



ALZHEIMER'S

THE SCIENCE OF PREVENTION

Episode 6: Eating To Prevent Alzheimer's



- David Perlmutter, MD: When it comes to food, it's easy to write off our choices as unimportant, but the food we choose to eat is one of the most significant decisions we make. Food is far more important than just fuel. It is information. Food directly communicates with our bodies, our brains, and even our DNA. It very clearly determines whether we lead lives of vibrant health or suffer from chronic diseases.
- David Perlmutter, MD: When it comes to our cognitive health, the food we eat influences both the actual structure of our brains and how well they work.
- David Perlmutter, MD: Our food choices can therefore be a powerful weapon to help fend off Alzheimer's or a quick route to a poorly functioning brain. Eating the right foods and avoiding the wrong foods can make all the difference.
- David Perlmutter, MD: In this episode, we're going to cover the connection between diet and brain health. We'll find out how to eat right in order to thrive with a healthy body and a healthy brain, and we'll see how a healthy diet can help prevent Alzheimer's disease.
- David Perlmutter, MD: I'm Dr. David Perlmutter and this is Alzheimer's - The Science of Prevention.
- David Perlmutter, MD: In previous episodes, we've learned that not only is Alzheimer's on the rise, but it is in fact a disease for which there is no meaningful treatment. More importantly, we've discovered the empowering notion that, in many cases, our genes are not our destiny. And this is important truth absolutely applies when it comes to Alzheimer's disease.
- David Perlmutter, MD: We've already introduced some of the important tools available to you to reduce your risk, such as engaging in exercise, avoiding various toxins in the environment, getting better sleep, and doing your best to reduce your risk for type two diabetes.
- David Perlmutter, MD: We've also learned about the detrimental effects of inflammation and the importance of minimizing it when it comes to brain health. Recent science has revealed that our diets play a direct role in determining levels of inflammation in the human body.
- David Perlmutter, MD: And as we will see in this episode, our modern Western diet can dramatically increase inflammation. When we eat lots of

processed foods like refined carbohydrates and sugars and don't eat enough healthy fiber and fats, our bodies and our brains pay a hefty price.

David Perlmutter, MD:

Unfortunately, most Americans are in fact consuming this very diet on a daily basis. This is a major issue when it comes to Alzheimer's disease.

David Ludwig, MD:

The problem today is that so many people base their diet on industrially prepared foods, which have the worst of almost every imaginable dietary component. When we process carbohydrates, we pull out the starch, which is just sugar in a long chain, and we pull out the sugar itself, we eliminate the fiber, we throw away these precious micronutrients and phytochemicals. We get the worst of all possibilities. That puts a big stress on our metabolism.

David Ludwig, MD:

Over time, this highly processed diet takes a toll, leads to, over time, rising insulin resistance, chronic inflammation, and then for too many people, development of type 2 diabetes, which we know about, and type 3 diabetes, which affect the brain, and sets the stage for Alzheimer's.

Max Lugavere:

We start our mornings with a glass of orange juice and a bowl of oatmeal, we have a granola bar to hold us over between breakfast and lunch because we're starving in between breakfast and lunch because of the high glycemic carbs that we ate just after waking up, and then at lunch, we're eating either the sandwich or the wrap or the rice bowl. And then in between then and dinner, we have that late afternoon coffee filled with sugar to keep our energy levels up, perhaps some modern cultivated fruit like a super starchy banana, another granola bar or a cookie perhaps.

Max Lugavere:

And then for dinner, we go all out on the pasta, maybe another rice bowl, a sandwich or even foods that don't seem quite as starchy like barbecue, which is a high protein food. But we slather it in sauces today made with high fructose corn syrup. So it's just like we're being inundated at every minute of the day with high-glycemic sugars and carbohydrates, and that keeps that ancient hormone, insulin, chronically elevated throughout the day. It's a growth hormone, so it contributes to adiposity, which is the scientific term for fatness. But it also might wreak havoc on the brain, contributing to brain insulin resistance, which is now considered one of the hallmarks of Alzheimer's disease.

