Announcer:

Bulletproof Radio, a state of high performance.

Dave Asprey:

You're listening to Bulletproof Radio with Dave Asprey.

Dave:

You guys already know that I talk with guests who are experts in different areas of life about how you can perform better at everything you do as a human being and one of the things that you probably haven't done enough of in improving your own performance is resting and today's episode is all about how to fully rest. Everyone's under stress all the time, because there's this whole fear thing. It's part of our body, our whole of hunger, stress, and maybe you have some kind of cold or something or maybe you're just worried about the end of the world. It could be any of those things: Zombies, apocalypse, chainsaws, whatever. We all have stress all the time, including exercise, including just life, right? Life is stress by its definition. But I think most of us have been under more financial stress and emotional stress and just weird stress in the first half of 2020 than in a long time. It affects you physically, mentally, probably financially, probably socially.

Dave:

So, I'm bringing in Greg Wells, Ph.D., and we're going to talk about health and performance under extreme conditions. I like him because he's a scientist and a physiologist who looks at human limits, makes them understandable, very actionable for you and he just came up with a new book in March called Rest, Refocus, Recharge: A Guide For Optimizing Your Life. And it came out right as lockdowns were getting rolled out everywhere, but he isn't a veteran endurance athlete who is going to teach us on the show today how to slow down, so you have the energy to speed back up as life gets back on track. Greg, welcome to the show.

Dr. Greg Wells:

Dave, thank you so much for having me here. I really appreciate it. So good to be able to talk to you.

Dave:

You are the second Translational Medicine Officer that I've had on the show most recently. I had the team from Viome on where we were talking about that, and Translational Medicine or Chief Translational Science Officer is a very new role in the world and you're one of the few out there and you do this in Toronto at Hospital for Sick Children. Do they have a hospital for well children by the way?

Greg:

They should. It's one of my goals, actually, that one day I walk into the hospital and it's empty.

Dave:

There you go.

Greg:

It's kind of cool. It's like saying my career mission is like, "Oh, there's no one here. I can leave now."

Dave:

It's kind of funny like as a name for a hospital like they don't have hospitals for any other children who aren't sick that I'm aware of. But anyway, what makes you a Translational Medicine guy and an endurance athlete? That's just a weird combination even by the standards that people have come on the show.

Greg:

Right. Yeah, it's bizarre. So, I live a balanced life, but it's of at the extremes, so the way that I ended up in both worlds is I ended up doing a Ph.D. in Exercise Physiology with a Respiratory Medicine, Respiratory Physiology bend to it. So, I looked at how breathing and changing breathing affects sports performance in train sports like rowing, cycling, swimming, running, like where your breathing and movement are linked.

Dave:

Huge thing.

Greg:

Yeah, super cool, right? So, if you can change your sensitivity to carbon dioxide, you can allow the movement to dictate your performance, not your breathing to dictate the performance. So, think rowing, right? You have to breathe in time with a stroke. If it falls out of link, sync, everything falls apart. Same with swimming, you can't rush to the next breath. You've got to let the technique dictate when you breathe.

Greg:

And so, that was all of my Ph.D. And then I took, as soon as I graduated, I went to Africa for five months and rode my bike and I got back and I couldn't get a job. Funny enough, you can't get a job once you have a Ph.D. and I ran into someone from the Hospital for Sick Children, Dr. Allan Coates, who ran the exercise lab that tests children with cystic fibrosis or lung disease. He's like, "Oh, you have a respiratory physiology background. Why don't you come and help me run the lab at Sick Kids?"

Greg:

And that launched the medical side of things. So, I've always sort of had this high performance sports interest, but then also applied it at the limits for children that are really struggling to be healthy. And then now what I do, is I take all the information that we get about research from research and translate it for people to apply in their lives, regardless of whether you're an elite athlete or whether you're battling illness, now, it's just for everybody. We want everyone to benefit from the knowledge and that's what we do.

Dave:

It's fascinating to be able to apply that to kids because breathing and cystic fibrosis are so important. It seems like there's a renaissance in breathing. I started learning about this from doing yoga. I did art of living breathing exercises every day for five years and met Sri Sri Ravi Shankar. I actually wrote a foreword for his lead trainer's book. And it turns out there's so much that happens there. In holotropic breathing, Stan Grof has come and actually done an event with the Human Performance Institute, the

training institute that I started, and I found that I've reached some very altered states from breathing that are unknown.

Dave:

And last night I had my lips taped close, so I'd breathed through my nose as I was sleeping and of course, putting, you're covering one nostril versus the other. I've gone pretty deep and biohacking for all that stuff. But I don't feel like there's a definitive guide like do this kind of breathing to get this result in this circumstance, and even though I'm pretty good at what I do as a biohacker, who kind of created that, I don't necessarily know what breath to choose for what time. Do you?

Greg:

So, any scientist that tells you that they have a definitive answer to something is probably like lying, like what we do is we learn as we go, right? We expand our knowledge anyway. So even in my Ph.D. defense, I had two of the most decorated Ph.D. researchers in Physiology and they started arguing about breathing and that wasted 20 minutes of my Ph.D. defense, which was great because they weren't questioning me, they were questioning each other, and I just had to let it go. But so like, here's an extreme. There's a medulla in the brain, which is where we control breathing, is actually linked to the center of the brain that is also involved in stress regulation. So if you take long, slow, deep breaths, you know that you can calm the body down. We know that. You can actually feel it. If anyone just takes three deep breaths right now you're going to relax.

Greg:

The other end of that spectrum is if you want to activate the nervous system, you can exhale really hard. That's why tennis players for example, scream and exhale when they hit the ball. That activates the nervous system and increases your stress and your explosiveness. In between those two extremes are all the other things that we can do with our breathing. I, too, have entered into some very strange altered states through breathing where literally, I felt like I was on LSD and I've never done LSD, so I don't know, but that's what it feels like, which is pretty wild. And I've also done the whole Wim Hof Method where you use breathing to heat yourself up, you're immersed in.

Dave:

Been on the show, yeah. That's crazy. You really go places, right?

