



**Transcript: #451 My Favorite Wearable to Calm Stress and Restore Healthy HRV
with Dr. David Rabin**

Dr. Wendy Myers:

Hello, I'm Dr. Wendy Myers. Welcome to the Myers Detox Podcast. We have a great show for you today. We have Dr. David Rabin on the show, who is the inventor of the [Apollo Neuro](#) device or, for short, the [Apollo](#) device. And he is going to come on the show to talk to us about what stress is doing to our bodies and how our HRV, our heart rate variability, is a measure of stress and our wellbeing. It's a more important predictor of mortality and your HRV level than smoking, diabetes, heart disease, and so many different factors of morbidity.

We'll also talk about the problem of feeling like you have to combat stress and how that can make you feel even more stressed. And we'll talk about what the vagus nerve is and what stress does to the vagus nerve. And we'll also talk about the power of sound therapy and frequencies to calm stress and restore healthy HRV levels. And we'll talk about some of the clinical trials David has done with his [Apollo Neuro](#) device and how it helps improve HRV. It helps to tone and improve vagus nerve function, which innervates all of our organs, and all the different benefits of his [Apollo Neuro](#) device. And we'll also talk about how it helps with trauma and PTSD. Really interesting show today.

So I have a new program called the Emotional Detox program, and this is something that, for me, it's been a lifelong love of psychology on a personal journey of also wanting to figure out what happened to me in the past and how do I feel better. So I developed this Emotional Detox program, a 30-hour course, and I want to figure out where trauma lies in our bodies. It lies in the energy field in our body. These negative emotions and traumas are energetic frequencies in our energy field, and they can cause energetic blocks in our body that cause physical malfunction, that cause physical health issues. And this was proven with the ACE study done by Kaiser Permanente. 17,000 people called the adverse childhood event study, and really, really groundbreaking research.

And so what these researchers found was that the more adverse childhood events people had, maybe emotional, physical, mental, or sexual abuse, people had a dramatic increase in autoimmunity, cancers, heart disease, suicide rates, drug addiction, mental health issues, anxiety, and depression, and they smoked more. They did more drugs and drank more alcohol and things of that nature.

And so I go into all that and more and solutions for resolving trauma and tuning it out of your energy field. Everything is based on conventional medical research. Everything in the program is substantiated and supported, and the modalities suggested in the program are substantiated by conventional medical research. And part of this program is the [Apollo Neuro](#), which helps use the sound therapy and the touch frequencies emitted by the [Apollo Neuro](#) device. So that's also recommended in this program.

So if you want to learn more about this program and emotional trauma and how it's affecting you physically, which I think many people are surprised by, I want you to take my free masterclass; check it out at [emo-detox.com](#), [E-M-O-detox.com](#). Check it out. So, David Rabin is an MD and a Ph.D., a neuroscientist, and a board-certified psychiatrist. He's also a health tech, entrepreneur, and inventor who has been studying the impact of product stress on humans for over a decade. He is a co-founder and chief innovation officer at [Apollo Neuroscience](#), which has developed the first scientifically validated wearable technology that actively improves energy focus and relaxation using a novel touch therapy that signals safety to the brain.

Dr. Dave has always been fascinated by consciousness and our inherent ability to heal ourselves from injury and illness. As such, he has focused his research on the clinical translation of non-invasive therapy for patients with treatment-resistant illnesses like PTSD and substance abuse disorders. Dr. Rabin is a co-founder and executive director of the Board of Medicine, a 503 non-profit organization of physicians and scientists, establishing the first peer-reviewed evidence-based clinical guidelines for the production and safe use of currently unregulated alternative medicines, including plant medicines.

And so the Board of Medicine trains and certifies healthcare providers and provides quality control standards for complementary and alternative medicines to support high-quality clinical research and best practices and risk reduction. In addition to his clinical psychiatry practice, Dr. Dave is currently conducting research on the epigenetic regulation of trauma responses and recovery to elucidate the mechanism of psychedelic-assisted psychotherapy and the neurobiology of belief. Really, really interesting. So Dr. Rabin received his MD in medicine and Ph.D. in neuroscience from Albany Medical College and specialized in psychiatry with a distinction in research at Western Psychiatric Institute and Clinic at the University of Pittsburgh Medical Center. He's been married to his co-founder, Kathryn Fantauzzi, since 2016. And you can learn more about Dave and his work at [drdave.io](#) and learn more about his [Apollo Neuro](#) device at [Apolloneuro.com](#). David, thank you so much for coming to the show.

Dr. David Rabin: Thanks so much for having me, Wendy. It's a pleasure to be here with you.

