



PULSED ELECTROMAGNETIC FIELD
PEMF Healing Summit

Reversing Alzheimer's

William Pawluk, M.D., MSc interviewing
Heather Sandison, N.D.



William Pawluk, M.D., MSc

Well, I'm Dr. Pawluk. And this session, this particular episode of the Post Electromagnetic Field Healing Summit is titled Reversing Alzheimer's Disease. And with us today, we have Heather Sandison, N.D.. And Dr. Sandison is an expert in this area, and we're very happy to have her with us to help us, to educate us on Alzheimer's disease, cognitive dementia, brain problems, et cetera. So she's an expert nut and we look forward to that, but rather than me telling you about her, it'd be actually better for her to tell you about her. So, let me introduce Dr. Sandison, please.

Heather Sandison, N.D.

Hi, thank you so much for having me. So, what I do is help people reverse their dementia, and really it's a privilege when I have the opportunity to help people prevent their dementia, because that is so much easier and so much less expensive and really a lot more fun. But what we've done is we have realized that people won't do the work that it takes to prevent dementia, unless we can prove that we can reverse it. It's much more easy to prove that you're reversing something than it is to prove you're preventing it. And so we've designed a clinical trial in my office where we've taken 25 participants through this process. It's a complex system science, individualized, functional medicine-based approach to brain health. And we're excited to have those results published this year in 2022. And this is very much in line with what Dr. Bredesen does that was published last year. They showed that 70, about 75% of participants in their trial doing something very similar reversed their cognitive decline. So, the natural progression of dementia is about a three point decline on a 30 point scale, a MoCA or a Mini-Mental Exam. And three points of decline over a year is what's expected. What we're seeing is in as much as seven,



eight, and nine points of improvement. So really, really, really exciting stuff that lots of people can get behind. So many people are told by their neurologists that there's nothing that you can do for dementia or here's some medications like an Aricept or a Namenda and really get your affairs in order because this doesn't work well. So, what we've seen is that it works the majority of the time, and especially if people can implement. What I was seeing in my clinical practice early on after studying with Dr. Bredesen, was that the people who didn't benefit were the ones who didn't have the cognitive capacity or the support at home to implement. So, because of that, I started a residential care facility called Marama, where we offer an immersive experience in this Bredesen type of approach. So we, in the clinical setting, we see patients who are struggling with dementia, or want to prevent dementia here at Solcere. We have a clinical trial going on, and then we also have the residential care facility. So I get a lot of opportunity to spend time with patients and families who are struggling with dementia, and then also have the privilege of getting to see many of them improve their health and get better.

William Pawluk, M.D., MSc

I totally agree with you. This is true in medicine in general, isn't it? So, you're a naturopathic physician. So, what we recognize is that the longer you wait, the greater the pathology, the deeper the damage, the harder it is to climb back out of that hole, right? So, this earlier you could start the better. Tell us a little bit about Dr. Bredesen and how you got involved in that, and why you've chosen this approach to dealing with dementia.

Heather Sandison, N.D.

Yeah, so what happened was I saw Dr. Bredesen speak at a conference, as you and I both know, we go to a lot of conferences getting our continuing medical education. And just because I'm curious, I wanna know what other people are doing out there. And so I saw him at a mental health conference and when I heard him speak about what he was doing, it meshed so well with my approach, which is basically a complex system science approach that I wanna know everything that is affecting cellular health. I don't wanna say like, oh, it's just this one molecule, it's this one biochemical pathway, or it's this one thing, it really is about saying what are all of the things impacting the way that cell behaves day to day. And Dr. Bredesen did essentially that. And he wasn't afraid to say, hey, you need to be comprehensive, right? I think a lot of times as doctors and especially as a younger naturopath, I didn't wanna overwhelm people. I didn't wanna say, oh, we need to do more than one lab. Oh, we need to treat your gut and your brain



and the infections and the toxicity. I felt like we had to simplify things and meet patients in this paradigm that we're all stuck in about like this one pill for one ill. And when I saw Dr. Bredesen sort of unapologetically be like, look, we need to look at hormones. We need to look at toxins. We need to look at blood supply and at the anatomy. We need to look at type 3 diabetes is one of the things that sometimes dementia is called. We need to look at diet and blood sugar regulation. We need to look at traumatic brain injuries. So, when he started describing his model, it overlapped so much with mine that even though I was a skeptic after being told by many well-meaning instructors and experts, that there was nothing you could do for dementia. Even though I had been told that and believed it, I was curious enough to go train with him because the model made sense to me. And then, when I got back from his training, I was on his list of people who had been trained by him.

And so, there were people who had read his book, patients and families who had read his book, who started showing up in my office and saying, hey, I wanna do this, can you help me? And really, they were the best teachers. They were the ones who inspired me to commit my life to this, to my career to this because I watched the impossible happen, right. I watched patients with severe cognitive decline, reverse it in just weeks, getting better in just, yeah, in less than two months. I mean, just really things that I was in disbelief I was seeing at first. And then when I started to see it over and over and over, I mean, there's so much suffering happening and I started to realize that it's unnecessary. So then what, you know, what else could I do with my life other than tell as many people as would listen.

William Pawluk, M.D., MSc

And dementia, when people know that they're developing cognitive decline, it's very scary.

Heather Sandison, N.D.

Absolutely terrifying. Dementia is, I mean, I think this is part of the reason why we don't talk about it much. One, we're told there's nothing you can do, which is factually inaccurate. In fact, it's almost overwhelming how much you can do. And then two, it's so terrifying we don't wanna imagine that it could happen to us, right? We say, that'll happen to somebody else, not me. And, the truth is that the moment there's some inclination, some feeling, some insight that my brain used to be able to do that 10 years ago, that is the moment to get started. That is the moment to seek help from someone who's been trained by Dr. Bredesen



William Pawluk, M.D., MSc

Let's go back to Dr. Bredesen for a second. Why is he an expert? What has he done to become the expert that you decided to go train with him?

Heather Sandison, N.D.

