# Discover Diabetes' Impact On Brain Health Transcript

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## Introduction and Guest Background

Hello. Welcome to another episode of Reversing Type 2 Diabetes Summit 2.0. I'm your I am your co-host. Dr. Will Hsu today I'm so it's such a high pleasure such a great pleasure to have Dr. Heather Sandison here with us today to talk about the relationship between a diabetes Type 2 diabetes and also brain health.

And Dr. Sandison, welcome to the show. Thank you so much for having me, Dr. Hsu. Yeah, and this this is I often ask my speaker to introduce themselves.

I think that's the best way for us to get to know you. So could you do that for us? Yeah. So I'm a naturopathic doctor and I've had the privilege of training with Dr. Dale Bredesen in 2017 and after, you know, being a skeptic around what was possible for those who are suffering with dementia and Alzheimer's, I really thought there was nothing you could do until I was trained by Dr. Bredesen.

And really even after that, I thought there was nothing you could do for Alzheimer's, because I've been told that by many well-meaning instructors and really intelligent people that it was irreversible.

And yet, after putting Dr. Bredesen's protocol to work in my own clinic, my own naturopathic clinic, I saw people reversing even severe cognitive loss.

And through that process, I kind of developed a reputation for helping people reverse their dementia. I also hosted the Reverse Alzheimer's Summit, and we're on our fourth year this year in 2024.

And I had the privilege of conducting a clinical trial in my office. So we've got a research study that we've published in the Journal of Alzheimer's Disease, where we showed that about 74% of the time we can help people with cognitive decline improve their memory.

And we also have a residential care facility for the elderly where we do an immersive experience. And Dr. Bredesen's program. And then I have my clinical practice.

Dr. Sandison it was such a great news for people, for our listeners, and a lot of people who come to our our, our educational session here do live with type 2 diabetes or have a loved one with type 2 diabetes.

And and tell us a little bit about the link. I mean, how is it that type 2 diabetes being a metabolic disease is linked to a brain health? Yeah. So sometimes we'll hear people call Alzheimer's type three diabetes that it's actually a manifestation of diabetes that people will experience cognitive decline.

And even the misfolded proteins that are associated with the dementia and Alzheimer's will be increased through the process of excess sugar and even excess insulin in the brain.

## How Diabetes Affects Brain Health

So we can think of Alzheimer's as a resource issue where the brain basically it uses just as context. The brain uses about 20% of the energy that our body produces every day, but it only makes up 2% of our body weight.

So it's a highly resource hungry machine our brain is. And yet those resources are not available if we have something called insulin resistance, which I'm sure you talk about at length on this Summit, essentially what's happening is if over time we have too much sugar showing up in the brain, there's several mechanisms by which this depletes us of nutrients.

One is it creates insulin resistance so we don't as efficiently turn that sugar or carbohydrates into fuel, into ATP, the

fuel that our cells run on. The other thing that can happen is that the sugar can actually caramelize our cells.

The cells in our in our brain, including our neurons, but also some of the support cells. And that that caramelization leads to something called advanced glycated end products or ages, and that can reduce the ability of our neurons to function.

So we have multiple and then there's many other mechanisms, but essentially this is increasing in not only inflammation but also increasing the it's toxic in cases inflammation.

It reduces our ability to create energy. So it's both zapping a very in energy heavy organ of the energy it needed to function. And it's creating more inflammation.

So it's making us require more energy. It's astounding with the contrast that you are pointing out, the weight of the brain versus the amount of energy that uses.

I mean, it's a it's a hot it's a highly consuming organ system of our body. And it's not surprising, right, because people with type two diabetes realize that they are processes where that affects the health of the nerves.

We call the neuropathy. And many of our listeners are aware of neuropathy. Some of them are painful, some of them are painless, and yet the other part of the nervous system, which is the brain, should also be subjected to these the potential damages with elevated blood glucose and insulin resistance.

But the way you put it together was was very easy to understand, right? So the elevated blood glucose and in addition to this insulin resistance are audience has has heard a lot about the resistance.