Greg:

Yeah, like I spent 20 minutes in Lake Geneva in Zurich in December in a snowstorm with Ian Lopatin from Spiritual Gangster. We were just hanging out, like I could stay there indefinitely once I learned how to do that breathing patterns. So, when we use breathing, breathing for many people, it's unconscious and that's a good thing because it's regulated and you breathe and you stay alive, but you can also use breathing to improve your performance. You can use breathing to perform better in sports, you can use breathing to perform better when you're doing public speaking, you can use breathing to calm yourself down so that you respond to people instead of react to them when they say something that you disagree with, so it's excellent in meetings and stuff like that. It's a very, very powerful tool for us and it's probably one that we just think that we take for granted, so I think it's definitely something you can get explore and learn a lot from.

Dave:

What's the best breath?

Greg:

If I need to relax, then obviously it's slow deep breathing. If I'm trying to fall asleep, it's slow, deep breathing. If I'm trying to meditate, it's bringing my mind into the moment so I can focus on my breath. If I'm trying to get psyched up for sports, maybe I want to breathe a little bit harder to energize myself. If I want to deliver a line better when I'm speaking, maybe slow down your speaking, so you can actually inhale as you deliver that sentence like I just did there. So yeah, there's no one best breath. It's using breath to do what you need to do at a higher level.

Dave:

No one best breath. All right. My favorite breath right before I go to sleep is called the Ujjayi breath and I've written about that in a couple of the books. And I rarely take more than three minutes to go to sleep. I used to take a lot longer. It's not because I'm exhausted, it's because I know I got to go to sleep, but if it takes more than three minutes or there's anything slowing me down, I feel like if I do maybe five Ujjayi breaths, I wake up the next morning. Is there a more powerful sleep inducing breath that you know?

Greg:

I don't know of a more powerful sleep inducing breath than Ujjayi breathing, which I'm learning about as I'm getting back into yoga, as I'm getting older and really starting to dig into that, getting out of hardcore endurance sports and sort of just using yoga and breathing to dissipate tension throughout body. What I've been trying to do with regards to that practice around falling asleep is using breathing in conjunction with a settling of the mind and bringing the mind back into the moment and actually letting the mind relax and turn off, which is the hardest thing for me. And when I am able to bring my attention into the moment and shut off my mind in conjunction with that breathing technique, then I just feel so good and I that's what creates the altered states, that's what enables you to drop into that deep sleep so quickly to recover and regenerate faster.

Greg:

We know that deep sleep so important, right? So, getting into that state faster is better. So, I've just been playing with it in that mind body connection and that's where I'd even been trying to teach my 10-year-old daughter because she struggles with sleep and she absolutely loves it. So, you can even teach this to kids, like they pick up on it really quick, which is kind of neat.

Dave:

They really do. My daughter was having a terrible time at exactly 10 going to sleep, and I ended up giving her the audio app for Dr. Barry Morguelan, who's a Master of Chinese Energy Medicine, who's been on the show a couple of times and a dear friend, and one of 12 living grandmasters of this esoteric Chinese thing. So, you think, why would my daughter listen to this and it's because every one of these 15-, 20-minute things is breathing with a story and it's not meant for kids. It's meant for adults, but the story is your energy's going to the middle of the earth.

Dave:

It's going to the heavens and now you're riding on a carpet and these stuff as you go into weird altered states, so I feel electricity zipping out of my body from it. It's very powerful stuff. Of her own accord, she

said after the first week, I said, "Do you want to do the Dr. Barry exercises again?" And she said, "You don't have to ask me anymore. Daddy. I'm going to do this every night, I decided. I promised myself I'll do them for a whole month." This is a 10-year-old without any encouragement.

Dave:

And at the end of the month, I said, "What do you think?" And she said, "I promised myself I'm going to do them every day for a year." And she did it. Without any encouragement, no rewards, nothing other than "I like breathing when I go to sleep, because now I can go to sleep." And there's some like 50 or 60 different ones, she learned all the different little ones and I was blown away. But that's what breathing does for kids when they finally learn. But so, I love that you're doing that. I'm teaching my son right now. We're doing Tai Chi in the morning. He's 10 now and it's all about the breath, right?

Greg:

Totally. And imagine when we're going to teach them in terms of emotional regulation and understanding that you can actually take control of how you feel and as they progress through those teenage years, 12, 13, 14, 15 when emotions are all over the place and everything is so reactive, that they can understand that they can actually control how they feel, hopefully that carries through their entire lives and puts them in a very different place when they're adults, right? Because then, we'll all end up with this ability to control our emotions to put ourselves in the right state we need to be in to do what we want to do at the highest possible level. It's so powerful and so cool. I love it that you're starting so young with that with your daughter and son, that's great.

Dave:

But you also, as a respiratory guy and just doing medicine and all, you're looking at feedback systems like you almost certainly is using capnometers, you're measuring CO2 that's coming out of people. And I have a capnometer behind me for feedback and most people listening even to this show, you probably haven't heard me say that word before. But yeah, you can actually learn to change your CO2 and oxygen ratios by looking at them, just like almost anything else. But when you provide that kind of feedback to kids, something interesting happens.

Dave:

I've met probably four or five adults and people over 40, who are just unusually tuned in. They're people who are doing good things in their life, they're unusually happy, they're making a mark in the world. And we sit down at dinner or whatever, and it's just like, "Okay, this person has a spark." And they'll just mention, "Dave, you're into that biofeedback. When I was a kid, my mom or my dad worked at this lab, and I did some biofeedback when I was eight, when I was 10, when I was 12, and I never thought about it, but I think it made a big difference." So this stood out to me as just massive outliers that people are just noteworthy and it's, "Oh, yeah. I did this when I was a kid." So I don't know, Greg, I think you're doing the right thing, I really do.

Greg:

No, it's interesting. That's why I love wearable tech. I've got an Apple watch. I've got an Oura ring on [inaudible 00:13:46]. And I think the data that we're getting on ourselves is so fascinating, and I don't love having electrical devices on my body per se, but I do like wearing this ring, what like for a week a month just to sort of check in on how we're doing, so I can understand my deep sleep, my REM sleep, my breathing rate when I'm sleeping, my body temperature, which I've been tracking very carefully. In

this COVID-19 era, because we know that, plus 0.5 degrees seems to predict an illness a few days before you get it. And I think that when we have this information about our heart rate about our heart rate variability, about our respiratory rate, about our CO2 levels, that it gives us great information.