Yeah, so he wrote a book called *The End Of Alzheimer's* and he has spent decades studying what he calls as mouseheimers. So looking at what affects the brains of mice in the lab. And sure enough, over, you know, over decades, billions of dollars and countless hours of incredibly smart people's time has been spent chasing this beta-amyloid hypothesis, right? That we have beta-amyloid plaques that form in our brain and that's what causes dementia. Well, I am open to that being part of the story. However, there's clear research that there are people who have perfect cognitive capacity at over 100. And when they dissect their brains on autopsy, there's beta-amyloid plaques present. there are Lewy bodies present. There are tau proteins present and they still had just brilliant cognitive capacity. So, it's not the entire story. There are also people with dementias and even who have diagnosed Alzheimer's who don't have a lot of beta-amyloid. So, we see that there's a lot of crossover. The name, this diagnosis we've given people called Alzheimer's is really, I think, dementia is the umbrella term where we lose cognitive capacity.

And then Alzheimer's is one type of dementia, but most people are familiar with Alzheimer's and use that term kind of interchangeably with dementia. So the, I like to use the word dementia because it's more all-encompassing and it doesn't have the connotation that it's associated with beta-amyloids, which I think is kind of a false pretense, right? That's not 100% of the story and we've chased it as a society for so long. So, Dr. Bredesen. Dr. Bredesen is a trained neurologist. He went to Duke, he was at the Buck Institute for Aging for many, many years. He is a researcher and he is one of the kindest, most sincere human beings I've ever met, who is just absolutely dedicated to changing the narrative around this so that people can get the help they need. And he's also been, you know, just an advocate for functional medicine and this common sense, how do we, you know, when we talk about the brain, it's a complex system, how do we get the bad stuff out and put the good stuff in so that the brain can do what it's designed to do, heal and then help you remember?



William Pawluk, M.D., MSc

So, what we know basically is that tau protein and beta-amyloid are in a sense, one of the end sign posts of a condition or a process, right? So in other words, that's the end, one of the end points the process, but what causes the process along the way? What causes that progression of symptoms along the way, besides you getting older?

Heather Sandison, N.D.

Yeah, well, so, and this is, that's one of the things to keep in mind here is that there, a lot of the medications, the drugs that have been formulated, like I said, we spent billions of dollars and decades of smart people's time chasing this beta-amyloid hypothesis. And what we is that when we take the beta-amyloid out, you still get a decrease in cognitive function. In fact, it speeds up often. And that's because these beta-amyloid plaques have antimicrobial properties. They're actually there to support us and to protect our brains. For the vast majority of human evolution, everyone had APOE 44 status. That meant an APOE 4 copy from your mom and an APOE 4 from your dad. And that was actually the most protective genotype in an environment where there were lots of parasites and other infections that were pretty ubiquitous. Now, as our environments became more sterile, we now express APOE 3 and 2, which are less associated with dementia. The interesting thing about these proteins is yes, they're misshapen, they're misfolded. And so they are, you know, over time that becomes damaging to the brain, but they're really there to protect us from infections, from things that cause inflammation, from toxins. So, when we talk about the why, why is the brain creating these plaques and proteins and tangles and kind of perpetuating inflammation in the brain? Why is that happening? Well, we go back to the causes. So, toxins are one cause. This can be heavy metals, mycotoxins or mold-associated toxins. This can be things like glyphosate. I was talking to Stephanie Seneff out of.

William Pawluk, M.D., MSc

It was Roundup.

Heather Sandison, N.D.

Roundup, yes, and Dr. Stephanie Seneff out of MIT has published extensively on glyphosate and its influence on glycine, which is an amino acid on our brain and protein folding again, and all of the ways that it interferes with metabolism, both in the gut and in the brain. So, chemical toxins like phthalates and PCBs and petrochemicals and perchlorates and all of these nasty things in



our environment that are small enough to be absorbed through the skin or come in through food or even be inhaled, they can start to accumulate in our system.

William Pawluk, M.D., MSc

And get through the blood-brain barrier.

Heather Sandison, N.D.

Yeah, especially when there's a leaky blood-brain barrier, right, because of stress and toxins and infections and all the other things. So yes, that is a piece of this. So toxins, nutrients, we need enough nutrients, but not too much, right. We all know that too little vitamin C can cause scurvy and too much sugar can cause diabetes. But there are even times when we need a bit more vitamin B-12 because of the way our genetics process things, or we need a bit more zinc, or we need a bit more glutathione. There is some nutrient that we can optimize so that we can get optimal cell function. Again, this idea that when we take a cell, what's gonna make it work best, work optimally, not get in the way, like the toxins, so get those out of the way, and then put nutrients in so that the cell has all of the building blocks it needs to make proteins, to synthesize whatever function it has in the brain to shoot, to fire off those neurons so that they can transmit information and you can collect memories. So toxins, nutrients, stress. Again, it's all about balance. Too much is a problem, too little is a problem, in the wrong place is a problem, at the wrong time is a problem.

You have probably had this experience if you're anything like me of too much cortisol at night. This will keep you from sleeping, not having enough cortisol in the morning, it makes it really challenging to get out of bed. So stress, one of the stress hormones is cortisol. You don't want too of that at the wrong time. We don't want too little of our hormones like estrogen, progesterone, testosterone. These send signals to our brain to create new neural pathways. They're signals of growth, of youth. And so if we have too much stress, that can reduce our sex hormones, and then in doing so, reduce our ability to think clearly. Many women who have been through menopause know exactly what this feels like when the brain isn't getting estrogen, you can't think straight. Also with stress, this is the reason torture doesn't work particularly well. It's very hard to remember when we are under stress, right? We're worried for our lives, we're scared. And, even if it's rational, whether it's rational or not, that fear that stress will keep our brain from making memories. And so, balancing stressors where we're getting enough exercise, right? That's a form



of stress. Even the ketogenic diet, which I'll talk more about is a form of stress. This is the idea of hormesis where we're getting enough stress that the system has more ability to respond to the environment. We're more flexible, more able to absorb changes in the environment or adapt. This is adaptability. So, we want enough stress that we have more adaptability, but not so much stress that we decompensate, right? So, finding that middle ground and things like meditation, extremely helpful. My bias is that everyone should be in therapy as long as you find it helpful. Everyone should meditate, and then getting enough sleep, right? Not stressing those foundational pieces, getting good high quality nutrients so that we're not on these blood sugar swings. That can be very stressful. Finding ways to optimize exercise. Exercise is a good stressor in some ways, it's great stress relief in other ways. So, optimizing that exercise routine in your day-to-day life. So toxins, nutrients, stress, structure.