Georgia Ede, MD:

The two signature ingredients of a modern diet that cause inflammation are the refined carbohydrates, sugar, flour, processed cereal, foods and fruit juices, things like that and the refined vegetable oils, soy beans, sunflower oil, etc. Both of those are very powerful promoters of inflammation and those ingredients are in almost every processed food in the grocery store.

Georgia Ede, MD:

For most of us, we have grown up with a very unhealthy relationship to food, it's because our food environment, the kinds of food we've been surrounded with, that we've been told are good for us, or that we haven't realized we needed to worry about. Those foods create unhealthy patterns inside of us, in our brains and our body so they, normally they damage our metabolism, but some of them are very addictive. The refined carbohydrates are incredibly addictive. So it's really hard to stop eating those but it's really important. It's really like trying to break a serious addiction in many cases. Sugar has been found to be as addictive as cocaine, so it's not an easy thing to do. A lot of people simply can't stop cold turkey without support and education and trying more than once.

Leo Galland, MD:

My favorite research...is research that was done at the Weizmann Institute in Israel and it relates to the problem of obesity and yo-yo dieting.

Leo Galland, MD:

Once you start, you go on to diet. If you're overweight, you go on a diet, you lose weight. You go off the diet, you gain the weight back.

Leo Galland, MD:

Next time you try to do it or maybe the third or the fifth time or the 10th time that you do it, it just gets harder and harder to lose the weight. That's yo-yo dieting. You keep ratcheting up. Each time you go off the diet you gain more weight, it gets harder to lose it.

Leo Galland, MD:

A big problem in the industrialized world is that people have lost their taste for the nuances in food.

Leo Galland, MD:

We are so overwhelmed by the sugar and the salt and fat that is added to food that that's about all we can taste in the food.

Leo Galland, MD:

It's kind of like you're so used to listening to heavy metal that when you hear a string quartet you don't hear anything. That's the effect of the western diet on our taste buds.



- David Perlmutter, MD: This type of poor diet is directly associated with Alzheimer's, but how exactly might our food choices contribute to our risk for this disease?
- David Perlmutter, MD: Let's take a deeper look into the mechanisms underlying how a poor diet can be so harmful and also how eating a healthful diet can be so healing for the brain.
- David Perlmutter, MD: To understand why diet is so critical for the brain and its function, there are a few main concepts that you need to understand. Among the most important of these ideas is the way in which different carbohydrates and fats affect the brain. When it comes to carbohydrates or carbs, we know that it is not only important to be intentional about the amount of carbs we consume, it turns out that it is the type of carbs that we eat that really matters more in terms of brain health and function. Rapidly digested simple carbs have a profound effect on blood sugar, and nutrition researchers have actually devised a way to measure how rapidly a particular food raises blood sugar.
- David Perlmutter, MD: This is called the glycemic index. Foods that cause a rapid rise in blood sugar, such as white bread and sodas, have a very high glycemic index. For good health, we want to prioritize foods that have a much lower glycemic index because they are digested more slowly and therefore keep blood sugar levels steadier.
- David Perlmutter, MD: A great example of low glycemic index carbs is above ground leafy vegetables.
- David Perlmutter, MD: And in addition to determining how rapidly foods raise blood sugar, researchers have also devised a way to measure the overall impact that foods have on blood sugar over time. This is called the glycemic load. Glycemic load incorporates the glycemic index, but also factors in the amount of carbohydrates in food to give you a better sense as to how a particular meal will affect your blood sugar. So, knowing the glycemic index and the glycemic load of a food can be a great way to know how a food is going to affect your blood sugar.
- David Perlmutter, MD: To keep these things simple, we want to be consuming foods that have a low glycemic index and a low glycemic load. Foods that are low on the glycemic index and glycemic load scale are also good for our microbiomes, the collection of microbes and their genetic material that live within our bodies, which is



closely tied to the health of our brain, and indeed, our entire bodies.