Greg:

And I think that the more we understand our body, the more that we can take control of our body, it's not just this thing that we're occupying for a period of time. It's something that we can adapt and that we can change and that we can help grow and we can make it better and with that feedback, with that information, that's how we course correct and it's a feedback system, just like you said. And the interplay between the feed forward from the brain and feedback from the physiology is basically, that's human physiology. That's that entire field of study. And it's amazing that we all now have access to laboratory quality data using these wearable devices that are exponentially improving every single day. It's so cool.

Dave:

It is cool. They're not helping, though with something you mentioned earlier, and I want to ask you about this correlation. So, you are a super high performance athlete, you did the world record setting 8,000 miles' expeditions across Africa, Ironman Canada, so you're kind of at the upper tier there and you work with super high performing Olympic World Champion athletes and all that. I find that people who are attracted to intense endurance sports are quite often the people who have the hardest time turning off the voice in their head. Do you think you were attracted to those sports because you had a meaner, louder voice in your head than average or because of your ADHD or is there something else going on there? Are you self-medicating with exercise?

Greg:

We could go really deep into that. So, this pandemic has served as a time when I've actually been asking myself those questions, Dave, and I've had a lot of time to think about like, "Why do I do that stuff?" I was a competitive swimmer growing up, so I loved swimming, and I just got quite good at it and I ended up at sort of all my friends made the Olympics, I didn't, that kind of level. I ended up commentating Olympics, which was amazing and super fun. I think I had more fun than they did.

Greg:

And then subsequent to that, after my Ph.D., loving cycling and having been to Africa and loving Africa, I heard about the Tour d'Afrique bike race, so I went and did that and that was more of an expedition and a life experience. The choice to go to Iron Mans a few times and a couple of marathons and climbing Chimborazo volcano and going to South America with my friend Ray Zahab and running from the Pacific to the Atlantic, or he did it. He ran and I did a lot of the physiology.

Greg:

That what I found there is that when I am doing ultra-endurance sports and I get to that point where I am tired, I'm exhausted, I'm in a lot of pain, that is one of the only times when my mind actually shuts off. And so I love it because I actually find that it's meditative and it's a chance for me to relax my mind. Subsequently, I've been doing a lot of work around Inner Engineering and following the program from Sadhguru around learning to calm my mind, not through exercise, but through breathing, through attentional control, and that's where the deep discoveries are being made about tension, about all of

the true insights into how you actually achieve the state of being in the present moment of being happy, of experiencing pure joy that all of us are capable of experiencing at any given instant.

Greg:

So, it's been quite the evolution going from mind to body, discovering the emotions and landing in a very, very interesting place. But you're absolutely right, like you hit it right on. I was absolutely self-medicating with ultra-endurance work and I still love it. I still like to do it, but it's different now. It's a choice whereas, yeah, it's a choice and it's a process in conjunction with the mental training that's going along with it. I think it's a lot more powerful now than it was before.

Dave:

The reason I'm asking is because even though I was 300 pounds, I was also into cycling in a big way. Dave Scott was one of my heroes when I was 12 or something like this. Long time, people have recognized him as the Iron Man guru of whatever, the '80s. And there was no way I could relax. I keep going fast enough on a mountain bike, if you don't just stop thinking, you'll hit a rock and die, so you stop thinking. And when you're exhausted and you're pushing everything, there's a state, right? And since then, I've done so much neuro feedback and breathing exercises.

Dave:

And I'm also a high altitude mountaineering kind of guy, and I've actually climbed in Ecuador, and I also found that there was peace from that the exhaustion, a little bit of hypoxia, same thing in Tibet, and you just go to these places and they're beautiful, but they're kind of expensive and kind of risky, and certainly time-wise, not that efficient, but also worthy and so, I've kind of gone through that over time, but I did recognize it.

Dave:

I had a family member come and visit from Europe and I'm in Canada, and you're also up in Canada, I'm in BC, and it's during the rainy season and she couldn't go exercise for a few days, and this is someone who runs five miles a day and it's like, "It's too wet." And you could literally see like a junkie, right? Not in bad way, but just like crawling out of their skin before finally, "It doesn't matter. I'm just going to get soaked and be really cold and fall on the ice or whatever, I'm out." And that means to me that there's some kind of an addiction or some self-medication.

Greg:

Well, it is an addiction because it's endorphins. Your brain produces the same actual chemicals that you can take exogenously through cocaine or morphine or whatever else every time that you exercise, so there's absolutely no question that it is addictive. There are a number of that we know so many benefits from exercise, whether it's yoga or it's running or if it's strength training, there's benefits and they're all different and they all do wonderful things for us. I believe and this is hard for me to say as an extreme athlete is like I believe that anything in the extreme is probably not good for us. You know that [inaudible 00:20:31], that's probably the hardest thing I've ever said in public in my life.

Greg:

But anyway, we know in the immune system, for example, right now that there's a J-shaped relationship between exercise and immune health and if you do no exercise, your immune health is worse, you're more at risk of respiratory infections. We know that a moderate level of exercise actually improves your

resistance to illness, 75% fewer colds and flus for people who exercise on a daily basis, 24% to 40% lower risk of cancer for people who walk every day, but then at the extreme levels, we know that if you're exercising to the point of exhaustion consistently over time that that is far worse than not exercising at all, for your risk for immunity. So, what we need to find for each of us is this moderate level where we're healthy, we're getting fitter, we're getting stronger, we're getting more mobile, without putting that excessive stress and strain on all of us.

Greg:

And now that I think back about it, too, the evolution in sports that happened from training in the '80s and '90s, when I was a young athlete coming up to being a physiologist in the 1990s and the 2000s, was that we went from high volume training, just whoever survived the training was the one who made the Olympic team, like if you didn't get injured and sick, you win, congratulations. But now, it's very different. It's actually like you're trying to break a world record consistently in practice and doing that through massage therapy, through amazing food, through recovery regeneration techniques, through cold, through heat and all of these other modalities that enable you to get actually radically improve your health as your training, it's a longer process and the benefit is like we're seeing careers, now people are now competing at a high level into their 40s, people are breaking world records over decades, not just over a three-year period.