Structure is, and when it comes to the brain, it's are we getting enough oxygen to our blood? Are we getting enough, excuse me, oxygen to our brain, blood to our brain? And then are we getting all the trash out? Right, again, that cell, we need a put good stuff in, take bad stuff out. Same thing with the brain. Now, if our head is way forward and we're stretching those arteries or bending those arteries that go through the spine, then we're not gonna get optimal blood flow. If we have, you know, if we have pain and our muscles are really, really tense and squeezing on those blood vessels, or if there's inflammation that's preventing us from getting good blood circulation and blood flow through the brain. If we're not getting enough sleep. So we're not getting that lymphatic cleansing at night, then we're not gonna get enough flow out and we're gonna have toxins accumulate. So that flow in and out of the brain is absolutely critical.

Now the other big piece that comes up here is obstructive sleep apnea. So, if we snore at night, if we don't have an open airway at night, if we're mouth breathers, instead of nose breathers, this is a huge, huge, huge risk factor when it comes to cognitive decline. So, addressing that immediately, really, really important. Toxins, nutrients, stressors, structure, and infections. I always put infections last because my clinical experience is such that if we can balance those first four, you should have a pretty robust immune system. And as long as you don't go to Mexico and drink the water, or you don't, you know, go get bit by a bunch of Lyme ticks, Lyme-infected ticks, then you should be okay and able to kind of get through your cold and flu season and not succumb to crazy infections. Now, there are some caveats here, especially in the case of dementia. We know that *P. gingivalis* which can turn into infections in the mouth can directly



impact inflammation in the brain. So, making sure that there are not infections in your mouth, whether it's in an old root canal or a cavitation around your wisdom teeth that were extracted when you were 18 years old, or there's not some abscess that you're not aware of, that is really, really, really important. And if I, you had been telling me this 15 years ago, I would've thought you were crazy, but I have seen it now enough times to know clinically that there is a connection between what's going on in the mouth and what's going on in the brain. And really in the immune system in general, you also hear an adage that health starts in the gut, well, your gut starts in your mouth. So, making sure that that oral hygiene is really, really optimized is important. If you see any blood on dental floss or blood in the sink after you brush your teeth, it's time to get to the dentist and up your oral hygiene game. Other infections that directly impact the formation of beta-amyloids or have been found on autopsy, basically in the beta-amyloid plaques are herpes viruses, HSV-1 and 2, which is your oral, genital herpes.

And people who have those successive outbreaks, they seem to be at higher risk. So, this is a place where I think getting treatment is important. I'm a naturopath. I don't, you know, I'm not writing prescriptions all day, but this is a place where if there's a risk for dementia and a history of herpes outbreaks, I do suggest aggressive treatment. And then, the other one is Lyme. And the Lyme co-infections. We know that these can cause a huge amount of neuro-inflammation. And that even after Lyme is successfully treated, a Borrelia infection is successfully treated, there can be residual neuro-inflammation that sticks around. So, this is sort of toxins, nutrients, stressors, structure, infections, and hormones. I would argue that that's a pretty comprehensive start to figuring out where someone stands in terms of their dementia risk. That if we can optimize all of those things, then people have relatively optimal brain function.

William Pawluk, M.D., MSc

Let me ask you what you think is the most common infection that people have?

Heather Sandison, N.D.

The most common infection? I'm curious, what, I don't know.

William Pawluk, M.D., MSc

EBV.



Heather Sandison, N.D.

EBV and CMV? So my, oh.

William Pawluk, M.D., MSc

No, no, no, EBV, not CMV, EBV. Well, CMV is very common and we all have we, people who get it tend to get it when they're children, but what I do testing, and studies have actually shown this about 85 to 90% of the population are positive for EBV antibodies.

Heather Sandison, N.D.

But is that because they've been exposed and they have an infection, they have a previous infection, right? So having antibodies doesn't mean you have a current infection, just means that you've been exposed at some point.

William Pawluk, M.D., MSc

No, no, having antibodies mean you've had a previous exposure. But if you had exposure when you were a college kid and now you're 65 and you still have significant EBV antibodies, then is it still active or not? And EBV has now been found to be actually resident. So once you get, it's like shingles, chicken pox, you got it forever. Then when you have other problems going on in your body, EBV can reactivate just like Lyme disease or chlamydia or all kinds of other infections. So EBV is our partner for life for almost all of us.

Heather Sandison, N.D.

Right, right, and then it can be this reactivation. And especially if there's excess stress, there's poor nutrients, there's toxic burden.

William Pawluk, M.D., MSc

Or COVID.

Heather Sandison, N.D.

Or COVID, yep, then you see these viruses that are pretty ubiquitous, get reactivated.



William Pawluk, M.D., MSc

So, stress tends to reactivate just like it does with shingles. Shingles doesn't sort of reactivate on its own. Usually there's a major stressor as well. One of the things I want to mention about supplements that we talk about nutrition is that it's been said that, but lot of doctors believe this, they've been taught this, that vitamins just make expensive urine. And I used to tell my patients all the time, I'd rather have expensive urine than cheap urine. And we know that our nutritions is not very good if you rely on the general nutrition that everybody is typically using or getting, it's depleted, significantly depleted, not only then, then it's hyper-processed. So actually supplements are a form of toxicity, not supplements, but additives are another ubiquitous form of toxicity. And let's say breads from a Subway or breads from McDonald's or breads from you name it that are commercially available, they're loaded with supplements. They're loaded with, sorry, with additives. And those additives accumulate just like glyphosates accumulate. So, now let's talk a little bit about glyphosate. How do we get glyphosate?

