



Overcoming Disconnection Syndrome

Guest: Dr. David Perlmutter

Alex Howard: Welcome everyone to this interview where I am super excited to be talking with Dr. David Perlmutter.

We're going to be talking about how to support and supercharge brain health, particularly with some of the ideas from Dr. Perlmutter's most recent book, *Brainwash*.

Just to give people a bit of background, Dr Perlmutter is a board certified neurologist and five time New York Times best selling author. He serves on the board of directors and is a fellow of the American College of Nutrition.

Dr. Perlmutter received his M.D. degree from the University of Miami School of Medicine, and Perlmutter's books have been published in 36 languages and include the number one New York Times bestseller, *Grain Brain* and other New York Time bestsellers: *Brain Makeup*, *The Grain Brain*; *Whole Life Plan* and *Brainwash*, co-written with his son Austin Perlmutter who's also a medical doctor.

Dr. Perlmutter, firstly thank you so much for joining me.

Dr David Perlmutter: Oh, I'm absolutely delighted to be with you today. Thank you.

Alex Howard: So one of the things that struck me in your most recent book, which I thought was a really helpful way of putting a lot of the challenges and suffering that people experience today. You talked about this idea of disconnection syndrome, can you say a bit about what that is?

Dr David Perlmutter: Well, we created the term 'disconnection syndrome' to mean many things, it's a bit of an all encompassing term. At a very specific neuro anatomical level, 'disconnection syndrome' means disconnection of the amygdala from an area of the brain called the prefrontal cortex.

And, you know, before the viewers get all worked up about the fact that we're getting the same brain anatomy, basically we're talking about a disconnection that is happening between two areas of the brain that are really important to be connected in the first place.

The amygdala is an area of the brain that's involved in sudden decisions, impulsivity; really self interest, narcissism when it gets out of control. It's a valuable part of the brain, allowing us to make an instantaneous response if we're threatened. But by and large, we shouldn't be relying upon this area of the brain for our day to day decision making that should think about the future, should think about other people, should think about the consequences of our decisions, of our actions. That's the type of stuff that's dealt with by the more sophisticated part of the brain called the prefrontal cortex.

Now, under normal conditions, this prefrontal cortex, the front part of the brain behind your forehead, exercises a lot of what we call Top-Down control over the amygdala. It's basically reining in the impulsivity of the amygdala, basically bringing the parent back into the room, when they are connected. But when they become disconnected, we see a situation where impulsivity reigns, where narcissism is the order of the day and we see activity based upon what I want for myself and what I want right this minute without considering how this may play out for oneself and for other people moving forward. Again, that is from a neurophysiological perspective. This relationship, the importance of this connection between these two very important brain areas.

We then generalize the notion of disconnection in that we realize that as we become disconnected between the prefrontal cortex and the amygdala, it does tend to disconnect us from other people, disconnect us from things going on around us. And, you know, this notion of being disconnected from others becoming socially isolated has profound negative consequences in terms of our physical health, in terms of our risk for disease, in terms of our longevity and in terms of neuropsychiatric issues as well, mood disorders and even neurocognitive issues like Alzheimer's disease.

So we very much need to be connected to other people in order to remain healthy as well. And that is kind of an extrapolation of disconnection syndrome as we embrace the profound negative effects of loneliness in our society. In major cities, as many as 50 percent of people living in urban environments report frequent, too often feeling lonely. This isn't just whether they're lonely at this point. This has profound negative health consequences.

And, you know, to call it like it is. I know this is an evergreen kind of interview, but you and I are getting together today; during a time when social distancing is being advocated as being a very important measure to keep us healthy. And I would submit that we can remain socially distant but don't have to be socially isolated, though we maintain our two meters separation from each other.

So it's a very interesting time when we're being called upon to keep ourselves away from others and recognize that the notion of social isolation actually damages our immune system, making us more likely to contract viral diseases and have bad outcomes related to the same.

Alex Howard: I think it's, so many places I want to respond on that, I think particularly let's come back to in a little bit what you've just been saying about social distancing.