Greg:

So, I think it's a much healthier approach when we do it this way that you and I are talking about, where we incorporate these other factors, these look, rest, recover, regenerate all these sorts of things into our lives. And it's been a huge adaptation for me, coming out of this as a young athlete in '80s and '90, into ultra-endurance sports and into these long expeditions into a place where I'm trying to be healthy and be a great role model for my kids that are coming up and to lead people into a new place. Now, that we have this information so we can all as a world be healthy and high performing and reach our potential.

Dave:

It reminds me of the Bryan brothers that have been tennis. The two brothers who play Tennis Doubles World Champions, playing way longer than they're supposed to be and winning. And then we see the same thing, Nick Foles has been on the show and we've become friends and he's, "Okay, how do I put as much recovery tech wherever I'm going to be as I possibly can, so that I can continue doing what I love to do." And it seems like it's working and even Mark Sisson who's been on the show several times, another friend, a former Iron Man athlete and ultra-endurance, really tough guy who just wrote a book about how a chronic cardio is bad for you. I was doing it wrong and it made me older than it probably needed to. And he's completely changed how we train is to be less intense and getting more results.

Dave:

So, what you're saying makes sense. So, this thing has happened but maybe isn't apparent to people who just pick up a magazine or they're still kind of stuck in this mindset, "I'm just going to grind it out," when grinding it out, probably wears some things away. Now, what in your mind is the best way other than breathing, obviously, unless that is your answer, to undo the grind? So, we're all stressed right now, so what's the recovery tech that's most recovery oriented?

Greg:

It's just that it's been we've gone through this global stress response, fight or flight, like literally every single person on the planet has been in fight or flight for about three months and this global pandemic, it's the Black Lives Matter revolution, which is wonderful to see finally getting some traction and everyone's waking up to that, the necessity for us to combat systematic racism and be anti-race. We had a lot go on, and I think that the way that we can all recover and regenerate and get reenergized to make the world a better place, like I don't want us going back to normal, I want us to reimagine the future. And if you're talking about like recovery tech, I think the number one thing we can all do, believe it or not, is still as simple as asleep. I think that if we're sleeping well, it's just-

Dave:

It's so boring.

Greg:

It's just so boring. It's probably not the tactic that you were looking for, but I think that sleep is a very powerful tool for all of us. I think I'm super fascinated also by the research that's coming out recently on the effect of music, especially on mental health. We know that the regions of the brain that are downregulated by depression are upregulated by music, so I'm fascinated by the effect of music on the brain. In terms of recovery from long-term aerobic oxidative exercise, I'm also fascinated by antioxidants and anti-inflammatory eating. I think that's a fascinating approach for all of us to consider right now.

Greg:

And also then just balancing exercise. We know that if we want to be healthy, we can do some cardio, it's totally fine, but if you mix that in with some strength development, then you get both AMP kinase, which lengthens your lifespan and you optimize mTOR which optimizes or your health span. And so when we mix and match exercise, I think we're in a better place than just doing one thing. So I think those are just a few things to get people started and ideas like how to recover, regenerate, but there's lots we can do.

Dave:

So, your whole book Rest, Refocus, Recharge, and I asked you what you could do, the number one thing you came up with was sleep. Okay, so I'm in agreement with you, but what would you do to optimize sleep during the pandemic or as people are emerging from it?

Greg:

So, the number one thing we did as a family was we stopped using a morning alarm and it's been an absolute game changer. We use a bedtime alarm, but not a morning alarm, we wake up when wake up. And that's been a really, like it's just a wild thing. And initially, when I first started, I was sleeping so much, I don't think I had any idea how tired I was because I'm doing a lot of public speaking, flying all over the world, I was getting ready to launch my book right into the pandemic when they shut every bookstore in the world but anyway, whatever.

Greg:

So, we now don't use morning alarms and I've started sleeping a lot. I'm actually back down to where I'm waking up pretty naturally between 5:00 and 6:00 every day, so I get up and I head out to the beach and workout. My daughter though she's 10 years old, 11, she's sleeping so much and she's grown like 2 inches since the pandemic hit. Adam is sort of like me. He's a bit of an early riser. He's five, and Judith is

a bit more variable, because she's starting to get back into running now after two years of being injured, and so she's training a bit harder, so sleeping in a little bit more to adapt to that.

Greg:

So, we just stopped using the morning alarm. I now want to go to bed early enough that I can wake up naturally, to get done what I needed to do and hit my meetings and those sorts of things without needing an alarm. So I do set an alarm, but it's the last possible second, where it can be set and not get fired. So, let's say I have a 9:00 AM meeting, I'll set it for 8:30, knowing full well that I'm going to get up between 5:00 and 6:00, but if I happen to need that extra three hours and my body needs it, it will get it and that's been the biggest change we've made. It's been so powerful for us.

Dave:

Thank you for mentioning the effect on kids of just getting enough sleep during the pandemic, so that's something most parents, most of you who are listening, you haven't done a gratitude of exercise where, "My kids just got three months of quality sleep that they would have otherwise never had," that's kind of legit. So, I hadn't thought about it that way.

Greg:

It is. It's really interesting. And also, so as you know, athletes around the world have been blocked from training basically for the last few months and then the Olympics canceled and then moved. I was chatting with Ben Tilly, who's the head coach for the Canadian swim team. He's got a group of athletes coming back in and there's a group of older athletes and a group of younger athletes. He said the really interesting thing that's happened is that since they've come back, he's noticed that the younger ones suddenly all grew. They're all totally rested. They've been sleeping. He said, "This is this weird, unusual thing I never could have programmed." Because swimmers get up, they train twice a day, you're in the pool by 5:30, 6:00. That's been wiped out.

Greg:

And so, there's all these really weird positive adaptations that have happened and not to minimize the fact that people are dying and have died and are still sick, but I think that there's definitely something that we can take out of this in terms of we're not commuting in the morning, we've got this time, and let's reimagine how we want to feel in the future. Do we want to fill our lives back up with all of these activities and all this busyness or do we want to be really intentional about health first, happiness first, joy first, connection first and then pick and choose the things to drop into our lives to actually make our lives better with intention instead of compulsion? And I think that there was a lot of compulsion and burnout happening right before the pandemic hit that I think we can avoid if we're careful about it as we emerge from the pandemic and get back to a more hopefully open life around the world.

