

Announcer: Bulletproof Radio, a state of high performance.

Dave: You're listening to Bulletproof Radio with Dave Asprey. Today's cool fact of the day is that nutrition during pregnancy and up to age five is shown to have really significant impacts on children's behavioral and emotional health. And the reason I want this to be our cool fact of the day today is that it's pretty shocking to me when I go to restaurants, they have a kids menu. And frankly that's stuff that I wouldn't feed to my dog, because it would cause my dog to be inflamed and have food cravings just like it does to children. And this data is coming from a nine-year Norwegian mother and child cohort study of 23,000 women and their kids. And they collected data during pregnancy, when the kids were six months, one and a half, three and five years of age. And they basically did some really careful math analysis to say the diet was "healthy" or "unhealthy."

Dave: In other words, they weren't saying this is testing Paleo versus semi whatever. This was basically, are you eating like crap? Are you not eating like crap? And they found higher intakes of unhealthy foods during pregnancy meant what they called externalizing problems among children, independent of other potential factors, like their family health and things like that. Children with a high and healthy diet had both problems with the space of the voice in their head. They're internalizing problems, and they're externalizing problems. And they have the same effect whether it was during pregnancy or whether it was post pregnancy. And this is a really big study that came out. So, what this comes down to is, if you're going to spend money on quality food, feed it to pregnant women and babies first. And if we just get that right, everything gets easier for that entire generation. And that's a really important thing.

Dave: I like to look at what I do for health and what specifically I do for nutrition, it has an ROI, return on investment. And the investment is how much does it cost? And how much energy did it take to make the food for you to take your own energy to make the food? And how much energy does it take to eat it? Because eating things like raw kale actually doesn't feel good. It's not something that usually makes you happy, but you do it because it makes ... you know you'll be healthier. At least you think you will if you do it. So, that's what the investment is. And what's the return? Do I feel good now? But when your return is measured in an entire lifetime change for human beings, that's just an absurdly high return. And that's why you feed kids the best food, and the adults get the scraps. Even though throughout history, it's been the adults eat the best food, and we give kids the scraps. It's just backwards.

Dave: Now, you might know, because of my incredibly predictable habit of foreshadowing, that we might be talking about nutrition. And we might be talking about health of children, as well as with adults. In this case, with just a luminary in the field, an international speaker on brain chemistry and behavior learning, on mental health disorders. And a guy who spent three decades is a research scientist and engineer, looking at how you can fix brains, even brains with bipolar disorder using nutrients and foods. He's been on episode 132 of Bulletproof Radio. And I mean, I just genuinely respect, he's someone who has gone really deep on the science and spent a lifetime learning how to get control over your own biochemistry. And we're talking about none other than Dr. Bill Walsh of the Walsh Research Institute. Bill, welcome back to Bulletproof Radio.

Bill: Well, Hi Dave. Glad to be with you.

Dave: Last time you came on the show, we talked about nutrient power. Your most recent book that talks about things like methylation, and biochemical imbalances. But that was about 400 episodes ago.

Bill: Yes.

Dave: And you've been continuing to do your work, really an incredible work on nutrients. And you've, I think, discovered some new things, or maybe you just had more clarity on things around some of the more difficult to treat and scary things like bipolar disorder. I would love to know, what have you discovered since we last talked?

Bill: Well, let me first talk a little bit about what you were just speaking about, on namely what one can do with diet for pregnant women and early childhood. There've been some studies that ... other studies that have just recently come out of the psychiatric research field. One I read just last week, and they have actually done studies of what foods can tend to help with cognition, and physical ability. And which ones can tend to make you, predispose you to mental disorders. And there are some surprises there. They found out that things like vitamin D, and zinc and other things that tended to strengthen the brain in many ways. But they found some pretty important nutrients that actually could predispose the problems like schizophrenia.

Dave: Interesting.

Bill: It's very interesting. And so we're learning more and more about what we can do to help the newborn's become more capable and have a better life. One thing that's especially important as what the mothers do before they're pregnant?

Dave: Yes.

Bill: One thing we've learned is that the critical time during the nine months of gestation is between days 16 and 22 of gestation. And that's before many women even know they're pregnant. I know when my wife had our first child, she didn't want to be around anybody that was smoking. She stopped drinking alcohol. She was a nurse and so she was pretty healthy to begin with. But it was too late for many things. Really, they have to be healthy before that critical time in gestation, it's when the neural tube closes. So, I think that ... And also there's many studies that show that diet during pregnancy mean so much. And even in early, the first few years, so you're right about the ROI, and the return on investment, and it's just something that is just critically important.

Bill: Since we last talked, which was a really long time ago, we have learned a lot. Neuroscience advances and my interest has always been on the brain, and on people with brain disorders. Depression, anxiety, autism, schizophrenia, the whole litany of brain science. And my focus has to be on the neurotransmitters themselves. And there are about more than a hundred neurotransmitters in the brain, of which there are about five or six that seem to be especially important in mental disorders. And we all have

biochemical individuality as you know, and we are born different. In a sense, we're all mutants. We share 99.9% of our DNA, but as that 10<sup>th</sup> of a percent, the ways in which we're different, these mutations our differences in gene expression that have come up over centuries and millennia that really make us different.

Bill: We're now learning so much about what, what we can do. We've now learned that for the first time in the last 10 years, we now are able with nutrients to directly affect neurotransmission, of many of the most important neurotransmitters. For example, with serotonin, we know that people with low serotonin activity are prone and predisposed to depression, and obsessive compulsive disorder, and a few other nasty problems. We now are learning that for years people thought, hey, what you really need to do if you're low in serotonin is get Tryptophan, and take nutrients that help you synthesize the neuro transmitters. Well, it turns out that's not a bad idea, but really the dominant factor is re uptake. The rate at which your serotonin in the synapse goes back into the original neuron. It's called re-uptake.

Bill: And we now, with the advent of epigenetics and knowledge, we now can tailor neurotransmission with nutrients. And were really quite good at that for Serotonin and dopamine and norepinephrine. But what's really new is the recent research on the NMDA receptor. That whole system, that's where memory exists. And that's where people who have problems with their NMDA are the ones who are prone to addictions and obsessive compulsive disorder. We for many years, for more than 25 years, we discouraged drug addicts like cocaine addicts and heroin people who are abusing alcohol, or these substances, we discouraged them from coming to the clinic. We now, because of advanced science, we now know how we could help them. And it all has to do with the NMDA.