Heather Sandison, N.D.

So glyphosate is, again, ubiquitous. You cannot avoid it 100%. The best way to avoid it, to do what you can about what you have control over is to eat 100% organic diet. So, glyphosate is sprayed on foods, not just, you know, people will spray it in, especially in planned communities. You know, it's on the sidewalk to keep the weeds from growing, it's on watermelon, but then you have these Roundup-ready crops. You know, the ones that are sprayed the most, things like wheat and soy and corn. And what's, I think a lot of people don't realize is that Roundup, even though these are Roundup-ready crops, Roundup kind of stresses them a little bit. So, what they do is right before harvesting, they'll spray a ton of Roundup or this glyphosate over something like wheat. And it makes the wheat bigger. Basically makes it so they can harvest more because that stressor at the end of the life of this wheat, it forces it to make more of basically this is its reproductive capacity, right? So, it makes a little bit more, and then they can harvest more. But that means there's tons of glyphosate in the food supply, because they've just sprayed it. This isn't to kill weeds, this is to stress the plant a little bit so it gets the secondary effect of a plumper wheat harvest. And so, this makes massive amounts of glyphosate in genetically modified wheat products and corn and soy. So, the best way to reduce your burden is to avoid genetically modified Roundup-ready crops. And that's again, wheat, soy, corn. Then, knowing your farmer, knowing where things come from, this can be kind of a depressing conversation because there's



big systemic issues that, you know, each one of us as an individual doesn't have a huge amount of control over, like the Farm Bill and there are massive lobbies and so many dollars, it's wild to think about that are being used to prevent things from changing, right, to support the status quo, which is Big Ag, monocropping, lots and lots of chemicals. But what we can do is choose to eat organic, support your local farmer, and don't spray it yourself. Don't buy it, don't spray it in your yard. It is so toxic. One of the ways it's toxic is first in the gut. So, it's an antimicrobial agent, right? This is part of why it's toxic. And so it will change your flora, your microbiome in your gut. It also is a chelating agent. So, it will rob you of nutrients when it's in your gut. And this is probably part of why we see so much more gluten intolerance, so much more wheat intolerance. It's not just the gluten or the wheat, it's the pesticides in it. It's the herbicides in it. So, you know, just making conscious decisions about what you're putting into your body every day, I think is step number one. The other thing I tell people is take your shoes off before you go in the house, because we're walking around all day and people spray parking lots and sidewalks. They're sprayed with all kinds of stuff we don't know about. Even the petrochemicals, the oil that's leaking. Whatever's out there. If you can just leave that stuff outside by taking your shoes off at the door, then you're not tracking it inside. And then you're not barefoot later on and then crawling into bed. And that can really reduce the amount of toxicity in your house. Also, opening doors and windows, you know, when it's not winter time on the east coast.

William Pawluk, M.D., MSc

So, we can't avoid these things, right? The problem is you can't avoid it. It's like EMFs, you can't avoid it. It's there, it's everywhere. So, if you can't avoid it, all we can really do is to decrease the burden. Now, how do we find out if we're at risk? 'Cause not everybody will show Alzheimer's from all that exposure, right? Some people are more prone to it than others are. And so how do you assess whether you have that risk?

Heather Sandison, N.D.

Yeah, so neurodegenerative, this is one of the interesting things is that nothing matches according to Stephanie Seneff's work, nothing matches the acceleration in autism rates and neurodegenerative disorders with the same accuracy as the increase in use of Roundup. Right, so these lines are just directly correlated. Now, the causation is, you know, the biochemistry, the biology of this, but from an epidemiological perspective, our exposure to this has gone up exponentially and in the incidence of these diseases, especially autism has as well. So, when we



talk about what to do about this, you can measure, I use Great Plains Labs. I use their glyphosate test and we just have people collect urine and we send it off. And then you can know about where your levels are. Now, I see people with severe disease with autism, Asperger's, well, Asperger's not being as severe, but severe autism, with ALS, with dementia who are up in like the six and seven range. And then I see people, you know, who aim to eat organic most of the time. And they're down around one, a little under one. You really, ideally we would be at zero, right? But that just, I don't see that ever. It just is next to impossible. But what can we do is, and this is true for all the toxins, for mold toxins, for chemical toxins, and for heavy metals. You know, if we can support our natural detoxification pathways, have a bowel movement every single day, at least once, drink plenty of good high quality, filtered spring water, or spring water. If it's coming from high enough up, you probably don't have to get anything out of it.

But water is really another one of these things. It's like, I don't wanna be too depressing here, but it's hard to get good water, especially in Southern California. We're at the end of the river here. But bowel movement every day, plenty of good clean water out of glass or stainless or healthy ceramic that hasn't been dyed with lead, paints, no red, but good healthy water source that's not out of plastic. And then supporting your liver. Things like dandelion and milk thistle and good healthy amounts of cruciferous veggies like broccoli and cauliflower and brussel sprouts. And then your lungs, so detox breathwork. I think the lungs get overlooked often. They are so good at balancing our pH, but they also, this is why a cop would use a breathalyzer, right? To test to see if you've been drinking is because we exhale toxins that are metabolized in the body through the lungs.