Greg:

So, I'm echoing everything that you're saying. I couldn't agree with you more. I think that we've there's some really interesting research that was published a while ago that showed that happiness is a correlation between happiness and financial stability up to about $75,000 a year beyond which there is no further correlation, and you and I both know very wealthy people who are miserable. So, I think that I fully recognize that if you have lost your job, if you are economically struggling right now further, to take it another step. If you're confined at home with an abusive partner or parent like that, that is also a

nightmare that we are seeing certainly in a number of places in Toronto, according to some friends of mine who are police officers.

Greg:

So, there's a lot of hardship that's come through this, and so if that's the case, then we're not at a point where we can talk about health and well-being and joy and happiness, we're just simply trying to survive. And I believe that our responsibility, if you're listening to this, is to do the very best you can at what you're great at. Therefore, if you do that, it's quite likely that you're going to generate some sort of economic benefit. So, if I do what I'm great at, if I go out and I do public speaking and books, that generates work for lots of people around. And one of the things I'm most proud of in the companies that I've run, we've laid nobody off, so that's my biggest accomplishment, I think in this pandemic, because we have not actually laid anyone off. It's been super hard, but we've gotten through it and we're going to come out better.

Greg:

It also forces a pivot and the companies that have been able to pivot very rapidly into digital have set themselves up, I believe, for a better future which ultimately will lead to more. So I believe that we're sort of like in 2008, there's a number of things that happened that led to some exponential growth for certain organizations. I think we're very much going to see that as well. We just need to get through this together, support each other like crazy. And as a community, do what we need to do to get through this time, have food on the table, create the jobs again, get back to taking care of keeping everyone safe. And that way we can open up as fast as possible to get our economy going again, hoping that the new economy will be different, will be better, will be safer. I mean, we will be able to craft a better future together where people are mentally, physically, emotionally and spiritually in a better place.

Dave:

It's definitely a time of rebuilding and I'm with you there and I know that it's possible because I've read the stages and done some very deep spiritual work and all that, it's possible and I've met Sadhus on the slopes of mountains in the middle of nowhere in Nepal who literally don't have any possessions, but a bowl where people put donations or food and actually, they're in very altered states, but they appear to be happy. And it when I first saw this, I was a younger man and it was a little bit disturbing. I was like, "What gives them the right to be happy when they have nothing?" It was almost a sense of injustice. They could clearly have something, but that the fact they chose not to is almost an affront to my little ego at that time.

Dave:

And now though, I know it's possible, but I don't know how to guide someone who's really financially there, other than to guide them to be in a more satisfied or less stressed state anyway, other than what you've talking about, breathing, so breathing is free, cold showers are free. And the very basic recovery technology is that it seems like if you have no time at all, it seems like you should follow what Winston Churchill used to do. During World War II, he would take a nap every afternoon, right? And he would put on his pajamas and have this whole ritual take an hour long nap. And people say, "How dare you have a nap in the middle of a war being on." And he looked back at them and I'm paraphrasing and said something like, "Do you think I could do this if I didn't take a nap every day?"

Dave:

So, if you're highly stressed, and you're really worried, doing a little bit more to calm down and recover even though, yeah, things are actually when you look at the facts, they're rough right now, but the free stuff that makes you feel more powerful, more gratitude, more hope is probably more nourishing and makes you more resilient than not, but I haven't lived through it. Does that sound like good advice?

Greg:

It's great advice. And I think it there's some neurophysiology to back that up if we take some time to decompress, if we go for the walk, if we sit in the park if we get in the cold shower, if we just sit on and meditate or read a great fiction book, what happens I've discovered recently in studying the brain a little bit more, is that right now, you and I are both in beta brainwave mode, we're hustling, we're concentrating. We're thinking figuring things out as we move through this conversation and beta brainwaves are at a certain frequency. When we relax and slow down and calm our brains down, the brainwaves actually slow in frequency, they literally slow down. If you put electrodes all over the brain, you would see the electrical activity in the brain decrease.

Greg:

If it decreases a little bit, you end up in alpha brainwaves. That's when we can be strategic, that's when we can reflect, that's when we can learn. It's very different. You can't actually learn. You can't think strategically. You can't reflect if you're in hustle, hustle, hustle, go, go, go. We have to slow down. If you slow down even further into theta, which is when you're meditating or you're standing in the shower with water going off of your head or you're driving long distances and daydreaming, which you shouldn't do, but it happens. And that's when you get the eureka moments, the new insights, that theta brainwave state where the brain is super relaxed is when we're creative. It's when we problem solve and it's when we have agile thinking when you come up with new solutions to problems. And so, I think that it's almost counterintuitive that by doing less, it opens us up to actually being able to do more.

Greg:

And now that we're sort of emerging from this, one of the things I really want to do this summer is to give myself a lot of permission just to have the space to sit and think or the space to sit and contemplate, the space to sit and reflect to make sure that the future that we're crafting is different and/or better than the one in the past. So yeah, that there's a lot in neurophysiology to back up the idea of just simply like it If you are super stressed, the thing that you probably want to do the least is to slow down and just go for an easy walk somewhere because you think you just have to keep going to push to get to the next thing. When in fact, the solution, the insight, the eureka moment, the opportunity might be lying somewhere else and you can't see that when you're in stress. We can only see those opportunities when we slow down.

Dave:

You talked about some brainwave states that made me really happy in your book. You talk about gamma, in fact, you have steps in your book and you talk about embracing the extraordinary and you talk about shifting into gamma brainwaves for flow states. Most people don't think gamma is trainable, I will tell you for a fact it is because we are doing that. What is your perspective on gamma brainwaves particularly and all the other associated stuff that happens in what you call extraordinary in your book? Just walk me through that

Greg:

Yeah. So, as an athlete, when you're trained to get in the zone, so that you're non-judgmental, you act, think, feel to have the best possible performance that you can and we know that that's a trainable state for the vast majority of people. We have random experiences with it, but we know that you can actually learn how to do it. We teach it through act, think feel, which is mind, body, emotional state that you can replicate once you know it's there. You can use biofeedback to get to that state as well, which is wonderful. But gamma is a new one that's been explored recently in the scientific community and it's when the entire brain works together at the same time and it goes beyond flow, it gets into peak experience, and peak experience you can think of as a flow state with meaning.