Bill: If that particular group of people, they need to reduce the activities of that neuro transmitter, and guess what works the best? People who have been trying for years to find a billion dollar drug that would really help them. They're finding that there are nutrients that seem to be far better than that. And this is in peer reviewed journals, things like Inositol cysteine, for example. There are finding-

Dave: These are long standing nutrient that everyone in anti-aging has used for 25 years to raise Glutathione levels in the body, which is profound. They're figuring out, oh yeah, it helps the brain of addicts too.

Bill: Well, we thought that the reason that inositol cysteine, called NAC, is helping these people was because of the ... it's a precursor of glutathione, and because it's a great antioxidant itself. But there's something else we now know it's something called an anti-porter. What happens is it has a unique capability to lower NMDA activity. And we now know the exact, and it's a very beautiful ... you might say, it's a system and mechanism by which it works. It works on the glial cells that surround neurons. And it acts as what's known as an anti-porter, it shoves cystine into the glial cells, and shoves glutamate into the synapse. Where you would think that would increase activity, but it doesn't. It actually shuts down and lowers the activity.

Bill: And what they're finding is even shopping disorders, and gambling disorders, and Trichotillomania, but especially severe OCD, and even people with addictions like ... these are very, very helpful. So, now we are able to accept patients who are on serious drugs, and have severe OCD, and we are quite sure we can help them and give them a better quality of life. So that's an example of new neuroscience giving us nutrient therapies that are far better than we had just to just a few years ago.

Dave: Now NMDA is interesting. I think a lot of people listening probably haven't heard of it. You might be saying, "Well, I don't have OCD, or any of these other things." Number one, you might have a little bit of it and not really realize it. I actually had meaningful amounts of OCD as a young man. Like, I had stimming behaviors and facial tics, and things like that. Just, for instance, this is weird. I could not serve a volleyball to save my life, unless I bounced it three times. I do not know why. All I know I couldn't do it, right? Bounced it three times, I'd nail it. The rest of time it was like, why even try? And a bunch of other just strange things that as I repaired my brain, and got my neurotransmitters working and all, like wow, I don't have that anymore. Like, I don't sit there and count all the time and do all these weird little things that you might not even see, unless you're a trained psychiatrist or neurologist to go, "Oh, that's a weird nervous system."

Dave: Number two, a lot of the anti-aging drugs in some of the nootropics, the cognitive enhancers that I've been using for quite a while, they're NMDA receptor agonists, or they changed the NMDA thing. So, if you want to live a long time, you want to raise your IQ, or you just want to run at the level that your body's designed to run but may not be, NMDA is probably as important as some of these other neurotransmitters, like Acetylcholine that we've all heard of. At least if you've dabbled in nutrients, you probably have heard of that. Do you agree it's that important?

Bill: Yeah. NMDA is where memory resides. The miracle of memory and we're beginning to understand how one can actually have a memory and there's something called memory extinction that resides in the NMDA. And that's what the problem that addicts, and OCD people have. It's a matter of getting able to transition from one thing to another, and sort of get rid of the memories you don't want to retain, and actions you don't want to repeat. And it's also where plasticity comes. People are really looking at plasticity to help the brain improve in many ways. That's all in the NMDA receptor, and it's a ... we're learning that it has everything to do with the neurons at the NMDA receptors, but also the partnership with glial cells. That's another major advance in neuroscience. We're now knowing that the glial cells are almost like another brain, and we have as many glial cells at our brain as we do neurons, and they collaborate in marvelous ways. And wow, is that leading to better and better understanding and better therapies.

Dave: I'm so happy that you're talking about glial cells, because in my last ... or I guess two books ago, Headstrong, I went sort of deep on that. And I look at glial cells in a very simplistic way as being sort of the cells responsible for the immune system in the brain, but also for pruning synapses, and for maintenance. And a lot of the current revolution in ketosis, it paralleled a lot of the early writing that I had done on ketosis as a state of high performance. And ketones feed neurons better than sugar does, better than glucose. Neurons will preferentially eat ketones. There's just one little problem. If you're in Ketosis all the time, guess what likes glucose a lot more than ketones? It's your glial

cells, right? So, you can starve the glial cells if you never eat carbs. And this is why cycling in and out of ketosis might be good. Adding ketones like brain octane to your food, that's a good idea, maybe. So, I think it is. But the idea that you're going to never eat a carb again, what's that going to do? I mean, you tell me Bill.

Bill: Right. Zero carb diet is not a good idea. I mean, we evolved from the cave man and of course to do something that radically changes that original diet that people had for millions and millions of years, it's not a good idea. Because our body has adapted to that. The glial cells are really interesting because first of all, that's where our brain cells come from. Neurons come from glial cells, and I've often wondered we have these 80 billion brain cells, and yet they're being nourished every day. Nutrients come in and trash leaves. Well, guess how it happens? Well, the glial cells do that. The glial cells, especially the astrocytes, which are a form of the glial cells, they've got end feet that wrap around our blood capillaries and they have gap junctions, and there's a really great a system whereby the nutrients from your blood flow through those glial cells right into the neurons.

Bill: And the microglia, the form of glial cells that are tiny, well, those are the ones that are the immune system. And they also, they are the trash collectors and the garbage collectors that get the junk out of the brain. Then you've got the oligodendrocytes, with this funny name, and they're the guys that make the Myelin Sheath. And it's just the ... they have the rewrite the neuro science books. I just bought a book called the Neuron, and it is a famous book, has about a third edition. And it just came out and I started reading it, and it's obsolete already. It's obsolete. It's so exciting, the field of brain science is moving so fast. The disappointing thing is that it's not leading quickly into therapy. And it seems like all the research is still aimed at finding the next billion dollar drug that can help people.

Bill: And we now have enough knowledge that from the new research, when you put it all together, we're learning that with nutrients in the diet even, we can make radical improvements in people with depression and anxiety, and problems like that. And that we don't necessarily need a drug. Because the problem with drugs is they're abnormal molecules, or foreign molecules, and they're powerful in your brain, and they don't lead to normality. Well, I think that within 30, 40 years we'll have a society where I don't ... I think drugs will be on the way out. We won't need them, and we'll learn how to normalize the brain.

Dave: Are we going to be normalizing the brain using lasers, electrical stimulation, neuro feedback, and some combination of nutrients, and food that's personalized based on genetics and epigenetics, and other things like that? What does the future look like? I'm asking you because you have 30 years of experience, your lens is more honed by wisdom than the average person. And you also discovered that nutrient deficiencies are tied to emotional disturbances, and mental illness. So, given your lens, you're probably the best guy I could think of to ask what it's going to look like in 20 year.