But this is probably their first time listening to this insulin resistance of the brain. So tell us more about that. How how do people know if they have the resistance of the brain?

Well, I was really surprised to learn that any of us, regardless of our diabetes status, regardless of how high our blood sugar has been or what level our agency is at as we age, we are less efficient at using glucose for fuel in the brain.

Now, the miraculous thing about this that I think is just it blows my mind how divinely designed the body is. We essentially are hybrid beings so we can run on glucose or on ketones.

And so one of the things that we very quickly recommend for most people struggling with cognitive decline or brain fog is to switch to a ketogenic diet.

And a ketogenic diet is one strategy for type 2 diabetes as well. And what this does is metabolically we flip the switch of our metabolism. So we basically say like a hybrid.

Instead of burning gasoline, we're going to burn electricity, so we burn ketones or fat for fuel instead. And this actually burns much cleaner. What I mean by that is when we burn sugar or carbohydrates for fuel in the mitochondria to create ATP, it creates a lot of oxidative stress, it creates reactive oxygen species.

And so when we switch to burning ketones, we actually get more fuel because we don't have that insulin resistance that all of us get as we age some more than others.

Of course, if you have diabetes, it's it's probably worse. But we all experience that. So we get this other fuel that burns more efficiently and more cleanly, not creating as many reactive oxygen species.

## Ketogenic Diet and Brain Fuel

Additionally, people like Stephen Country and other scientists in the field have detailed why they're other mechanisms that are as at work as well that help to reduce inflammation in the brain.

We also find that the ketogenic diet is a detox diet, so it can help us to clean some of the toxins out of the brain, but out of other areas in the body as well.

I think there's other benefits. We recommend a ketogenic diet, but even going in the direction of fewer carbohydrates, particularly processed foods, so reducing your carbohydrates, even if you don't fully get metabolically into ketosis when you cut out processed foods and grains, we can reduce a lot of the things that cause excess inflammation in the body and in the brain.

Oh, that's a lot of information that's sort of taken a little bit more there. When you mention the ketogenic diet, it's a simpler it's a it's a easier fuel in a way for the brain to use.

Do you think the effect on the brain is mediated through weight loss or it has an independent effect on the brain function? You know, it's such a great question that you ask.

I don't know if well, actually, I think that there's multiple things that are at play. So I would not say, you know, the brain and Alzheimer's and dementia, whenever we talk about it, so many people want to say, okay, what's that one silver bullet?

It's something to tie in to your jaw, actually, Right? Yeah, hundred percent. I think whenever we try to simplify these things, it helps our brains. It it makes us feel more at ease if we have certainty.

And it's simple and it's straightforward. And yet dementia is a complex disease. It's a chronic, complex disease. And I think that that's part of why, after decades of brilliant people's time and billions of dollars, we don't have we don't have a silver bullet, What we have that we see works, both Dr. Bredesen's team and my own have have published the research showing that when we take this more acute, he thinks of it like a it's almost like you're throwing everything at it, right?

We're just doing all of it. We're throwing all of functional medicine at it. And what we get it is, is a stacking effect. So instead of taking one thing and expecting that to do all of the work of reversing something like cognitive decline, what we do is we change the diet, we add exercise, we add cognitive engagement, we add stress management, we make sure sleep is optimized and we add nutrients when needed and we treat infections.

I mean, the list is long, but we take a systematic approach at stacking interventions that optimize neuronal function. And when we do this, we see out we see miraculous outcomes.

And do you see a difference where if the ketogenic diet is implemented early in the stage, in the mid-stage, that does even work at a later stage? What's been what's been the trial results and your experience?

Yeah, so it's interesting, you know, we really recommend that people dive in fully, like if you're just dipping your toe in the water of this, we don't have as much confidence in the outcomes.

However, I haven't had a single patient who's done everything and especially done everything perfectly right. So it's really about changing the trends of your life, changing the way I think our health is made up of those small decisions that we make every day, right?

What we're going to eat, what time we go to bed, even the temperature of our bedroom. It's about how much movement we get our our interactions with other people.