I want it back up for a moment and one of the things that strikes me is that disconnection feeds disconnection. What I mean by that is the more disconnected we become, the more we lose contact with the emotional nourishment and satisfaction and support that comes, the more we pursue the behaviors to try and to fill that void, the more disconnected we end up becoming.

And it's almost like its own epidemic that people get caught in, people get further and further and further away from themselves.

Dr David Perlmutter: That's right, Alex. And anything that strengthens our connection to the amygdala will distance us from the adult in the room, will distance us from this top down control. And as you well stated, this situation will manifest to a higher degree as we move forward; it is what we call a feed forward cycle. And there are many on ramps to that superhighway. It can be a lack of sleep. It can be lack of exercise, lack of nourishment, appropriate nutrition. It can be a constant stress. All of these tend to enhance our relationship with the amygdala at the cost of our connection to the prefrontal cortex.

And what happens next? Well, when we are behaving more from an amygdala based paradigm then our choices are more impulsive rather than going to bed at a decent hour. Our impulsivity says, no, I'm still going to binge watch a program and stay up late.

The very next day, after even one night of non restorative sleep, the amygdala activity on specialized what's called functional MRI brain scans is as much as 60 percent increased.

And what does that do? We become more impulsive right away in terms of, for example, our food choices. It's been estimated that people who chronically do not get a good night's sleep, restorative night's sleep, will consume somewhere around three hundred and eighty extra calories every day. That quickly leads to significant weight gain.

And what does that do? Weight gain is associated with declining ability to get a good night's sleep. We then eat more, make the wrong food choices and decide that, you know, exercise today isn't something I really need to do; I want to stay home and watch television and and, you know, eat the wrong foods so people get locked into this vicious feed forward, no pun intended cycle that gets worse and worse, making it much more difficult moving forward to make better decisions.

We tend to see what happens. People become much more impulsive. They become much more fear based. And they become much more self-centered. And let me just kind of generalize this to some of the things that we're seeing going on on our planet these days.

We know that the global diet has changed quite significantly in the past 10 years, becoming what we call westernized, and meaning that by and large, across our planet, people are eating far more ultra processed foods and much higher levels of refined carbohydrates, basically sugars, if you will, raising their blood sugars, increasing inflammation.

And it's inflammation itself that also tends to sever our connection to that area of the brain, the prefrontal cortex leading to continued poor food choices and exacerbation of this paradigm whereby inflammation is further increased, compromising, for example, our body's ability to make serotonin, a very important neurotransmitter, for keeping our mood stabilized. And it becomes really a feed forward cycle whereby we become more impulsive, more self-centered and ultimately angrier about what we see going on around us.

Now, here in the States, we are seeing anger expressed around every corner. It isn't just that we're seeing it on the news, but even out in public. I think we're all experiencing the fact that people are all on a hair trigger these days.

And it's so important to, you know, again, isolate, it seems, from other people because we don't know anymore how other people are going to respond, because the fit the flames have been fanned as it relates to anger, impulsivity and really being self-centered and, you know, moving forward for our own health and for the health of all those around us, the health of the planet we have to reconnect.

We have to dissolve this disconnection syndrome, reconnect to this prefrontal cortex so we regain something very important and that is called empathy, empathy for our future selves.

You know, typically we talk about empathy. We're talking about having empathy for another person. Well, that other person may be the future Alex, maybe you 10 years from now, who will experience the aftermath of the choices that you make today?

Empathy can be expressed, obviously, towards other people, but empathy towards the world around us, towards the planet upon which we live. Empathy towards future generations as well.

We're seeing that really dramatically decayed levels of empathy have declined as much as 50 percent in the past decade in standardized measurements of empathy performed on college students in one actually two studies that were done here in the United States.

So what fans the flames of this is, you know, are incredible time spent in front of a screen. Our lack of restorative sleep. Our dietary choices. Lack of exercise. Lack of meditation. And overall self centeredness that tends to reduce the value, our perceived value of our social interactions.

Alex Howard: Yeah, and I think one of the things that is particularly important in what you're saying here is that there's it's almost like the more one becomes focused on themselves and the individual, and what I need and what I want and what I must have in my life, the more one disconnects from the support and the holding, the emotional support, the practical support, the connection of human relationship.

