



## Episode 487: Dr Andrew Hill on How to Build a Better Brain at Home (Starting With Sleep)

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Katie: Hello, and welcome to the "Wellness Mama Podcast." I'm Katie from [wellnessmama.com](https://wellnessmama.com) and [wellnesse.com](https://wellnesse.com). That's wellness with an E on the end. And this podcast is all about the brain, and specifically how to build a better brain at home starting with sleep. I'm here with the neuroscientist I trust my own brain to, Dr. Andrew Hill, who has been on this podcast before. And we talked in the first episode a lot about neurofeedback and very specific brain training for things like attention issues, TBIs, and much more. And I wanted to have him back today. He's one of the top peak performance coaches in the country. He has a Ph.D. in cognitive neuroscience and he has been the one that's done EEGs and guided neurofeedback for my own brain in rehabbing some TBIs and early childhood stuff. But I wanted to have him on today to talk about more of the at-home stuff you can do to improve your brain, to improve your children's brain.

So he goes into an overview of what things like cute EEG and neurofeedback are and how they're used as tools in neuroscience. But he also really goes deep on things like how meditation changes the brain in a tangible way and why meditation is a focus exercise and not a relaxation exercise and he makes a very strong case for why sleep is the most single important factor you can focus on for the sake of your brain. He gives his top three rules in order of importance for improving sleep. And you may not like some of them, but I can say from tracking everything very carefully, they make a tremendous impact and I've seen drastic changes in my brain

by implementing his protocol. He also talks about some dietary strategies, why he isn't a fan of certain supplements and nootropics, but how some can work complimentary with brain training. We go in a lot of directions with this one. There's a lot of key takeaways and if you really want to profoundly improve your sleep and by doing so, your brain function, definitely listen about halfway in when he starts talking about his top three sleep hacks. Without further ado, let's join Dr. Hill. Dr. Hill, welcome back.

Dr. Hill: Thanks, Katie. Thanks for having me back. Nice to be here.

Katie: Well, I'm excited to chat with you again because it's always such a pleasure and because I'm in the middle of a bunch of neurofeedback training myself right now. But before we jump into that, I have a note in my show notes, you were attacked by an ape while traveling as a teenager in Gibraltar, and I would love to hear a little bit more about that story.

Dr. Hill: Okay. So, yeah. I guess in terms of curious and interesting things that have happened in my life, when I was, I don't know, 14, 15, something like that, I traveled a lot with my grandparents in my teen years, actually, and we were in Gibraltar having visited from Spain and there are these apes that run wild called Barbary apes, tailless apes that are about 3, 4-feet tall when they're fully grown. And the little ones are jumping on people and swinging on car antennas and stealing hats and looking in pockets and are really adorable and the big old grumpy ones are sitting on like stone walls looking at you. And I walked too close to one and my cousin and I walked...well, he was eating something, some peanuts or something, and he kind of grunted at my cousin when he passed and then I smiled at the ape, and I was young and foolish and didn't know that showing your teeth wasn't a good thing you should do to a primate.

Years before my neuroscience, you know, experience would've told me that was a bad idea. I was like, "Oh, hi, old ape." And he grabbed my arm and sunk his teeth in and started yelling at me and swinging his arms and I yelled and he ran away. But that was my experience. My grandma's like, "Oh, we should probably clean that up." They were very nonplused about it. Like, "Oh, okay, whatever, you know, a little ape attack." So thought that was kind of funny. So not a gorilla, nothing big, not a chimp, you know, nothing massive, but probably as strong as I was at age 14, 15. So I was a little bit, you know, mildly taken aback. So.

Katie: Wow. That is quite a story. People who have listened to our first interview would know that you are and experts in all things related to the brain, and I'll make sure that first episode is linked for some foundational stuff if people haven't heard about it. There's several directions I wanna go today, but I think to start, I'd love to start broad and just have you give an overview of when you are looking at someone's brain and you do a QEEG, explain kind of what that is and what you're looking for in the brain and then we'll go a few different directions with what the results of that can help with.

Dr. Hill: Sure. So brain mapping or quantitative EEG is a tool you can use to assess your brain and your performance. We don't do just a recording of the brain generally at Peak Brain. We always combine it with also measurement of the performance. So we have you do, as you know, a boring, tedious attention test and then we put a cap on your head, squirt it full of gel, and have you do two recordings, an eyes-closed resting baseline, and an eyes-open resting baseline. These three things, the performance, and the resting brain activity, these averages will be compared to averages of people your age. So we get this sort of bell curve distribution of, "Hey, here's all your individual performance aspects." So we get things like impulsivity, and sustained focus, and auditory tension, and visual attention, and fatigue in the attention resources, speed in the attention resources, nice and granular.

So we're not, sort of, looking for like an ADHD diagnosis or that kind of performance, you know, confirmation. We're kind of trying to unpack for you what you kind of already experience and understand but give you a sense about where it's active. And I often see in an attention test things that are much different than the labels people walk in with, which is kind of interesting. And it often, almost immediately, informs things in their life they can do, especially in some adults when they had one perspective on their brain like they had a perspective on it being, you know, inattentive or something, kind of spacey. And then you look at their brain and you see just an auditory processing issue or so you look at their performance and it's just an auditory processing issue. You're like, "Well, does your partner yell at you for not listening to them? Oh, well, just have them wave at you first. And since you have no visual, you know, processing issue, you'll orient and be right there."

So you can sometimes tease apart your performance in a very granular way. We get 14, 15 different little features that are much more nuanced than simply attention. And they're really valid on a bell curve. You know, you have 100 is the average on an age-matched sample with a 15-point, sort of, standard deviations. So a typical range is about 85 to 115. And people come in with various resources in that range and then we can sort of look at the stability of the resources against each other, you know, are you relying on your speed or your stamina to plow through a test because it's harder to be focused or harder to be alert or something? So that's the attention test. It takes about 25 minutes, but it feels like it's forever. And then we do a brain map or a cap on the head and it takes 10 minutes or so or 15 minutes to set up, more if you're slow or new at it. And all of our home trainers, like, I think you probably did your own at home, I would guess, right, recently? Yeah. So did you...the first round a couple years ago was in the office, is that right?

Katie: Yeah. I think 2019 or 2018 I was in your office in L.A. and then did a home one.

Dr. Hill: So you've done it in the office, a brain map, and you've also done it yourself with live coaches supporting you. So, yes, this is your podcast, but let me ask you, was your experience different doing it to yourself with live people helping you or doing it in the office? Like, what was the difference in terms of, you know, were you a little concerned about doing it yourself? Was it scary? Did you feel okay doing it? I'm curious, you know, just to dive in, a tiny second there.

