The Evolution of Neurology: Gut Brain Connection
Presenter: Dr. David Perlmutter

The purpose of this presentation is to convey information. It is not intended to diagnose, treat, or cure your condition.

James: Hello! And welcome back to The Evolution of Medicine Summit. This is your host, James Maskell. And we are in the medical part of this conference. We are speaking mainly to doctors. But I'm sure there are some patients who are trying to get the inside scoop on what doctors are learning. And an extremely warm welcome today to Dr. David Perlmutter who is the evolutionary and empowering neurologist. And we're so glad to have you on the summit today, Dr. Perlmutter.

Dr. Perlmutter: Well, James, I am absolutely delighted to be here today. Thank you.

James: It's obviously great timing to have you on the summit. I know a year ago today, your book *Grain Brain* came out. And that's been such a smash hit. It's been all over the *Times* bestseller. It's led to appearances on *Dr. Oz* and all over public TV, as well. And also, I know it's a big time for you with your second book coming out now and then also on Monday, tomorrow, your new journal. So do you want to just share a little bit with some of the people here about some of the literature.

Dr. Perlmutter: I'd be delighted. So just last week, we put to publication our newest book, which is *The Grain Brain Cookbook* with over 150 recipes. Really, here I am a doctor writing a book about how to eat. I mean, who know? Who knew that Hippocrates was really onto something 2,000 years ago? "Let food be your medicine. Let medicine be your food."

And the real cornerstone, again, is that people need to cut their carbs. Increase their consumption of dietary fat. And in the case of *Grain Brain*, we're really very strong advocates of looking at the powerful role of gluten in terms of increasing inflammation. So these recipes are all gluten-free.

You mentioned Dr. Oz. And I actually did his program several months ago. And the focus of that really was how powerfully detrimental gluten can be to the brain. I actually presented a couple of my own patients who've developed movement disorders. Who would think that's related to gluten sensitivity? And it was. We got them off of gluten, reduced the inflammation. And lo and behold these abnormal extraneous movements that people were suffering from went away.

The other thing that you mentioned is this week we are launching a peer-reviewed journal called *Brain & Gut*. And the focus of this new very exciting journal is, in fact, this very profound relationship between what goes on in the gut and how that influences moment to moment brain activity, brain functionality, and the brain's ability to become resistant to disease.

And by the same token in a bidirectional way, how does what goes on in the brain influence digestion? What are the effects, for example, of stress and stress hormones in terms of the digestive process? So it's really a back-and-forth beautiful communication. We are launching this journal, as I mentioned, this week, globally. Over a hundred countries are going to have access to this journal.

So it's really a very exciting and empowering time that the world seems to be opening up to the notion that the gut plays such a huge role in brain health, brain functionality. And even, as I mentioned, the brain's ability to resist disease.

In Western cultures, we're primed to just live our lives, come what may. And then suddenly, when we're in trouble with one disease or another, we are prescribed some magic pill. And how interesting it is that, in fact, there is no treatment, for example, for Alzheimer's. And yet nutrition is so fundamentally important in keeping that from happening in the first place.

James: Yeah. That's amazing. Well, this of particular importance to me because my grandmother died of Alzheimer's. And my father and his twin brother have both been looking at Parkinson's. And when I've seen you lecture to doctors about, "Heal thy practice" and also at the Integrated Health Symposium a number of times, you've really very clearly laid out the cascade of things that happens, which ends up with these diseases where we have to treat them. And the only thing that we can treat them with are the things that help with the symptoms. But it seems like you've already helped to identify some of these causes further down.

And part of this evolution of medicine where we've heard consistently through the process is that we need to look at cause rather than the symptom. And so you're speaking to a lot of doctors here. They're probably not all neurologists. But there's a lot of primary care. There's a lot of internal medicine doctors. There's probably people who are interested in health policy, as well.

Given the importance of the brain, can you just lay out as simply for everyone as possible this cascade of things that happens and why we need to turn our attention to the beginning of the cascade rather than where it's been at the end?

Dr. Perlmutter: Well, no question about it. I will say that one of the themes of my lectures has always been to pay attention to the fire and not just treat the smoke. And, unfortunately, in Western cultures we're trained to deal with the smoke, deal with the after effects, deal with the downstream issues that arise from factors, for example, like inflammation and free radical mediated stress, the effects of free radicals in terms of damaging our tissues. So up close and personal, the most fundamental player in all of the neurodegenerative conditions is, in fact, inflammation.

And for your listeners, I'm talking about the same inflammation that might cause your arthritic knee to be painful or the inflammation that might surround a mosquito bite: the redness, the swelling, the loss of function. This is exactly what happens in the brain of a Parkinsonian patient, a patient with Alzheimer's, a patient with MS. And even a kid with autism. So we've got to pay attention then to not what are the ultimate manifestations of this inflammation, but look very closely at what are the causes of this inflammation in the first place?