You asked if maybe it was the weight loss that was having an impact on our cognitive health. We know that excess weight obesity is one of the modifiable risk factors for dementia.

We know that smoking is we know social isolation is we know blood sugar that's out of control is one of the risk factors for dementia. There are in The Lancet, a very highly reputable journal out of the UK.

They published in 2020 an updated commission report on dementia and Alzheimer's, and they listed 13 modifiable

risk factors. These are all things that we have control over, right?

There's things we don't have control over. We can't control when we were born, we can't control our sex. We know that women are two thirds of Alzheimer's patients.

They're also two thirds of caregivers for Alzheimer's patients. So we're more affected. And then we also know that chronological age is of course, this is sort of common sense.

We can't we can't change the day we were born. And as we age, we have higher risk. So what we can do is change these risk factors and diet, exercise, sleep.

Many of the things that put us at risk for diabetes are the same things that put us at risk for dementia. So you mentioned that prevention is key to many of these things.

And so early detection and early interventions are going to be key for a lot of our listeners here.

## Stacking Interventions for Cognitive Decline

Can you give us some tidbit, some insight into how do you figure out whether you're you're dealing with a memory loss issue and how do you find out definitively?

Yeah, and I wasn't trying to evade your question. You asked like, who who can we help? And especially with this ketogenic diet. So our confidence goes up if people start earlier.

So kind of tying this all together. Yes. We've seen people with severe cognitive decline get better. Yes, I have. In fact, my first patient I saw after being trained by Dr.

Bredeson was this as she was just an absolute walking miracle. I could not believe it. In fact, when I saw her come back after six weeks, she had improved so much, both measurably and in terms of her day to day experience that I thought I had done the testing wrong the first time.

And her husband assured me, No, no, she is so much better and she continued to get better. It was really an incredible experience to watch and now I've seen that over and over again.

So is it possible for people with severe cognitive decline, people who are totally dependent on others? I've watched them get better, but it's harder and that happens less commonly than people who are at those earlier stages now. Dr..

So one of the things that is so frustrating to me is that so many people are still told there's nothing you can do if you have cognitive decline. They see a neurologist and the urologist measures their cognition, takes away their driver's license, put them, puts them on medications that don't work very well, and then says come back in six or 12 months and we'll measure and see how much further it's gone.

And that to me is so maddening because it's almost overwhelming how many things we can do to improve our cognition. Now, all of this works better if you're younger and if you start earlier.

And I think that people avoid that, they cope with it, right? They find their strategies and they try to hide it and they don't tell anyone and they don't seek help because they still believe there's nothing you can do when the opposite is true.

There's so much to do. So it's important to find a doctor who's been trained by Dr. Bredeson or work with a health coach, read the books, listen to the summits, get the information so that you can start stacking these interventions.

Many of them are completely free, but the ketogenic diet and getting carbohydrates just like for diabetes, getting those complex excuse me, getting both.

But actually it's both complex and simple carbohydrates, all the carbohydrates, mostly out of your diet is one of the big things that we can do to go in the direction of optimal cognitive function.

In fact, I have told patients that it does it at 50% of the lifetime. So if we can change diet, we often what we see is there's almost a self-perpetuating benefit.

It's like your spiral lean up, like things get better and better when you can change diet. We find that people start sleeping better. Sometimes they'll lose weight like that.

That modifiable risk factor when it comes to dementia, they optimize blood sugar, they optimize weight as they get on the ketogenic diet and then they start sleeping better, which also helps with the rinsing, the detoxifying of our brain through the lymphatic system at night.

And now they have more energy when they wake up in the morning. So they start exercising, they cook for themselves, they start having the energy to socialize.

So again, that's another modifiable risk factor when it comes to dementia is social isolation. So we start seeing this virtuous cycle where the interventions start to build on each other and people feel better and better.

So it all sounds fantastic. So does these intervention, as you mentioned, work as well in the prevention setting as well as in the therapeutic intervention?