Katie: Yeah. I was a little bit apprehensive at first of if I was gonna be able to figure out how to do it on my own, but in some ways, I actually really liked it because I felt like I had a better understanding because I was having to be involved in the process. It was cool to learn that side of it, and they were so good about talking me through not just what I was doing, but why, and so I learned a lot through that.

Dr. Hill: That's great. That's good to hear. I'll just get some good perspective on how my staff's working now. Thank you. And, you know, one little aside for home people doing mapping, you have the freedom to map a couple of times. So you can do things like look at your brain on caffeine or other lifestyle things you, sort of, rely on or enjoy and you'll pick up really quick perspectives. So if you're wondering about your ADHD or something, you can look at your Adderall or whatever in terms of how it's actually operating on your performance. And, again, people are often surprised just like their life, you know, when they see their performance, it teases apart some differences, looking at your caffeine or your cannabis through Adderall, whatever, sometimes it's a mixed bag. People, "I rely on the Adderall." And then you look at their performance on it and their brain on it and they're faster and they're not drifting their focus, but they're much more error-prone or, you know, they burn out faster and have stamina issues even on the caffeine.

So these paradoxical things, our brain, because it's nuanced and we'll experience, kind of, the sum of all these experiences, it's kind of interesting to kind of look at how the sub-resources are working and use that to start informing models for yourself about where you wanna perform. And now we're getting into the perspective I have on QEEG, of brain mapping in general, which is not a diagnostic process, but you wanna paint some neuroscience for yourself and say, "Oh, hey, my neuroscience is like this. I think, maybe."

And again, not to be 100% because the brain's mysterious, your brain's mysterious even of the brain map, and I'll explain what the QEEG part is in a second, it's still mysterious. So instead of saying, "Here's, what's true and here's what's wrong and let me be the expert like a doctor might, we treat this like personal training. So even from the view of brain mapping, we're sort of saying, "Hey, athlete, where's your performance stuff here we care about? Here's some differences from typical. Here's some things that might get in the way for some people. What do you think? What do you care about? What's valid and what's important?"

And then the client, you know, like you, get to sort of select and prioritize their goals, give me some additional perspective on what's going on, and then like personal trainers, we just create, you know, iterative programs to push the brain around in this case. So brain mapping itself or quantitative EEG is a cap on the head and it's got a couple ear clips and about 19 or 20 channels or wires in the head and the version we use mostly is a cap where you squirt gel through little holes and takes about 15, 20 minutes to set up and you sit still for eyes closed and eyes open recordings, as I was saying.

Now, out of that, we get the amounts of brainwaves, the speeds of brainwaves, and connectivity patterns of brainwaves for you. And those will start to look possibly useful. So on an eyes-closed or eyes-open recording of your brain, we expect to see certain things. And if for one person's brain we saw a statistically unusual phenomenon, so I can talk to you...I don't remember what your brain looks like. I intentionally did not prep

myself to give away any secrets for you before this call. But let's say I saw an unusual feature in someone's brain, I would know it's an unusual feature statistically. I would know they had a lot of beta, or a lot of alpha, or not a lot of theta, or something. I wouldn't necessarily know what it means for you or for any one individual person.

I would kind of know it's plausible across people. Oh, in general, when this thing shows up, sometimes we get this particular, you know, complaint or resource hitch or bottleneck, and other times we don't. And so does this thing sound like it's operating and relevant for you? And then we end up getting the place of action, not the place of, like, reality necessarily. We know it's probable, or plausible, or important, and we can then test things. So that's why brain mapping QEEG is not a diagnostic because it doesn't really tell me what's true for one person and it's also not...we don't use it to train your brain to the average. It's not a tool that's used to train you towards the middle of a database, let's say.

We at Peak Brain use the brain mapping like your sophisticated coach at a nice gym who has a DEXA scan and has a bunch of, you know, individual fitness assessments, and some body composition charts and, you know, sits down with you and goes through all the different data and helps you figure out what you may wanna intervene with. But it's goal-driven, not symptom-driven. Even with suffering, "Oh, my low back hurts," it's still goal-driven. Oh, you wanna have nice abs and a non-sore low back? Great. And it doesn't have to be about, "Oh, your back's broken. I'm going to fix you." You know, I mean, if a trainer sat in the gym and they're gonna take the agency, you know, why? That wouldn't make sense.

And I think with the brain, we have to do that perspective often. I think the difficult thing that most neurofeedback people do, the difficult aspect of doing it is not sticking wires to heads or even sort of like, you know, setting up frequencies and moving through a training session. The hard part is knowing, for one individual, how to tune and adjust and get effects you're looking for. And the way historically...the field is more than 50 years old. The way that historically this has been accomplished is with a therapist in the mix, so it's a therapy kind of model where your person, your trainer works with you two, three times a week, they sit with you, they interact with you, and they often...

There's probably 6,000, 7,000 practitioners, maybe 5,000 in the U.S. only who do this stuff professionally, and of them, almost all are therapists or in the therapy model and, sort of, have a tight one-on-one relationship with their clients because they need to do that transference and perspective thing so they're understanding with the client what's shifting, their mood, their stress, their trauma, their eating disorder, their brain injury, their seizure, whatever it is. They have to kind of be part of that informed process because the transference, if you will, a container of a therapy environment gives the neurofeedback therapist enough perspective to guide the client's brain changes even if they're not especially good at owning the process. And that's always been a problem in terms of scalability, and the amount of people you can work with, and even in understanding what's happening because it conflates the physiology and the psychology so thoroughly.

So when I started Peak Brain, especially...years ago, I did a little different model with addiction that was sort of this direction, but Peak Brain's been around for about six years now. And when we started Peak Brain, we made the conscious decision to really do personal training-focused stuff. And the brain map is a, "Oh, hey, here's your brain. Here's what's unusual. What do you think? What's important?" And then, of course, we move into the neurofeedback. And I can unpack that if you like, but the point is your brain maps, your QEEGs don't change by themselves. We're looking at this 10,000-foot view of your averages, you compared to the average person your age, and while you might fluctuate a lot day-to-day, you don't fluctuate much compared to the mean of the average person your age.

So we kind of get this 10,000-foot view of these resource traits and some general ideas and then we get to explore it and decide what you wanna do, kind of like you're deciding, I want abs and I want, you know, a nicer, I don't know, butt or something, you can just go to the gym and build those things and you can kind of build your executive function, rebuild things like a trauma response that's gotten a bit pinched or seizures or migraines are dysregulated or just do peak performance work like creativity or, you know, flow state, and those sorts of things are pretty accessible. So that's the elevator pitch, long as it is, for why brain mapping is so amazing.

Katie: And yeah, like I mentioned, this is the thing I've been doing for several years. I took a break in the middle. And I wanna make sure we definitely, at the end of this, get to a lot of things people can do at home that I'm doing as a complementary with neurofeedback, but for people who have a more direct focus, they wanna work on with neurofeedback. Can you just kind of give us a high-level overview of what is happening during neurofeedback? So for context right now, three times a week, I'm hooking up wires to my brain and playing games basically with my brain, but can you explain kind of what's actually happening in my brain during that process?