And I've been in breathwork classes, detox breathwork classes where I thought like, who's painting at 7:00 PM? Why is someone outside painting or are they inside? And it was just people starting to get rid of toxins through the breathwork. So, highly potent stuff. This is really effective when you use it to use a detox breathwork practice. And then it also helps with managing stress, which is a nice two for one there. And then the last organ of elimination, it's kind of again, a two for one here, the lymphatics and the skin. So sweating and getting rid of toxins through our sweat and then guiding them to the liver through the lymphatic system. So things like dry skin brushing, sauna, exercise helps with this, castor oil packs to the liver. There's really a long, long list of ways that we can support getting toxins out through the skin and lymph. But sweating is by far one of the best, especially if you can tolerate it. I like a sauna blanket. That's what I have at



home. It's really easy, it heats up fast. I sweat quick, it's easy to clean and then I can fold it up. It's like the shape of a sleeping bag. My head sticks out so I can tolerate it really hot for a little while, and then I can just clean it out, fold it up, and put it in a closet, and it doesn't have to take up a bunch of space. It's also quite affordable. So, an easy way to have access to a sauna or sweating regularly. Epsom salt baths are another great option.

William Pawluk, M.D., MSc

Hot baths, yes. Bikram Yoga.

Heather Sandison, N.D.

Yes, love it.

William Pawluk, M.D., MSc

One of the things you didn't mention as a cause is concussion.

Heather Sandison, N.D.

TBIs, yeah, so structurally, the traumatic brain injuries. Absolutely, I'm so glad you brought that up. So, structural issues there, yes, can cause all kinds of inflammation and damage, cellular damage. This is something where if we have the opportunity, getting that treated within a couple months, within a couple weeks of the injury happening, we see the best outcomes, but there's so much that we can do for anyone that's had a traumatic brain injury. And even later on, there are functional neurologists who will see people with decades-old traumatic brain injuries and get really good results, kind of retraining the brain. This is neuroplasticity, right? That even though there's been some damage, our brains have this phenomenal ability to rewire and create new pathways to make up for whatever was lost.

William Pawluk, M.D., MSc

So you can't get smart without exercising your brain, right? You have a natural smartness, but that's only a potential then you have to exercise that potential to maximize the function of that brain. So, talk about brain exercise.



Heather Sandison, N.D.

Yeah, without a doubt. Well, so what I tease by patients is that this whole protocol is brain exercise. We love when, you know, the ketogenic diet nutrients, our brains, many Alzheimer's brains are not very efficient at using glucose or sugar for fuel. And so we ask them to switch the fuel to ketosis, to ketones, which is a burning fat for fuel versus sugar for fuel in the brain. And sometimes just switching the fuel makes the brain run much more efficiently. Now, it's a big ask because it means asking people to stop eating sugar. But it's like, I tell them, it's like bicep curls for your brain, to figure out how to shop differently, to figure out how to cook differently, to figure out, you know, what's on the yes list, what's on the no list, then to, you know, prick your finger and measure your ketones and figure out what means ketosis and what doesn't. This is a whole new way of living. And just going through that process, reorganizing your life in that way, going through the aisles in the grocery store that you might not have been before, learning to do new things, that is exactly what I think you're talking about.

Now you can learn to play the ukelele or you can learn to speak French or Mandarin. And that would be a way to do it as well. And I encourage my patients to make sure that there's space to do the protocol, right? So, if you're stressed about learning Mandarin, then that might take away from improving your diet or getting the exercise. And what we see is that the protocol works when you apply it. And so I don't wanna create too many hurdles. But yes, I, you know, with like, should I do crosswords or Sudoku? If you wanna get better at crosswords and Sudoku. But I, what I want for my patients is that they maintain independence. So, doing those things that are a little challenging for you, if it's your taxes or whatever it is, that's practical, cooking, new recipes, that is so practical, making sure that you stay nourished and fed, keeping your house organized, right? These things that maybe take a little bit of extra mental energy or effort, lean into them and do them.

William Pawluk, M.D., MSc

However, if you keep pouring gasoline on the fire and then you throw water on the fire to put out the fire, but you keep pouring gasoline on it, then there's a problem, right? So doing all the plasticity stuff during all the memory enhancement is not very helpful if you continue pouring gasoline on the fire, right? So some things are more critical than others. So if you could prioritize what you should do, if you can only do five things, we gave you a list of 10 things you should be doing, or 20, what are the five things that you should be doing?



Heather Sandison, N.D.

Ketogenic diet. If you are postmenopausal or older, hormone replacement, as long as you've discussed it with your doctor and it's safe for you, then I think hormone replacement makes a big difference for a lot of people. There's a supplement that I, you mentioned supplements. There are some nootropic supplements that combine a lot of the things that are really helpful. And the one that I really like is called Qualia Mind by Neurohacker Collective. It's the one that I've used in my clinical trial and that I have the most experience with, although there are others on the market.

William Pawluk, M.D., MSc

Could you repeat that one?

Heather Sandison, N.D.

Yeah, it's called, and here I'll show it to you because I take it myself. It's called Qualia, Q-U-A-L-I-A, Qualia Mind. And this is full of phenylalanine and taurine and theanine and Bacopa and citicoline and Coffeeberry, the green coffee berry, whole coffee extract, phosphatidylcholine, theobromine. So many of it, huperzia, the list goes on, ginkgo, of course. So this is.

William Pawluk, M.D., MSc

In the right doses and proportions.

Heather Sandison, N.D.

Yes, so this, what I, these guys are my friends. I make no money if you buy this or not, but people who I trust and respect put a lot of time and effort and really genius into formulating that product. And so, they have taken a complex system science approach, which I appreciate to figuring out how do we increase acetylcholine and dopamine in the synapse, but create production, right? Acetylcholine and dopamine. How do we create more production? Increase the amount of time in the synapse where it does its heavy lifting, its work, and then also support metabolism, healthy metabolism so that we're not getting imbalances in neurotransmitters. So what they have done is really compiled a lot of research. They didn't just take one research trial. They took a bunch of them and then synthesized a ton of information. And so what I noticed is that people get benefit quickly. And so that particular supplement stands out to me because



people come back and say that was life changing. I can think again. And that's what's satisfying. That's what I wanna see, right? So, ketogenic diet.

William Pawluk, M.D., MSc

Hormone.

Heather Sandison, N.D.