Dr. Wendy Myers: Yeah. So I've had you on the show before, but I wanted you to come on again because I love your [Apollo Neuro](#) device. I think it's a fantastic device, as I have one right here. You just wear it on your wrist right here. It's a novel and interesting device that you power with an app on your phone. And we're going to talk about that. But the main reason someone would want to use it is to combat stress. There are so many different forms of stress in our world today. So what's happening to the body on a physical level when we're stressed? Can you go into that?

Dr. David Rabin: Sure. And I think this is a really great place to start because I think that you highlighted one of the major misunderstandings about stress, which is, I think, something that has impacted most of us, which is that we are attempting to combat it, meaning that there's an implied fight and that we are the fighters. Right? And I think that this is something that we learn from Eastern medicine, Eastern traditions, and tribal traditions. Part of the problem is the idea of this being combat or a fight and that we have to put up resistance to it that is actually creating a lot of the suffering in our lives. And as Bruce Lee said, our goal is to be like water and to flow like water. So when water gets poured into a cup, it becomes the cup. And when it gets poured into a stream, it becomes the stream. Think about it. Right?

Dr. Wendy Myers: I saw that yesterday on Facebook. I saw that clip of him talking about that yesterday.

Dr. David Rabin: That's one of my favorite quotes of all time because it so elegantly summarizes the idea of stress being inevitable and that we will face it. It will come up because it's required for us to grow. And so if we resist it, even though it's inevitable, when we resist inevitable things, we create suffering. And let's move smoothly and flow with what's coming, the inevitable, the things that push us that could be hard or painful at times but also challenge us to grow and become better, stronger versions of ourselves. We actually become better, stronger versions of ourselves on the other side. And we minimize the suffering along the way.

Dr. Wendy Myers: Yeah, I think that's a good point because you can get stressed about being stressed and stressed about being overwhelmed and depressed about being depressed. So that's a good point that it's not about combating it so much but going with the flow and finding ways to ease it.

Dr. David Rabin: Right. Yeah, exactly. And I think this is a big part of the conversation about stress in our world today that it's not so much that stress is bad. Again, it's really that stress is a thing that exists with us from the moment we are born, from the birth's stress that we face coming out of our mothers. Right? That's something every single human being and mammal has to face. That is the first and probably most dramatic stress we all face as human beings and mammals. And from there

on out, it gets harder in some ways. Right? And we have to learn to do things on our own. At least when we were in the womb, a lot of things were happening to us. And so this break from our moms becomes this moment of great transition into independence that unfolds over many years to come.

And I think the best way to think about stress is that it is inevitable, it is something that we all face all the time, and the way that we think about it has a lot to do with the impact it has on our bodies and our minds and how we feel. So if we think about it from the perspective of it being something that's just there that we have to work with and we have to learn to adapt to, then we spend our time learning to adapt and becoming better adapters, which is arguably our best, most powerful human skill. And if we instead spend that time thinking about, "Why me? Why do I have to deal with the stress right now? What's wrong with me that all these challenging things are happening to me and that everybody else's life seems so easy?" Well, then, we spend all of our precious resources resisting the fact that these challenges in front of us are challenges for us. They may be similar or different to challenges others face, but they are still challenges.

And so if we can look at that in a way that's more fluid or more consistent with the way things are, that this is just a way for us to grow, it's not personal, then we grow faster, we grow stronger, and it takes less of a toll on our bodies. And effectively, that toll means that there are fewer resources on a regular basis since we only have 100% of resources available at any time, meaning blood flow, oxygen, nutrients, waste removal, that kind of thing governed by blood flow. We only have so many of those resources available at any time. We want as many of those resources as possible to be spent and devoted to our recovery nervous system, which is our parasympathetic vagal system that governs reproduction, digestion, immunity, metabolism, sleep, recovery and creativity, and empathy, all those things that help us feel good and live wonderful happy lives.

And when we have as many resources going to that system as possible, because of the way we're thinking about stress contributing to it and how in control we feel of our environment also contributing to it, then the better we feel on a regular basis and the more we devote resources to our ability to adapt and overcome challenges. On the contrary, if we think about stress from the standpoint of what's wrong with me that I am facing these stressors, or why me, why do I have to deal with this and we put up resistance, then we actually increase our fight or flight response. We increase resources to the survival nervous system, which is called the sympathetic system, which is balanced by the parasympathetic recovery system, which makes us feel like we're under threat. And most stress is not a survival threat. Survival threat is supposed to turn on our fight or flight system. Not emails, not traffic, not our children screaming, not somebody is giving you a funny look across the table. Right? Those are supposed to signal something else, but not survival.

And so, if we learn to misinterpret stress as an actual survival threat, our bodies don't know the difference. Our bodies jump into survival mode, taking resources away from all those great systems we just talked about and sending them to skeletal muscles, the motor cortex, the heart and the lungs, and all parts of our brains that are solely responsible for fight or flight. So it's really a resource allocation and balancing problem that we are in control of at the center, but most of us just never learned how to regulate and control ourselves in that way. Ideally, I think more of us are teaching this to children now because it's easier to learn as kids, but understanding it as a resource allocation problem means that it's something that we can all learn to do overtime at any point in our lives, which I think is really empowering.