In one area that I've been really interested in as you know, has been the role of diet in terms of inflammation. And what we have going on in America right now is just a bombarding overall the physiology of humans with carbohydrates and sugars. And the reason that relates to this discussion of inflammation is through a very straightforward mechanism. The higher your blood sugar, the more that blood sugar will bind to proteins. When proteins are bound to blood sugar, it's a process we call glycation. Glycation dramatically turns on the production of inflammatory chemicals. So this is a direct relationship then, between elevation of blood sugar and the increase in inflammation that so characterizes our most dreaded neurological problems like Alzheimer's.

And guess what? Your blood sugar directly reflects your dietary choices. Those dietary choices that are higher in carbohydrates, higher in sugars, are those dietary regimens that will increase your blood sugar and, lo and behold, have a dramatic effect upon your brain.

For example, in 2013 August 8th, *New England Journal of Medicine* was of a very powerful article that looked at the relationship of blood sugar in a group of cognitively intact individuals to their future risk of developing dementia. What they did was took a

large group of individuals. And they measured their blood sugar. Then they followed them for several years. And what they found was really quite remarkable. Those individuals with the highest level of blood sugar initially had a profound increased risk for developing dementia, a disease for which there is no treatment.

Now, the important part of the story is that these results revealed that these levels of blood sugar that translated into risk for becoming demented were not high levels that we'd be worried about normally. These were levels of like 105 and 110, when many doctors are going to tell you, "Hey, don't worry about it. You're not diabetic. Continue on, life as usual." It turns out that even these subtle elevations of blood sugar translate dramatically to an increased risk for becoming demented.

How do you keep that from happening? It's really very simple. You increase your consumption of fat. And at the same time, you decrease your consumption of carbohydrates. Blood sugar will fall and risk for Alzheimer's will fall. In addition this is really important, mild elevations of blood sugar through this mechanism of binding to protein causing glycation are directly related to the rate at which your brain's memory center called the hippocampus shrinks. Blood sugar higher, determines the rate at which your hippocampus shrinks—your memory center.

So, again, this is a very powerful call to get that blood sugar as low as you can and bring back to the table as an alternative source of calories—fat. Why would I say that? Well, interestingly enough, the Mayo Clinic publishing in 2012 in the *Journal of Alzheimer's Disease* revealed that those individuals who have the most calories from fat have a forty-four percent reduction in risk for developing dementia as opposed to those individuals' diets are highest in carbohydrate, whose risk for dementia is increased by eighty-eight percent.

So I think it's really very important that we understand that we've got to welcome fat back to the table. Earlier this year, in the *Annals of Internal Medicine* was a very powerful meta-analysis looking at about 500,000 individuals and demonstrated quite profoundly that saturated fat consumption has absolutely no role in increasing risk for cardiovascular disease.

And, James, what can I say? We've been told for decades that if you eat saturated fat the world's going to come to an end. You're going to have a heart attack. And your kids will be born naked. Or some horrible thing's going to happen. That's just not what the science is telling us. The science is telling us that the big thing that's causing our degenerative conditions, whether it's heart disease, brain degeneration, diabetes, and

even cancer, is the level of carbohydrate that has worked its way into our diets. And it's got to be stopped immediately.

James: Wow, that's so important. So for those doctors who are listening and thinking, "This is not scientific or otherwise," I know in *Grain Brain*, you had over a hundred citations of clinical literature. Just given now that you have this journal with the gut and the brain, is that a sign out there that this science is bulletproof now?

Dr. Perlmutter: I don't think anything's bulletproof. And, frankly, ten years from now, I may have a different story to tell. That's the beauty of science. It's always changing. And that's what allows us to make progress. But I think the argument about carbohydrates has two strong feet to stand on.

The first is the science. I think the science is profound. And it's not even that new. I'll get back to that in just a moment. But the other leg that supports this contention is the historical notion that humans have never eaten carbohydrates to speak of. We never had carbohydrates. They didn't exist. So the notion that we've always eaten bread and carbs is silly because we never did.

For 99.6 percent of our time on this planet, we had no bread. We had no cultivation. No agriculture. We didn't grow apples and grapes and those types of things. Basically, we ate what we found growing on the ground. Or what we could kill. Or what was already dead, for that matter. And that basically means very high fiber containing, for the most part, above the ground growing vegetables, as well as animals that had been grazing and not fed grains and genetically modified foods and were treated with antibiotics and growth factors. So that's how we've always eaten.

But let me just get back, if I could, to the comparison of a diet that's high in carbohydrate versus a diet that is high in fat. And, again as I mentioned, these comparisons are not new.

In the *New England Journal of Medicine* way back in 2008 July 17th, a powerful report was published which compared…It was predominantly designed to look at weight loss comparing low-carb or a low-fat diet. If you go into any of these commercial weight-loss venues, it's always, "Well, we're going to cut the calories and cut the fat." That's not how you lose weight.