I would say that they work even better in the prevention setting because it's just such an easier lift. And so we highly recommend prevention is so much easier than reversal, and yet it's harder to prove prevention.

And so that's why we focused our our research on that reversal stage. So what we did, we were funded a scale so grateful we were funded for a trial in 2019 and we started recruiting in 2020.

We wrapped up data collection in 2022. We took 23 participants through a six month intervention, which is Dr. Pedersen's approach, and part of that was an organic ketogenic diet and we saw the people who had higher levels of A1, CS and higher blood sugars normalized.

We often see that people who have diabetes who get on our program actually who have hypertension, obesity and diabetes, they are able to come off of medications.

We see a lot of that normalize and even antidepressants. So that organic ketogenic diet was a big component of the trial, but it wasn't the only thing we did.

Supplements. We treated infections, we did bioidentical hormone replacement. We had people exercise more. We treated sleep apnea among a litany of other things that are available in that paper or just reading doctor reticence books.

But after six months, what we saw is that 17 of those 23 participants improved their cognitive decline. They all started with measurable cognitive decline.

We measure it on a 30 point scale.

## Prevention, Early Detection, and Reversal

It's a MOCA or the Montreal Cognitive Assessment. There are other 30 point scales you may have heard of the Slums test or the many mental status exam.

So there's a handful of ways that we can test cognitive status. We also use the Cambridge Brain Sciences battery of testing. So we didn't we didn't just use the clinical Toby's research tool as well.

But what we saw is that memory and cognition they started, we used MOCA scores between 12 and 23. So all of them had measurable cognitive decline when they started.

And then we saw a statistically significant increase across the mean of all the participants after six months with our intervention. Sounds really promising.

Of our listeners have a particular concern because many of them are on diabetes medicine, their insulin. So I just wanted to make sure we address that.

Do you should do this under the supervision of a clinician that could prescribe and manage the diabetes medicine otherwise, because kids genic diet is an effective intervention, the chances are that you're going to go hypoglycemic.

You know, you might experience low blood sugar if the medication is not adjusted well. Would you like to address that a little bit? Yeah, that's absolutely correct. Yeah.

So we have a residential care facility for the elderly and we have people move in there and we often see we keep very close tabs on their blood sugar and insulin and if they're on metformin or any of those other antihypertensives antidepressants, as we mentioned, because what we see is they often need less of those medications and that if they don't have a responsive clinician who's there to adjust those medication levels, then they can easily and quickly become overmedicated.

So this is not something you want to do without a doctor on your team. And typically we recommend, you know, working with a naturopathy like myself or a functional medicine train provider who is expecting this and knows how to do it.

Sometimes we'll see that in the conventional settings, they're not expecting it and they're not prepared and they don't quite know what to do. And although that's not true across the board, you just want to make sure you're talking to somebody who's willing to have these conversations with you and see you regularly enough and test regularly enough that this isn't doesn't get missed.

I'm the first to admit, as a conventionally trained physician, that that we're often skeptics of nutrition interventions that promises to sky and but the the the work that we're doing through the fast American diet right now with nutrition and that diabetes program we're putting together for diabetes remission, it is such a innovative intervention, much like the work you are doing right now through this ketogenic diet.

And I think food is medicine is a true movement that will change the face of many of the management disease programs around the country, if not around the world.

So so I salute you for being sort of the pioneer in this space. Right back at you, because, you know, we have struggled with one of the biggest components of Dr.

Madison's approach is this ketogenic diet. And it's hard. It is not an easy thing to change your diet when you have full cognitive capacity, let alone when you have declining cognitive capacity for whatever reason, whether it's dementia, brain fog or other other, you know, diabetes.

And it sometimes people notice their brain just doesn't work the way it used to. And so changing your diet, shopping differently, cooking differently, just cooking, right?

Many people are used to relying on convenience foods. What's quick and fast food and what's easy. It often comes in packages packed with carbohydrates, simple carbohydrates and through nutrition for longevity.

One of the businesses under al-Nusra, they've partnered with Dr. Reticence Group at Apollo. And you guys do a meal delivery service that has made this so much easier from here of the patients we work with.