Dr. Wendy Myers: And I think a lot of people, whether they're aware of it or not or maybe they have awareness, are living a very stressed lifestyle, and they don't know how to get out of it. They can have this high-stress set point, and they don't know how that happened, and they either get stressed. They can't calm down. What is going on there?

Dr. David Rabin: So, in general, to reemphasize, it's no fault of yours or no fault of ours. We all find ourselves in these situations at different times or sometimes often. I think what's going on there is that we're simply over-stimulated, right? There's too much incoming information for us to process, which, again, comes from things like too many responsibilities, too much noise, too much visual stimulation, too much news, and too much X, Y, and Z of a similar variety. Many of us at least have not learned or mastered the coping strategies we should have learned as children, which is how to control our attention effectively.

If we can't control our attention or haven't learned how to control our attention, which is our most valuable resource as human beings, because it allows us to control what is allowed to enter into our consciousness and into our being is what we pay attention to. And the longer we pay attention to anything, like things we don't have control over, the more out of control we feel. That is anxiety. The longer we spend paying attention to things on the contrary that we do have control over, like our breath, our movement and what we put into our bodies and things of that nature and what we put our attention on itself, the more in control we feel and therefore the less anxiety we have.

So most people, myself included, never learned this as children. So then, all of a sudden, we find ourselves in these situations that are very complicated with lots of things to consider. And we're overwhelmed by responsibilities and incoming information that we think is important or we're told it is important to us, but it isn't actually important right now. And so, all of these incoming information points lead us to feel overwhelmed, overstimulated, and frankly, at some point, helpless and often hopeless to change anything because we are so overwhelmed. And then anything new that comes in, even if it's something that can help us, seems just out of reach or unbelievably hard to access, like breath work, right, which is so simple. But when you never learn as a kid, and you're

already overwhelmed, it requires your attention to learning a new technique and taking time out of your busy day to learn a new technique. That is very, very hard to do, even though it's helpful.

And so this is, again, about just reminding, If the body gets conditioned to be in this fear state or threat state, that makes it really hard to take on new things, even if they're good things and constructive, helpful things. And so the overstimulation of our bodies just sends us off into this spiral of focusing on stuff we don't have control over. So that's why it's so interesting to think about what fixes the problem. Well, it's practicing or learning the techniques in whatever way you can that restore control. Right? So that's how [Apollo](#) works. It's wearable. It delivers a soothing touch to the body that reminds us that we're in control of how we feel, just like when somebody holds your hand on a bad day or gives you a hug, just like playing your favorite song when you're stressed out. Right? These things remind us, just like taking a deep breath, that we're in control of how we feel.

And so, by practicing these techniques, we can reverse the stress response by keeping it in check. But what we practice is what we become good at. So if we practice being stressed out, it can take time to learn these new techniques and insert them into our lives again.

Dr. Wendy Myers: Yeah, that's a really, really good point. Wearing this device, it's like practice also. If you just wear it on a regular basis, it really has a big impact. A friend of mine, I gave him my old [Apollo](#), and he started wearing it, and he just refused to give it back to me because he got so addicted to it. He didn't really know how it worked. He didn't know anything about it, really, but he started wearing it and playing with the different apps, and he just absolutely loved it because it really helped just calm him down and make him feel less stressed. This is someone that had a lot of trauma as well.

So what's happening in your body when you're wearing this device? So you put it on. There are eight different settings here. I mean, there are settings for energy, like waking up, relaxing, and unwinding sleep. There are about eight different programs here or seven that you can use with it. What's happening in your body when you have the [Apollo](#) on and one of the modes on?

Dr. David Rabin: That's a great question. I think the best way to think about it is to think about what happens to your body when you're having a really bad day and somebody you like gives you a hug. Right? So what happens is really two things. The first of which is that the feeling of somebody you like giving you a hug has a physical sensation and an emotional sensation to it. So the physical sensation first is the feeling of a hug from somebody you feel safe around, which sends a signal to our brains that we may be aware of consciously or we may not be aware of consciously that tells the fear center of our brains that says, "If I have the time to pay attention to the soothing, gentle feeling of this hug, just like with a deep breath, then I can't possibly be running from a lion at this moment," because we

were hardwired for tens of millions of evolutionary years to have our fear response, that survival system not allow us to take our attention away from a threat if it's an actual survival threat. So this is why we can't sleep when stressed out because our bodies become very physically vulnerable when we're trying to sleep.