So this was a two-year trial looking at 322 moderately obese subjects. And they were placed on either a high-fat diet or a high-carb diet. And what they found was the markers across the board favored going on a low-carb diet.

For example, the people who lost the most weight are the people who ate the most fat and the least amount of carbohydrates. The people who had the best improvement of their good cholesterol, ate the most fat and the least amount of carbohydrates. The people who had the best drop of their triglycerides were the people who ate the most fat and the least carbohydrates. The triglyceride drop in the people on the low-fat diet was 2.8 points. The triglyceride drop on the people eating a lot of fat was 23.7 points. That's huge!

When you look at other of metrics, for example, we like to look at something called C-reactive protein. That's a commonly used marker of inflammation. And it has a strong correlation with risk for heart disease and even Alzheimer's. And C-reactive protein and people on the low-fat diet, again, published in the *New England Journal of Medicine* didn't budge. Whereas, it went down 1.3 points, which is huge, in people eating the most fat and the least amount of carbohydrate.

So, again, you make a good point in that is that this is not just Perlmutter's anecdote and idea. This is what has been published for years and, again, are arguably one of the most well-respected, peer-reviewed medical journals on the planet. And that is the *New England Journal of Medicine*.

James: Yeah. So if you go to a neurology conference and there's a lot of neurologist around, is this being discussed? This science?

Dr. Perlmutter: No. It's not. That's why finally, I've said, "Well, it's not being discussed at these neurology conferences. What could you do so that this would be discussed at a neurology conference?" And that is you make your own conference. And that's exactly what I did. As a matter-of-fact, it begins this Friday in Hollywood, Florida. And it's Integrative Health Symposium Brain Conference where I've had the wonderful opportunity to invite the top leaders in neuroscience from around the world to meet with us in a couple of days in Hollywood. This is a huge event. So many doctors have signed up for it and other healthcare practitioners, as well.

And we're going to be getting into exactly this information. I have been honored to serve as chairman of this conference. And our hope is that we make this an annual event. The response has been just profound. And it's really very cool for me because the

people I got to invite are the people that I have had such admiration for all these years. You send them an invitation. You say, “We’re having a conference.” And they say, “Yes.” It’s really a dream come true. And coupled with that, our *Brain & Gut Journal* launches this week.

So it’s a big weekend. I get to talk to you today. So this is very cool!

James: It’s a great week. And it's great for me, as well because I just see how important this is. And having seen your lectures, I just wanted to make sure that I got this out to as many people as possible, but, particularly, physicians.

And I just want to go back to the fact that you're talking about these low carbohydrate strategies. But this is not just a neurology issue. This is an internal medicine issue. This is an autoimmune issue. The inflammatory processes that are kicked in from this high carbohydrate situation is not unique to neurology. Is it?

Dr. Perlmutter: No. It’s a health situation. And it encompasses everything from top to bottom. And, again, the notion that there could be a heart smart diet that's bad for the brain or a brain smart diet that's bad for diabetes or another diet that’s good for arthritis, but bad for your liver is silly.

We’ve evolved over the past two million years to really cater to the desires of our genome, our foods’ direct gene expression from our genome. And we've eaten a certain way for a couple of million years. Now suddenly, were sending signals to our genome by the foods that we eat. And we’re seeing maladaptive genomic expression. And that's the cornerstone of our most dreaded situations today.

I think it's important to understand that the human genome is about 23,000 genes, which really is about half of the number of genes in rice, for example. But be that as it may, it's not fair to say that those are the only genes that are involved in human health. Within the gut, we have a number of bacteria that actually outnumber our body cells by ten to one. We have between ten to the thirteenth to ten to the fourteenth bacteria living within us. And they have their own DNA. And that DNA, of the bacteria in the gut, have a huge role to play in terms of dictating our health or risk for illness. So we’ve kind of off-loaded our need to store so much information in our DNA. We’ve out-sourced it to the cloud or an external hard drive. And that resides in the bacteria that live within the gut.

Now, why is that important in terms of nutrition? It's fundamentally important because our food choices dictate the health, the balance, and the diversity of the population of bacteria and their gene expression that live within us.

So the microbiome—and that's a term that talks about the genetic information contained within the bacteria that lives within us—plays a huge role in determining our health outcomes. So we've really got to change our notion about bacteria as always being foreign invaders of the cornerstone of all diseases and recognize that by-in-large, we live in this beautiful symbiotic relationship with this vast number of diverse organisms within our intestines, whose mission it is to keep us healthy because we provide their home. So changes in levels of the gut bacteria have been now associated with things like autism, with things like Alzheimer's disease.

One interesting report just published by a group in England actually looked at the levels of parasites in humans gut around the world, several hundred countries. And what they determined was that the relationship between the level of parasites in the gut, in other words, being dirty, poor hygiene, was inversely related to the incidence of Alzheimer's, meaning that those countries, for example, in sub-Saharan Africa, where people were colonized by all kinds of bacteria and parasites, had incredibly low levels of risk for Alzheimer's in contrast to Western cultures like America and Finland and Germany and European cultures where antibiotics are so heavily used. And we have this obsession with hygiene where Alzheimer's rates are dramatically elevated.