Greg:

So, let's say that you are delivering a presentation and you are in flow, but the meaning just connects with the audience and you could feel yourself changing lives or you're staring into the eyes of a loved one and you know that that acted moment is altering the course of both of your lives. That's flow plus meaning which is peak experience, and it's in those states where gamma brainwaves are produced also in deep, deep, deep meditation and a few other states, but this is a bit more accessible to us. And that it's moments that we can all identify with. The moment when you're with your children and they're playing and you see them, you're fully focused on them, and you can see them exploring and experiencing the world, which makes you feel absolutely spectacular as well.

Greg:

That moment that I really feel like I experienced that almost to an extreme level was climbing Chimborazo in Ecuador to a volcano and we're climbing all night long into a snowstorm and super dangerous and hypoxic and really stressed. But then at one point as we got high enough, we broke through the clouds. And so the snow stopped and we were hundreds of kilometers away from a city or town, so it was pitch black, and the sky opened up above us and I've never seen that many stars because we were like 19,500 feet. I've got all of this. I've got the white clouds beneath me and I look up, and all that I can see is the snowcapped peak and like the full on stars. And I just remember saying, "Holy shit," like just. And everyone in the community and the group stopped, and everyone just looked up.

Greg:

And there was this moment of silence as we realized that we were the closest humans to the stars, because Chimborazo was the furthest point from the center of the earth, because the earth bulges at the equator, so it's 2 kilometers higher than Everest, not for sea level, but in terms of distance and closeness to the stars other than the space station, the astronauts. So, we had this moment of realization and this moment of experience and that was just like, I could feel everything. I felt my entire life. I knew that everything that I'd done that led up to this moment, I knew that it was going to transform what I wanted to do with the rest of my life, so this is the zone plus peak experience and that was pretty magical. So I've become really interested in peak experience and gamma states and happiness and moments of joy that we can access and to try to create. So yeah, that's a pretty interesting state, I'm pretty fascinated by it.

Dave:

Greg, I think that ought to be your next book. What though, if someone doesn't have access to tech, they don't have access to mountain tops right now, by the way, if you do have access to mountain tops, people who live at high altitude tend to not die of coronavirus. In fact, they do not get it almost at all. There's really interesting research about that. It's has to do with I think hemoglobin and the way our

[inaudible 00:40:26] work. Anyway, assuming you have access either one of those and we want to experience more theta, that really deep relaxation, or we want to experience more gamma, do you have techniques to turn that on?

Greg:

So, let's say you want to get into alpha, which is the reflective strategic thinking that's just getting yourself into a location where you can read in journal, like those are two really powerful ways. I think journaling is probably the best way of getting into alpha because you're just reflective of your thinking, but you're still awake.

Greg:

Theta, you just need to get somewhere where you can stare off into the distance. That's just get into it park. If you can find a beach and just stare at the waves. If you can go for a walk, that works wonders. If you can do what you love to do, so that's art, music, sports, like riding your bike will often trigger it. Paddling does it for me quite often. I'm big into paddle boarding right now, I've dropped into that state easily.

Greg:

And then gamma is associated with meaning. So it requires us to think a little bit about what matters to us in our lives. For some people, that's their work. For some people, it's their hobby. For some people, it's their families, whatever it is, and then create those magic moments, and the magic moments really just require you to be there and let it happen. So, let's say you're playing with the kids in the park, you're not on your phone, you're not checking your email, you're with your kids playing in the park. If you're having dinner with your family, the devices are away and you're allowing the conversation to flow with no judgments and no push-pull, it's just simply experience and when we have the magical experiences in combination with what we care about in our lives, then I think that you'll discover that peak experience begins to pop up into your life more and more and more.

Greg:

It's one of the reasons why I'm trying to, as we come out of this coronavirus era, I'm trying to really schedule and build expeditions into my work because I love them. I love doing it. I love going to these places. At Christmas, we went to Galapagos with my family and my daughter, Ingrid, got into the water and we were swimming with sharks. Swimming with a 10-year-old with sharks is pretty profound. She had a face-to-face moment with a sea lion in the ocean, pretty cool, right?

Dave:

So good.

Greg:

And again, it doesn't need to be that. It can be sitting in your local park watching your kids play soccer. I've seen, I've been in to 50 countries around the world and it's not necessarily money that you need to make these happen. You don't need to go to the mountain tops, like I've seen incredible things in India, I've seen incredible things in Africa, I've seen incredible things in Central America with people doing what they love to do with the people that they love to do it with or the people that they just love, and out of that just these sparks of magic pop into your life and that's I think something we all need more of these days.

Dave:

It's beautiful. I want to know about high-altitude hacking. I have done a lot of this myself to be able to survive and thrive in a hypoxic environment. What do you do when you go up to these high things? You're an expert in breathing, the respiratory side of things and an expert in high altitude stuff and exercise and endurance and all this. So, you are one of those rare people who kind of know more than me.

Greg:

Got it. So, I think we did Chimborazo really well. We put two people on the summit. Julian White, Sire Thompson, both of whom did research with me. Another doctor from Sick Kids came along and a bunch of his friends from Germany. We got close, but did not get to the summit. I turned around at around 6,000 meters because I thought it was 50/50 as to whether or not I was going to get off the mountain and I had a family, so I made that conscious decision.

Dave:

Good decision. Yeah.

Greg:

Which I know sometimes people don't make, but we did a really good job at this time and that we had a very good base camp at around 14,000 feet, the summit was like 21,000, so we set ourselves up at a really good base camp. We did a lot of exercise at moderate, like 14,000 to 16,000 feet, like just long walks in the two weeks that we were there. We found that really helped us to acclimatize quickly. Hydration is one of the hardest things to do because you're constantly blowing off water, and so we worked a lot on drinking enough fluid and just continuously doing that. The challenge when you're up at altitude is you hyperventilate because your oxygen levels drop, which makes you hypersensitive to CO2, then you blow off all your CO2, then you under ventilate, and so you get these wicked headaches. And so we took acetazolamide at this time, which helps to control your eyes.