And so we perceive that if there's a lion or something that reminds us of a lion outside our den, then our bodies and brains will not allow us to make ourselves that vulnerable by sleeping deeply because it puts us at risk of not surviving the night. So again, most of us are not being faced by lions, thankfully, anymore on a regular basis, but our bodies then learn to attribute threats to other things like what we might have to do the next day or whatever else. And so the soothing touch, just the physical sensation of soothing touch, just like the physical sensation of paying attention to a deep breath coming into our nose, mouth, and lungs, reminds our body and our brain, whether we're aware of it or not, that we are safe enough to pay attention to that soothing feeling. And just by that reminder, it sends an overwhelmingly powerful signal from the emotional cortex in the insula, specifically, to the amygdala, that reptilian fear center in all mammals, and going back to ancient reptiles, that says, "You can calm down. You're not under threat right now." If you were under threat, the amygdala would counter that by sending the signal back to the insula that would say, "You're actually under threat. Get the heck out of here." Right?

But when there's not a real survival threat, the insula overwhelms the fear center and says, "Hey, you can calm down. There's not an actual threat right now." And then, the entire nervous system in the body and mind deescalates and allows resources to go back to the recovery system. So, [Apollo](#), we developed to replicate that effect through sound waves that are like music but composed for the touch receptors of your skin. I'm wearing an [Apollo](#) with a clip on my chest right now, and you can wear it anywhere on your body. It doesn't have to be worn on the wrist, but it delivers these gentle vibrations to the skin that are effective sound waves like what would come out of a subwoofer that is picked up by the skin rather than the ears and tell the skin, just like getting a hug or holding at someone's hand, et cetera, that you are safe enough to emotionally and physically to be able to notice and pay attention to this feeling in your body. And if you can do that, then the brain's fear center gets that signal and calms down. Right?

And so it basically forces a pattern of neurological firing that's consistent with what happens when you deep breathe or what happens when we do something called reappraising threat or reevaluating threat, and that forced reevaluation reminds us to breathe as well, and it reminds us to be present at the moment. And it reminds us that if we're not under threat, we can take a moment to think a little bit more carefully about the decision we're going to make next.

Dr. Wendy Myers:

Yeah. Great. And it's interesting that you're almost describing sound therapy, using frequencies to help change the nervous system in the body. And there's a

lot of conventional medical research behind this. Dr. Carlos Ventura has done a lot of amazing research on this. So how did you determine how the [Apollo](#) works, and what kind of clinical trials have been done?

Dr. David Rabin:

Yeah, it is very much like that work that you described. This research on sound and touch and the benefits of it actually go back probably over 50 years in the science community. It's only now that we've had the technology small enough to be able to turn it into a wearable, but we've known about the way that the body responds to sound and touch for over 50 years in the scientific community and actually probably hundreds or thousands of years in the old traditional communities where they use music as communication and music to induce ecstatic states in tribal culture and all of these kinds of things.

But ultimately, we were all musicians, and I and many of our research team members all had musical backgrounds. We were also in the field of psychiatry and psychology, and cognitive neuroscience. And we were really trying to understand how to help our patients with PTSD recover more quickly because teaching them breathwork meditation worked in some of them. Still, it really just wasn't working for most of them because if you're already overwhelmed by stress from having unresolved past trauma. If you've taken multiple medications that have failed to help you achieve symptom remission, then you're probably feeling pretty darn bad at that point. You're probably feeling pretty overwhelmed and minimally confident in your ability to get through this. And that's not your fault because that's what your experience has told you, and that's probably what many of your doctors or therapists have told you because that's what the data shows.

And this was really hard for us as clinicians watching our patients struggle. And so we started to ask, "Well, what do our patients do to soothe themselves? What actually is helping them respond to cope with stress better? And could we tap into some of those techniques?" And so we started asking them, talking to them, looking at the literature. And we saw that music, in particular, was a huge, huge area that was common across many of these people who had trauma. They would listen to music that they found familiar and enjoyable, which was a big part of it. And many of them had pets, and pets were a big part of them feeling safe, holding their pets, spending time with their pets, and interacting with their pets. All of these things helped reinforce a sense of safety with other humans when they had the opportunity to interact with other people.

And so we went back to literature. We investigated all of this work done before at ad nauseum. And we figured out something very, very interesting, which is that in these people, if the stress response is overactive all the time people with PTSD, this also similar to chronic pain, depression, ADHD, and many other mental illnesses, that it would be possible, theoretically, to reverse that stress response by providing extra safe stimulation to the body. And so then the safe stimulation became things like touch, music, et cetera, but we wanted to give people something that didn't require them to monopolize their ears and didn't

require them to disengage from the conversation. We wanted them to be able to do everything they normally can do in their normal lives but just have a little bit of extra safety around.