David Perlmutter, MD:

We will learn much more about this fascinating connection between our microbiomes and our brains in episode seven. But for now, let's take a deep dive and learn how diets high in sugar and simple carbohydrates are really bad for the brain.

Ayesha Sherzai, MD:

So when we eat refined sugars, say in sodas or in baked goods, or in the form of just simple sugar on the table that we add in everything. Everything has sugar. When we avoid that, we actually avoid these incredible rapid spikes in the amount of glucose that enters into our circulation. Everybody tries to vilify carbs, but there are good carbs. There's a difference between carbs. There are good carbs, and then there are bad carbs. Good carbs are the complex carbohydrates that are bound with fiber, that are bound with micronutrients in your guts, and it's slowly, incredibly slowly releases a steady flow of glucose. Those are the low glycemic kind of foods.

Ayesha Sherzai, MD:

The high glycemic kind of foods are the simple sugars and the processed foods like sodas and donuts, that rapidly goes up into circulation, and the body goes into a frenzy, and the brain doesn't know how to use it. That's what develops a lot of inflammation in the brain. It causes the production of a lot of oxidative byproducts. These are like acid and damage the walls of the cells, the walls of the arteries, and so there's a lot of dysfunction in the brain. And what does that represent? It represents itself as foggiess, not being able to remember things very well, lack of coordination.

Ayesha Sherzai, MD:

And over a long period of time, it actually causes damage the brain cells into the arteries. That brings us to the point where people develop vascular dementia, they develop strokes where half of your body's paralyzed or you can't see or you can speak. It's not magical. It's these incremental amount of simple sugars that continue to cause damage to the arteries in the brain and it completely disrupts the normal functioning of the brain.

David Ludwig, MD:

A major determinant of chronic disease risk at any body weight is the amount and type of carbohydrates. Not all carbohydrates are bad. Some digest slowly, contain many protective plant substances, including fiber, which will be good for the microbiome of the gut.

- David Ludwig, MD: By far and away the greatest risk factor for type 2 diabetes is obesity...the most important dietary factors relating to type 2 diabetes risk is the processed carbohydrates in our diet now, not just added sugar, but white bread, white rice, potato products, and what's the mechanism there?
- David Ludwig, MD: The more processed carbohydrates we eat, the higher the insulin levels in the body go, and insulin itself can cause insulin resistance and metabolic dysfunction, but closely related to that is chronic inflammation.
- Georgia Ede, MD: If you eat too many of the wrong sugars too often, the refined carbohydrates like processed sugar, flour, fruit juice, processed cereal products, those cause very big blood sugar spikes and crashes throughout the day, not just in the body, but also in the brain. So you definitely want to avoid those refined carbohydrates and they're in pretty much every food product in the grocery store, even some of that we think of as healthy, like energy bars.
- Leo Galland, MD: The foods that tend to provoke inflammation start with sugar and with a concept called glycemic load.
- Leo Galland, MD: The glycemic index of a food is the likelihood that that food is going to raise your blood sugar.
- Leo Galland, MD: Glycemia or glycemic refers to an increase in blood sugar after eating a meal. The total load of foods that raise blood sugar, which is glycemic load for any meal, that is strongly associated with an increase in inflammation in the body.
- Amy Berger, MS, CNS: High carbohydrate diets can contribute to weight gain for a number of reasons, but mainly by jacking up the hormone insulin and keeping it elevated especially chronically. One of insulin's primary roles is inhibiting lipolysis, inhibiting the breakdown of fat. If you want to lose body fat and you have chronically high insulin, you cannot release fat from the fat cells. That's what insulin does, it's like a security guard that stands outside that fat cell and keeps the fat in. That's how it hinders weight loss. How it can contribute to weight gain is that it's a storage hormone.
- Amy Berger, MS, CNS: Carbohydrate affects blood glucose, and insulin tends to respond to the blood glucose level, so when we eat a lot of carbs, it raises the blood sugar and the insulin.