Bill: Well, I have to say I believe I see the future, and it's a beautiful future, and I hope I live long enough to see the beginning of it. I think that the next big real breakthrough is going to be preserving the integrity of our DNA. I think that's going to be the really big

thing. And when that, when they learn how to do that, we're going to ... I think that conditions such as autism, schizophrenia, post-traumatic stress disorder, I think they're going to disappear from society. It might be that we won't be able to die unless we get hit by a truck, or at least we might be able ... I think lifespans will get into the 150 and 200 years, quality lifespans.

Bill: And now what you mentioned, the techniques you mentioned I think are short term, and I think they're going to be useful for the next five, 10, 20 years, and they will help people. But we now have the ability to change gene expression CR. We have about 20,000 genes, and they work for us all day, every day. I mean, people think of it as that's why I'm tall, or why you've got blue eyes. But really our genes have the code, and the recipe, and the blueprint for sending special proteins, and chemicals, and enzymes into our every cell in our body. And that system tends to deteriorate with time. And that's why people age. Aging is nothing more than our DNA getting old, and changing, and deteriorating. We're learning how to protect the brain.

Bill: The three guys who got Nobel prize about five years ago because they worked out all the details on DNA repair. We have 30 trillion DNAs in our body. There's an enormous amount of information there, and it's vital to our health as much as anything. And every one of our DNAs is ripped apart and massacred every day. Between 10,000 and a million times a day, every one of our DNAs that are vital to our health is torn apart and ripped apart. And one of the remarkable aspects of human life is DNA repair. It's like we got, every single tiny little cell we have, it was like we got a hundred or a thousand repairmen in there constantly fixing these breaks. Including just ripping a DNA apart, it immediately goes back together. And this has led to a, of something that is truly exciting called CRISPR. Have you had any programs on CRISPR?

Dave: Absolutely.

Bill: We now have the ability to edit our genes. And this is probably the fastest grown, or growing technology I've ever seen in the field of mental health. Just five years ago, people were just talking about it, and they now have the ability ... there are sort of fingerprints for every gene we have. And they're developing what they call guy RNA, and there are companies making this and selling it, they're competing with each other already. That you can put into the body and it will go straight to the gene you want to affect. And they bind that to another gene that's called the scissors gene, that cuts the DNA and separates out the gene, which of course the body quickly puts back together. But of course what they do is they introduce a proper gene. And so they can take a defective gene, which might cause some nasty disorder for someone, and they can change it, and put in a good one.

Bill: They started working with rodents and were successful in correcting severe illnesses in rodents with it. Then about two years ago, I started seeing data on chimpanzees, and that was very promising. Then they started working on human embryos in Europe and in China. And just two weeks ago there was a child born using CRISPR to improve and to perfect a couple of genes that looked like that child was going to run into real trouble. So, now we don't know for sure whether we can solve all the ethics problems, but they are able to ... for example, if a woman has the [Burka 00:23:58] gene and she's prone to

cancer, they will be able to get rid of that dysfunctional gene and put in a proper one. That I think might become standard in 10, 20, 30 years.

Bill: There are already in billions of dollars going into this field. That's kind of exciting. It's kind of scary too, and what we don't know is if it will ever really be done safely. Because of what they call the off target effects. They might want to be affecting one gene, but you don't want to affect another hundred, and maybe screw things up and make things worse. But that's just an example of how technology is moving. But to me, I think that we know what healthy is. And with our ... there are diseases and conditions that I call epigenetic disorders, and these include cancer, heart disease, schizophrenia and autism, and bipolar and a few others. And these are incredibly complex diseases, and they occur because of environmental insults, usually together with a genetic predisposition. And it's an event, cancer is really an event where suddenly your DNA gets overwhelmed, usually by oxidative stress. Excessive oxidative stress, operating on the guanine part of your DNA, which is the weak link in your DNA.

Bill: And it changes, it can change dozens or hundreds of genes. And so then you have a condition like cancer. And when that happens, you then have a cancer stem cell that nobody can get rid of. And anyhow, we're understanding exactly why this happens. And I think what it's really leading to more than anything is prevention. I really believe prevention, we're going to learn how to ... We're learning more and more about the predisposition for these diseases. We know that so many of them involved oxidative stress. We all have a dozen or so really great natural chemicals like glutathione, and catalase and catalase and others that protect us against oxidative stress. We have cosmic radiation and environmental insults all the time, and some people ... so these are genetically expressed protectors. We have an army of protectors. Some people are born with weakness in that. They're born with a weak weakness. They may not be able to make enough glutathione for example.

Dave: I'm one of those, by the way, which is why I manufacture glutathione supplements, and I take a lot of it. It just seems like in my self-interest, plus it helps a lot of other things too. Like if you're going to have alcohol, you might want to have glutathione present to detox it, right?

Bill: You're trying to make yourself Bulletproof.

Dave: You called it. It's interesting because you are one of the game changers who made it into my book, *Game Changers*, and Law 28 ... And the game changers are people who've done really big things to change the world, just achieved at the top of their field. And the law that I cite your research in is Law 28, it says, if you get toxins only from nature, you get nutrients only from foods, right? If that's how the world worked. And the broader way of saying that is you evolved in a clean environment to feel great and live long enough to reproduce, as long as you had enough high quality food. Those days are gone. High performance now requires that you overcome the decline of clean air, food and water by going beyond what you get from eating even the most nutritious food. The highest performers use supplements to perform better now and live longer too. Take your vitamins.

Dave: Now, the reason I'm bringing that out is, you're talking about epigenetics, the study of how the environment changes DNA, but everyone listening to the show now we're breathing air that has stuff in it that was never there before we put it there. We're eating food that has artificial molecules, like glyphosate, and has less nutrients and all of that. Do you still stand by your, "We're going to live to 150 to 200 years," given the decline in food quality, soil quality, air quality, water quality, etc., etc.?

Bill: Well, I think I'm optimistic and the reason-

Dave: And so am I by the way.

Bill: ... is I think we can sharpen our protection against those nasty guys. We know what the protectors are, and most of them are genetically ... Some of them are things that you can give a nutritionally, but some of them also ... and some of the nutrients can affect gene expression, that can really sharpen our defense. And so I think it's like a war. And yes, we do have increasing amounts of nasty guys trying to hurt us, but I think we could strengthen our defenses.

Dave: So, what are some things that people listening today might do in order to strengthen their defenses given what we know? Most of us won't CRISPR edit our DNA at least for a few years. If you're thinking about doing that and you're listening, think twice. But if you decide to do it and tell me about it, I want to know.