And so we took on the challenge of trying to replicate some of the benefits of soothing touch with vibration. And this was started in 2014 at the University of Pittsburgh, the Department of Psychiatry, and then little by little, year after year, we did more and more in lab research, mostly just experimentation on ourselves and our friends and family. And we found finally, about 2016, that there were very specific patterns of vibration that were things we learned from frequencies other people had studied and from the biofeedback literature of what patterns the heart and lungs get into when people enter into a meditative state, which is where people start to feel really calm and in control. And that certain patterns of vibration, sound waves, and physical vibration in the body showed clues that they could get people or nudge people into these states.

And so we started to investigate that more. And then, in 2017, we ran a double-blind, randomized placebo-controlled crossover study, the most rigorous clinical trial you can run, to test the first two vibration patterns that became [Apollo](#) vibration patterns. And what we found, which was so fascinating that we did not expect to see, was that people who received these specific [Apollo](#) vibration patterns to the chest and the wrist and a couple of other parts of the body, when they were totally blinded and randomized and had no idea what they were receiving or what was supposed to happen, they received these vibration patterns and only with these vibration patterns did their cognitive performance go up on a very stressful task, but also their heart metrics, cardiovascular metrics improved. They improved proportionately to their cognitive performance.

So the more their body showed signs of balance, the more hurry went down, the more HRV went up, the better they performed under stress cognitively, and the better outcomes they got on the task. And this was relatively consistent and statistically significant. And when we saw that we were getting cognitive performance improvements that were comparable to what we see with amphetamines under stress with just a little bit of vibration on the body, we said, "Okay, this is a really cool effect. Let's test it more, and let's test it in the real world." And so we did three more clinical trials with meditators and with non-meditators and then with nurses and with elite athletes, and we showed and then 2,000 to 3,000 case studies in the real world using prototypes we built with the university and grant funding, and we showed that we were actually getting these consistent results. And anywhere from 80% to 95% of people, depending on the population, were saying that they were feeling the same way, which was more relaxed, slower mind, a quieter mind, and more able to do what it is they set out to do, whether it was focusing or falling asleep.

And then, from all that data, we refined that into what became the [Apollo](#) technology released in January of 2020 to the general wellness community

because we found it to be exquisitely safe because it's just sound. And those modes that we released that were tested in those populations were the energy and wake up mode for most energizing, which is like an espresso shot, then social and open, which is a creative social flow. Clear and focused is the deep-focus flow. That is what we showed to induce very substantial improvements in cognitive performance. Then the rebuild and recover, which is what we showed, helped athletes calm down more quickly after extreme exercise. And that was what we just had a publication come out on just last week, and then much, much more coming from there is the meditation mindfulness mode, which improved access to deep meditative states. Then they relax and unwind, which helps people wind down before bed and then deeply relax, sleep, and renew.

And the combination of all of these together in our current study with Oura Ring users showed that when people use these for three and a half hours a day, five days a week, over three months, over 1200 people, we see very statistically significant improvements in deep sleep, REM sleep, heart rate and resting heart rate and HRV that are equivalent to or comparable to what you would see with adopting a new exercise routine or a new breath work or meditation routine over the same timeframe, which is very, very exciting.

Dr. Wendy Myers:

And that is huge because you can just wear a totally passive device. You don't have to learn any new skills. You don't have to be actively doing something. It's just super, super easy to wear. And it's really important, I believe, to be tracking your heart rate variability or your HRV because having a low HRV dramatically reduces the risk of all-cause mortality. That's a really incredible study by Hendrick and his team. They analyzed all these different variables, and they found that after adjusting for age and sex and all the different predictors of mortality, the lower HRV you had, was a more important variable than a history of heart disease, smoking, your class in society, medication, blood cholesterol and glucose concentrations like diabetes. HRV is more important than all of these other variables in regard to mortality. So can you talk a little bit more about the HRV and how it reveals our stress levels and wellbeing?

Dr. David Rabin:

Sure. So HRV is really interesting. It stands for heart rate variability, which is the rate of change of our heartbeat over time. So this means that if you think about your heart beating at 60 beats per minute, most people think that each beat is exactly one second apart, but that's actually not the case. What we actually know is that the heartbeat varies in time anywhere from it could be a half-second between each beat to one and a half seconds between each beat, and this is an example. And it changes with every breath and every thought and everything that changes in our environment, every movement.

And so what this means is that it's not one second between HB. It's actually a variable amount of time for HB. And it turns out from the biofeedback literature originally, which started to understand the impact of HRV, and from the cardiovascular literature that started to look at measures for how to understand

when somebody who's had a heart attack is going to do poorly versus do well after their heart attack. That you could predict that with HRV because HRV is a sign of how much the body has recovered. And so, in general, we want to have a high HRV, or at least if we don't know what high HRV means, we want our HRV to be trending upward week over week.