David Perlmutter, MD:

Now, we understand how sugar and high glycemic foods cause inflammation, which increases our risk for Alzheimer's disease. And knowing this, many people instead opt for artificial sweeteners, but these are not the answer, I assure you. And as we will explore in more detail in episode 11, these sweeteners can actually be incredibly damaging to our microbiomes and have been associated not only with weight gain, but with increased risk for type two diabetes.

David Perlmutter, MD:

As such, I strongly recommend that you do your very best to avoid these artificial sweeteners.

David Perlmutter, MD:

We've covered the essential information you need to know about carbohydrates.

David Perlmutter, MD:

Now let's turn to fats. Just like when we were discussing carbohydrates, we know that it is not only important to be intentional about the amount of fat that we consume, but perhaps more importantly the type of fats that we eat, since both of these things are critical.

David Perlmutter, MD:

Let's find out why.

David Perlmutter, MD:

You've talked quite a bit about dietary fat. In fact, you wrote a book called Eat Fat, Get Thin, and you really indicate that to a significant degree. Some of our illnesses including Alzheimer's has to do with the type of fat that we are consuming. Can you explain that?

Mark Hyman, MD:

Absolutely. When people say you're a fat head, that's actually true and we know that certain fats are really beneficial for the brain. For example, Omega three fats are critical for the chemical transmissions that happen for regulating inflammation, for developing brain function and help activate all these healing mechanisms in the brain. We know that saturated fat may be very stabilizing because it's a very stable fat that makes up cell membranes and it makes them less likely to be injured. And we know, for example, that people who consume higher levels of saturated fat have much lower risk of stroke, for example, so we know that this boogie man of saturated fat may not be the boogie man when it comes to the brain, even in the heart, it turns out it's not that there's a diet is good for your heart, it's bad for your brain and vice versa. There is actually a way of eating that's good for all of your body's systems.

- David Perlmutter, MD: To be clear, if diabetes and obesity are strongly related to Alzheimer's risk, and those two things are related to our dietary choices, as one example, then our dietary choices strongly relate to our risk for Alzheimer's.
- Dale Bredeesen, MD: Absolutely, and there are, of course, other factors that play into this, but arguably, the most important of all is dietary choices.
- Dale Bredeesen, MD: You want to have, whether you use oil, whatever you like to do, you want to get good fats from avocado, from polyunsaturated oils, and things like that to give you the appropriate fuel for your brain.
- Georgia Ede, MD: The oils and fats that people should generally avoid for brain health are the unnatural ones. So all of the vegetable oils which you would never find in nature if you're just walking around the world, they don't exist, they have to be manufactured in a factory. Think how much processing needs to go in to turning a pile of canola beans into a bottle of oil. The natural fats that exist in the world as is are the animal fats believe it or not. The fats from the fruits of plants, so avocado oil, olive oil, palm fruit oil, coconut oil, these types of oils you would come across in nature. So those are the ones believe it or not, the animal fats and the plant fats, even the saturated plant fats like coconut oil, those are the healthiest for the brain.
- David Perlmutter, MD: Trans fats are another problematic but common component of the Western diet that we all need to avoid. These trans fats are unnatural, they are processed fats that trigger inflammation in the body and in the brain. Trans fats are becoming less and less common, gratefully, in our food system, but we still need to be vigilant about avoiding them.
- David Perlmutter, MD: It's simple, really. When we eat healthy fats, our brains are getting an incredibly healthful source of fuel.
- David Perlmutter, MD: A brain smart diet starts with eating the right types and amounts of carbs and fats.
- David Perlmutter, MD: The right types of carbs are the unprocessed, low-glycemic fibrous carbs like leafy greens, asparagus, and low sugar fruits like berries. The right type of fats are the naturally occurring fats like avocados, olives, and olive oil, nuts and seeds, as well as specific types of fatty fish, Grass-fed meat can also provide some good fats if you choose to eat animal products.