We know, for example, that there is a unique microbiome a unique set of bacteria, an array—a fingerprint, if you will—of the bacteria in the gut that is characteristic of autism. So these relationships are just beginning to be revealed. And certainly the role of the microbiome in brain health is really one of the cornerstones of our new journal *Brain and Gut.* It's the focus of my new book that's coming out in May of 2015. And beyond that, it is certainly something that I'm going to be talking about in the next several days at this International Brain Symposium.

So we've really got to get our arms around this.

James: Yeah. It must be exciting for a topic like the microbiome to be so fresh because I think naturopaths and several other types of practitioners had an inkling that this was happening, and functional medicine doctors going back years, right back to the beginning of Jeff Bland and Leo Galland. But as medicine, we only really understood the microbiome a couple of years, three or four years. And just given what a change that's

made to medicine and now seeing how it's related to the brain, it seems like it's such an exciting time to be in this field because you get to have such a level of interest and such a level of newness in your understanding of the complexity of the interrelation of the human body.

Dr. Perlmutter: Well, I think you bring up a very good point. And that is, not to blow our own horn, but those of us who are involved in functional medicine have been involved in this for fifteen, twenty years where we've understood this. We've understood the fundamental role of the microbiome in health and disease.

And all of a sudden you're seeing that people should be eating yogurt because it's rich in probiotic organisms. And that's about as far as people are taking it. This is so profound that, for example, gastroenterologists should embrace this wholeheartedly. This is a powerful leverage tool to gain back gut function.

You mentioned autoimmunity. Absolutely! Rheumatologists, immunologists need to be absolutely involved in this research and embrace the notion that the set point of immunity, the set point of inflammation, the production of neurotransmitters and its effects, for example, upon mood and cognition are all fundamentally dictated by the array, the diversity, the numbers, the ratios of those bacteria that live within us beyond bacteria, fungi, viruses.

We serve as this closed ecology walking around with all manner of signaling happening from the brain to the gut, from the heart, from the intestines back and forth, the endocrine organs, the immune systems. The production of cytokines being dramatically regulated by what goes on in the gut. And for your listeners, cytokines are the chemical mediators of the inflammatory process being directly governed, mediated by the levels of bacteria in the gut.

This is revolutionary science. And what is so exciting about it is it's absolutely as we speak paving the way for novel therapeutic interventions for some of our most challenging and pernicious illnesses. So this is revolutionary science.

James: Well, this is exciting because, as well as the cost of Alzheimer's disease and neurodegenerative diseases, one of the things that I've heard you mention is just the huge financial cost. Because patients who have these issues just take a lot of looking after. And so it seems like it's almost an economic imperative for us to be able to come up with you new strategies. And when we look back at the strategies that we had been using, my understanding of the drugs that are given for, in a traditional neurology office

or otherwise, they're just dealing with the symptoms of that issue, right? Like controlling the tremors and so forth?

So could you just speak a little bit to the scale of the problem like financially in neurodegenerative disorders? And then sort of like this new evolutionary and urology concepts, how neurologist should behave in this new paradigm?

Dr. Perlmutter: Absolutely. So we can look at various metrics to have these a-ha moments in terms of how devastating the situation is. But, for example, Alzheimer's disease is something that affects 5.4 million Americans. And as of just earlier this year was thought to be now associated with some five million deaths in America. That's pretty outstanding. So the consideration here is the cost. And we've got to understand that this is costing us about $200 billion a year. And that said, that's twice what we spend on coronary artery disease. It's tripled what is spent on dealing with cancer. So, again, the number, though, of deaths in America from Alzheimer's is now five hundred thousand, not five million. I think I misspoke.

So that said. I think the point is no one seems to be paying attention to the notion that Alzheimer's is a preventable disease. And it is. Dr. Debra Barnes from the University of California, San Francisco publishing in the journal *Lancet Neurology,* I think made it clear that about fifty-four percent of Alzheimer's cases in America didn't have to happen if people had paid attention to these lifestyle factors. And we're not getting that message out. We're not doing a good job about that, at all.

Your risk for developing Alzheimer's doubles if you become a type II diabetic. That said, by and large type II diabetes is a choice. It's based upon the foods that you've chosen to eat. Now, there are people who keep a low-carb high-fat diet who may develop diabetes. But they are few and far between. By and large, you know as well as I do what that type II diabetic patient looks like and how they're being treated with medications.