The challenge of HRV is that most people think you can measure it daily at home. You can, but it's not particularly accurate because so many variables go into HRV. So probably the most accurate home assessment of HRV is the Oura Ring because it measures it when you're still asleep. It averages your stillness measurements over time. And they've had some great studies that have shown that you can use HRV to predict whether somebody has COVID in advance of having COVID, which is pretty cool. Because when we're starting to get sick or when we're not recovered, our HRV goes down. And when there's a big drop in HRV, that typically means that something is off and that our bodies are overwhelmed and under-recovered or overstressed.

And so, by tracking that week over week, you can start to understand, "I am on a trend to being more recovered, or I'm on a trend to being overwhelmed and overtired and not recovered," which would give you a hint of, "Maybe this week I need to take a little easier on myself and get a little more rest. And maybe next week when I'm feeling a little bit more resilient and a little bit more balanced and recovered, then I can really push myself," but you don't want to push yourself if you're already overwhelmed and under-recovered. So these can be really helpful tools that can guide us on how hard to work, how much to push ourselves and when to take it easy and focus a little more on recovery because ultimately, to perform at our peak on a regular basis has to be balanced by peak recovery. We can't just output all the time and not give ourselves back something. We have to balance those two, or we will burn out. That's really, I think, the easiest way to understand burnout is constantly putting out and not taking enough in. So we have to have that balance. And if you have that balance, you can sustain peak performance for your whole life. But we will all burn out if we don't have that balance. None of us are immune to it.

And so, tracking HRV can be really helpful, but the week-to-week measurements or month-to-month measurements are the best ways to understand how we're doing. Otherwise, you have to measure it with an EKG in the lab, which can give you a moment measure, but without an EKG machine, it's really hard to get an accurate measure in a single moment.

Dr. Wendy Myers:

Yeah. And I think it's also great before you do any modality, you have your baseline HRV. Maybe you're tracking it with your Oura Ring and then try different modalities, like the [Apollo Neuro](#), and see how it's working for you, see how it improves your HRV. Different things work for different people. But I think it's a great way to measure the success or the efficacy of what you're using, like [Apollo](#).

Dr. David Rabin:

For sure. At the same time, HRV is very complicated. Right? So when you think about all the factors that go into your HRV, it's everything. It's not just a soothing touch and how much you're getting. It's not just how much [Apollo](#) you're getting, and it's not just how much good food you're getting or exercise. It's really everything. The two biggest factors that impact HRV the most that we don't talk about are sleep, alcohol consumption, particularly before bed, and sedatives in general. So if we are not getting high-quality sleep with good deep sleep and good REM, then our HRV will tank.

No matter how good everything else is, if our sleep is not good, we will have a low HRV. So getting good restorative sleep and practicing good sleep hygiene on a regular basis, which includes trying to go to bed around the same time every night and trying to wake up around the same time every day and trying to minimize, get a little bit of exercise during the day so that we feel tired at night and ready to fall asleep and making sure that we are not exposing ourselves too much blue light and screens and overstimulating things before we go to bed and all this stuff, not eating too close to bedtime, not drinking alcohol too close to bedtime. All of those things will impact HRV. So no matter how much good work you're doing on the exercise front or on the nutrition front or on, frankly, [Apollo](#), soothing touch, any of these other things that boost HRV, if you're not getting good sleep and you're not prioritizing your sleep, your HRV will be in the pits.

And so this is really, really important to understand that HRV is interesting because it also shows us what's at the foundations of health, right? Sleep and getting good restorative sleep is absolutely essential to being healthy. If we are not sleeping well, that doesn't mean long necessarily, it just means well, meaning deep sleep, and we're getting at least somewhere between six and eight hours a night a good deep and REM sleep, our HRV will not be high, which means we are not recovering sufficiently, which means we're going to be more likely to make mistakes during the day. We're going to be more likely to get sick. And we're going to be more likely to struggle with challenges and adapt when they come. So this is really, really important.

HRV and heart rate and respiratory rate and all these things are really interesting because it reminds us that our body is a laboratory and that we can safely test things that work. If we are noticing our HRV's lower when we drink before bed, that's a good sign to probably drink less before bed, or maybe try to have a drink or two earlier in the day, around 5:00 and then stop drinking after 7:00 PM. Because if you drink after 7:00 and go to bed at 9:00 or 10:00, you will impair your sleep quality, which prevents you from recovering, right? And then it will be more likely to have you drink caffeine in the morning or take a stimulant in the morning when you wake up because you're going to be feeling sluggish. And that means you're going to be overstimulated later in the day, and you're more likely to want to drink again before you go to bed the next day. And it creates these vicious loops. Call it the Elvis diet or whatever you want to call it, but it's not good for our recovery. And we know what happened to Elvis. So let's try to avoid that.

Dr. Wendy Myers: Or you want to drink more high-quality alcohol. No, I'm just joking.

Dr. David Rabin: That too. Yeah.