Dave:

Yeah. [crosstalk 00:45:02].

Greg:

Yeah, bicarb lit by carbonate levels in your blood. And we took a lot of gear with us, so we monitored our hemoglobin and hematocrit levels every single day, a few times a day, actually, until we were all at 50% to 55% red blood cells, which is a lot, like 50%, you're basically out of the Olympics, right? So, we're at the limits of what we were capable of. We all just naturally adapted to that. But the really interesting moment of the entire trip was we did a training climb up to 5,800 meters, 6,000 was sort of and 61 was the peak, so there's some thresholds there but we got to 5800 meters one day on the training session, and we were sitting on the mountain having a bite to eat and all of a sudden it got dark. So these clouds came over the back of the mountain and it went from warm to below freezing within about three minutes and the wind picked up and the pressure dropped. And so we went from oxygen saturations of 85%, which is low but fine to 65 or lower, which is dangerous, like legit dangerous.

Dave:

That's bad news.

Greg:

Yeah, like, you're hospitalized. If we were anywhere near a hospital, we would have been thrown in the hospital. And we all looked at each other, "We got to get off this mountain," but I got tunnel vision. So, I could only see literally like if I held my arm out at full arm's length, I could only see the space where my hand was. And so I stared at the boots of the person in front of me and followed them for three or four hours down the mountain as we all got ourselves off and someone was puking. It was bad, like really bad.

Dave:

You're lucky you made it.

Greg:

Yeah, it was not a good scenario. Anyway, so what was really fascinating about that experience, though, is that the day after and the day after that our body has hyper adopted, so our hemoglobin levels shot up and we were tracking a bunch of other measures as well, and we had an amazing device called an i-STAT with us. We were looking at all these different-

Dave:

I'm so jealous you got to climb with all that stuff. That's so cool.

Greg:

It was so cool. We had so much gear with us, it was so fun. Lactate as well because you lose lactate when you're in high altitude as well. So we'd be like hammering, like going so hard and take our blood lactates and it will be like 1.8, which is lower than resting at sea level. It's like you just simply don't produce lactate when you're in sort of this weird paradox once you get up there. But anyway, that state where we're in, we're really low oxygen for a few hours, I think triggered our bodies to hyper compensate with this massive production of EPO, erythropoietin, where it stimulated the growth of lots of red blood cells and dumped a whole ton of new red blood cells into our systems, which three days later, when we went for the summit, we could feel it was way easier. We went harder to climb, but clearly we had physiologically adopted at that point in time. So, we're learning, we're getting better at it and Diamox definitely helped and water definitely helped, and some of these training days, which were so brutal definitely helped as well.

Dave:

That is fascinating. One more thing before we go, and it's something that I did years ago, as I rented a capnometer to be able to learn how to control my exhaust gas. I don't know that it did huge amounts for me, but it probably made me more aware of my breathing and I bought one a couple of years ago, I haven't really played with it too much since. It's sitting on a desk behind me amongst a stack of other biofeedback toys I haven't had the time to deal with. And I know for years then, we used HRV and we actually showed people this respiratory rate will create the best heart rate variability for you. It's part of my first day training, so people can have the right breathing while they're doing alpha and other types of brain states reset mode stuff.

Dave:

What is the ideal respiration rate for people? Should people consider finding a respiratory therapist to do a capnometer and figure out what breathing works for them? Like just walk me through exhausted gas biofeedback because most people, even in biohacking, this is cutting edge stuff.

Greg:

Oh really? Okay, cool. This is what I've been playing for a long time, man. [crosstalk 00:49:08]. This is great. No one ever once talked to me about this stuff, it's so great. So, the easiest way to think of it is that we have chemo receptors in our aorta, so the blood leaves the heart, and in the aortic arch, there are sensors called chemo receptors that taste the blood for hydrogen ions and carbon dioxide. So, how acidic is the blood basically what it wants to know that. So, the more CO2 you have, the more waste gas that you have, the more than these chemo receptors send information to the brain to make you breathe harder.

Greg:

You have a second set of chemo receptors on the inside on your brain that tastes the cerebral spinal fluid. That's sort of like the last line of defense. So, if your cerebral spinal fluid is getting acidic, then it's like, "You got to breathe a lot." So then what happens as you breathe harder the nerve, it's a feed back to feed forward loop. It increases the drive to breathe, so when you breathe harder, you then blow off all the CO2, and you bring yourself back down to your set point.

Greg:

So for most people, the set point is 38 to 40 mmHg of carbon dioxide pressure in your blood. If it goes below that you stop breathing or you breathe less. So if you hyperventilate, for example, and blow off all your CO2, you can sit there for five minutes and not breathe, because it's the co2 will slowly build back up, be careful your oxygen doesn't drop because then you pass out and die. So it's not something we recommend. And that's why we have shallow water blackouts in the pool when you're trying to hyperventilate, and then see how far you can swim underwater, so don't do that. Bad idea.

Dave:

Tim Ferriss had to pull that out of his first edition of Four Hour Body because people were passing out and having real problems from it.

Greg:

So, warning, don't do that. So then, when it comes to the optimal breathing rate, the speed with which you breathe is one thing that's for breathing frequency, and then your tidal volume, how deep you breathe, is the second factor, if you multiply them together, you get volume, liters per minute, and that's your total ventilation. So, what we're looking for is to ventilate the lungs effectively, so that you're breathing deeply, you have gas exchange everywhere, so there's more blood deep in your lungs than there is at the top, so those deep breaths are better for gas exchange, because there's more gas interacting with the blood that's deeper in your lungs. This gravity just pulls it down.

Greg:

So, we're looking for nice deep breaths, smooth, slow breathing. So, my breathing frequency when I'm sleeping was around 14 to 15. I know that 15 breaths per minute is good. When I'm exercising, it's up to 60 times per minute depending on what I'm what I'm doing and how hard I'm going. So really, I don't worry about it in terms of the breathing frequency, I worry about it in terms of clearing CO2, ensuring

that you're oxygenated, making sure that you're taking those nice deep breaths as you're speaking to people, pausing every once in a while to take those deep breaths to clean out your lungs and release the tension from your body. And it's amazing when you do that, the effect that it has on other people around you is quite profound.