Dr. Hill: Sure. Yeah. Let me assume your listeners are deeply sophisticated and then I'll break it down for...there might be one or two kids listening who want me to break the big words down. But what we're doing is involuntary operant conditioning and using implicit learning to get the results done. So to unpack that, your brain's already doing stuff, lots of stuff, it's making brain waves, or changing speed to the changing amount. They're connecting briefly with neighbors, letting go of circuits briefly. And we can watch that a couple of specific things. So if you wanted to work on your focus, there's a circuit in the right for not being distracted, the circuit and the left for sustained focus when you're bored.

So if you can never read a book without your mind drifting and you're off doing something else in your head and you can't absorb the information, then probably you're having trouble maintaining nice beta tone, the muscle, if you will, is kind of weak on the left and you might decide to exercise that resource or you would say, "I have a goal of sustained attention, sustained focus. I wanna read, I'm having trouble or something." And I'd be, "Okay, great. Let's train the beta up on the left." And so I'd have you stick a wire here. You know, Katie, that's called C3, but that's the left somatic sensory cortex and we would measure that compared to one of the ears, left ear, put a right ear clip on as ground. So three wires total, it would measure your beta waves under that circuit involved with sustained focus and would also measure your theta, which is kind of the breaks are

off, the circuit's doing stuff automatically, not a very organized mode. And the brain tissue's going to make these brainwaves, these little gears, if you will, at the same time.

So as you're making more or less of theta and more or less of beta, whenever the beta happens to go up on its own and the theta happens to go down, the software goes, "Ooh, good job, brain," and your little game starts to run better. Your Pac-Man eats more dots, your puzzle pieces fill in, your zombie gets hit more by...you know, this little car-racing zombie killing game we have. Have you seen that one or not? But the idea is that your brain is doing tons of things. This is operant conditioning, think Skinner's pigeons, not Pavlov's dog. I've never made somebody drool, I promise, from a bell ringing or a light going off, never, not once. And we're shaping. We're taking little things that are already fluctuating like your beta waves or your theta waves and whenever they happen a trend for half a second in the "right direction" for the workout, the computer goes, "Ooh, good job, brain. Good job, brain. Good job, brain. Nope. Ah, good job. Good job. Good job. Nope." Again and again.

And the big trick here is moving the goalposts every few seconds. So this is adaptive and the brain essentially gets applauded for little runs, little trends. It's engaging. And so in 30 minutes if you're doing one protocol, you may have a handful, 10, 20, 30 little runs of your beta going up on its own and the theta going down as you feel more focused or try to focus, or your brain is happening naturally get to focus, little boost somehow because the brain's always changing a little bit.

And the brain will notice that whenever it does some things, stuff in the outside world was happening, and the brain can't tell that apart from you like picking up a random musical instrument, or driving your first car and like, "Wait. What does all this stuff do?" It's looking for that loop. And it figured out that you can't feel your brainwaves. I mean, you can feel your muscles, you know, when you're moving a car wheel or whatever, you know you're touching it, you know it's part of the loop. But you can't feel your brain waves. So the brain's like, "Whoa. Why is my theta dropping, causing stuff to happen in the outside world?" The mind doesn't know. The mind can't really tell the first few sessions at least, but the brain's like, "That was interesting. I'm gonna buy into that. I'm gonna, you know, use that information."

And so the next day, typically, your brain will reach for the same mode, and your beta will rise, your theta will drop, and you'll have a little brief subjective experience of, "Whoa. I'm kind of focused. I just plowed through that 30-page chapter of my textbook. Didn't get distracted. Took me half an hour. Oh, yeah. Look at me go. That's kind of weird. I'm feeling really focused." And then it wears off and you have this experience with neurofeedback of like trying to go after different resources and they burgeon a little bit for, you know, a few hours to 24 hours and then we're off again, the little exercise, the training, we call it, the operant conditioning.

And what happens eventually is you can build up the same effect and once you built it up enough, if it's something the brain's already doing, especially the big resources, sleep, stress, attention, that kind of stuff, then the brain takes over and it's now practicing those new modes all the time and you have a good, permanent long-term change, generally, for those kinds of things like ADHD or even big things like trauma



and, you know, severe anxiety get reregulated pretty thoroughly for most people in about a few months, like three, four months, five months, that's been the timeframe for a lot of big change for people typically.

And then big things like autism, and schizophrenia, and major brain injuries and, you know, major aging problems, there's an active disease process fighting back in some ways, you know, keeping things a bit dysregulated so it takes longer and/or you may wanna do it ongoing, but for most things, most things that most brains do, even things that are really problematic, you can train the new mode and the brain's happy to hang out there with good resilience and stability from then on, so.

Katie: Yeah. It's been interesting...in my experience having done now QEEGs a few years apart, it was interesting to see the change in my attention because I think the first time I met with you, you asked me if my attention issues had ever gotten in my way before and I was like, "What? No." Because that's the first I've heard of them, but I had like not as optimal results on the attention test and then there was a big improvement by this next time we did it. I don't put a lot of stock in them, but I also noticed a big jump in IQ, which I thought was an interesting metric as well. Not that I think that those are that necessarily relevant, especially at my age, but I just did it for fun.

But I think like you've mentioned a couple of very specific conditions, I know you guys work with people on attention and also like TBIs and trauma recovery, and I've been curious too. I know the brain training helps, but I think also I did a lot of trauma processing in the last few years and sort of meditating in the past few years, which is kind of a segue into the next question I wanted to delve into you, which is what are some of the ways we can improve the brain at home? Because I think even if people are doing neurofeedback, this is very much a both/and equation and it seems to make the neurofeedback better and vice versa.

Dr. Hill: Absolutely. neurofeedback added to other things lubricates them. And before I move on, we actually...there's good research that, and I've heard anecdotally tons of times, IQ scores typically go up a lot with neurofeedback for some reason. We don't know why exactly because IQ's not a very valid concept itself as you were alluding to, but I'll tell you...I can't stop lecturing, sorry...there's three things that IQ is really. One is speed of processing, one is working memory ability, and the third is implicit learning. And speed of processing can be trained up in neurofeedback, so can impulsivity, which means you can hold things in a working memory better. So I think that's why.

Anyways, meditation, as you were saying, draws huge things and synergizes with all kinds of stuff and is a...I consider it sort of like a minimum viable practice. You got to do something day to day to like...just like you brush your teeth in the morning, you probably should do some movement and some meditation, that kind of stuff, and build some nice viable basics. But everyone, you know, for the past 30 years anyways, has been talking about mindfulness, and NBSR, and meditation and, you know. It's even in places that aren't California, people are doing mindfulness in the schools now. So that's a good one. And there's a billion resources there.