Dr. Wendy Myers: I'm joking. So let's talk about the vagus nerve. So the vagus nerve is something that is affected by stress. So what does stress do to the vagus nerve, and what is the vagus nerve?

Dr. David Rabin: So the vagus nerve is a core nerve of the parasympathetic recovery nervous system that innervates almost every single organ of our entire body, if not every organ, and every blood vessel, and it provides the parasympathetic recovery input. So when we're stressed, our sympathetic fight or flight nervous system sends signals down through the sympathetic nerve endings that tell our heart rate to go up and our breath rate to go up, and our blood pressure to go up to get more blood to certain organs, like our skeletal muscles and our heart and lungs. Then the vagus nerve is activated by safety like deep breathing and intentional breathing. It's activated by a soothing touch. It's activated by soothing music, by generally soothing stimulation. And when we activate it, it sends the opposite signals to the same organs. So it tells our heart rate to slow down because it doesn't need to be as high. And it tells our breath rate to slow down and become deeper because it doesn't need to be as fast. And it tells our blood pressure to come down because it doesn't need to be as high because we don't have as much of an urgent need to funnel blood flow to those muscles and organs to get us out of a threatening situation.

So it's triggered by safety to send the signals to the body that remind the body to calm down and that it's safe enough to be in a recovery state and divert resources to the recovery systems like reproduction, digestion, immunity, sleep, et cetera. So stress decreases activity in the vagus nerve because stress, as in stress that's interpreted as a survival situation, decreases activity in the vagus nerve because our bodies interpret the stress as a threat. So if we change the way we look at stress, going back to what we were talking about earlier, and we change the way we look at stress to, "Hey, this is inevitable. I know I'm going to have to deal with it at one point or another, but every time I'm facing stress, it's challenging me to grow. So I'm going to dive right in rather than resist it and fight it." Then that simple shift in perception, which is a lot of what we do in psychotherapy with our clients, is powerful enough in and of itself to help change what we call our association with stressful events, which means that when stress comes, instead of our heart rate and our blood pressure going way up right away, the first thing that happens is we start to say, "All right, what am I going to do to adapt to this and overcome this challenge right now?"

And then you start to engage your creative brain, and you start to engage all these parts of your brain and your body. They're potentially different than what you'd be engaging in if you're in a pure fight-or-flight survival situation. So you're re-diverting resources back to that creative system, empathy system, and all

these other parts of our bodies and brains that are activated by the vagus nerve that allow us to perform better in a balanced way rather than in a way where we're only focused on tunnel vision fight or flight, which is in general in most of our challenges we face in day to day lives. The tunnel vision fight or flight is actually the response that gets us into a heck of a lot of trouble, right? Because it prevents us from seeing all the options we have available.

Dr. Wendy Myers: Can you talk a little bit about trauma and using the [Apollo](#) device? There's childhood developmental trauma. You mentioned PTSD. What aspects of mental health is [Apollo](#) most useful for?

Dr. David Rabin: Trauma is an interesting topic of mine. As many of you know, I'm an addiction and trauma psychiatrist. And this has been a passion of study for me for many years, probably almost 20 years now. And I think the thing about the trauma that's so interesting is it's not something that is only something that people with PTSD or mental illness experience. Trauma is universal to the human experience. It's actually the denial of it. That is what causes most of the problems that we face. Right? So if we act like the trauma is a sign of weakness and deny it or say, "I couldn't have been traumatized. That would mean that I have something wrong with me." Well, it's actually the opposite. We're all traumatized, and the denial of it is making it out to be something wrong with you by not accepting the parts of you that have struggled with challenges.

And this is really what trauma is. It's struggling with challenges, whatever they might be, where we don't have the support from our community, either during or after or the support from ourselves after. And we blame ourselves. This leads us to blame ourselves for how we respond to a challenging situation. And it could be something as wild and crazy as military trauma, or it can be something as benign as getting picked on in school. It doesn't really matter. All of these things can be traumatizing to us. And so what trauma does when we are blaming ourselves for something that's happened to us when we were really just doing the best we could because we didn't know any better at the time typically is that we engage in a self-judgment reaction that creates a cycle in our bodies that minimizes our self-worth and makes us feel disempowered to change things in our lives, which in short can be defined as the victim mindset.

And so when we adopt this victim mindset, again, it goes from the idea of thinking about ourselves like, "Oh, stress is here. It's inevitable. I'm going to do whatever I can to overcome it and adapt to it. This is my opportunity for growth and becoming and exploring what I'm capable of." To, "Oh no. Why me? Not again. I have to deal with this again. What's wrong with me that this stuff keeps happening to me, right?" And so that simple shift in thinking goes from one where "Look at me. I was born to adapt. Let's see what I'm capable of," which is a self-reaffirming, empowering way of thinking that is encouraged by the support of our community to one in which when we're not encouraged by our community, we develop a low self-worth approach where challenges become

something personal that is happening to us. We are the victims of it rather than we are in control of the outcome.