- David Perlmutter, MD: In addition to eating the right types of carbs and fats, let's look at other ways we can improve our diets to help prevent Alzheimer's disease.
- David Perlmutter, MD: There are a lot of practical steps you can take to start eating a healthier diet today. Remember all of the wonderful benefits of eating a healthy diet such as keeping inflammation low, insulin levels steady, and energy levels constant, can all play a role in helping to prevent Alzheimer's disease.
- David Perlmutter, MD: Let's review the best way to eat for brain health so that you can take action today.
- Leo Galland, MD: First dietary intervention is just cut out all the junk food, cut out so much of what makes the American diet the standard American diet. Go to fresh whole foods, vegetables, fruits and then good sources of protein but stay away from the snacks and the processed foods. That's just the first step. That's not going to get you all the way to where you need to go for optimal health but it is a foundation.
- Leo Galland, MD: An ideal plate will vary depending on whether your diet is vegan, lacto-ovo vegetarian, Paleo. There's not one ideal plate but it will always include vegetables and in terms of the volume, about twice as much vegetables is everything else.
- Leo Galland, MD: Characteristics of that diet are that it should be dense in nutrients and very low in what we'll call empty calories, added sugar, added fat, foods that supply calories without nutrients or foods that tend to raise blood sugar.
- Leo Galland, MD: Vegetables, fruits, diets that are high in bioflavonoids and carotenoids, those are plant-derived chemicals often very colorful. They make your diet colorful. Those have well-documented antiinflammatory effects.
- Max Lugavere: You want to feed your brain the nutrients that it needs to again, grow new brain cells, healthy new brain cells, and also fend off from the many insults thrown at it by the modern world. So, cruciferous vegetables, dark leafy greens, low sugar fruits like avocados and berries. These are some of the healthiest foods that are available in your supermarket. Grass fed beef, eggs.
- Lisa Mosconi, PhD: Water is really important for brain health and that's because really the brain is 80% water. Whenever you look on the

internet, you'll get that the brain is 50% fat and 50% protein and this and that but in reality, a brain that is alive is 80% water. If you take the water out that yes, there's there's 50% fat, but a real brain is mostly water, and that's really important because every single chemical reaction that takes place inside the brain needs water to occur. Energy production, synthesis of neurotransmitters, literally anything that takes place inside the brain needs water is a substrate. And that means that the brain is the organ that is most sensitive to dehydration. So even minimal dehydration like a 2% water loss in the brain can really trigger neurological symptoms like brain fog, dizziness, confusion, memory slippage and brain scans show that there's also brain shrinkage associated with dehydration that can be easily reversed by just drinking more water.

Lisa Mosconi, PhD:

Usually, my number one tip for a healthy brain in terms of foods to eat or avoid is to just avoid processed food. Really processed foods should not be part of anybody's diet for anybody who's concerned about Alzheimer's prevention.

David Ludwig, MD:

We want to start with diet, and the place to do that is by reducing the processed carbohydrates that flooded our diet during the low-fat years, sugar, but also the refined starchy foods. Replace those fast-digesting carb calories with nutritious and delicious high-fat foods, such as nuts, nut butters, avocado, olive oil, real dark chocolate. Get an adequate amount of protein, not too much or too little, and this is going to vary based on your individual needs, which can also be from plant sources. And have an abundance of non-starchy vegetables, which you can either cook or dress with some of these high-fat foods, making it a win-win.

Ayesha Sherzai, MD:

So highly processed foods have high calorie and they're very low in nutrients that are good for the body. Calorie-dense, nutrients-sparse. It's easily available everywhere, and it's very important for people to be able to know what they look like and where they are and how to avoid them. When we eat a highly processed food, it's usually very high in simple sugars, in simple carbohydrates, in unhealthy fats, and salt. Those are the things that damage the connections between brain cells. They damage the arteries, which are the highways of how nutrients are carried to the brain. This inflammation and this oxidation and this dysregulation in glucose and fat metabolism, destroy brain cells.

Ayesha Sherzai, MD:

On the contrary, when you eat an unprocessed food, when you eat, say, unprocessed plants, they're low in calories, they're very high in nutrients. And so you get fiber and you get vitamins and you get the great kinds of proteins and carbohydrates that make those connections between your brain cells that actually provide the raw material for your brain cells and the arteries to function in a normal way. One of the easiest things that you can do is to start cutting down on processed foods because the results are immediate. You get to see a reversal in your insulin resistance and your cholesterol and in your blood sugar spikes.