The only thing I'll say about mindfulness or meditation, if you haven't done it, folks, you might not understand what it is. It's not a relaxation exercise. People think, "Oh, I can't relax. I can't still my mind. I can't meditate." Come on. Well, then, no, actually that's not what meditation is. Meditation is a focus exercise. You anchor your attention in a specific way, on purpose, to the present moment, to something, and then you just kind of hold that anchor, hold that attention style. It can be a single point of, you know, awareness of a sensation, or a color, or a light, or a breath, or whatever, but you hold your attention to a single thing and since you have a mind, within a few seconds, you're distracted and you bring your mind back to the focus. That's a rep. So if you're really distractable, great, lots of opportunities to keep re-anchoring. And it doesn't take much to make a big change, 10, 15 minutes a day will do a huge amount for a lot of people over time, I would say. What is your practice like?

Katie: Do you have any favorite resources I can point people toward to if they're totally new to mindfulness?

Dr. Hill: Sure. On Peak Brain's website, and I'll make sure it's a little more visible and we can link it in the show, there's a little mini how to meditate practice because I like to use basic techniques that are somewhat old and combine a couple basic ones in short little 15-minute or even 7.5-minute practices if you're new where I have folks do a 5-minute single point awareness practice and then a 10-minute present-time awareness practice. So you're shrinking your attention down to the sensation of air right here for 5 minutes and then you're moving to a 10-minute watching something more rhythmic like your breath or the cars going by on the road or something. And there's a tool you can use called InsightTimer which you can set up little chunk blocks in your audio to help you transition your modes, but it's a very simple practice, very basic.

For those of you who are not new meditation, what I'm doing, this is a basic Samatha into a Vipassana, that kind of style where you anchor and settle and then you go to awareness. Vipassana is kind of what's behind the Western-style, if you will, in some ways of meditation or mindfulness, the MBSR stuff kind of came out of that, the Vipassana stuff, and it's really the insight tradition. If you folks ever hear the word insight attached to meditation, it kind of means that end of the pool where you're watching, you're aware, and you're anchor in sense of awareness on a focus, on a sensation, on a feeling tone, so you end up getting things like meta, which is loving-kindness, progressive ways of feeling loving-kindness, actually.

First, you think about someone you love, and then you think of someone you don't care about that much and someone you kind of like, and someone you really hate, and you practice feeling love for them and that helps break up the sort of perspective. But it's type of attention. It's a type of intentional feeling that you're reaching for just like the focus or mindfulness can really build. So, again, not to be your meditation teacher for all the folks who are brand new, but you can grab our tutorial off the website. It's pretty useful. It's a short one and it's a great place to start. And the effects will accrue subjectively usually within a few days. So you don't have to do very much of it to, you know, figure it out.

Beyond meditation, because that's kind of, you know, old hat for most Americans now, most Westerners, I would say the biggest thing people are not doing properly or the biggest place you can make change is in

sleep, sleep-hacking, specifically. And people don't really understand sleep even though sleep trackers are all the rage these days. Heck, I'm wearing one. I have an Oura Ring right here, and I love it and I rely on it, there you go. But sleep trackers are a little misleading. The map isn't the territory. The data's not the person, and data is imperfect. Physiological data is noisy and imperfect.

So, first of all, if you have a sleep tracker, ignore the REM measurements, never valid on any tracker. Any sleep tracker in the market has bad, misleading, and potentially completely nonsensical numbers in the REM. Look at the deep sleep if it uses their heart rate as a tracker. The Whoop, the Oura, Fitbits, the Huawei, I think the Apple Watch, they all use the heart rate variability, the changes of heartbeat rhythm as a way to stage sleep. Pretty decent for deep sleep and for the total sleep, not really valid otherwise. You can't get REM or other things that do it, an EEG, or you need like really sophisticated, what's called actigraphy, which is like really sensitive movement devices on your limbs.

So you have to look at your deep sleep, but the good thing is, or the good news on sleep is your REM doesn't change that much. It's really hard to push your REM around. It's really easy to push your deep sleep around. If your REM did get pushed around, you'd be full-blown psychotic, or hallucinating, or having major mental illness that was really disorganized, disruptive. So by the time your REM is dysregulated, you got bigger problems and you know it. So don't worry about your REM. Do pay attention to your deep sleep because that will flex night-to-night as a function of your previous day, day-and-a-half of behavior. You know, your autophagy signals of fasting or exercise, your repair signals, you're feeding, how late you eat, if you're ill, if you're hydrated, aspects of the environment, the place you're sleeping in, this all impact how we sleep and how much of that is deep sleep.

And so we should be aiming for getting, you know, husbanding, tending that resource of deep sleep. I have a few bio-hacks I like to do and they're about watching a resource and making sure I'm tending it appropriately. One of them is watching my deep sleep. I was watching my ketones, but it in the breath, not in the blood. I think that's not a very useful measure in the blood, actually. So watching these things, you know, gives you a two, three-day window of sense. If you're really stressed out, working out hard, changing your habits, you'll get a sense on your Oura Ring about your deep sleep. What's nice on the Oura too is you get body temperature. So if you eat too late at night or if you're getting sick or too stressed, your body temperature will be spiked and that will directly contribute to poor deep sleep and poor recovery.

But let me give you my top three sleep hacks. And these are in order of importance and I sort of think they can make, no pun intended, night and day difference for a lot of people's performance. And the first one that I think many of us do poorly is we have to let our insulin drop really thoroughly before bed, which means you got to fast, no calories for a few hours. If you're insulin-resistant, that could be four or five hours, six hours. If you're not super insulin-resistant, relatively healthy, it's still like three hours to clear all the food, if you will, all the blood sugar you ate at dinner. So we should not be having late-night snacks and evening meals before bed and, you know, snacking in front of the TV between dinner and bedtime. All that stuff is really gonna screw us up. And I never like to tell you just a rule, but here's the why.

I mean, essentially if you go to bed with any insulin, you'll suppress growth hormone release, it can't come up when insulin's up. And so you'll end up skimming the surface of sleep kind of like if you're on a pond all night, you know, little skimming on the surface, never diving down. And, you know, the sort of rule of thumb here to encapsulate is go to bed a little hungry and you wake up full of energy and full. If you go to bed full, you wake up hungry and tired. If you stuff yourself full of food before bed, you'll wake up hungry and tired. But if you go to bed fasted, you wake up full of energy. So really important because what you're letting happen is not just the growth hormone pulse that drags into deeper sleep. And if you're north of 30, 35, the only growth hormone you're getting every 24 hours is that somewhat blunted pulse. And so if you're like 30 years old and eating snacks before bed, you're getting old fast, and not recovering, and getting fat.