Bill: Right now it's more of a dream than a reality. You're right. Well, what can we do now? Well, the first thing is to recognize that, is that every human being is biochemically unique. And for many years I thought the biggest problem was deficiencies. And it was just a matter of finding out what you're low in, and providing these really important nutrients that you're missing. But well, probably the first thing I learned that really surprised me, and working with hundreds of, and then later thousands of patients, was that the greatest mischief is caused by nutrients that are in overload.

Dave: Right.

Bill: And things like-

Dave: Like copper.

Bill: Like copper, yeah. We have a beautiful system that's supposed to regulate copper in our body. So, even if you chewed on a copper bar, you'd be normal in your bloodstream. But if you can't do that, and your copper escalates, that's why people would get postpartum depression, causes anxiety. It's associated with violent behavior, mental illness-

Dave: Gray hair.

Bill: So, what we do at our clinic, and by the way I have a team that travels around the world training doctors how to do this. It's one of our best programs. We now have 630 doctors, psychiatrists, medical doctors that are now evaluating patients with severe



problems, but it might be anxiety or depression or behavior disorder. And we're learning what their individuality is, and we're learning how to ... Showing the doctors how they can normalize these chemistries and these chemical imbalances and these brain imbalances with nutrients. And we're going to have our next training program in late April of 2019, right here in the Chicago area, and-

Dave: That's through the Walsh Research Institute?

Bill: Yes. And it's really a growing and a popular program. We've also done more than 300 doctors in Australia. We've had programs around ... It's just growing and growing. Our most enthusiastic doctors by the way, are psychiatrists. They're not ... As a group, they're not the happiest group that I run into. I just came from the American Association of Psychiatric Association annual meeting with 18,000 psychiatrists. And what's happened is they go to medical school all these years and learn all kinds of important stuff. And then a patient comes in maybe with schizophrenia or depression, and they spend their 30 minutes, which is about all they're allowed by insurance, wondering what drug am I going to give them?

Bill: So, the psychiatrist that we see, we show them how when a patient comes in for the first time with a serious problem, they can do some blood studies, and do some very careful medical history. And they can identify which neurotransmitters are misbehaving? And we can show them how to fix it with nutrient therapy, sometimes together with drugs. We're not opposed to medication, which are now called biologics, because that's supposed to be a softer name than a psychiatric drug. But we show them how sometimes severe problems can be corrected without having to use a drug. And sometimes we can show how drugs can be enhanced. We could, also our testing has shown them and guides them to which drugs are the right ones to give to people.

Bill: Like, we know that there are some young teenagers who if you give them an antidepressant, they're likely to become suicidal, or even homicidal. And that seems to be the reason why we've had school shootings. Or people, teenagers who inappropriately had been given the wrong drug. So anyway, I think we've made a lot of progress, but the future I think is really bright. And there are these literally thousands of really wonderful neuroscientists around the world making advance after advance. The only problem is they don't seem to talk to each other, and there's little pieces of information here and there.

Bill: About four years ago I got really frustrated about bipolar disorder. And the main reason is I didn't understand it. I had more than 1600 patients that I saw with our doctors, with bipolar, but I didn't understand it. And when I wrote my book, I had a chapter on schizophrenia, and on autism, on behavior disorder. I did not have a chapter on bipolar. I didn't think I knew enough about it to write a chapter. So, I decided to delve into it, and I spent years studying neuroscience around the world. And guess what I found? I believe I have discovered exactly what it is. There's all these mysteries of bipolar that have plagued people for more than 100 years. for example. People don't understand why it's late onset disorder. Usually comes after the age of 16. And it often comes suddenly. And once a person develops bipolar disorder, it doesn't go away. It's there as a problem that challenges for the rest of their lives.

Bill: And why, for Heaven's sakes, do they suddenly start with mania? Why does the mania get worse early on? And then why do they cycle? Or why did they switch between mania and then sort of an opposite condition of depression? After several years of doing this, I think it's all right there. The neuroscientists have the answers, and we have ... I believe we have solved all the mysteries of bipolar, and we now know exactly what it is. And I'm writing a book on it. And I went to the annual meeting of the APA, the big meeting of the world's psychiatrists and I presented this at a new research section, and I was really disappointed. Nobody seemed to care a lot. A psychiatrist would come up to me and say, "Well, this is really interesting, but I've got this patient coming next week who's got bipolar disorder, or schizophrenia. How is this going to help them?" Well, the answer is no. We now understand what causes it. We know the mechanisms, and this should lead directly to far better therapies.

Dave: Okay. Are you allowed to say? Give me the layperson's view of what's causing bipolar.

Bill: Well, I'd be happy to. Basically, what it amounts to is that our brain neurons are remarkable little guys. We've got these 80 billion of them. They have a remarkable ability to develop a high voltage, called a potential. Psychiatrists call it a potential. And we have all of these billions of neurons, but if you took 20 of them and stored them together in series, you'd have enough for a flashlight battery. There's an enormous amount of really high potentials and there are about 300 or 400 genes that collaborate to enable that potential. So, that's critical to brain function and to living. What we found is that the cause of bipolar is when local parts of the brain lose the ability to form complete voltages.

Dave: So, it's an electrical problem in the brain?

Bill: Yeah. Caused by some combination of these hundreds of genes that are needed to make that voltage. And so what happens is that when the voltage drops, the neuron becomes hyperactive. When neurons fire, some chemicals rush in, some ions rush into the neuron and some rush out. The ones that rush out are potassium ions. Well the potassium and the sodium ions rush in, and that's how brains work. And what the interior of a neuron, it's not a problem of clearing out the excess sodium. In fact, they call it a drop in the ocean. It's really not hard to do. The problem is getting rid of the potassium that's outside the neuron. And so it tends to collect and it can flood in certain parts of the brain. And when the potassium outside the neuron collects, the voltage drops additionally.

Bill: So, those parts of the brains get to the point where they ... it gets more ... you get more and more hyperactive, more and more manic, and then you get to a point where it shuts down. It seems to include the area called the Raphe nuclei, which is what makes serotonin.

Dave: Interesting.

Bill: So, the serotonin supply in the brain shuts down rather quickly. And so that's why they go into depression. It's a channel apathy. It has to do with ion channel movements and

being able to ... Because that's where the voltage comes from. It comes from the voltage gradients inside and outside. So, that's basically it.

Dave: And if that sounded a really technical for you listening to this-

Bill: Then I apologize.