So thank you. Thank you for what you are doing. We are so grateful that accessibility and the ease of changing your diet has really changed with with what you guys have offered.

You mentioned this, this adherence issue and especially for family members. A lot of times they feel like, oh, I should not be restricting their choices because, I mean, they're losing their mental function.

You should not deprive them of the joy in their lives. How do you address that? Yeah, you know, this isn't for everyone. And there are many families and many dynamic.

It's great. I think a lot of your listeners can probably relate, right? There's there's multiple people involved in the care of this person. And one person is going, Oh, that's quackery.

That's just crazy. Why would we try that? Oh, that's too expensive or it's too time consuming, or there's any number of reasons they're going to lose too much weight or there's any number of things that come up.

## Medication, Safety, and Combining Approaches

And this I, I often will tell families, you know, if you're going to ruin relationships because you've decided that this is the right way, then walk away like this is and don't don't don't create more problems than we're solving.

Right. And yet, you know, through through like nutrition for longevity, making it easier, making it more less expensive, making it more accessible. These things make it, I think, worth the experiment.

And that's often how I approach it is Let's just see what happens. Let's try and let's see how you feel. But I don't want anyone to ever feel forced into it.

And it's okay to make that decision that, Hey, mom or dad, they're in a spot where they enjoy their chocolate and they enjoy their pizza with the grandkids.

And if that's really valuable, that's okay too. There's space for all of it. My one big opinion here is that everyone should know that there's an option.

No one should be told there's nothing you can do. You do have choices and everyone has a choice about what they put in their in their mouths. And so that gives us a lot that's empowering.

And so if you want to choose something different, you can, but you don't have to. That's so empowering to to know that there are alternatives because we are led to believe that there's only one way.

In fact, the medication that's being prescribed right now really hardly do anything to to improve cognitive. They don't improve cognitive function. So some of our listeners may be asking the question, you know, it's it's hard to go wow when go down one way and at the exclusion of others.

Is there room where both therapeutic approaches can be deployed here in people with cognitive dysfunction? They're getting on these drugs. But at the same time, Kit, you know, being on a nutritional pathway, are they contradictory?

Are they are they the positive of one another? Are they synergistic? Yeah. So, you know, one thing I want to be clear about the ketogenic diet. I don't recommend anyone in ketosis forever with cognitive decline.

I recommend people get into ketosis for 3 to 6 months and then go back and forth between a ketogenic diet and having plenty of carbohydrates. There are about a third of your of your diet being carbohydrates when you're not in ketosis.

And I recommend backing off of the animal proteins when you're having more of the carbohydrates. So something like a Whole30 diet and a ketogenic diet and going back and forth or a paleo diet and a ketogenic diet and having

lots and lots excuse me, lots and lots and lots of veggies.

Now in terms of combining a conventional approach with a more of a reticent approach, a functional medicine approach, what I would say is look closely at what the conventional medicine is, is offering because antihypertensives make a lot of sense that can help prevent vascular dementia.

You know, that makes a ton of sense. Modulating your blood sugar with something like metformin or potentially insulin if needed. That makes a lot of sense.

You want to manage your blood sugar and your blood pressure. However, when we started looking at the dementia specific medications, things like Memantine or Donepezil, these medications, the Journal of the American, a JAMA, the Journal of the American Medical Association, published in I think it was December of 2018, they showed that dementia patients who started one or both of those medications, five years later had worse cognition than those who had never started.

And so sometimes people will notice they'll have a bump in cognition for the first few months. But over five years, those are not beneficial. They can be detrimental.

And so, you know, having that conversation with your doctor and hopefully, you know, whoever is considering taking them, they still have the cognitive capacity to evaluate that risk.

I think that's worth doing. Now, when we talk about the new medications, are the the can be is the way and or we can't IMDB is the one that's covered by insurance and has been FDA approved most recently.

What that does is it slows the rate of decline. So you do not get do not expect an improvement in the condition. What you get is a lengthening of this torturous process.