Dominic D'Agostino, PhD:

The optimal diet for brain health, really, to some extent needs to be personalized, but should involve a degree of carbohydrate restriction, from the classical standard American diet, that optimizes the person's blood glucose and prevents wild fluctuations in blood glucose and blood insulin.

Dominic D'Agostino, PhD:

Most low-carb diets have little or no risk associated with them

David Perlmutter, MD:

The broad stroke recommendations are decreasing sugar consumption, as well as intake of processed foods and refined carbohydrates, and instead choosing healthy carbs and healthy fats.

David Perlmutter, MD:

With this said, there are several specific dietary approaches that are great for the brain. One thing that's common to all of these is an emphasis on plants. Vegetables are the cornerstone of a healthy diet. Let's learn about the wonderful brain benefits of a whole food plant-based approach.

Ayesha Sherzai, MD:

When you eat plants, you eat more than 8000 types of polyphenols. These are the colored compounds that are in plants, whether they're the greens and the berries and the whole grains. And you eat resistant starches, and you eat soluble starches, which keep feeding your good gut bacteria, and they produce the necessary chemicals and the hormones that build your brain. So a whole food, plant-based diet is important for so many reasons. For managing the vascular risk factors that cause brain diseases, and also providing the necessary fuels. Whether its minerals, vitamins, the good kind of proteins, the good kind of carbohydrates for the brain to thrive.

Ayesha Sherzai, MD:

A whole food, plant-based diet or a diet that is mostly unprocessed plant is great for the brain. But even in that kind of

a diet, there are certain things that stand out as being extremely brain healthy. These are greens. Greens are one of the healthiest foods on the planet. Why? Because they have the necessary anti-inflammatories and antioxidants that fight against inflammation and oxidation. Then comes berries, berries again have a lot of polyphenols and nutrients and vitamins that fight against inflammation and oxidation. And beans are the cornerstone of longevity.

David Perlmutter, MD:

Another dietary idea that's getting a lot of interest these days is the so-called Ketogenic diet.

David Perlmutter, MD:

Let's explore where the Ketogenic diet fits into this discussion.

Dominic D'Agostino, PhD:

Ketones are byproducts of fat metabolism, but they can be elevated in the body by ketogenic fats. Fats are a critical and key macronutrient for giving our bodies energy. And I would take it one step further and say the body, in particular, the heart and skeletal muscle run most efficiently when using fat as an energy source. So having a robust source of fat in the diet and getting our body fat adapted, which means transitioning our metabolism from a glucose or carbohydrate based metabolism to being adapted to metabolize and utilize fat more efficiently can be advantageous for exercise performance and also for our brains.

David Perlmutter, MD:

The ketogenic diet is certainly very popular these days. Why is that such a good thing for the brain?

Mark Hyman, MD:

Well, the ketogenic diet has been around for a long time. In fact, it's been pioneered in medicine to treat epilepsy when no drugs would work. So if you're having seizures and nothing works, they use a ketogenic diet. We're learning now that it also has beneficial effects on many other brain problems. Brain cancer, autism, Parkinson's and Alzheimer's. So the body has two alternate fuel systems, a backup fuel system. We have sugar we can run on, we can also run on fat. And it turns out that running on fat is much cleaner than running on, for example, it's like coal versus solar energy in very different ways the body runs through using fats and it turns out that it activates so many healing mechanisms that reverses insulin resistance. It increases stem cell production, increases muscle mass, bone density, increases brain function and cognitive function. Has tremendous benefits as a therapy in people who already have pre dementia or dementia.