That disease doubles your risk for a disease for which there is no treatment. And that is Alzheimer's. Your risk for developing Alzheimer's, on a good day, if you live to be age 85 is 50/50. So add some diabetes to that, along with your family history that you can't really control, and you'll find that your risk has gone up significantly. The view of the glass being half-full, however, is now you and I getting this information out to your listeners, telling them that, "Look, let's find this to be empowering information about embracing these lifestyle changes. Get that blood sugar down. Bring back fat to the

table. And get some physical exercise" because we know that we can actually grow back new brain cells, which growing up in medical school, we were told that didn't happen. We now recognize that this process called neurogenesis happens throughout our lifetimes. And it's governed by—let's call it a growth hormone—this brain growth hormone is called BDNF, brain derived neurotrophic factor. I don't mean to be too technical.

But the point is that we can enhance the growth of new brain cells by enhancing the body's production of BDNF. And how do we do that? We do that by getting aerobic exercise, by getting sunshine, and by making sure we have adequate amounts of a nutritional supplement which is called DHA. And you don't have to get it as a supplement. You can get it by eating fish.

Now, interestingly enough, that is the way that I believe will reduce a person's risk for becoming an Alzheimer's patient. Well, why do I say that? What could there possibly be that allows me to say that people, for example, with a low level of brain derived neurotrophic factor have a higher risk for Alzheimer's disease? What a statement!

Well, in the April 23, 2014 issue of the *Journal of the American Medical Association*, there appeared an article entitled "Serum Brain Derived Neurotrophic Factor and the Risk for Dementia." And this study actually reviewed what is called the Framingham data. As you'll know, the Framingham study was probably the largest epidemiologic study so far on the planet looking at risk factors for heart disease, cancer, and in this case, dementia.

And what they did was they measured at baseline the level of brain derived neurotrophic factor or BDNF in a group of participants and found a perfect correlation between low levels of BDNF and high risk for Alzheimer's. Those individuals who had the highest level of a brain-derived neurotrophic factor had it least a forty to fifty percent reduction in the risk of becoming an Alzheimer's patient.

How do you raise your BDNF level? Simple, aerobic exercise, DHA, which is a form of omega-3, and as one recent study has shown us, sunlight. Just getting sunlight in and of itself—and I don't know if the relationship has to do with vitamin D or not—but sunlight can do it. Sunlight raises BDNF.

Now, what a powerful report appeared in the proceedings of the National Academy of Science way back in February of 2011. Researchers at University of Pittsburg showed by

measuring MRI scans of the brain's memory center, increased growth of the size of the brain's memory center in individuals who did aerobic exercise over one to two years compared to those who simply did a stretching program whose hippocampus, whose brain's memory center actually shrunk.

They showed three things. A larger hippocampus, better memory function on cognitive testing, and higher levels of the BDNS—the brain's growth factor—based upon simply doing aerobic exercise. This was a study with 120 randomized adults. And you can't buy this in a pill. You can't write a prescription for this. All you got to do is go out and buy a pair of sneakers. And that's twenty minutes of aerobics a day will grow back your memory center. What are people waiting for?

James: Yeah. So now, if you're speaking to neurologists, on the line here who are…I wouldn't think your average neurologist is used to prescribing sunlight and exercise for their patients. What tips would you have for engaging these lifestyle factors with patients who are not used to having empowering solutions from a specialist like a neurologist?

Dr. Perlmutter: I think the first thing I think is really important is to engage the professionals. What I mean by that is what I've talked to you about today has been, "What is the most well-respected peer-reviewed literature telling us?" And the problem is that according to Dr. Jerry Avorn at Harvard, publishing in of all places *Consumer Reports*, more than seventy percent of the information that doctors take from medical journals comes from the advertisements. And the advertisements are treating the smoke and ignoring the fire.

I'm trying to bring to professionals a recognition what our most well-respected peer-reviewed journals are telling us. And that is quite simply that lifestyle choices play a fundamental role in determining the brain's destiny. It's time that we bring the notion of preventive medicine to the realm of the neurologist. This is what I talk to my patients about. Two hundred of these citations went in to writing *Grain Brain*.

And when patients come in, they've generally read the book. That's why they come to see me. Or if they haven't, I give them a copy. And I wrote that book to make this stuff that we're talking about today very understandable, user-friendly, and most important actionable. "What can I do now that I know this information to change the destiny of my brain?"

“Number one, I’m going to cut the carbs and sugar. Number two, I’m going to look quite seriously at going gluten-free. And number three I’m going to start getting some aerobic exercise” because that's what leading scientists are telling us. This is from the Department of Psychology, University of Pittsburgh and the Beckman Institute for Advanced Science and Technology.

These are not articles that somebody wrote and they’re going to stick in your grocer back at the health food store. These are our most well-respected scientists that are telling us, “Look, there’s a way out and here's how to do it.” Again, the problem is this cannot be monetized. There’s nothing to sell here. And the word *doctor* doesn't mean healer. It means teacher. And that's what you and I are doing right now for your listeners. It’s teaching them what they can do, how to become empowered, how to preserve the brain.

And how early does this happen? Well, is this important for children? You bet. Does it have a role to play in things like ADHD? Absolutely! But I, in my new book take it even further back. When we recognize that the immune system and things like inflammation, that the gut bacteria play a pivotal role in determining how that all happens, we have to ask ourselves, “Well, where do we get our gut bacteria from in the first place?”