Hormones, exercise, exercise, exercise, exercise, maybe that should be first, really. A lifetime of exercise, a habit of exercise is critical and the outcomes are just so, so, so different. A lot of this has to do with signaling. What is the signal our brain is getting? Is it getting the signal to grow? Dr. Bredesen has this great analogy. It's if you call this MyBrainistan, it's a country. Is the country of your brain, is it oriented? Is it fighting a war? Is it fighting off a pathogen? Is it having to clean up toxic waste, or is it able to build schools and build infrastructure, right? Is it building new pathways and new connections? And what we want in our brain is if, right, to get the junk out and the good stuff in, the signaling, especially to the brain that says, build new memories, build new connections, build more cognitive capacity. So, that is tons of that comes from yes, the hormones, but also from exercise. And exercise helps again, structurally with blood flow and then also with stress. So, if we could bottle exercise, we probably wouldn't be here. We'd be on our yacht somewhere because it's so, so, so valuable. And really, we don't have to talk about dementia. We could be talking about cancer or diabetes. We can talk about whatever chronic disease you want. Exercise is helpful. I think I get one more.

William Pawluk, M.D., MSc

Yeah?

Heather Sandison, N.D.

I think that was only four. So, I might have a bonus in a minute.

William Pawluk, M.D., MSc

Okay, well, diet clearly is important. So avoiding things, but diet clearly is important. So let's go back to concussion for a second. We tend to think of TBI as a big injury. When I was working with TBI, I discovered as I started asking patients on a regular basis, whether they ever hit their head. I would say probably 60 to 70% of the population has hit their head, if not even more. And I'm not



talking about a major fall, I'm not talking about somebody hitting you in the head with a bat, right? We're talking about small dings to the head. And we often, many people will actually report on, if we start asking that question, many people will actually report multiple small dings to the head, and each ding to the head causes shifts in the way the brain functions. And that becomes cumulative. Now, sometimes that that ding to the head causes problems with memory, causes problems with function and sleep and so on fairly quickly. But then you recover from it. And that's why medicine tends to not pay a lot of attention to this because we recover from these things. The problem is every one of those leaves its scar. Every one of those leaves its imprint on the brain, right?

Heather Sandison, N.D.

Yeah, without a doubt. When I have a mom come in, who's had a child with a traumatic brain injury. I, you know, if they're playing football or some something where there seems to be repetitive head injuries, I say, you must stop, please. Like, if you make any of the other decision, I don't care, but this one, you cannot have repeated head injuries. And we see this as very clear with the football players and CTE and there's been, you know, there's some politics around it. And so you get different opinions, but it seems very clear that there's a type of dementia, particularly associated with the head injuries football players get in their helmets that not only has memory loss associated, but personality changes, especially towards violence. And as we see this with Lewy body a bit as well, like severe personality changes, hallucinations, and sometimes violence. So you know, this isn't just about memory loss when we start talking about traumatic brain injuries, of course, hearing loss, vision changes, there can be pituitary function that changes, depending on the type of traumatic brain injury, you can get very different outcomes.

And again, kind of like dementia, the conventional world seems to think there isn't much we can do. Now, they say that you'll probably recover. But, what we see is that you can recover much, much, much, faster and more fully. I had a patient, a young soccer player who came in and she had been told that she had EBV. She'd been told she was fatigued because she had a virus, and sure enough, I said, you know what else happened around the same time? Oh, well I had a soccer goal fall on my head. Like, the goal, the goal, the metal? I couldn't believe it. And she's like, yeah, but they told me I was fine. And but sure enough, that was when her fatigue started. And then she tried to go back to exercising and she would just crash. And so, my cocktail that I use is IV NAD, lots of phosphatidylcholine, phosphatidylserine, Methyl B-12, high dose fish oils. And,



then hyperbarics or contrast oxygen therapy can be really helpful. And I would imagine that PEMF would be very helpful as well.

William Pawluk, M.D., MSc

Well, thank you for that segue. So yes, I actually did a study on PEMF therapy in concussions with a relatively low-intensity magnetic system that was portable battery operating, that people applied it to their heads front or back, or let's say half an hour, an hour to the sides of the head, and an hour front and back. And we use a device called the Brain Gauge. And the Brain Gauge measures, somatic sensory function, basically, or sensory cortex function. And you get an objective measure of how the brain is processing sensory information. And that is a good indicator of the degree of damage to the brain. It's objective, so if you wanna look it up, it's called Brain Gauge. So we did that and we did a scale. We had everybody doing two hours a day for three months. We had, you know, measurements over that whole three months. At the end of the three months, we had everybody stop the therapy and then remeasured them. So everybody got improvements in brain function, significant within the first week to two weeks. And that's with a low-intensity PEMF system. When we stopped it, they regressed, they had like 50% loss of the gain. So my hope was that doing the study, that we would actually show physical changes to the brain that would be more or less permanent. The regression indicates that basically what we did is we improved function. Right now.

Heather Sandison, N.D.

Maybe done a little longer.

William Pawluk, M.D., MSc

Well, that's the question is, did it need more time with that level of intensity magnetic field or did they need more, over a longer period of time? So these are open questions. But there's plenty of research now using rTMS, repetitive transcranial magnetic stimulation. So high intensity magnetic field devices, and there's a substantial body of literature that suggests that people get big time benefits from it. And again, it probably has more to do with a bunch of different things that PEMFs do to the brain. Improving circulation, increasing ATP, basically detoxifying the brain, increasing just basically eliminating or reducing inflammation in the brain, stimulating stem cells in the brain. So, recovering all of that kind of functionality, improving sleep helps with memory and there's plenty of research now that shows that PEMFs actually help Alzheimer's as



well. And significantly, so that you could get months worth of benefit from short courses of high-intensity magnetic therapy, or better yet if you own your own system and you can do it at home on a regular basis. 'Cause when you own your own system, it's not only helping your brain, but it's helping the rest of you because if you can decrease inflammation throughout the whole body and we never got into this, but obesity, for example, floods the brain with cytokines and that leads to brain fog that leads to memory problems as well. So reducing obesity, reducing weight is a clearly, a very important way to address the problem too. So, magnetic field therapy can become critical not only to the brain itself, but also to the rest of the body is what I'm saying.