Dave: No, no, no need to apologize. I think that that was a great description. It's a complex thing. I would just say read *Headstrong*, the book that I wrote where I described mitochondria in your brain. They're what's making that voltage potential.

Bill: Yeah, exactly.

Dave: All right, so a lot of people ... Okay, maybe have a little bit of this going on, even if you're not bipolar, but a lot of us have some problems with the electrical potential in our brains. I think it's, well 48% of people under age 40 have mitochondrial dysfunction. And everyone over age 40 has some of it, unless they're doing radical things like I am, and maybe I still have some too. I'd probably do given my 300 pound of former obesity in my health history. But is this something that you could solve just by having more salt? I mean, sodium, potassium ratios seem pretty important and we should ...

Bill: Unfortunately no. Basically it's hard to fight an enemy if you don't know who it is. If you don't know who an enemy is, or what it is, it's really hard to combat and fight it. I think what our contribution is, and we've now unveiled what it really is, we've ... I think we've now disclosed what it is, and I think it's going to take researchers and clinicians, I think it's going to lead to greatly improved therapies. We even know why lithium works. I mean there are about eight or nine theories of why lithium helps some bipolar patients. And these are all plausible theories, but we ... I think we know why it really works. And so, it really helps to have that kind of an understanding.

Bill: I do believe that the real answer will be in prevention. And the reason is, we now understand why bipolar strikes, and why it strikes late onset. And I think we already have lab tests that can identify people who are about to become bipolar, and we know how with nutrient therapy, to prevent it. I think that's what's coming, I think.

Dave: What are the nutrients that work when it's about to happen?

Bill: Primarily antioxidants. See what happens is that the weak link in your DNA for some people who are predisposed to this problem is the Guanine. Well, we have 30 trillion of these DNAs containing the ... That's one of the four nucleotides that make up DNA. And when that starts to deteriorate, it shows up in the blood stream. There are lab tests you can do right now, and I think in the future when a guy goes in for a checkup, they're going to check his guanine level. Because if it gets high that means, wow, you're on the verge of an epigenetic disorder, of a permanent disorder in which is going to involve many genes suddenly doing the wrong thing. And that's what cancer is. It's what most of heart diseases is. It's what schizophrenia is, it's what autism is. I think we're going to

how to prevent every one of those disorders. I think they're going to disappear from society. That's going to take a while.

Dave: I fully agree with your assessment there, and when you say that though, probably 80% of the normal population, and only 50% of Bulletproof Radio listeners hear that and go, "You're crazy." And there was actually a couple of other laws and game changers about dealing with critics, and people who do the things that change the world somehow just don't worry about the naysayers. And say, "Well hey, here's the data. Here's the facts. This is going to be what it is." When you say a statement like that, do you have a little voice in your head that says, "Oh, people aren't going to believe me," or are you just old enough and wise enough that you just don't care?

Bill: Well, the first thing I do is I ask myself, could I be wrong?

Dave: Yes.

Bill: I have to do that first. But after many, many years of having experienced different ideas I'm quite confident this is what's going to happen. And really all I want to do is speed up the process. There's so much human misery out there, I really would like this to become available earlier.

Dave: When we talk about antioxidants, I do some really radical things. I started out way coming from behind in terms of arthritis in my teens, and a lot of what I would term the diseases of aging. Or at least things like them before I was 30. And I've gotten rid of most of them. But I am a huge fan of using ozone therapy. And ozone naturally turns up your cells ability to make their own antioxidants inside the cells. Things like SOD and catalase, which you mentioned earlier. When I'm flying a lot or I'm particularly biologically stressed, I actually supplement with SOD and catalase, which you really can't take orally. They don't work very well. SOD you can get it in a little bit, but catalase gets destroyed in the gut.

Bill: Are you doing that because of the increased cosmic radiation?

Dave: Increased-

Bill: There's a lot higher up there in the airplane.

Dave: That is a big part of it. And I take a bunch of our iArmor, something that I make that's full of a bunch of things that are protective. Massive doses of Asxa, Xanthan, Lutein, thiotonine, other things like that. And a bunch of mitochondrial things like one we make called Ketoprime. It's a part of the Krebs cycle. And I feel better when I land. I'm less puffy when I land. My brain still works when I land, which is pretty objective evidence that something I'm doing works. So, I figured by increasing my natural antioxidant capacity, taking my polyphenols, my antioxidants, and doing intravenous glutathione after I land, when I can, I'm able to travel at a way that is biologically destructive if you don't have these things at your disposal.

- Dave: And I would say the healthcare thing would be to do that stuff, and not fly as much as I do. But I feel like by flying around and giving talks to large groups of people, and educating about these things, I'm helping a lot more than I'm harming, so ...
- Bill: I think that antioxidant therapy is going to become mainstream. We now have, vitamin D is mainstream. I think that soon we're going to have zinc and all kinds of antioxidant therapies, that's going to be a mainstream thing. And it's going to really benefit so many people. It's going to slow down aging, it's going to help prevent a lot of diseases. And yeah, I think that's what the future is, I believe.
- Dave: One of the things that is of concern to me, there are some pretty good studies out there that show, I think the technical term is "willy nilly" use of antioxidants. It reduces the beneficial impact of exercise. Because you never get the oxidative wave that comes from lifting heavy things, or sprinting, because the antioxidants you took orally took away the pro oxidants. Like a brief exposure to high oxidative stress, like with ozone therapy causes your cells to get healthier. Are you concerned that that chronic use of antioxidants without an opposing force might have negative effects?
- Bill: Well, I'm absolutely certain that exercise is going to continue to be essential to everybody. No, I'm not. I think that's a good question, but I don't worry about that. I don't worry about that. And even if that was a real threat to well-being, I think you could alternate, couldn't you?
- Dave: Yeah, that's what I do actually. I don't overwhelm myself with antioxidants every day. And sometimes I intentionally expose myself to more oxidants. It's the chronic ones, or having pollutants in your body, like heavy metals, things that are creating just free radicals having glyphosate incorporated into your collagen matrix, because you still eat industrial animal products, instead of pastored ones. I think things like that, that are chronic are just horribly destructive. But occasionally telling yourselves, if you can't make antioxidants, could you just die already, and make some fresh cells that can make antioxidants. That seems like a good strategy.
- Bill: It does, and some people simply don't make enough natural antioxidants, and they're the ones who die young, and develop all kinds of diseases. And I think that the good news is nutrient supplements can do that job for us.
- Dave: I think that at this point if you're in a position to be able to listen to a podcast, which puts you in rarefied air amongst all humans on the planet, that you probably ought to be taking your basic supplements. If you're not getting your magnesium and things like vitamin D, vitamin A, vitamin K, and certainly the right forms of vitamin E, probably the gamma form, you're just missing on a low hanging fruit that has a high likelihood of being beneficial. But isn't terribly expensive compared to any of the bad effects of not having those. Do you agree that assessment? It sounds like you would, but ...
- Bill: Almost. I agree with it with respect to certain nutrients. But there are some nutrients that can cause mischief in some people. For example, folates. Folic acid is vitally important. However, if a person has low serotonin depression, or obsessive compulsive