- Dale Bredeesen, MD: What we recommend to people though... is what we call the Brain Food Pyramid. Our approach, we call Ketoflex 12/3, and it's simple because, number one, we'd like to get you into mild ketosis.
- Dale Bredeesen, MD: It's flexitarian, so if you want to be a vegetarian or vegan, fine. If you want to have some meat, fine. Meat is a condiment.
- Dale Bredeesen, MD: And then, the 12/3, you want to have a minimum of 12 hours of fasting between finishing dinner and starting your next meal, be it breakfast, brunch or lunch, and then you want to have three hours between finishing your dinner and going to bed.
- Valter Longo, PhD: There are a number of studies now that have shown that ketogenic diet can improve brain health, both in mice and some early studies in humans, so it's very interesting. The reason for that, we believe...is the rewiring of the brain metabolism. So, the brain is now forced to utilize ketone bodies, as well as sugar, for fuel, and we believe that transition can sort of reprogram the brain to function differently, and maybe to function better, and that's the evidence.
- David Perlmutter, MD: In that ketones seem to be good for the brain, what else can a person do to increase their ketones from time to time aside from fasting?
- Jeffrey Bland, PhD: Well, I think the most important thing, in kind of inducing mild ketone or ketosis increase, is to lower glucose intake in your diet. Well where does glucose come from? It comes obviously from sugar, but it also comes from time release sugar, which are carbohydrates. And the more the carbohydrate sources been refined, the more available that glucose is to go in the bloodstream and prevent the buildup then of ketones, because your body will preferentially use glucose before it starts to go into metabolism of fat. So what that would mean is, limiting, particularly simple carbohydrate and refined carbohydrate intake and minimum amounts of long chain unrefined carbohydrates so that you are inducing the body to go into fat metabolism.
- Dominic D'Agostino, PhD: I think if you can transition rapidly into the ketogenic diet from eating high-carb to high-fat, low-carb, and you're comfortable with that, I think the faster you get into ketosis, maybe the more benefits you get. And even the stress that your body goes through to get into a state of ketosis kicks on adaptive

mechanisms that help us adapt faster. And one way to ease that transition is to use things like coconut oil or medium chain triglycerides, or now we have ketone supplements. And that can help give the brain a source of energy as it's essentially withdrawing from the glucose that it was getting from a high carb diet.

Anna Cabeca, DO, FACOG:

With the approach that I've taken to help empower women hormonally is to really work on...those plant-based micronutrients, the low carbohydrate greens and herbs and spices that can help with digestion and detoxification to add that into a healthy ketogenic diet, so the healthy fats and the healthy proteins so that we're getting good amounts of that for hormone balancing. So we need healthy fats for healthy hormones, and that's an important distinction, but also we need those nutrients to balance our hormones. And when we have that combination as women, we do really, really well. We get that clarity and improve cognitive function.

David Perlmutter, MD:

You're talking about the ketogenic diet. Some people don't feel well on the ketogenic diet. What are they doing wrong?

Dale Bredesen, MD:

Some people will have a keto flu at the beginning, and that usually takes, and as Dr. Ludwig has pointed out, it typically takes a few weeks before you are keto-adapted. It may be, what they're doing wrong, it may be just that they haven't finished their adaptation. It may be that they're not able to generate the ketones, if they're actually too thin, so then in that case, they should cycle.

Dale Bredesen, MD:

That actually has helped many people. You keep a metabolic flexibility so that you can use either. And then it may be because you've changed diet or that you've changed microbiome, so there are a number of ways. And yes, you need to work with your doctor to get yourself optimized.

Amy Berger, MS, CNS:

Mitochondria are your cells energy generators. They're key players in Alzheimer's disease.

Amy Berger, MS, CNS:

Lower carb, higher fat diets help the mitochondria produce energy more efficiently. When insulin levels are very low because we're eating a very, very low carbohydrate intake, it transitions the body from running primarily on carbohydrates, from having a primarily glucose-based metabolism, to having a

more fat and fatty acid-based metabolism. The fatty acids are more of a clean burning fuel, if you will. They are less damaging to the mitochondria. The burning of fats in the mitochondria, which is where we produce energy inside the cells, the burning of fat in the mitochondria produces fewer free radicals, it's less damaging to the physical structure of the mitochondria.