So the other thing it does is it suppresses the sort of cycling of all the other regulatory hormones, like cortisol. You want cortisol to spike 5:00 a.m. or something, and that brings up everything, wakes you up, squeezes your liver to feed you breakfast, all the glycogen jumps out from cortisol responses, essentially, that's why if you have a little iffy blood sugar, you'll have a dawn effect in the spike in blood sugar. But if you don't, if you have healthy glycogen and insulin metabolism, you can kind of have a stable period in the morning of also fasting.

So first rule, fast before bed for a few hours, second rule, get up early seven days a week. I don't care roughly what it is as long as it's working for you, but it probably should be by sunrise, if not before. There's a certain frequency of light, a color of light that's in the sky only for the first hour of the day and it goes in and hits a nucleus behind the optic crossing, the optic chiasm, the optic nerves across, and it's called the suprachiasmatic nucleus, the SCN, and it watches for the color of light in the sky. It's only sensitive at morning light and it's a, bing, reset for all the other clocks throughout the entire body. So it synchronizes all the brain circadia and then they cascade down and synchronize everything.

So without good morning light, somewhat routinely, you're not getting the only actual light cue that really matters. People always, in the biohacking world, are focused on blue blockers and, you know, other things at night and stuff like that. And as a mom, you're gonna hate to hear this too, but screens don't matter that much in terms of circadian stuff. They just don't. You shouldn't have bright lights on at night, super bright, and you shouldn't have things that are super overhead. Check out Dr. Andrew Huberman's talk on that, but in terms of circadian suppression or progression of light that's concerning, the morning is where it's at. You wanna get the morning. And later in the day, it doesn't really matter that much. You know, if your kid's on a screen after dinner and it's really, really bad all evening long, the worst they're gonna do is progress their circadian rhythm by about one hour, and the brain can handle about one hour every night and ignore it. So it's not a huge risk, so to speak, in modern society to be on screens late at night, I don't think, unless they're really bright, which then can mimic some of the morning impact.

So fast before bed, get up super early seven days a week even if you didn't get much sleep, and get some fasted exercise in few days a week and low intensity to moderate intensity, like you can talk over it. The reason being is you wanna burn off that low amount of cortisol and moderate amount of glycogen you have

circulating. You don't wanna create more, you don't wanna call for more by hitting the gym and hitting the weights and make more cortisol go up. You wanna bonk your muscles and strip out all the glycogen in your bloodstream so the muscles are shaking and demanding more, you'll cause a secondary hormonal cascade. It'll call from more cortisol, insulin, everything else, and you have high cortisol-ish in the morning, so you're resistant to it. If you drive it up when you're resistant to it, it's gonna weaken the signaling anyways.

So you move your weight lifting to between 3:00 and 7:00 p.m. when cortisol is naturally its lowest and your cardiac output is at its best, the most relaxed, and the highest volume. So you can hit the gym hard and briefly drive up cortisol. You aren't making very much so you burn it off. You're very sensitive to it, so it mobilizes lots of fat and then you end up burning it off and having your dinner, whatever, and refeeding, a little carbohydrate, a little insulin, and you're good to go.

Oh, and last reason not to eat before bed is because melatonin secretion suppresses insulin secretion. So you're gonna have a hard time getting insulin even up if you're eating late at night, you're gonna have this weird thing about the insulin not doing its job well enough, so triglycerides and everything else is gonna go really high as you fall asleep. So worst of all worlds if you eat before bed. So those are the big three rules. Fast before bed, get up early, exercise, or get up early and exercise in a fasted state a few times a week.

Katie: And those are all, not even...they're free and/or better than free because we are avoiding doing some things sometimes that cost money.

Dr. Hill: That's right. I always joke that the most cost-effective thing you could do is often nothing like just don't eat or don't engage in that slightly maladaptive habit you have or whatever it is. It's often easy pruning to get better performance and health. So, yeah.

Katie: And just to highlight what you said, I wanna make sure everybody understands. You are a neuroscientist who looks at thousands and thousands of brains. And while there are these amazing high-tech interventions we can use, and they're so helpful, especially for very specific cases, your advice that you're giving to everyone is free advice, and it all centers around this. And we've all heard that.

Dr. Hill: Sleep is the number one thing. Blood sugar is important, and that's in the pathology, often, realm or, you know, most Americans are, but I would say for sleep is the number one general thing, biohacking your ketone glucose, kind of, management. Understanding metabolism is another big thing. And that's really important and does more for the brain than almost anything else in the world, driving down your stable glucose and up your stable ketones. That's a very complicated discussion, takes large amounts of, you know, figuring out.

I'll basically give people the nutshell of a system I've developed where you can essentially partition food in three different ways, three different axes. You partition it in time, people call that intermittent fasting, or time-restricted feeding, or whatever, you know it. But you've heard about this stuff. It's time restriction. You partition the food and time. You can also partition calories. People call that dieting where you just drop the calories, you eat less. And then the third thing is you partition your macronutrients and that will create different for hormonal internal environments for signaling, and accelerate, or at least make the behavior easier by controlling environments, not being driven by the hormonal spikes, and that ends up being things like going into higher protein ratios than you might expect.

I think the keto world is kind of missing the boat in terms of the most optimal way to eat. I think long-term keto is a little dangerous. I love short-ish to medium-ish term keto or carnivore for brain injuries, for inflammation, for mold, Lyme, for so many reasons as an intervention, as a good thing to make change. I don't like it as 15, 20, 30-year optimal. If it works for you, great. If you like it, great. But if you're trying to get the optimal performance, the most muscle mass, the most athletic performance, the most cognitive performance, I think it's suboptimal. I think closer to paleo or primal kind of thing is better, but I think many of us are trying to manipulate the internal environments metabolically and in terms of the macronutrients, a lot of the way we can do this is kind of like a protein-focused keto, not a fat-focused keto where you try to keep your protein, the energy coming in from your protein higher than the energy coming in from your fat.

So, you know, yesterday, I had...I struggled yesterday today to eat 1,550 calories. Struggled. And that's probably a good 1,000 or more calories under maintenance for me, it's a huge deficit, but I struggled to eat that much because I had four steaks. You know, they were small-ish, but I had four steaks and something else, but like that was over 1,500 calories. And I was stuffed after having two meals. And I'm doing it to cut down some body fat and play with a really high protein-to-fat ratio, but a lot of the keto people will discover their performance will improve if they...You have to keep fat above 30 grams, 40 grams, 50 grams a day, otherwise you get hormonal issues, especially for women who are doing keto, maybe even higher. But keto, as it's practiced today, is 90%, you know, fat for most people. It's ridiculous. So I think people should be more like 50% or above protein and 40%, you know, fat or something. The rest is carbs.