Greg:

And even though it feels like you're taking an eternity to take those one or two or three deep breaths, people just think you're being thoughtful, and then you calm down, and everyone else around you calms down as well. Sort of like when you start a speech, "It's okay." You just took a breath there, but everyone knows, you're just like they're thinking, you're just like reading your notes or something, right?

Dave:

I love it that you said that, by the way. Most people they go on stage and they just freak out and they'll never be quiet. Yeah, you want the crowd's attention. I've been on Tony Robbins mainstage and you walk out there and you have that just pregnant pause. The longer you wait, the more they'll lean forward, but it's so counterintuitive. And so that's a secret only someone who's been on the stage for a while would know about, but just a little on the side, just keep going, yeah.

Greg:

That's funny. That's cool. I'll do that someday if I'm ever on Tony's stage, but-

Dave:

But you're on big stages anyway.

Greg:

Yeah.

Dave:

You do a lot of talk, so you learn that or someone taught it to you. That's cool.

Greg:

Yeah, it's very, very cool. And then I learned it by actually being an athlete, because I remember going up and doing races where I was terrified and those races where I looked at the cameras or looked at the stands and stuff like that, and I got too nervous. I mean, the way that you calm yourself down and bring yourself back into the zone is through breathing. It's the easiest, fastest way to control your state and if you can learn to do that, I mean, the direct impact is literally that you control your oxygen and CO2. And so, if you're nervous, you hyperventilate, you blow off all your CO2, blood vessels in your brain contract and you can't think.

Greg:

So when you slow down your breathing, you allow the CO2 to come back up, you take the deep breaths to make sure that oxygen is optimized, then all of a sudden, you're getting good oxygen levels all through your body, your CO2 levels are optimized, your blood vessels are working the way that they're supposed to work and it's a very, very tightly controlled system in the body. It's one of the most tightly controlled systems that we have and it's literally just these chemo receptors that taste your blood and

they keep your blood at that perfect acidity level and that's how we do it. So, pretty Interesting. No one's ever asked me that before, so very, very cool.

Dave:

There are a good number of people in the audience who are going to say, "Oh, wait. I didn't know I could train that." And if you don't want to go to that, putting things in your nose and measuring what's coming out of your body, which is just to me fastening a little graph on the screen. If you have an Oura ring, and you guys probably have heard me say this before, but I like to disclose I am an early advisor and investor Oura, so I do have a financial incentive for telling you this. They're not paying me to tell you this, but I am an investor, so there you go. I just believe in the tech, but it will tell you in the morning what your respiratory rate is.

Dave:

So, mine is almost always 13.9 breaths a minute. Last night, it was 14.2 because I taped my lips shut because I was playing around with nasal breathing versus mouth breathing. There's a whole episode of Bulletproof Radio about that about the Buteyko method. So that apparently is about right, so 14, 15 is where people want to be, but if they're far either lower or higher, how much do they need to worry?

Greg:

So, if you have a very low respiratory rate, I would be worried because that means that your CO2 levels are getting up. That would definitely be a reason to go get a sleep study done and investigate that a little bit more. Similarly, if you're hyperventilating, if your respiratory rate is very high, that is a good indication to me that your body is really stressed because your nervous system is very tightly linked to your breathing and your heart rate. So if your heart rate is high, if your breathing frequency is high, that's an indication to me that your sympathetic nervous system is really activated, and I'd be like, "Let's just sort of investigate what's going on in life right now. Are you sick? Are you fighting off a bug? Are you super stressed about something? Are you worried about something," and dig into the mind body because that's probably definitely something to be concerned about as well.

Greg:

I think breathing is a very good indicator for us because it's so tightly linked to our nervous system. If your parasympathetic system is operating while your breathing, it will relax. If you're super stressed, your breathing is going to come up like it's tightly linked because it enables us to do what we need to do in fight or flight. So yeah, definitely something to be concerned about if it's at the extremes there for sure.

Dave:

Greg, you're just a wealth of knowledge about recovery, about all these, like real biohacking techniques like the stuff we just talked about that is never in 700 episodes been covered at that level and your book though, I think is very accessible. It's nowhere near as geeky as our conversation. I find there's something really special when someone who's a deep expert goes to the trouble to write a book that is very accessible. So you're taking all of this stuff and you're making it teachable, and then making it actionable. So even though, it's probably one of the roughest times ever to put a book out on the market and for the people listening to this, you probably never thought of this.

Dave:

But authors, we spend five years thinking about a book, we spend two years writing a book and it all comes down to this one day when it goes on the market and it's like the Olympics for us like it really matters and the years of effort and the thousands of hours of late nights, "Is this word the right word?" All those things we've done for our readers to have that come out on the day right in the middle of basically a big pandemic is stressful of all times. But it turns out I think this might have played in your hands because a book about rest, refocus, recharge and that's what everyone needs the most, it might have been a blessing in disguise.

Dave:

So, your book is prime for the time, and it is definitely readable and worth reading and so guys, if you want to know about this, Greg, or it's drgregwells.com, D-R gregwells.com and the book is Rest, Refocus, Recharge. If you like what we talked about, you should read this because you might find you need more of those things.

Greg:

Thanks, Dave. I really appreciate it. Yeah, that book launched on the Tuesday after everything in the entire planet went into lockdown. It was definitely one of the most stressful things I've seen. You just sort of, you let it go, but then it's interesting, like two months in, everyone starts realizing, "Okay, I can breathe. Oh, my gosh. I've got some time. Oh my gosh, I've spent time with my family. I'm actually having dinner with them." So you're right, I think that it's going to land in a great place and I really appreciate you having me on the show and giving me a platform to share some of my ideas and talk about physiology because it's so cool and so fun and just blessed and very, very grateful for the opportunity, so thanks a lot.

Dave:

Well, you're learning and your commitment to putting it into a usable book, they're laudable and you earned your way unto the show. Thanks, man.

Greg:

Right on. Thanks a lot.