disorder, or a movement disorder, it'll make them worse. Supplements, that will make them worse. So, there is a handful, maybe six or eight, nutrients you have to be really careful of. But in general, what ... I agree with what you said in general, with a few of these exceptions. You also would not want to do any methylation therapies on people who are born with over methylation. 8% of Americans are born genetically with too much methylation. So, you wouldn't want ... They can be harmed by things like methionine or [inaudible 00:48:23]. And these are ...

Bill: Whereas people who have too little methylation capability, that would be like mother's milk for them. It's, one man's meat is another man's poison. So, I've got a lot of people coming to me saying, "Gee, what would be a really great multivitamin?" And I think it depends on their individual chemistry. Most people who get nutrient supplements broad based ones, they are probably getting five or six or seven that are really essential, and where they would benefit from having more of it. But there might be a couple that would tend to make them worse. And so I think that's going to be ... That I think is going to become commercial by the way. I think people are going to be able to develop quickly the ability to do inexpensive lab testing that might cost less than \$100 to find out who they are biochemically. And I think people are going to start marketing and selling this.

Bill: I once developed a system where we typed people, and put them in a 26 different types, A through Z, with different inborn tendencies. So, to identify which nutrients they needed to emphasize, which ones they needed to suppress. And I think that's going to be something that somebody is going to develop and make a lot of money on.

Dave: I've talked to several startups working on doing that. In fact, maybe 15 years ago, I registered a URL [inaudible 00:49:57] called vitamintests.com or something like that, and dug in on this. And a lot of people probably don't know this. I also helped to start one of the first direct to consumer lab testing companies in the US. Where the idea is, hey, it's your data. You just got to get your data, do what you want with it. You can give it to your doctor or not, but it's your data. And the-

Bill: I liked that by the way. I really liked that approach.

Dave: I think it's just part of basic human right. You should be able to know what's going on without having a permission slip to be allowed to know what's going on in your body. The problem though is interpreting the results can become relatively complex. But now we have AI and machine learning, and the stuff I'm seeing out there, some of it unreleased, coming from startups, I have great hope that we'll be able to say, "All right, here's what you should do." And we will find what you're saying is that there's clusters. I like your number 26, that's probably going to cover 80% of the market. The problem is that if you're one of those people like me, I'm probably a biological outlier on a whole bunch of different ways. Just, in fact, I would go beyond probably because I know my genetics, and I've talked to some of the top geneticists in the world going, "Oh, that's interesting. Are you really human or not?" And-

Bill: You might need 1000 types to pick you up.

Dave: Yeah, exactly. So, but you can be an outlier. But here's the thing, even if you were to take, say, one of those 26 types, you're probably going to be way better off as a human being, even if you're not perfect. Than if you were to just say, "I'm going to go take this big mix of nutrients." And it's one reasons, if you go to my vitamin counter, you don't see a lot of multivitamin kinds of things. What you see is, there's some targeted form, it's like, this is-

Bill: Exactly.

Dave: ... There's 10 polyphenols. One of the things I manufacturer, 10 different polyphenols in one thing. So, if you need polyphenols, you're probably going to get the right ones. But I have just a basic problem, same thing with some of the nootropics out there. Saying, "Oh, we're going to put together 30 different things." Like, well, some of those [inaudible 00:51:55] helps some people and they hurt others. How would you ever know until you try the individual ingredients? So, I would encourage people listening, get tests, get your genetic tests, get lab tests. Look at red blood cell nutrient levels. If it can be data driven, great. If not, try-

Bill: Try it.

Dave: Yeah, try five or six things for a month, if you feel better, cool. But do things that are clustered to have the effect and what. Yes, you're going to spend a day on Google, you're going to read blog posts and things like that. Invest \$100 on getting three or four different supplements. One mindset, and it's kind of a long question for you, but one mindset that I started with was I'm only going to test one thing at a time. And I realize there's more things that exist and I have months of my life to try them.

Bill: That's right.

Dave: So, I started saying I'm going to try the things that all push this pathway in the same direction, to see if I get a result. And then I can stop taking some of them. Do you like that kind of what I call pragmatic, multifaceted approach? Or are you a single nutrient at a time kind of guy?

Bill: I'm not. And I think if you did every lab tests you could do, you wouldn't have a drop of blood left, and you wouldn't have any money left. You have to prioritize. And with respect to supplement combinations, I think targeted supplement formulations are a great idea. For athletic enhancement, for muscle development, growth, anxiety, I think that's a great thing. I just don't approve of the multiples that are one size fit all for everybody. So, I think we agreed on that.

Dave: Okay.

Bill: So, I think this is moving rather quickly, I believe. You may have good statistics on it, but I believe that the number of Americans who are taking nutritional ... really interested in nutrition, and taking nutritional products is ... Isn't that higher than 30% by now?

Dave: I believe it is, who are taking at least one supplement a day. And part of me is a little bit horrified. One of the most common supplements out there is calcium. If you want to calcify your arteries in your brain, that's a really good strategy. At least for God's sakes, take some magnesium with your calcium, and maybe some vitamin K too to keep the calcium where it goes. Just as vitamin D. And it's like, if you do just one thing and you're not educated, and you went to your favorite drug store and picked up a bottle of something, man there's risk in doing it without any guidance. Do you-

Bill: We know that under methylated people tend to be calcium deficient, and they need to have calcium together with magnesium, and vitamin K. But people who are born with over methylation can harm themselves with ... They already have more than they need. So yeah, it's individual.

Dave: And so, I could see listening to this and saying, "You know what? I'm just going to throw up my hands. I'm either going to just take a multivitamin and hope it's good. Or, to heck with that, I'm just going to have a piece of chocolate cake." So, how is one person who doesn't have \$1,000 to spend on lab tests and carefully doing a bunch of stuff? Let me put it this way. You're on a budget, you have 50 bucks a month to spend on supplements to make yourself function better. How would you possibly prioritize that without lab tests?