And where we first get our appreciation of the gut bacteria is when we’re born. And we pass through mother's birth canal and our faces and mouth and nose are covered with the bacteria that live in the birth canal and bacteria that have come from other areas down there, if I can be so bold. That’s what inoculates the microbiome of the newborn. That those bacteria from the mother’s birth canal are what inoculates that child. When you deprive a child of that experience, you do not inoculate that child. You do what's called a cesarean section where the child doesn't pass through the birth canal, that deprives that child of the necessary bacteria that will serve him or her for the rest of his or her life.

Now, I don't want listeners who have had their children by C-section to feel like I’m coming down on them. This is a plea for people who are planning to have children moving forward. We know right now that in America about thirty-five percent of births are via cesarean section, and not because there's complications and they have to have that. Most of these are elective. Dare I say, cosmetic or convenient or for whatever reason.

And, frankly, in America we’re not at the top of the list for having the highest incidence of C-sections. In Rome, for example, eighty percent of kids are born by C-section. When

children are born by cesarean section, they are deprived of that microbiome inoculation. And their gut bacteria are derived from what was on the surgeon's hands, what is in the operating room, what's on the linens in that operating theater. So that said, you would think that, therefore, there might be some increased risk for autoimmune conditions or even brain conditions.

James: So doc, what I hear you saying is that as we move towards this evolved state of medicine, it's not just neurologists who are going to have to start to understand the rest of the body. All specialties really are going to have to start. If neurologists have to understand cesarean sections, how do you see medicine evolving from here now given these kinds of concepts?

Dr. Perlmutter: It's a challenge. Buckminster Fuller has a great quote. He said, "You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete." And I think that's what I'm talking about here. I'm talking about building a new model, a new paradigm, and really raising awareness that fundamentally what we're talking about here is current science peer-reviewed science that is dead center telling us that, for example, the microbiome plays a huge role in health destiny from all perspectives. From an endocrinology perspective as it relates to our metabolism, obesity, diabetes, from a heart perspective as it relates to coronary artery disease and inflammation and, my interest, brain disorders.

So it's certainly intriguing and raises the eyebrows to think that at this stage of my life and my career, I spend most of my day talking about what you should eat as a neurologist. That is, who would think that a brain doctor would have anything to do with nutrition? And as Hippocrates said, "Let food be thy medicine. Let medicine be thy food."

And I would submit that the most powerful leverage point that we have for brain health is looking at the food on the plate. That's fundamental.

James: Absolutely. Well, part of this medical conference this weekend has been people like yourself and other doctors talking about the evolution of psychiatry and endocrinology and neurology. But we've also had some practical sessions for actually how to do this.

And it seems to me that a health coach or someone who's training people to eat properly has just as much place in a neurologist's office as a primary care office in this evolution

of medicine because it's not really even necessary for doctors to gain these new skills. They just have to understand the importance, right?

Dr. Perlmutter: That's one way of doing it. That's why I have a dietitian. Her office is right…I can open up my door and see her there coaching patients. So you're exactly right. How odd it is that a neurologist has a dietitian on staff. Think about that.

But we're coming away from this so-called reductionist mentality where we want to reduce the body to its individual functional parts—the lungs or bellows. The heart is a pump. The brain is a laptop. And the vascular system is a series of pipes—to really recognizing that this is an integrated system Chief Seattle said that "Man did not weave the web of life. He's merely a strand of it. What affects one part, affects the whole." And, basically, that's what goes on in human physiology.

There's not disparate systems here that are totally ignorant of what goes on elsewhere in the body. We know that that's for certain that what goes on in the gut is moment-to-moment reflected in the brain. If you don't believe it, have a cup of coffee in the morning or not and see how you feel. It's very clear, what you eat, what you drink plays a huge role.

But I think getting back to really one fundamental mission for me today on this interview is to really recognize how devastatingly important it is to consider the role of the microbiome—the gut bacteria—in terms of causing neurological troubles, but then also as a leverage point for keeping people healthy.

If you have a choice in terms of how your child is delivered, I think that choosing a vaginal delivery is absolutely the way to go. Again, when we see the profound increased risk of autism, ADHD, type I diabetes with kids that are born with cesarean section, be very, very judicious in using antibiotics in children. Kids gets a sore throat or a sore ear, and right away he or she's put on a powerful antibiotic that kills bacteria. Guess what? That also kills off good bacteria in the gut and changes the balance. Diet is fundamentally important to nurture what goes on in the gut.

One really interesting study recently compared the gut bacteria levels and variety in children living in Africa compared with those living in Europe and found a huge disparity in that fingerprint, not just in terms of the types of bacteria, but the diversity of the bacteria in the African children was so much higher. And they don't get things like we do, like autism, for example.