And I think once you're well-adapted, once you've recomp'd sufficiently, once you've got the abs you wanna get, once your chronic pain is gone, inflammation's gone, you've done the elimination stuff to fix your gut, once you've moved beyond the more acute intervention, I think humans are really, really good, best, at performing at around 50 grams to 100 grams of carbs a day, actually relatively high in the keto, you know, obviously, world. But, you know, I think you can figure out ways to get metabolically flexible to stay in light ketosis often and still eat 50-plus to 100, maybe even, grams of carbs a day. I sort of worked out a system to do this, to stay in light ketosis. Every morning, I wake up about 1 or above, but some days I eat 100 grams of carbs before, and I'm able to, like, cycle in and out now years after, sort of, rebuilding some metabolic flex. I couldn't do it, you know, two years ago. I was just fat, and slow, and tired and would have no ketones if I ate sugar, but now I can do it.

But I think it's important to get in that mode only because we're designed that way. We've got a liver that can handle between 50, 80, 90, 100 grams of glycogen carbs and muscles which aren't really a storage mechanism per se, but they can handle more, you know, a couple 100, 300, 400 grams more, but the liver is the energy flux. So getting back to let's say with sleep hacking, part of that was about the energy flux, allowing it to happen, hormonal fluxes at the end of the day, the energy fluxes, allowing them to happen as they're designed, so to speak. That lets the seesaw swing more widely in their circadian rhythm and locks in so much other.

Well, I think the same's true of carbs for many people. If you're having 50, 60, 70 grams of carbs of day and you're active, you're burning off more than that in terms of energy and you're providing, sort of, the most optimal, you know, flexible environment. I do think that we should still go low carb. I do think we should still go zero-calorie or fasting here and there to create the environments where we can switch. But beyond that, I'm not, these days, a super huge fan of, like, long-term years of keto, basically. So another intervention, mindfulness, sleep, and then this diet hacking thing, which is got this sort of tri-partitioning thing that I'm sort of outlining for folks, so.

Katie: Yeah. And I mean, to recap that, I think it's really valuable that the things we're seeing are best for the brain are things that also have benefits in every other area of health and that are inexpensive or free. Granted, I know for a lot of moms the sleep part is a tough thing to hack when you have young kids and I totally can sympathize with that. But I think it makes sense, start with those keys and then add brain training and if you need it or add in other interventions, but I feel like every expert agrees sleep is super important. I've never had anyone come on this podcast and say like, "Oh, sleep really doesn't matter." Get the free basics first, get those really dialed in, and then anything else you manipulate will become much more effective because you've got that solid foundation.

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I also am right now getting a lot of questions, nootropics are such a hot topic. People are wanting supplements to improve the brain. There's a lot of different supplements and stacks of supplements that people are trying and I see people using more and more things like Adderall and Modafinil off-label. So I'd love to have your perspective on those things, especially for people listening who maybe have teenagers who are experimenting with those, are there safe ways to supplement and improve the brain, and what should we be wary of?

Dr. Hill: I mean, there are, but you should have a nutritive perspective on this in general. And for teenagers, you know, food is the way to go. For elders with reduced absorption, there may be need to supplement, and for the rest of us, you can spot target things. But just like you were saying with this foundational stuff, it's relatively accessible that makes a huge change like sleep-hacking. I think supplements are pretty far down the list in terms of when you bring them on board, or nootropics. Once your sleep is sorted out, you know, your other basic practices, your basic nutrition, I even bring neurofeedback in before nootropics because I wanna make a permanent change in a few months, and then let's figure out what needs gap-filling, use nootropics for that.

I don't like most nootropics or most things called nootropics in spite of having founded a nootropic company, I helped found TruBrain years ago, but I like some nootropics, but the definition's pretty narrow and the marketing has blown up in terms of what people call it. I'm not a fan of Modafinil. I think Modafinil's dangerous. I have personal experiences with Modafinil. It put me in the hospital for several days with head-to-toe hives. Modafinil is mostly a histamine booster. It's mostly how it does its job. And if you have any attention difficulty, you already have high histamine probably if you're distractible or if you're anxious. You might have some or allergies and you add Modafinil, after a couple of weeks, you're dysregulating your histamine system and really potentially causing risky issues.

And there's a great early, not early, 10, 20 years ago now, paper on Modafinil called...I forget who the author is. The title is "Approved and Investigational Uses of Modafinil." You can find it easily. And it's a metadata study showing a bunch of other studies and how they sorted it out. And all the ADHD studies, people dropped out at an alarmingly high rate because they had massive side effects. So that trope of the geek who's got allergies, there's a reason for it, histamine. it's a neurotransmitter and it sits ahead of all the other ones essentially earlier. So if you boost it, you get vigilant, you get alertness, you get...it's on. But I don't think most people should be getting the...It's not a very large boost. It's a very sexy one in the business world and Silicon Valley world and the father of biohacking talks about it or used to talk about it a lot. But I don't think it's...I think it's a very weak tea in terms of cognitive impact and attention impact, almost nothing, and it's only really, really useful and so impactful for many people because they have sleep issues and dysregulated attention because of dysregulated sleep. So I'd rather they sort this stuff out permanently without bringing this stuff on board, if at all possible, and then layer in additional strategies.



Now, I do think based on developmental bracket, there's different supplemental strategies that are fairly important. As you get older, north of 40, 50, 60, you may have to supplement with protein because it's hard to absorb. Vitamin D becomes super important for many, many people. Certainly, right now in a pandemic, I would encourage folks to go up in vitamin D levels as much as possible. Don't go crazy with it if you are dosing for months and months. It takes about eight months if you're overdoing vitamin D to get into toxic levels, it's a very slow overdue. So, you know, don't megadose vitamin D for a year without getting a blood level, but you can do it for a few months with impunity pretty much.

And then I tend to go after specific things for people based on their needs with supplements. Like, I'm a middle-aged dude who, you know, is stressed. So I have at night phosphatidylserine and...what else do I have? Not much else right now at night, actually. But that helps drop cortisol, which helps my sleep be deeper. I'm pretty dialed into my hacks though. My sleep's pretty amazing, to be honest. I get like six, seven hours of just the best sleep you could possibly imagine. And now I wake up, you know, today I woke up at 3:30. My alarm's set for 4:00. I almost never wake up with the alarm, almost always just before it. And I was like waking up fresh, like 3:30 in the morning today, which is a bit late for me usually. It's only six hours of sleep last night. So I was just feeling great because I'm locked in.

I've noticed this for clients, whether I help them fix their sleep with their feedback or behavioral hacking, whatever it is, as it gets more efficient, the hours will compress dramatically. Someone's getting eight hours, eight-and-a-half, nine, feeling like crap and you dial it in, some getting six-and-a-half, feeling amazing or something. And that's really quite common. And I find it it's much more common in people who move their wake time much earlier. I think humans are really actually quite good at getting up in the circadian times, you know, well before nautical dawn. So an hour, hour-and-a-half before sunrise, basically. An hour before sunrise is nautical dawn. I think that, kind of, humans are creatures of that time because we're flexible and I think that's when we're often the best in terms of dialing stuff in. I don't really believe in this, sort of, larks versus owls, morning people versus night people. I think we're imminently adjustable. And what I'm hearing is an accommodation of the modern world and a bunch of excuses when people say that, honestly. I don't think that there's anything...not a true chronotype in people essentially.