Heather Sandison, N.D.

Yeah.

William Pawluk, M.D., MSc

There's lots of ways that magnetic fields help with brain function, including reducing, and what they found is that if you had mild to moderate MCI, if you did magnetic field therapy, the people who did magnetic field therapy with MCI and responded, didn't go on to develop Alzheimer's. Those who didn't respond to PEMF therapy with MCI, mild cognitive impairment. If they didn't, then they were much more likely to progress to Alzheimer's. But obviously they didn't do what you do in terms of evaluating them for who responded better and who didn't 'cause they didn't really look at the person comprehensively. And so you and I, we know that it's multifactorial. We know that it's complex. And PEMF therapy, the value of PEMF therapy is it goes right through the brain, goes through the body completely. Does not stay in the body. And it's not like EMFs, which are hard on the brain as well. So, EMFs are cell phones to your head, wifi, routers, smart meters. All of these things are basically really, really inflammatory and they cause significant dysfunction. So, you never should have a cell phone by your bed. Never!

Heather Sandison, N.D.

I think what I love so much about PEMF is it sounds like it's the same theory, right? That what can we do to support cellular function? Well, PEMF does that. It gets the stuff out. It helps to optimize all of the organelles, the mitochondria, and the ribosomes and everybody in there. It helps them to do their jobs more efficiently and effectively so that you get better function in the organ and then in the body, whether we're talking about the brain or the liver or the kidneys or wherever we are.



William Pawluk, M.D., MSc

Well, so it provides the nutrient support 'cause nutrients get absorbed better, right? Then it also provides repair and recovery, and it improves function. So it does all of those things. And that one technology does all of that. And the value and the beauty of PEMF is it goes right through the brain, goes right through the body. The body does not stop a magnetic field. Now EMFs on the other hand are a whole different ballgame. They get absorbed by the body. They get absorbed by the brain. They've done studies where they showed the people who have a cell phone to their heads for hours at a time, hours throughout the day are more likely to get brain cancer on that side of the head. So we again, keep cell phones away as much as possible. And if you need to, use it on speaker or you have an air tube system, but speaker's probably the easiest thing to do.

Heather Sandison, N.D.

Not the wireless? What do you think of AirPods? I'm terrified of them?

William Pawluk, M.D., MSc

Well, it's better than Bluetooth.

Heather Sandison, N.D.

Okay.

William Pawluk, M.D., MSc

Bluetooth is still wireless. So, it's not as bad as a cell phone to your head, but Bluetooth is still wireless. And I see people who have a Bluetooth attached to their ears for hours at a time, not a good idea. So you use it, you get off. Put it, you know, keep it away from your body as far as you reasonably can. And again, by having it by your bedside, there's a syndrome now that's been described in kids where they have their cell phones on next to them in bed all night long. They cannot not receive their text during the night. And they look at their phones in the morning and they look at what they said during the night and it's gibberish, but they respond to their cell phones, all their messaging. They can't not receive their message. They have this paranoia about not receiving your messages.

Heather Sandison, N.D.

So just put 'em in the kitchen. Leave them in the kitchen for the night.



William Pawluk, M.D., MSc

Turn them on airplane mode.

Heather Sandison, N.D.

Or on airplane mode, good idea. And then buy an alarm clock. 'Cause that's what I hear from everybody. Oh no, I can't leave my phone in another room because then I can't tell what time it is. So you're saying you could just put it on airplane mode all night.

William Pawluk, M.D., MSc

Yeah, airplane mode's fine. Airplane mode's fine.

Heather Sandison, N.D.

And then you can use it as your alarm clock.

William Pawluk, M.D., MSc

A what?

Heather Sandison, N.D.

I think other, then you can use it as your alarm clock?

William Pawluk, M.D., MSc

Exactly.

Heather Sandison, N.D.

Well, my other concern is that it's like the sleep hygiene, right? If you're texting right before you go to bed or you're reading the news right before you go to bed or checking your email right before you go to bed, and then it's the first thing you do when you wake up is who texted me, who emailed me back?

William Pawluk, M.D., MSc

Right.



Heather Sandison, N.D.

What doesn't support healthy brain for other reasons?

William Pawluk, M.D., MSc

And they clearly inflame the brain. So, think about EMFs. So a cell phone is microwaves. What do you do with a microwave oven?

Heather Sandison, N.D.

I don't use one.

William Pawluk, M.D., MSc

Well, but people who do, what do you do? What do you do with it? You're cooking. So, why do you cook? Because the microwaves are so short, the wavelengths are so short, they heat.

Heather Sandison, N.D.

Water, right? They jiggle water?

William Pawluk, M.D., MSc

Anything, they'll heat anything. And so as a result, you're cooking your brain. You're cooking your body in many ways.

Heather Sandison, N.D.

That's terrifying.

William Pawluk, M.D., MSc

And it's not just the one big cook. It's all the little cooking that goes on all day long that basically you're exposing, whether it's the environment or whether it's your cell phone yourself. And then again, if you have a wifi system and the routers are broadcasting all night long, people should turn off their routers. So anybody with MCI early on in the process, one of the first things to eliminate is as much wifi as you can in your environment. You can, we used to, right, have cell phone, we used to have telephones, right? And you didn't talk to anybody until you used the telephone. And what happened between calls? We got by. Nothing's that important. For most of



us, nothing is that critical or that important that you have to be there on top of it all the time. This is another sort of neurosis that we've developed in our society that we have to attend to our message immediately, right? So I think that's a bad one, but PEMFs then are supportive as opposed to EMFs. EMFs are destructive, but PEMFs are constructive.

Heather Sandison, N.D.

It's good to make that distinction that they're different. And also, I appreciate this message you're sending, it's like this habits, it's those decisions we make every day, even though they're small about like where our phone is at night or whether or not it's on airplane mode, those decisions are really what accumulate over time and determine whether or not we're healthy or not at the end of our lives.