Bill: Well, hopefully the person you're talking about is reasonably intelligent, and has a computer, and knows how to use it. And what I would do-

Dave: Those are the listeners in the show. All right, you got-

Bill: And listen to podcasts like yours, and others, and try to identify maybe the five or six or the 10 most promising nutrients that might help them. And then to try them one by one, and see if it really makes a difference in their life. If you don't have the money, the idea would be to go to a doctor who understands this and you can spend maybe \$1000 finding out who you are. And if you have a serious problem like schizophrenia or bipolar, or severe depression, I think you need to go to a doctor. You may not want to, as they say, do this at home. But, if you don't have the money, you have to do the best you can. And I would try to identify the most promising possibilities, and do them as a trial.

Dave: It's really good advice, and it does require a little bit of self-confidence. And here's the thing, if you were to go out and do that, you might screw something up. But if you don't do that, and you continue eating whatever the heck it is you eat, you're already doing the same thing. You just did it without any knowledge of what's going in. So, either way you're putting something in your body, maybe you could increase the odds of what you put in your body doing the right thing for you, with just a little bit of research. And that's been the foundation for me that helped me turn that corner from weighing 300 pounds, and having a brain that didn't work.

Bill: I think we should all try to find out who we are, who we are nutritionally.



Dave: Yeah. I love that advice. If there was one lab test that you could suggest for people, the first lab test to get, what would it be?

Bill: Is this a healthy person or a person with a serious problem?

Dave: Let's call it a healthy person. Someone who would say, "I don't have any serious problems. Things are kind of okay." And that's the most of us.

Bill: I would start with plasma zinc.

Dave: Interesting.

Bill: Plasma zinc. And the reason is that so many Americans are low in zinc. It has so much to do with health, and with bio chemistry, and brain function, and physical function. I've learned that the average person who comes to our ... Our clinical process has now investigated more than 30,000 of them. The median zinc level of those people is 76 micrograms per deciliter, which is really low. Every one of those people would be better off and healthier if they normalize their zinc. Now, many people would get all the zinc they need from their diet. Many people get the zinc they need from supplements. But I think if you're going to do one test, I would do a zinc test. Because if you're low on zinc, that means your chance of getting cancer, chance of developing dementia, chance of developing heart disease is much greater. And I think it's just ... I would guess that probably half of Americans would benefit from more zinc. And so if you can only do one test, it would be good to find out if you have that problem or not.

Dave: And that's a very affordable test too?

Bill: Yeah. Back when we first started the clinical work, the labs used charge us 80 bucks for that test. And then after we started getting high volumes, began to negotiate with lab companies, and then at one point we were able to get zinc, copper and lead for \$20 for all three. And they were still making a profit on it. Yeah, I think it's an inexpensive test, probably less than \$50. Plasma zinc, not serums, plasma zinc. And we know what healthy is, it's between 80 and 120 micrograms per deciliter. And that's where people should be, if you want to be as healthy as you can possibly be.

Dave: That's a fantastic. I definitely supplement with zinc, and there's a bunch of different forms. And I ended up putting together one of the Bulletproof supplements, which has zinc orotate with a smaller amount of copper orotate. And the idea there is, I did for several years take relatively high zinc levels to correct a deficiency that's tied to one of the genes that I have. The problem was, I ended up suppressing copper, just the ratio of zinc to copper got so much that my hair started turning gray, which is a sign of lack of copper. So, I added a little bit of copper in.

Bill: Well, I think that knowing you, and having met you before and talking to you, and knowing a bit about you, and reading your books, I would give you about a 20 to one odds that you're under methylated.

Dave: That would be accurate. Yeah.

Bill: Under methylated people, I've now tested and studied thousands and thousands of them, as a group they tend to be low, normal in copper. And so I think you were born with a tendency to be a low normal in copper, and under methylated. So, if you took ... And say you needed zinc, you would unfortunately be driving your copper level too low. So, I think that's ... I understand that, and we see people ... And so there are people that need zinc, and we have to give them some copper too. There are other people who are copper overloaded and we have to give them zinc and make sure they don't get copper. It's quite individual.

Dave: It is very individual, and I'd prefer to have one or the other. And when you were saying, how do you help the broadest number of people who are only going to take one supplement? There's also this question of, do you have zinc? Sorry. Do have a copper in your serum versus red blood cells, versus everywhere else? And what we're starting to find is fascinating. You can take a nutrient, whether it's a certain type of fat, whether it's an essential one or not, or you could take a certain kind of nutrient. But where it goes in the body might be individual as well. Like, people wouldn't know this. You can have a diet of only mono unsaturated fat, and it will not change one degree, the amount of monounsaturated fat in your membranes in your brain. But it'll change the amount of mono unsaturated fats greatly in your adipose tissues, and in the fat you start.

Dave: So, even then you eat it, but your body moves stuff around. How do you know that when someone takes copper or zinc or anything else, where it goes in the body? Do you think we know enough about that?

Bill: Not as much as we need to know, and certainly not as much as we need to know. And then of course the brain is separate, and that's almost a separate system. So, it depends. And also your GI track. Sometimes the biochemistry of the GI tract is different from the rest of the body. But what we do know, we know some things. We know what the healthy level is in say, plasma or zinc. Sorry, plasma or your bloodstream, and in your urine levels. So, we do have some lab tests where we can identify problems. Now, there are many different ways of testing and person. There are nine ways, for example, of determining a person's zinc level. And plasma, whole blood ... And even a taste test. Are you familiar with a taste test for zinc?

Dave: Yes.

Bill: That's [crosstalk 01:02:34]. Every five years or so, the zinc experts of the world get together and they try to identify the best tests that will identify normality or a healthy level of zinc. And they have a ... There's like nine different tests you could do. The one on the very bottom is the taste test, because if you're zinc deficient, your taste is not very, very accurate. And right now, if it's zinc, we know that they continued to say the plasma zinc is the best. But the red pack cells is number two, and you get different information.

Dave: Yeah. So there's still some mysteries out there. And what I'm most excited about for the future is that our ability to do correlative analysis with machine learning and artificial intelligence is so good. Pretty soon we'll be able to say, "If your levels of this are high and your genes look like this, your levels of that will be low, we don't need to draw a lab test."

Bill: Yes. Yes.