Anyways, those are all straightforward interventions. I would start there. And then in terms of supplements, I would say it becomes critical if you have specific genetic stuff going on, MTHFR, you know, issues with clearing comps, etc., etc., you should dial in the right B vitamin stack, but that's somewhat sophisticated and very individualized and you should have a methylation analysis with a good functional medicine doc to look at your B vitamin needs based on your genes. And that can make massive differences in performance as well as symptoms, anxiety, and depression, and ADHD, all kinds of stuff can be really, really assuaged with the right nutritional stack because we don't inherit...It turns out if you look at all the genetics in mental illness, and performance, and everything else, we don't inherit traits, the endpoint of traits. We inherit like some metabolic, you know, slow pathway or some potential and a bunch of stuff will sum, but it's usually some metabolic chain.

And in mental illness, mental health, it's usually methylation. We can't move stuff down the methylation chain rapidly enough so it's useful. We can't take the food and methylate the B vitamins rapidly enough to then use them in energy or cognition. And so I think that's an untapped resource for a lot of people, this methylation analysis, B vitamins. I would, again, put that before I would put in random supplementation, this targeted supplementation. Or if you're an elder having, you know, cognitive issues, there's some specific things you can bring in, or fatty acids. Acetylcholine is an amazing...you know, sort of, acetylcholine toner, if you will, as well as things like phosphatidylcholine, phosphatidylserine.

But, you know, and then for kids, other than the spectrum, I would say DHA probably from algae forms becomes the only real thing I would probably be very encouraging of supplementation in by default because kids, you know, A, brains are made up of DHA in general, mostly two-thirds of brains are DHA, and kids are making brains all the time so they need a lot of fat. So I would give them a lot of DHA supplement or at least a couple grams, probably, you know, if I had a kid. But beyond that, I wouldn't supplement just because. I would do it after everything else is built in, sort of spackle over the gaps, you know?

Katie: Yeah. I think it's important, like you said, to also realize how individualized that is and to work with someone who understands maybe the functional medicine side. Like, for me, an example would be, I was intolerant to eggs for a long time. I've since resolved that, but I was eating almost no dietary choline because I wasn't eating eggs. And I had a number of genes that are highly dependent on choline. So supplementing with that was life-changing, but that wouldn't be the case for most people. And so it's learning those things about yourself.

I also wanna circle back. That's so interesting how early you wake up, for one, but I heard this from numerous guests who, when they get really good at meditation, find that they are sleeping less and less or that they like sleep in a shorter window and wake up earlier. And I actually, when I started intensifying brain training and really dialed in my deep sleep and then added meditation regularly, for a while I was like, "What's wrong with my sleep? I'm waking up at 4:30 or 5:00 every morning and can't fall back asleep." And then I finally realized, "Oh, my body's just waking up now. I'm ready to be awake. It's not middle of the night. This is what my brain is now considering morning." So I just go to sleep a little earlier and make sure I get enough sleep. But that is interesting that you said that's probably the natural state of the human brain is to wake up...

Dr. Hill: I think it might be. People are...I'm sure there's neuroscientists listening who are like, "What? What? He's not right." But I'm convinced both experientially as well as working with people. And I work with people that have weird schedules and weird shifts, and actors, and athletes, and musicians, and everyone else, and I find that there's things you can do if you're a night shift person or a musician to ameliorate it. And I would actually be more interested in supplementing, like, circadian and chronotype stuff, finding ways, some vitamin D at certain times of day, or, you know, giving...Food timing is the number one impact on circadian rhythm. So I would actually encourage someone who's eating...or sorry, who's living a night shift or an evening shift, you know, second shift at a hospital, a musician, whatever. I would still encourage that person, if it's not gonna be their life all the time, to eat in a time schedule that is like a normal, if you will, sunrise/sunset because then you'll still get all the circadian benefits, you won't progress your clock deeply, basically.

But there's ways of, like, pegging your food timing to lock your brain into a certain time of day. There's a great app I use on the phone called...Oh, I'm blanking the name of the app now. But it's used to cross time zones. I haven't traveled now in a year-and-a-half, so I'm blanking in the name of it, but it's an app by NASA, which is about if you're crossing time zones, it tells you, sort of, when to eat and you can pick the number of days and it progresses your meal times earlier and earlier, and when you're sleeping, when you're light, to get you into a circadian rhythm for the zone you're in. But a lot of the benefit or a lot of the way...the most powerful lever you have to pull is when you eat. So just don't eat at random times and you do eat at same mealtime for the life you're living and you'll lock in pretty easily for most people.

Katie: And I would guess the advice to get up before sunrise is gonna be the toughest one for a lot of people listening. That was not fun advice for me for a while. I think the other kind of controversial topic I wanna touch on with you a little bit is caffeine and, like, what place it has in brain health and sleep and what you recommend from a neuroscience perspective.

Dr. Hill: Yeah. I think caffeine, well, coffee is largely healthy for most humans. I think individual humans have issues with cardiac or gut stuff, you know, heart's sensitive to it or there can be some gut acidity stuff going on. But coffee or tea, I think that the phytonutrients are generally healthy. I also think that, you know, they're habit-forming slightly and like anything else that is stimulus and enjoyable, we have to kind of manage our relationship with it, be that television, or food, or sex, or shopping, or a drug, or whatever else. And I mean, I think Westerners consume more antioxidants through coffee beans than all other dietary sources combined pretty much in terms of dietary antioxidants. And antioxidants are a thing you should get from your food, not from supplements. You should never take supplemental antioxidants. It'll shut down your body's ability to hear the free radical signals it needs to hear to clean out dead cells and dead mitochondria and things. So you never should supplement like large amounts of vitamin E or large antioxidants or something, you know? But the body has good redox and antioxidant capacity.

Coffees, actually, and tea are both really quite helpful in those ways. And so are other foods that have large things that help with antioxidant ability. I think that the average human's clearance time, the half-life of caffeine specifically, is between three and six hours depending who you are. So it's four-and-a-half hours on average, as you may know because I've probably told you. Privately, things affect your brain for five half-lives that's why I make you have no caffeine before a brain map from sometime the day before. But actually, if you take four-and-a-half hours as the mean times five, you're at a full day. That sort of means that most people, if they're having coffee daily, never have coffee out of their system, not ever. So it becomes somewhat important to look at your use of it because, again, cortisol is high in the morning and caffeine will crank it up. So you got to kind of...I would recommend not going...