And that is something that strikes me about the disconnection syndrome, that it's not just disconnect from one's self and disconnection in terms of the brain, but it's also disconnection from that which in life is ultimately the most satisfying and the most nourishing.

Dr David Perlmutter: And this is a very powerful survival mechanism for humans. The way we've ingrained ourselves in social structure has been a wonderful tool, aiding us in survival, allowing not only the notion of safety in numbers, but specialization within the group, that people can carry out specific tasks that they're better at and really contribute to the safety and viability of the whole. We're losing that.

And I think, you know, looking around, we're seeing a significant retraction of people's sense that they need to be integrated into a larger network.

I had a very interesting experience recently in the parking lot of a health food store. And I ran into somebody I knew and we were talking this was early on with respect to Covid 19. And he said, you know, I don't know what all the excitement is about, the bottom line here is I'm healthy. If I get it, I'm going to be fine. I couldn't respond because I was about to say, well, it really is all about you, isn't it? Not to mention, I didn't mention the fact that, you know, I'm 65 years old and if you get it or if you even have that infection right now and transmit it to me, I might not do as well as healthy, wonderful you.

So it is a really interesting confluence of events right now that this infectious situation that has descended upon our planet is really having much worse of an outcome, I think based upon people's lack of wanting to make good decisions for the long term and their self centredness, thinking that it's really all about my decision not to wear a mask because I will be OK if I get this infection - Not considering the fact that if I happen to have this infection and I wear a mask, that might be an empathetic thing to do to that person I'm interacting with whose health may not be as good as mine. That's what empathy is all about.

Not wearing a mask is demonstrating lack of empathy to me. It demonstrates disconnection syndrome, people being locked into the amygdala, not having that adult in the room to think about other people.

Alex Howard: There's something also about. I'm also reflecting on the sort of their liveness of the race issue at this point as well. And there's something around how one facilitates

dialog with people that hold a different perspective to us. And one of the things I think that's really important is the ability to hold empathy and compassion for another, even when we may not agree with all of the aspects of their beliefs and there's something around as soon as we lose empathy, when we're trying to deal with complex and difficult issues. And the more we go into I'm right. You're wrong. I have to win. And I'm not being in touch with the impact on another. We're going down a slippery slope back into conflict. And we're not really progressing those issues.

Dr David Perlmutter: Well, you're right, Alex. And again, this is as you read in *Brainwash*, one of the fundamental things that we talk about in terms of this disconnection from the amygdala, from the prefrontal cortex.

So to clarify, we talk about a couple of different types of empathy, emotional empathy. Meaning I feel your pain. And then something called cognitive empathy whereby I'm able to put myself in your shoes for a moment and see what it's like to see things from your perspective, even though I may not agree with you.

We're seeing an incredibly dramatic decay of the ability for people to engage cognitive empathy, to even briefly try on somebody else's viewpoint and see how it feels. And again, this is a manifestation of disconnection from the prefrontal cortex.

In a moment, we'll talk about how we can reconnect, because really, that's the Take-Home message here.

But it is this lack of cognitive empathy that is being exacerbated by all of these lifestyle choices and experiences that we are all seemingly having these days. And I think nothing serves to enhance this lack of ability that we have to engage another person's perspective than what we see going on in social media, whereby people are able to spend excessive amounts of time in areas of social media that only cater to one perspective.

That's the only viewpoint that I will be exposed to because it's all I care about, to the exclusion of being able to to experience what other people believe or how they see the world. And, you know, that is in great contrast to our entire history, you know, the term agora means marketplace.

You know, agoraphobia, fear of crowds. And it was really in the agora where ideas were shared, where ideas were compared. And it is that comparison of ideas that allows progress. It's why scientists get together who have different points of view. For example, on a subject, they check that narcissism at the door and then are able to come up with novel ideas moving forward by synthesizing seemingly disparate points of view.

That's how we as humans make progress by reading research articles that are a little bit contradictory to our framework that, you know, somebody said no. As a matter of fact, the Earth might not be the center of the universe. It's possible that the Earth actually orbits the sun. No, that's not possible. I can't embrace that. Well, some people did. And with time that became our central dogma, I would still say, though, it seems likely that the earth is round, that, you know, there's some people who say the earth is flat. It does challenge me aggressively, but I'm willing to listen to what they have to say.