One recent report show that Somali children—children living in Somalia—that autism has never been seen, basically. But that when they move to America, they get what's called Western disease, another name for autism. So it's not a genetic issue. It's an environmental issue. And that means we have control over it once we learn what is predisposing children to that condition.

James: Yeah, that's so interesting. And if I take all these things together, we've had Dr. Kelly Brogan speaking about the evolution of psychiatry and talking about mental, emotional issues and the role of inflammation and so forth. Dr. Mark Menolascino's spoken about the evolution of endocrinology. And guess what? He's speaking about gut microbes, too.

It seems like everyone, every patient could avoid a lot of these specialists if they just had some cool practitioner teaching them about how to avoid the causes of inflammation. And how that ends up manifesting in different patients is maybe going to be a neurologic issue or a psychiatric issue or an endocrine issue. But it seems like that's really the core of what we're getting to here is getting people in touch with practitioners that have the ability to understand the body as a holistic mechanism, first. And then if you can take those issues out of the way, first, and it's still not resolved, then maybe you need to see a neurologist who understands this. But let's go with the percentage move first.

Dr. Perlmutter: It's very, very powerful. I mean all day, every day in my office, I'm seeing these wounded warriors. You know, people who've been to the major well-named clinics around the country, around the world. And they get a prescription—if there is one—and hope for the best. And I think that that's a bit myopic. And I say that because it's a heck of a lot more than a bit myopic. It's a profoundly narrow-minded approach to understanding what's going on in human physiology.

This situation with the gut, I think, is really important as it relates to the brain. But by the same token as I mentioned earlier, this is a bidirectional relationship, meaning that the brain also influences dramatically what's going on in the gut. That emotion, for example, a stress, for example, that increases cortisol. That cortisol plays a huge role in the dynamics of the gut.

It leads to changes in permeability. It leads to changes in the levels of bacteria, the ratios of bacteria in the gut. It can lead to overgrowth of things that are not helpful. Things like yeast. It also stimulates immune cells that leads to increased cytokine

production, which then feeds back to the gut leading to further damage from inflammation, and also is detrimental, as I mentioned earlier, to brain health.

So there's a lot of what we call crosstalk. The gut is talking to the brain. And vice versa, the brain is always talking to the gut. There's a special nerve called the vagus nerve that has outflow to the gut and receptor function, as well, bringing information back from the gut moment to moment to inform the brain as to, "Hey, what's going on down there?"

So, again, what's going on down there is there is this vast universe of bacteria that are making chemicals. They're making vitamins. They're making neurochemistry. They're detoxifying some of the things that we've consumed. Their making short-chain fatty acids, which we use for fuel by breaking down of the fiber in implants, for example. There's so much going on that we're just beginning to understand that play the most fundamental role in total body health.

So this turns out to be, I think, the biggest revolution in medicine. And that is that we've come full circle to recognizing that we're not the center of the universe anymore, that we share this body with bacteria that outnumber ourselves ten to one. And we need them much more than they need us. So it's time that we respect the microbiome.

James: Yeah, that's so huge! So given that you're in this world and so forth, what are your thoughts on the evolution of medicine? Obviously, your journal is coming out tomorrow and there's a lot of excitement about that.

But you mentioned something earlier, which I think is so crucial, is that this science is out that. And physicians aren't finding it because it's not something that is easily marketable into other drugs, which is how the majority of science gets to the brain of the physician is because it's put there by someone that benefits.

In the evolution of medicine, how will doctors understand what is commercial information versus what is the right information for having a leveraged effect on their patients?

Dr. Perlmutter: Well, that's—no pun intended—that's a million-dollar question. And money talks. And it talks very, very loudly in healthcare. When I see, for example, that the current administration has decided to dedicate $300 million to help find a cure for Alzheimer's disease, I rejected that. I wrote an op-ed about that. I don't think it's a bad idea. But I think that we know how to prevent the disease today, not find a cure for a disease ten years from now to cure a disease that we can prevent right now in a non-

monetizable way by giving people the information of how they should live their lives in terms of the food that they eat and the exercise that they get. But no one's interested in that. No pharmaceutical company would have any interest in that. In fact, quite the opposite.

So I think my mission here is to light the single candle and not curse the darkness. Although, I guess I curse the darkness a little bit from time to time. But that said, the mission here is to hope that enough physicians and other healthcare providers will listen. And if that's one percent, that's plenty. It doesn't take that many to catalyze a huge seachange in this paradigm.

And I think the other side is that results will speak, as well. When the results come in where people who've done X and Y have noted improvement…For the first time in interventional trial, the Pyramid Study was published in January of this year, demonstrated that people with cognitive issues who changed their diets and adopted a high-fat low-carb diet actually had improvement in cognitive function. That's an interventional trial. That's pretty darn exciting. That's really also something for the skeptics to take a close look at.