And so ultimately, in short, what that does to us is it trains in all of us a response in our bodies that equates stress to threat. Right? And so if then everything that's stressful that's triggering something in our bodies, like a stress response, which normally is good in some ways because it helps us to adapt, is now something that we look at as, "Oh no, why is this happening again? This reminds me of something bad that happened before. I don't want to feel this way. Why should I feel this way? What's wrong with me that I feel this way?" Then all of a sudden, we create a self-judgment reaction that results in not just one traumatic experience but the perpetuation of traumatic experiences throughout our entire lives until we process that initial thing that happened and realize what we're doing to ourselves by not giving ourselves the opportunity to recover.

And so it's not, again, anyone's fault. It's just that we haven't learned how to cope with it. And so soothing touch by the nature of how it works by delivering safety signals to the skin, just like intentional breath work, just like [Apollo](#), all help to restore a sense of control to us that reminds us that we're in control of how we feel by calming the body and then clearing our minds and helping us recognize that we're at the center of our experience. We are in the driver's seat, not the passenger's seat. We have the ability to choose by being present with what's going on right now and not judging ourselves or the situation. We have the opportunity to choose the outcome of the situation, which we actually do when we realize that.

So [Apollo](#) works in the same way. Delivering these gentle, soothing vibrations to the skin calms the body, minimizes the stress response that we're not actually under threat, and reminds our emotional brain and our fear center, the amygdala, that we're not actually under threat by sending overwhelming safety signals to it. Then the amygdala comes down, and then we're able to re-appraise the situation and say, "Okay, well, maybe I can make a different decision right now. Maybe I don't need to think about this situation of being in a crowded supermarket as something that is a life threat. Maybe I don't need to consider this traffic situation a life threat." What's actually a life threat when you're in traffic is tunnel vision, right? Because tunnel vision, when you're in traffic, is going to make you make bad driving decisions, which puts your life at risk and the lives of others at risk.

So by settling ourselves down and reminding ourselves that what might seem like a threat, which is stressful, is not actually a real threat, then we actually restore power to ourselves in those moments, which allows us to dramatically change the outcome of very challenging situations for the better.

Dr. Wendy Myers:

Well, David, is there anything else that you want to touch on that we haven't talked about yet in regard to the [Apollo](#) or trauma or anything of that nature or addiction?

Dr. David Rabin:

I mean, there's so much we could talk about. One thing that I will mention, unless there's something else you want to toss in, I think that it's really the idea that touch is so important because it helps to send safety signals to our brain, and we need touch to be healthy. It's not an option. It seems like an option, but it's definitely not an option. It is required for us to live good lives. So this is why technologies like [Apollo](#) work so well to do what they do because they tap into something that we need to feel good. And the evidence for that is very clear because soothing touch results in the release of all the amazing, positive neurotransmitters and hormones that we want to be released in our brains and bodies when we feel good, which is all the same chemicals that we seek from the outside world when we self-medicate or when we binge on Netflix or video games or whatever are the same neurochemicals that we get from soothing touch. It's dopamine, it's serotonin, it's oxytocin, it's endorphins, endogenous opioids, and endogenous cannabinoids. All of these molecules, especially the last three I mentioned, are our natural pain relieving system. So by engaging in soothing touch and making that more a part of our lives in any way, even if it's self-touch more often, giving yourself hugs, which is something I never learned to do, can be very helpful and soothing.

All of these kinds of things actually result in the natural release of all these powerful hormones and neurochemicals that if we don't get from touch, we will seek from anywhere else, which is why when things like the pandemic happen, and we're socially isolated, the first thing that you see in the world, especially in America, is increased alcohol use, increased drug use, increased overdoses. Why? People are in emotional pain, and they're not supposed to touch each other as much because we're socially isolated. Right? So how do people fill that void? They fill it by self-medicating, right? So this is really important to understand because it's this pathway that we can intervene in, using anything from giving each other hugs, which is totally free, or holding hands more often to using things like [Apollo](#) and breath work. All of these things that we can do are things that we should all do ideally altogether because the more we do all of these things, the more we strengthen our vagus nerve activity and the better we feel, and the more recovered we'll be on a regular basis, and our HRV will go up and up.

Dr. Wendy Myers:

Yes. And that's the goal. We want a good HRV. Well, David, thank you so much for coming to the show. It's always awesome to have you here. And everyone, I'm Dr. Wendy Myers. Thanks so much for coming on the show every week and tuning in because it really is a joy for me every day to bring you experts from around the world to help you to upgrade your life and upgrade your health because you do deserve to feel good and you do deserve to feel joy. And so I'm hoping this podcast helped you with another piece of the puzzle in accomplishing that. So thanks for tuning in. I'll talk to you guys very soon!