prescription of FDA approved medicine or medicines that are off label that are prescription that might cause more harm because that's what our guidelines and our books say, which don't actually take into account all the plant medicines and the supplements that are available that can be used safely.

And also natural techniques like breath work. Breath work is one of the most powerful techniques for controlling and managing homeostasis or the balance between our stress response and our recovery response nervous systems, but how many people know how to do breath work properly? I never learned it in medical school. You kidding? It's not something that we even talk about. So we just, the way they teach this to us is, "Oh, there's two parts of the nervous system. They do their own thing on their own. They rarely dysfunction. Don't worry about it." You know?

Dave Asprey:

I wish they rarely dysfunctioned.

David Rabin:

I mean, it couldn't be further from the truth. There's so much more to that story. And so-

Dave Asprey:

All right. Tell me about just the best breadth. So, breathwork. It. I mean, in fact, there have been entire books written on breath work. I've had Stan Grof do holotropic breathing, he's been on the show. Actually did an event with him. I've breathed with him several times. But that's okay. Go trip balls, kind of breathing like you would do with ketamine or something. So what is the kind of breath work that is most effective for stress relief for people right now?

David Rabin:

So that's a good question. It's a hard question to answer because I personally truly believe that I don't think there's one form of breathing that works best for everyone.

Dave Asprey:

Right.

David Rabin:

I think it's a very personal thing, and that's why meditation is so hard to learn is because we're often trying to meditate in a way that someone else tells us to do, rather than seeking it on our own and

seeking what meditation means for us. So I think part of breathing is really just doing it intentionally to start, which means focusing as much of our attention as possible on the feeling of breath coming into our nose and our mouth, ideally nose over mouth, but they're both fine to start. And just focusing our attention as much as possible on that feeling of air coming in and filling our wind pipe and our lungs and just being present with that feeling more than anything else and allowing that feeling to permeate our entire bodies. And then holding a little bit as we finish the inhale, and then releasing the breath, and then repeating a little bit over and over again. I can tell you that those guidelines are the best that works for most people because it creates some flexibility.

But my fancier question, my favorite breathing technique is a one that is... I actually don't know the name of it because, speaking of finding breathing on your own, I found this on my own when I was having a lot of anxiety and I realized that by breathing... And I had a lot of trouble learning how to breathe, deep breathe through my nose, and I couldn't control air flow very well. I was a huge novice at it. And so what I realized is I like to whistle. And so I realized that if I pursed my lips, and we also recommend this technique to people with emphysema and COPD to help them breathe more freely. And I realized that if I used the same technique I recommended to my patients, which is effectively breathing through pursed lips like a whistle, but without making a sound, or inhaling, imagine inhaling through a straw, then you can control the air flow with your lips in the moment.

And so what I would do is I would inhale through my lips to start and I would try to make the airflow as tight as possible for a five or ten second inhale, and then hold for two seconds and then release through my mouth with the same pursed lips for 10 seconds, hold for two seconds. And then just keep doing that and trying to make my inhales and my exhales as long as I possibly could. And the longer that they got, the more that my mind quieted. So that was the technique that worked best for me.

Dave Asprey:

It's very similar to Andrew Weil's technique.

David Rabin:

Mm-hmm (affirmative).

Dave Asprey:

And he's been on this show. We actually did an episode at his restaurant, True Foods Kitchen, it was really cool.

David Rabin:

Incredible [inaudible 00:45:26].

Dave Asprey:

And especially the purse lips part is a big part of his technique, which has validity. And with yours, what's really interesting is that your carbon dioxide levels go up when you hold the lungs empty or when you breathe out really slowly. And when your CO2 levels go up, cerebral blood flow and oxygenation go up, which is calming for the brain. It's surprising a lot of people aren't familiar with that correlation between the two. And I learned this many years ago using a capnometer, where you're actually able to measure the CO2 mix and oxygen mix in the air that you breathe out. It's a little thing that kind of sticks in your nose and samples the air. And it's very fascinating that you have this ability to tweak, and I figured out

too from doing yoga, I had a really strong stress response where I would breathe until my lungs were empty. And then immediately it was like, "Ah, I'm going to die." Actually, if you measure my blood oxygen, I'm not going to die. I have like two, three minutes here. But right away it was like, "No, you have to breathe right now."

And just telling it to calm the F down. Like, "Okay, now you're just getting to learn to sit with the lungs empty and it's going to be all right." It really lowered my overall stress response. If there's some dumb little voice in my head saying, "Take a breath, you're going to die. Take a breath, you're going to die." You're like, "Could you just shut up and stop bothering me?" And so the piece that I got for learning how to just breathe out. And like you're saying, I think it was really valuable. And there's in fact, James Nestor is going to come on soon and talk about that. I've just read the book *Breath*. And so your technique of 10 out and then two, okay, [inaudible 00:47:01] going, "You have to live 12 seconds without inhaling. Oh my God." Do you find that that is part of what's bringing you a sense of calmness from it? Do you think that's it?

David Rabin:

Yeah. I mean, I think so. I think it's multifactorial. Right? So it goes back to the same way that Apollo and touch and music work, which is that as I'm breathing in intentionally, again, the intentional breath being the most critical part. However you decide to breathe, is that as you breathe intentionally, it instantly sends a signal to our brains that says, "If I have the time right now to pay attention to the feeling of this air coming into my nose and mouth and down into my lungs, I can't possibly be running from a lion in this moment." And for example, if you have time to pay attention to how empty your lungs feel, you know that that little voice that's going on in the back of your head can shut up because it's not warranted. Right? You're not actually in danger.

And that voice is like this vestigial voice that sits there in the back of all of our minds, or maybe more in the front, neurophysiologically if we're talking about the amygdala. But basically it's sitting there because we have had trauma and we have had negative things happen to us, and we've been in situations where we feel out of control. So part of why breath is such an interesting technique, and similarly why we designed Apollo the way we did and pairing breath and Apollo works incredibly well together, especially for people who are learning to debrief for the first time. These things help us to restore a sense of control and agency in the present moment, by bringing us back to our bodies.

Our minds can be anywhere. They could be in the past, they could be in the present or the future, but if we're not conscious of where they are, then they're generally in the past or the future. So by focusing on that breath, focusing on the feeling of soothing touch, it instantly brings us back into our bodies, which helps us center us firmly in the present, which is literally the place where we have the most control of what's going on in our lives.

Dave Asprey:

That's actually pretty amazing. So a side effect of that is just being in the present versus the past [inaudible 00:49:06] for breathing, but of course it makes sense.

All right, I'm going to end part one of our interview now, and we're going to move in the next episode to part two, because there's just too much good stuff here. We could have just a single episode about psychedelics or a single episode about vibration, but we've got epigenetics, we've got some intriguing questions, conversations about COVID. So it's just worth your time for two episodes. Coming up next, part two.