I mean, but these days, it seems that we've lost that. People who don't agree with us are separated by police lines these days to keep them from killing each other just because they have different points of view, whether it's on racial relationships, legality of abortion, the right to bear arms, whatever it is, let's at least talk about it. That's what we've always done. And we see that that ability to communicate and come up with a new idea that is satisfying for both sides is something that is very, very rare these days and that is a direct manifestation disconnection connection syndrome.

Alex Howard: Yes, it's funny you say that I remember a number of years ago, I deliberately went out and ordered and read books by some political leaders that I really disagreed with. And a friend of mine came to visit my apartment. I can't believe you're reading so and so's autobiography.

And I remember at the time, it wasn't - at the end of it - that I necessarily liked them a lot more or that I necessarily agreed with them. But what I did get is, I really understood how much they'd agonized over decisions that I didn't agree with. And there was something about that realization that it wasn't just an impulsive reactivity, they'd really try to weigh up, they just weighed with different morals, perhaps something very helpful about understanding the thinking process and the reasoning of someone that may not share a similar perspective.

Dr David Perlmutter: Yeah, I mean, you know, we've called them by a lot of names over the years, you know, iconoclastic these days, it's disruptors whose viewpoints are really quite radically different from the mainstream.

The point is, that's how we make progress. You know, when Elon Musk said, you know, I'm going to enter into a partnership with NASA and help to put people into space. You know, initially that was looked upon as being totally ridiculous, you know. And now we see what's happening.

I interviewed a gentleman yesterday, Dr. Dale Bressan, who has written books about how he's been able to reverse Alzheimer's disease, not by giving a magic drug, which is the central dogma in America; create a magic pill, make a billion dollars and cure disease. But he leverages thirty six different entry points and has turned people around who have

Alzheimer's. He has a new book coming out. I wrote the foreword, and in the foreword to that book I talked about people in the past like Pasture and Lyster who believe, for example, this crazy idea that germs that we couldn't even really see might be playing a role in infections and in diseases and if doctors, for example, would simply wash their hands prior to surgery, they would have a better outcome. And people like that are laughed at and then ultimately, you know, their ideas might become accepted and then finally get to the point where it becomes self evident; 'Oh, yes, we knew it all along'.

But you're right, we need to embrace the outliers. We need to embrace people who have far differing opinions and ideas then, do we? And that's how we make progress when we isolate ourselves from the viewpoints of others we can't make progress. And this has been a central theme in terms of humanity and how we've been able to accomplish as much as we have.

What we see happening right now, which is really quite remarkable, is globally there is this incredible sharing of ideas as it relates to treatment of existing Covid infection, as well as in the development moving forward of treatments and perhaps even immunizations.

I think it's unprecedented and that's it, sharing ideas. It's accepting the notion that people with differing ideas might be, quote, onto something. And I think it's always been very healthy to do that again.

When we lock ourselves into one mindset and the term 'set' means set in our ways. It's very limiting. And again, it's isolating. And it does not allow us to progress and that is really kind of the amygdala doing its thing. I'm right and you're wrong, end of story.

Alex Howard: Yeah, there's something I think that's been very deeply moving by the amounts of international collaboration that has happened in the academic community around Covid 19. It just seems so unprecedented. And for once, it really doesn't feel like profit is the primary motive in trying to solve a problem. I think that's also really something.

Dr David Perlmutter: Yeah, I think people finally got to the place of recognizing that this is a lot bigger than a blockbuster drug making profit, that we're in a bad situation here. And, you know, we've got the know how to pull it out of it. And the cooperation internationally, I think, is not only valuable, but it really represents a powerful upside of this experience that we are having. And there'll be no turning back I think after the fact in terms of how we've learned how beneficial it is to share ideas and cooperate globally. And I think the more we do it, the quicker we'll see resolution to this issue.