Here's how I recommend the, sort of, practical way to handle coffee. If you love it, don't have it first thing in the morning. Ride the cortisol, ride the blood sugar, let it wear off, get some exercise in, give it an hour, then have your coffee. Once cortisol's dropping, you'll feel it more. You may notice you feel your cup of coffee at

1:00 p.m. way more than at 7:00 a.m. It's because cortisol's low at 1:00 p.m. probably. So I would recommend having, you know, limiting coffee a little bit. I used to sort of say...and then the research does support this. There's been papers out every few years showing the upper limit of coffee is ridiculously high.

Like, this meta study out of Finland, I think, showed that across countries, across thousands of people, and some absurdly high, you know, users of coffee like the Swedes and the Fins, the health benefits seem to keep increasing and it asymptotes, doesn't go away, but it just stops increasing the health benefits. It was like 56 cups a day. It was absurd amounts. Most of us would have cardiac issues or gut issues at that level. But in general, it seems to be an incredibly tolerable substance for humans to abuse. Just like cannabis, a lot of people abuse cannabis successfully and/or there's some benefits for it. I think the benefit ratio for coffee is a little more clear potentially in terms of just general cognitive benefit. There's plenty of other benefits, of course, in cannabis that are anti-tumor, anti-cancer, anti-whatever, anti-pain.

But coffee has, I think, some good cognitive benefits. It reduces long-term aging stuff too in terms of the brain. You got Parkinson's, Alzheimer's, and other forms of dementia that could creep in, there's dramatically blunted, the risk factors are blunted and multiple when you have lots of coffee onboard. So I think we should have...you know, if you like it, don't have it right away. Have a couple of cups, 2 to 4, and stop before noon, you know, especially if you're going to bed at 8:30 or 9:30 like I am, you know? Then stop a couple of half-lives. If you're a fast metabolizer, maybe you'll get away with having coffee at 1:00 p.m. or 2:00 p.m. If you're not a fast metabolizer, you should probably have your last cup of coffee late morning. You know, have a cup at 7:00 or a pot at 7:00. The amount doesn't matter so much. What matters is the cutoff time so your liver can clear it out of your system and have enough time to fall asleep.

So I don't care if you really, really rely on coffee from, you know, 7:00 a.m. until noon. If you cut yourself off, it was three pots, it's okay. You know, you'll end up becoming...you'll notice the absence of it, especially if you do what I'm suggesting and giving yourself a gap in the morning. But like any other drug, I think we need to manage our relationship with it and not take the amount we can handle and tolerate, but engage with the amount we enjoy, the minimal amount we enjoy in some ways and need to experience what we want out of it, be that coffee or cannabis. I think, you know, many stoners I know, especially here in California, they smoke as much weed as possible. Not as much as they enjoy, as much as possible. I mean, George Carlin had an old skit on this. He would say, "Don't smoke more weed when you're high. You just get less weed, not more high."

So I think with alcoholics, there's this like, you know, one drink is too much and, you know, 10 isn't enough kind of thing, the slippery slope of continually imbibing. I think with sugar, if you're eating sugar, you get an insulin spike and the falling insulin triggers more feeding behavior. It's hard to stop eating once you're eating sugar. Relationships with rewarding substances and appetitive, enjoyable substances with high reward value are tough and it's up to us to manage that relationship, assuming you like coffee like I like coffee. But beyond that, I think it's a pro healthy thing within reason, you know, and more so than things like alcohol. I don't think there's really any...I think we've firmly established, the neuroscience field has finally established there really isn't any health benefits of alcohol. And all the red wine stuff is about grapes, not about the alcohol. There's a

recent study showing grape extract has as big effect, it looked like, in the population. So grape juice does. So it seems to be a grape skin resveratrol effect in that.

Katie: So get up before dawn, but we get to keep our coffee, and stop eating a few hours before bed. And it really does make a big difference. I think we often underestimate how big of a difference some of those small changes can make. And I've seen it now in my sleep data, which I track really regularly, and now also my brain mapping. And I think that advice is so sound across the board and is starting with those factors. And then if you, like, I did know you have past brain injuries or past trauma or attention issues and wanna work on specifics, then you have a great foundation for neurofeedback. And I think then you're coming to you with a good canvas to help paint the brain as you say. As we get close to the end of our time, a question I love to ask is if there is a book or a number of books that have had a profound impact on your life, and if so, what they are and why.

Dr. Hill: Yeah, I was thinking about...I got this question before and the last time I was asked this question, I didn't have a good answer. I probably still don't is the short answer. I've read so many books. I was one of those kids who like just until I like hit my late teen years and I emerged blinking from a dark attic somewhere, I just read. I got up in the morning, I read. I read all day long. And after fifth grade, I went to the library for four hours and read all the books I could and checked out the max amount you could take home, read them all, bought them back the next morning. Like, books are an amazing thing, but there's just been so many in my life, I could never pick just one. It's like having a favorite child. You don't have a favorite child, do you, Katie? Come on. No.

That being said, I don't wanna give it a cop-out. So I'm really a big fan of Ladinsky's Hafez translation. There's a collection called "The Gift" that I'm a huge fan of. Hafez is a Sufi poet, just like Rumi basically, but a little bit less well-known. One of the dervishes, you know, the sort of same, the ecstatic end of Islam essentially. And Hafez's poetry's all about that, sort of, being present and enjoying and finding celebration and love in the moment. It's very resonant with me. So I found that very...For a book anyways, I'll give you that answer.

Katie: I love it. That's a new one. I'll make sure that's linked in the show notes as well. And along with...I know you have resources on your website about a lot of the things that we've talked about, I'll make sure all of those are linked. And I know I see in reading studies just how profoundly things like meditation and certainly sleep impact the brain and the aging of the brain and you see this playing out in the data that you look at in people's brains daily. And so it is so helpful to have your perspective and explanation. I love that you gave us so many practical, free, at-home tips to build a better brain and also, hopefully, to help our children build better brains from a young age and that you also have these resources available for people who have more specific focus or questions related to their brain. I'll make sure, for you guys listening, all of those resources are at [wellnessmama.fm](http://wellnessmama.fm). So you can find the links. And, Dr. Hill, as always, it is such an honor to chat with you. Thank you so much for your time.

Dr. Hill: Oh, my pleasure, Katie. Thanks for having me. Look forward to talking to you again.

Katie: And thanks as always to all of you for listening, for sharing your most valuable resources, your time, energy, and attention today. We're both so grateful that you did, and I hope that you will join me again on the next episode of the "Wellness Mama" podcast.

If you're enjoying these interviews, would you please take two minutes to leave a rating or review on iTunes for me? Doing this helps more people to find the podcast, which means even more moms and families could benefit from the information. I really appreciate your time, and thanks as always for listening.