So you definitely want to discuss with your family if that makes sense for you. The other thing that comes with that medication is that you need to be relatively close to a major medical center because you need to be evaluated and monitored for something called Arias.

These are the changes in your brain that can be side effects of the the antibody therapies. So this can include brain swelling and brain bleeding. And although this happens relatively rarely, you do need to be monitored.

So that means that you need to be seen, the doctors, to make sure that that's not happening. So you need the imaging to assess the safety of the medication for you so they don't make anything better.

They make things worse more slowly, and you need to have the medical management. So you need to be ready to go to the doctors pretty regularly to be having, you know, all of that management happening.

And so when we look at at combining these, what I imagine in the future is that the monoclonal antibodies, what they're doing is they're getting rid of the misfolded proteins.

Now from a Bredesen perspective, from a functional medicine perspective, those misfolded proteins are a symptom. They are a downstream effect of a cause that came first.

And our goal is to identify the cause and eliminate the cause of that inflammatory cascade. So those are things like toxicity, which we know blood sugar can become toxic.

## Root Causes and Closing Advice

Things like metals or, or mycotoxins bio toxins or chemical toxins that are known neurotoxins. When we can get rid of those, when we can get rid of infections that we know affect the brain, things like PE gingivalis that causes gingivitis in the teeth, things like Lyme or Lyme co-infections, of course COVID.

If we can prevent that and keep that minimized in terms of the cytokines that it produces, that can then trigger an inflammatory cascade herpes outbreak.

So if you're someone who's prone to herpes outbreaks aggressively treating those and preventing them as much as you can, that that has been found in the beta amyloid plaques.

These plaques are antimicrobial. They are produced to prevent things from getting worse in the brain, and they're there to protect us. And so if we can stop whatever's upstream creating the inflammation, then we aren't as likely to form those plaques.

So what I can see in the future is those two medications complement each other. But our functional medicine approach, getting rid of the why for why that cascade starts in the first place, and then those antibody, the excuse me, the monoclonal antibodies coming in and then getting rid of the damage that had been done, the structural damage that had been done.

And then hopefully we have everything we need to regenerate and get our healthy brains back. Okay. So this is so inspiring for me. I've been doing several interviews now and people come in from different backgrounds and and I think the over arching theme is treating the root cause of conditions, right?

So that's very much the the central tenet of functional medicine. It's truly my hope that one day all the treatments will be addressing the root cause that we no longer talk about conventional medicine and functional medicine, but just good medicine, period.

And this is what we ought to be doing. You know, not only treating the symptoms as symptoms, you know, they are troublesome. We want to address the symptoms, but also reverse the true the root cause of these conditions.

So, so inspiring, so helpful. Lots of information. Dr. Sandison. And so before we close, what would you would you like to say to our our listeners, if there is that pearl of wisdom for our listeners, we're mostly people with type 2 diabetes and they, they the reason they listen is because they want to be empowered. And what would you say to them in terms about their cognitive and about their brain health?

Well, while it's not your fault, we live in a society that is designed the food system is messed up. The insurance system admits that the medical system is misguided.

And so it's not your fault if you feel frustrated. And the most impactful things on your health are what you eat every day, how well you sleep, how much you move.

And so those things are entirely within your control. And so the more that you can optimize exercise, diet and sleep and stress management, then the more the healthier you're going to be, the longer you're going to live and the healthier you're going to live.

And so even though there's a lot outside of our control, focus on those things that you can control. Listen to the summit. You know, take the pearls of wisdom, do the things you can and just get started.

Dr. Heather Sandison, fantastic Summit speaking engagement with us today. Where do people find you All listeners want to learn more about about what you have to offer. Sure, thanks.

Yeah. drheathersandison.com is where you can find out more. I've got a book called Reversing Alzheimer's coming out with HarperCollins in June of 2024, so you can learn lots about how you can do this at home through that and we've also got a residential care facility, a clinical practice, and then online coaching programs.

Thank you. Thank you very much. Dr. Sandison. Such a pleasure.