Alex Howard: Yeah, I think that's right, and actually it takes me back to something you were saying a bit earlier when we were talking about some of the vicious circles that people get into. But, of course, it can go the other way by people can get into virtuous circles of people, start to change a few things that then positively impact a few other things.

So let's come to some of the things that people can do to start to address disconnection syndrome and actually, perhaps one of the places we could start is just starting to slow down and disconnect from the endless connection to devices and media and the sort of digital obsession that people have.

Dr David Perlmutter: Sure, and let me preface this upcoming part of our time together with the value of doing that. It's not just that it allows you to make better choices and to maybe be more empathetic towards yourself and your neighbor and other things. But the implications of reconnecting to the prefrontal cortex extend to a reduced risk for chronic degenerative conditions, including diabetes, obesity, Alzheimer's disease, coronary artery disease and even balancing immunity.

Think about it, that the immune system is profoundly affected by this, by the impulsivity that's generated from being too locked into the amygdala that threatens immune function moment to moment.

So when we see this powerful correlation between underlying disease states and bad outcome, for example, with Covid 19, those bad underlying conditions are related to our choices. And this takes us right back to making impulsive choices, as in terms of the food we eat to sleep, we get exercise regimen, getting out of the nature, meditation, etc. and outcome, be it not getting a chronic a general condition and therefore reducing our risk for having a bad outcome or having a diagnosis of Type two diabetes or chronic pulmonary disease a corner or disease or obesity, which bode poorly should one become infected.

So I think the first thing that you mention is this notion that we are spending; at least Americans spend somewhere north of six hours per day in front of one screen or another, whether it's computer, smartphone or their tablet, whatever it is, that's more than six hours a day. You know, that's about twenty three years in a lifetime spent in front of a device in terms of your time. You know if you are extending that out over a lifetime.

And it's not just that this has no negative implications that we'll talk about, but it's also important to consider that when you are doing one thing, you're not doing something else. So six hours of your awake time. I don't know how long people are awake, but let's say they're awake 14 to 16 hours a day.

Six hours of that dedicated to screen time would indicate that there's not enough other time to do the other things shop, prepare your meals, interact with other people, which is so important. Get out a nature, exercise; the various things, meditate, for example, that we know are really important for reconnecting, reconnecting to the prefrontal cortex and all the downstream benefits of that in terms of making good choices that will be beneficial for your body weight, for your immune system, for lowering inflammation, for lowering stress, lowering cortisol.

So I think just the sheer amount of time that people spend in front of a screen is really important. Now, what can we do to address that? In *Brainwash*, we talk about an acronym called the test of TIME - t i m e and that's an acronym, the word time.

Number one is:

T - How much **time** are you going to dedicate to the task that you want to accomplish with your online experience, whether you're researching a paper and you need to pull some references or you want to get on social media and see what your high school alumni group is doing, whatever it is, I'm going to budget forty five minutes for that or whatever the number may be. You set a time.

I - Is it **intentional**? What is your goal? What do you hope to accomplish? You want to buy a new set of golf clubs, whatever it is you're trying to do. What is the goal that you want to accomplish?

M - Do you remain **mindful** while you're online in terms of being focused on the task that you're trying to achieve, understanding that there are massive efforts to harvest your attention while you're having your online experience in terms of in terms of other advertisements popping up click bait that appears magically promoting something that you're kind of are interested in. Gee, how did they know? So it's very important to remain mindful and focused on your task.

And finally:

E in the acronym TIME is **enriching** and that is an after the fact kind of judgment. And that is was this experience I had just now net positive. Am I feeling good about how I just spent that period of time or did it detract? Was it something that really I'm not feeling good about that I spend too much time watching news that fans the flames of my anger and fear? Or did I learn about oak trees or why fungi are important in the ecosystem, whatever it may be? Was it enriching?

So, applying the test of TIME, I think is really very important. Hey, you know, what we can do online is exceedingly valuable. It's incomparable to anything else. I mean, you know, I write books based upon access to unlimited resources of information by virtue of having the Internet. What a great tool. But, you know, you can just as easily get lost. And there are profound efforts underway to take you away from your task and to harvest your attention. There is great value for others in terms of what you look at online, what advertisements pop up has exceeding value for other people, and you know that that's revenue.