Dave: And it's so cool. Dr. Paul Zak was on, he spoke at one of the Bulletproof conferences, and he basically said, "Look, in order to tell oxytocin, I can get this from just testing electrical signals coming up into the brain, or from heart rate variability." And the data is so [inaudible 01:03:51] blood sticks, he's now drawing one third as much blood as he did five years ago. Just because like, hey, it's predictable. We just never knew it before. And I'm so excited that they'll come a day where you stare at the camera on your phone and run a little electrical current. And say, "Oh yeah, now we know most of what we need to know about your labs." Those days are coming, but that's probably like a 10 plus year kind of thing.

Bill: Yeah. And I think technology is remarkably improving everything. And the epigenetic, the ... I think genetics and epigenetics, I think, can really define a lot about a person's health. And it's still incredibly complicated. We're going to need the cloud, and we're going to need information ... all this new technology. But my guess is that this will happen. Maybe it'll be like a Woody Allen movie where he steps inside a cubicle, and things happen, and then you walk out and you know everything about your body chemistry, and what you need to do. Who knows?

Dave: I cannot wait for such a day. In the meantime, we have people like you, and the doctors you trained. So you said it a minute ago you said, "Well Dave, based on reading your books and talking to you, you're probably under methylated." And of course you're right. How did you know that? Because you have 30 years of clinical experience, you're a walking correlation engine, and this is what all great doctors do by the time they've been in practice for decades. Like someone walks in the door, you're like, "I know what's wrong with that guy." Right? Then of course you have to do the dance, but you know.

Bill: We had people that would walk into our clinic, and by the time they sat down in the reception area, we knew that had [inaudible 01:05:28] disorder. Because they are the classic symptoms and traits. We were 95% certain.

Dave: I like to ... *The Matrix*. We have that thing where Neo looks out one day and he sees everything as zeros and ones. And as soon as like ... I can see, and I think that clinicians who are gifted in practice develop that ability to the point you can see things that normal people just wouldn't see.

Bill: And I've met doctors, I've now worked with so many doctors. There are some doctors who I call healers. They have some ... I don't know if it's intuition, or what it is, but they have the ability to look at, and get to learn everything about a patient, a human being. And they can home in on what's really important. It's just a gift that some people have.

Dave: It is a gift. I think some of those people are drawn to the medical profession, and some of them become body workers, energy workers, yoga teachers, whatever. But there are healers who are licensed professionals, and there are some who aren't. And when you find a healer, you'll notice. And the more of those you know who are your friends, the probably the better off you are, the longer going to live. Because I don't know how some of them know the things they know. Sometimes I know a few things about people as well, but it's a skill that I believe is teachable, and is trainable. And we're going to have systems that help us do that. So, even if you don't have friends like that, or you don't have a doctor who's also a healer, that doctor will have the tools that allow them to be a better healer, which makes me happy.

Bill: Yeah, their waiting rooms are very full, but they should try to spend as much time as they can showing others how to do it. Other doctors.

Dave: Now, we're coming up on the end of the show and we've talked about how you think it's going to be possible for us to live to 150 or 200 years old, which makes me happy, because my goal is right in the middle of that. At least my minimum goal. Now, you've been practicing for a very long time, and Ray Kurzweil and people like that are saying there's an escape velocity. If you could just keep yourself young long enough, the technologies are going to come along. And here's my question for you, a question I've asked everyone I've interviewed in the last dozen or so interviews. How long do you think you're going to live with a highly functioning brain?

Bill: Well, of course, I'm not a happy about the prospect that someday my brain may turn to green crackers.

Dave: Gluten free ones or...?

Bill: I'm half German and half Irish. My German people die young. The Irish side of my family lives forever. I have an aunt who lived to be 109 and she was mentally sharp all the way. On her ...When I was ... She called me on my birthday when she was 109 years old. She was saying to me, "Happy birthday." We talked about politics, we talked about the family, she knew everything.

Dave: Wow.

Bill: And I've got uncles and aunts who died around 100. So, I'm hoping I got some of those genes. But realistically, I think that ... We know there are tribes in South America mountains that that are ... where you have people who are 110 years old are out working in the fields and are fine. So, we know what's possible for humans to be like that. If you asked about me personally, I'd be happy with another 15 years. I'm pretty old.

Dave: Got it. And even with all of the nutrient knowledge you have, the ability to balance your brain, the ability to manage all these things, you think 15 years?

Bill: I don't know. I'm just happy with every day.

Dave: All right. Gratitude is great, but I would just encourage you, because I don't think you're done contributing yet. Now, bump your number up a little bit.

Bill: I think I have reverse Alzheimer's because I'm having trouble remembering things that happened 50 years ago. But when I study neuroscience and new things, it seems to stick faster than ever, so-

Dave: Oh, beautiful. Well, keep studying, keep writing Dr. Walsh. I am truly a fan of your work. You've done some things that really have alleviated massive amounts of human suffering, and helped a lot of people who you felt like there was no hope. And people who are under methylated like me, definitely benefit from the knowledge that you brought forth. And I think there's just a wave of change will happen even in our penal system, when we realize what happens if we fixed the nutrients of the people who are incarcerated. And there's so much derivative work that'll come based on some of the original discoveries that you've made, and are still making. So, just keep it up.

Bill: Well, we're a dedicated group, we're a public charity, we're not interested in money. We're interested in trying to help the world, and we're going to do the best we can. And thanks for your health.

Dave: Oh, you're so welcome. Your info, you're at walshinstitute.org. If people can find the list of the 600 and something doctors that you've trained in your techniques at the website.

Bill: Yes, we have. And we have a lot of YouTubes, and podcasts and things. Hopefully, people can learn about yours, and all the others we've done. We've already had ... I think a couple of years ago we got to the point where more than a million people had listened to one of our informational lectures.

Dave: Beautiful. Well, keep doing what you do. Walshinstitute.org, and thanks again.

Bill: Well, thank you Dave. Good talking to you.

Dave: If you liked today's episode, you know what to do. Find a doctor who's trained in nutrients, who can give you some good lab tests and help you take the right supplements, and eat the right foods, and do the right things. That's one of the highest returns on investment you can get, which is why it's one of the laws in game changers. And if you're going to go to the doctor, you're going to need something to read in the waiting room. So, there's a couple of books you should get. One of them is called Game Changers, where you can certainly read about that one law that has Dr. Walsh in it. You could also by Dr. Walsh's book, which is called *Nutrient Power*.

Dave: So, bring both of those books to the waiting room, you'll really impress your doctor when you do that. And then after you read the books, go to Amazon and leave a review, because guys like Dr. Walsh and me, we actually read our reviews. We care what you think. Thank you for listening and thank you for picking up both books.