So that said. We're going to stay in the batter's box. And we're going to keep waiting for that perfect pitch. And we're here to stay. And at the end of the day, we will see what people decide to respond to. But I can tell you from personal experience based upon what I write on the internet, the books that I write, the lectures that I give, there is a growing number of individuals who are embracing this notion and are ready to take back their health when they have this information.

James: Yeah, it's amazing. And even for the doctors who are listening to this, it seems like we're that much on the front end of this revolution or evolution of medicine that even if you were a completely allopathic neurologist listening to this for the first time, if you were to make the switch today to being the holistic neurologist in your community, you would be busy with as many patients as you can handle for the rest of your time. And you'd have a much more satisfying experience helping people with preventing these kind of issues and the potential for education.

So for those physicians who are listening, I would venture that you're still early enough in the paradigm to switch to doing more of an integrative model and be a financial success. Because I think some of those fears are what stops people from moving across to doing integrative neurology. Yes, it's the thoughts of your peers and so forth. But it's

also, “Will I have enough patients who want this kind of content?” And just by the way that your book has sold and the PBS, it’s clear that people want this type of care, right?

Dr. Perlmutter: Well, I’m going to have to disagree with you because I don't think that the way standard medicine is set up in America is conducive to this type of approach. In other words, how medicine is set up is fifteen minutes in and out. And that’s how insurance remuneration and Medicare remuneration is geared at come up with a diagnostic code. Submit that diagnostic code. And you’ll get paid.

And what physicians are up against is the necessity of rapid put through. And by its nature, it precludes the very type of interaction that you're describing, where the doctor does have this interaction looking at lifestyle issues. There is no remuneration for that. It’s write a prescription. Order a test or two. Next patient.

So I am disenchanted by that. There’s no incentive for doctors to really want to be involved in this unless they come out of the paradigm, which is what I did fifteen years ago. I decided I wasn’t going to play in that ballpark anymore. And in that regard, then you're able to spend wonderful quality time with your patients and get paid for it, make a living.

And it’s extremely satisfying because patients, their eyebrows go up when they hear what you have to say. And they feel so empowered. And at the end of the day, you’re not burned out. You’re thrilled just looking forward to doing an interview like this! It’s a very, very exciting way of looking at it.

James: Absolutely. And I guess what I was referring to is jumping out of the system altogether. And, actually, that’s one of the things that we’re going to cover this weekend with Dr. Jeff Gladd, who has built a very successful cash-only functional and integrative medicine practice in a poor rural zip code with, by his own admission, a not very intelligent local community. He’s been able to thrive and do this.

And so that was more of my point is that the opportunity to be able to skip out of the system and still be able to add value to the communities. We’re even seeing doctors innovating with things like group visits and telemedicine to make this the kind of care where you could spend a lot of time with people—affordable to most people in the community.

And I think it’s, hopefully, examples like Dr. Gladd that will encourage doctors to make the shift business-wise. If the clinical information that yourself and other doctors have

shared isn't reason enough, there's other practical models that are popping up everywhere.

So doc, it's been great to share this hour with you. And I really appreciate your work and continuing dedication to neurology, neurodegenerative diseases. It is such a massive issue and financially, clinically or otherwise.

Just as a final thought. This conference is called The Evolution of Medicine. It's an amazing week for you with your conference and your journal and your book. At this moment when you have to think about the evolution of medicine—and you're speaking to physicians right now—what are your thoughts on the evolution of medicine? And what would you like to share with all of them?

Dr. Perlmutter: I'd say that they ought to consider their excitement when they got accepted into medical school. And they started medical school and that altruistic sense of wanting to do the right thing in moving forward. And recognize that here is a second chance to have a profoundly fulfilling career to do a heck of a lot more good and to really be on the leading edge, be open to the leading edge, be on that leading edge. And recognize that these are going to be the most powerful tools in your toolbox. And to be your own person. I think that's what I would say.

James: Well, I think that's an incredibly empowering message to physicians. And it's been so great, actually, because I've asked this question to every one throughout this summit. And everyone's come up with a very different answer. And it's all melding together to really provide a clear message to medicine that medicine is not going to be without patients. We're going to have to engage patients into the process if we want to reverse. And we want to get a handle on chronic disease. And I really appreciate all of your efforts ongoing to do that.

Dr. Perlmutter, where are places where people can find all of these resources, your books, the journal, and the conference just before we leave of for today?

Dr. Perlmutter: Sure. My book is *Grain Brain*. And that's available everywhere. The new book that's coming out this week is *The Grain Brain Cookbook*.

And I think the best place for people to go would be DrPerlmutter.com. All of the references that I mentioned today and then thousands more are on that site. Not just the abstracts, but as many PDFs as we're allowed to put on there. That's a great resource.

And as far as conferences go, all the conferences are listed in the conference section of DrPerlmutter.com.

James: That's a great resource.

Dr. Perlmutter, thanks so much for your time this evening. This has been The Evolution of Medicine Summit. This is your host, James Maskell. This has been the doctor portion of the summit. And we will see you next time!

Dr. Perlmutter: Thanks, James!