So what pops up doesn't have your health and well-being in mind, it's for advancing the bottom line on those who want to harvest your attention.

So I think as an overview, we recognize that we're spending too much time, that six percent of the global population has been characterized as having what is called Internet addiction. To the extent that it is their degree of involvement with the Internet is disruptive to their ability to live a meaningful social, interactive life and at times it even interacts and damages their ability to make a living.

So this Internet addiction, that's a quarter billion people. That's five times the population of England that are characterized as having Internet addiction. And, you know, in adolescents who are particularly at risk for Internet addiction, it is associated with a fourfold increased risk of suicide. Keep that in mind.

This time spent in front of a screen isn't necessarily benign and there are some clinical criteria by which we are able to use the term Internet Addiction. But I would submit that it's not kind of a binary - you either are or you're not Internet addicted, at least by definition you are. But I'd say that even if you're not fully Internet addicted, that there is you know, there are issues associated with spending a lot of time online, even shy of being diagnosed with Internet addiction.

You know, there are very few things in medicine that are binary. Either you are or you're not. Pregnancy, for example, you're either pregnant or you're not pregnant. It's kind of not sort of pregnant.

But, you know, you could be not necessarily diabetic yet, but you do already have elevated blood sugar and some insulin resistance; so you're on your way. It is similar with this Internet addiction.

I think many of us are on our way and thus have higher risk for the issues that we're talking about now. So I think you've got to manage your time online. I would say, though, if you were to ask me and let's make believe that you just did because you did what is, I think, the most valuable and most important off ramp from this disconnection syndrome.

And I think it's sleep. I think it's so undervalued and yet so desperately important, especially these days. And it's fairly easy to remedy. But I think first we have to call out how incredibly valuable it is when we recognize how pervasive lack of restorative sleep is in modern societies.

You know, as many as 60 percent, for example, of adults in Japan do not receive enough restorative sleep on a nightly basis. Not getting enough restorative sleep, I mentioned early Soucy with a variety of chronic gender problems, bad decision making, weight gain and impulsivity. So those things add up to making bad choices, which then would further degrade our ability to get a good night's sleep.

So I can't emphasize it enough, that we need to pay attention to how we're creating an environment that allows us to go to sleep and remain asleep and get deep sleep, which is the time in our sleep cycle where we are able to clean up our brains, REM sleep. That allows us to consolidate information that we experience during the day and relate that information to previous experiences.

This is a key thing that is done by animals of every kind on our planet in one way or another. Everything needs to sleep. And when we undervalue it, thinking that, you know, the way to succeed is to stay up late and get up early and be productive.

Productivity is compromised by lack of enough restorative sleep. So, you know, limit your caffeine. After 2:00 p.m., no caffeine, for example.

Think about the time of day that it's best for you to exercise.

Try not to eat within three hours of the time that you want to go to sleep.

Limit your exposure to blue light after dinner - blue light comes from your computer screen, your phone, etc. Blue light inhibits your body, your brain's ability to make melatonin and therefore could have an effect on your ability to get a good night's sleep.

Make sure your room is quiet and dark and maybe a little cooler than you are used to. If you are sleeping with somebody who may have leg movements at night or awakens frequently, you might want to consider a pillow between you, or separate beds or maybe even separate rooms. I'm not suggesting that people, you know, move out, but I am suggesting that sleep is really important for long term health.

Again, lack of restorative sleep is strongly associated with Alzheimer's, and that is a disease for which there is no treatment. So it's a very, very big deal.

Now, how do you know that? How would you know? You say I woke up in the morning. I guess I had a good night's sleep. Well, there are various wearable devices that people can use that now can tell you as a matter of fact, you got one point three hours of deep sleep, one point four hours of REM sleep. It took you 10 minutes to fall asleep. Your heart rate with such and such during the night and your heart rate variability, another marker of the rate that your heart actually varies, the amount of heart variability that you have, which is a good thing, was a specific amount. And matter of fact, you awakened three times during the night that you don't even remember.