William Pawluk, M.D., MSc

And we're adding that stressor on top of all the other stressors that you discussed as well. It's just one more stressor. It's a modern stressor.

Heather Sandison, N.D.

I see this as people get sicker and sicker, they're more and more sensitive to their phones, right? So those small triggers, maybe for someone really healthy and really resilient, their phone doesn't bother them at all. And so they think it doesn't bother anybody, but as we get sicker, as we age, we're more and more sensitive to those things.

William Pawluk, M.D., MSc

Yes, and you build that sensitivity 'cause EMFs are basically irritate.

Heather Sandison, N.D.

Right?

William Pawluk, M.D., MSc

They demand, they are a stressor, they demand a response by the body. And when the body is already sort of on edge, stressed, as you said, then that's a response that your body can't tolerate. So again, it can put you over the edge, essentially. So if you have an infection, EBV or Lyme or COVID, and then you're recovering from that, you don't need another stressor on top of all of



that. And if you haven't recovered completely, which often happens as well, right, then what you're doing is it's another chronic stressor that you're adding constantly to your system. So, avoid it. But again, PEMFs actually mitigate EMFs because they strengthen the body. They actually help the body's natural health systems to be much stronger. And when you're stronger, you can resist better. So, it helps with detoxification, it helps with nutrient absorption, and it just, the list is on and on. So people wanna find out more about that, they can go to drpawluk.com or they can read a book called Supercharge Your Health with PEMF Therapy.

Heather Sandison, N.D.

That's so exciting. Dr. Pawluk, thank you for sharing all of that.

William Pawluk, M.D., MSc

My pleasure, likewise. Thanks for the opportunity to share with you as well. Do you have any final comments or final thoughts?

Heather Sandison, N.D.

No, I think this was a good dive, at least a quick one and to how people can support their brain health through PEMF and some other things that what we're doing in our comprehensive clinic, and I am looking forward to having you on the Reverse Alzheimer's Summit. So, that'll be something that's gonna air in June as well.

William Pawluk, M.D., MSc

Yes, we look forward to that as well. All right, so the key is that. And one of the things I say about PEMF therapy is you can't build a house without bricks and mortar. You need to put in a comprehensive approach, because if you're trying to stimulate a body to be healthy, when you're pouring gasoline on the fire, it's not gonna work. It's just not gonna work because PEMFs don't do the job. All they are is a stimulus. They encourage the body to be better. They encourage the body to be healthier. And one of the benefits of PEMFs too, is they cross the blood-brain barrier.

Heather Sandison, N.D.

They go all the way through the body, right?



William Pawluk, M.D., MSc

All the way through.

Heather Sandison, N.D.

In one side, out the other.

William Pawluk, M.D., MSc

It's like the body is like air to a magnetic field. It's like, there's no body there at all. And the key is that PEMFs also don't cause problems, they reveal problems. So, if you have a reaction to a PEMF, there's a problem that needs to be dealt with there. So that's actually, it could be used that way diagnostically as well.

Heather Sandison, N.D.

It's so interesting. I've had patients, you just made me think, I've had patients tell me they feel better after an MRI. Is that similar to, yeah, is that part of what's going on?

William Pawluk, M.D., MSc

Well, there's two parts to an MRI. There's a huge static magnetic field. So, the static magnetic field in a sense, by having the magnitude of that field just basically stops everything. And so, you get rest in a sense from that magnetic field. On the other hand, the other part of the MRI is radio frequency. And radio frequency like microwave is extraordinarily agitating to the body. So the one causes you to relax and the other one causes you to be stimulated. So, some people will respond either way to an MRI, but magnetic field therapy is not MRI because it's only a very low frequency that's designed for therapeutic purposes, as opposed to EMF, which is very high frequency.

Heather Sandison, N.D.

Got it, that's really helpful. Thanks, I understand more biochemistry than electrophysiology.

William Pawluk, M.D., MSc

Physiology, right? Yeah, electromedicine well, and that's also again, they work together, one controls the other.



Heather Sandison, N.D.

Yeah.

William Pawluk, M.D., MSc

One controls chemistry.

Heather Sandison, N.D.

Right, yeah, well, I mean, light therapy changes how enzymes function. They're so interrelated and like as someone who appreciates complex system science, you know, I wanna know about each of these pieces and put together the optimal plan for a person that's gonna get them the best results.

William Pawluk, M.D., MSc

Well, we are a light body, right?

Heather Sandison, N.D.

Yeah.

William Pawluk, M.D., MSc

We are an electromagnetic body. We feel that we're tissue, right? We can tug on that tissue. We slap ourselves and then we slap the tissue, but what's tissue, what makes tissue? Molecules, which is what you, one of your major strengths is molecules. Well, what controls molecules? Physics. Electromagnetics.

Heather Sandison, N.D.

Yeah.

William Pawluk, M.D., MSc

You can't dock a sodium with a chloride without the physics telling you, you can't. So it's subtle, it's behind us. We don't feel it, we don't touch it. We can't see it, but it's controlling everything below that level.



Heather Sandison, N.D.

Yeah, all those protons and neutrons and electrons that I haven't thought about in 25 years.

William Pawluk, M.D., MSc

Well, we're gonna get you to go that way. Go in that direction.

Heather Sandison, N.D.

It just sounds like an exciting trip, let's go.

William Pawluk, M.D., MSc

All right, we'll be talking.

Heather Sandison, N.D.

Good stuff, thank you so much, Dr. Pawluk.

William Pawluk, M.D., MSc

Thank you, Heather. Thank you so very much for joining us and sharing your wisdom and hopefully we'll be able to help a lot of people prevent their Alzheimer's, prevent their cognitive decline, and maybe even recover from Alzheimer's.

Heather Sandison, N.D.

Certainly, it's been such a pleasure, thank you.

William Pawluk, M.D., MSc

Enjoy the rest of your day.

Heather Sandison, N.D.

You as well.

William Pawluk, M.D., MSc

Be well.