So wearable devices of all kinds are available and can give us that information. So, you know, I don't think sleep was on the top of our list. It was near the top of the list, but it's probably on the top of the list now of things that we should pay attention to, to reconnect to the prefrontal cortex.

Alex Howard: Could you also say a bit about, because I think it's almost like the opposite of being kind of obsessed by and addicted to screens; the importance of nature and the

importance of actually being in surroundings that have the ability to actually calm and settle the system.

Dr David Perlmutter: I will. And again. Throughout our entire time on this planet, we have been intimately related and involved with nature. Nature is signaling us as to what is the environment like so that our bodies can respond to that, that, you know, our bodies responded to the diurnal cycle of the day, we call this a chronobiology. And we now know that the incredible amount of time that we're spending indoors is associated with significant health repercussions, including immune dysfunction, blood sugar abnormalities, et cetera.

So we're seeing an explosion of science relating to the power of simply exposing oneself to nature, in terms of being able to restore this relationship and have good health outcomes, consequences associated with it.

Much of the science is done in Japan. Shinrin yoku is what they call forest bathing, where people are actually prescribed spending some time in the forest are seeing dramatic reductions in things like cortisol, a chemical related to stress, for example, and therefore a better immune function, lower blood pressure as examples; with research showing that even people who live in a city, if they can spend some time each day in a local park, surrounded by trees measuring their salivary cortisol levels shows that that has a profound effect in terms of lowering the level of that stress hormone right away.

And it may even be as simple as a potted plant in your home or even photographs of natural environments have been shown to affect our decision making, and have been shown to affect the action of the amygdala in terms of calming it down, allowing less impulsive decision making. Think about that.

You know, people say, oh, I can't, I don't live near a national park and there is Covid. I'm not going outside on and on. It may just be that even a photograph or a painting of a natural environment can have a profound effect on a variety of markers of biomarkers, including those involved in immunity.

Alex Howard: I'm mindful of time, but I just want to cycle back something that you said earlier on when you were talking about the social distancing and the impact of that, and that we can keep our distance, but we don't necessarily have to be isolated and not be a nice place to sort of bring some of this together.

Dr David Perlmutter: Well, you know, man is a social animal and it is a requisite part of our daily experience in terms of our health. We need to interact with others.

I mentioned the statistics related to the number of people living in urban environments who feel isolated. That sense of isolation has profound relationships to significant health

consequences; blood pressure, immune function, chronic degenerative conditions, weight gain, Alzheimer's, heart disease, diabetes, cancer.

So we really get a lot from others when we interact with them. These days the notion of interacting with others is looked upon through this, this filter of the fact that we need to stay away from other people. And I would submit that we can still and need to interact with other people, either doing it with appropriate distancing, perhaps with the use of masks which are now socially acceptable. And even current research coming out of Oxford has shown that we do benefit quite substantially from our virtual or digital interactions with other people.

So the Take-Home message is that even though we are told to socially distance, under no circumstances should that be considered synonymous with social isolation. Cultivate and spend time working and nurturing your relationships with other people - now, more than ever.

Alex Howard: Dr. Perlmutter, I just wanted people to find out a bit more about you and your work, and it has been a really important interview. And we've been touching some of the themes from your book, *Brainwashed*, which I highly recommend. But say a bit more about how people can find out more about you and your work.

Dr David Perlmutter: Sure. Well, there is www.drperlmutter.com, that's my Website. We have thousands of peer reviewed research articles in their full form available, it's totally searchable.

I write blogs frequently that appear, there are video blogs. I interview people just about every week on a program called The Empowering Neurologist that's linked to www.drperlmutter.com and my Facebook, where I actually do post (I haven't for a couple of weeks) and that is David Perlmutter.

Alex Howard: Very good, you only do the six hours a day, right?

Dr David Perlmutter: Yeah, I'm very mindful of that, in fact, I'm adding our time together as screen time, though I find this to be very positive to have made a new friend. That's you're helping my immune system. So I appreciate that.

Alex Howard: Great. I really recommend people go in and check out your work. I think you also have a fantastic way of making complex ideas really simple and accessible, and I really appreciate that. So thank you for your time today, I really appreciate it.

Dr David Perlmutter: My pleasure. Thank you.