David Perlmutter, MD:

So, these are reasons why a ketogenic diet is a great option for brain health. Remember, a proper Ketogenic diet should still include plenty of above ground fibrous vegetables that are considered carbohydrates. Like the Ketogenic diet, fasting is another tool we can use to improve brain health and help prevent Alzheimer's disease, so let's explore the concept of fasting in greater detail.

Valter Longo, PhD:

Periodic fasting or Fasting Mimicking Diet can improve brain function but also overall longevity and health span.

Valter Longo, PhD:

Also, at least with the fasting and Fasting Mimicking Diets, we're seeing evidence of regeneration in the brain, neuro stem cells being activated in certain regions of the brain, and we're seeing evidence of them going to work and, basically, helping the brain produce new functional neurons. We're not sure whether they are contributing to the improved cognitive function, but we believe they're involved. The other role of fasting, and potentially ketogenic diet, in the brain is the effect on inflammation. So, we're seeing clear effects on the neuroinflammation, so the brain as it gets old, or older, it becomes dysfunctional, and one of the dysfunctions have to do with immune reaction, or certainly immune-like reactions. Those are believed to be key in Alzheimer's Disease, potentially Parkinson's Disease, and other neurodegenerative diseases.

Valter Longo, PhD:

Fasting, of course, revolutionizes energy production, so normally we are working on sugar essentially, so the carbohydrates come in and they are sufficient to, a) fuel the system, and also to be stored in the form of glycogen in the liver, so that 12-24 hours the body can keep using sugar for energy even though we're not necessarily eating. Fasting changes all of that very slowly, so it takes days. For example, let's say you do an overnight fast, the glycogen is not gonna be depleted, or is gonna be barely depleted by that time, but if you do two or three days of fasting then the brain begins to change into a ketogenic mold, and the entire system, the body, starts going to, particularly, visceral fat as a source of energy. Now, the fuel instead of coming from the outside in the form of sugar,

it comes from the inside in the form of visceral fat. This is beginning to fuel the entire body in the form of fatty acids and ketone bodies.

Anna Cabeca, DO, FACOG:

Intermittent fasting and getting our body into ketosis is really a key concept to have healthy neurologic function as we're aging and to prevent Alzheimer's. The benefits are in allowing our body to get into a state of autophagy and getting our body working that muscle to use ketones for fuel, which our brain uses preferentially over glucose especially as we're aging.

David Perlmutter, MD:

We've heard that when it comes to diet, there are a couple of key considerations to keep in mind. First, you should make sure to incorporate lots of vegetables, colorful vegetables into all of your meals.

David Perlmutter, MD:

Indeed, a primarily whole food plant-based diet makes a lot of sense as an option for preserving brain function, though you do need to make sure that you're getting adequate amounts of certain vitamins and important brain healthy fats, and we'll be covering more about this in detail in episode 12.

David Perlmutter, MD:

The new science of a ketogenic diet also holds promise as a way of looking after our cognitive health. Finally, fasting may be a good way to help protect our brains.

David Perlmutter, MD:

We are so grateful to our guest experts for sharing their incredible knowledge with us on how what we eat impacts the health of our brains. We've learned that a healthful diet is one of the best tools we have in our Alzheimer's prevention toolkits and that it is absolutely essential to eat a brain healthy diet.

David Perlmutter, MD:

In summary, here are some of the foods you should avoid when it comes to Alzheimer's prevention:

- Processed foods like sodas, chips, doughnuts, flour, and other forms of refined carbohydrates.
- Become familiar with the term glycemic index and avoid foods that have a high glycemic index like cookies, and candies, cakes, pastries, and cereals.
- Avoid things that have added sugar, added sugar in the form of high fructose corn syrup, cane sugar, agave, honey, rice syrup, et cetera. Any added sugar is bad for your brain.
- Avoid unhealthy fats like trans fats and vegetable oils, including soybean oil and canola oil.

- Watch out for artificial sweeteners like aspartame, sucralose, and saccharin.

David Perlmutter, MD:

And here are some of the foods you really want to be sure to include on a regular basis:

- Whole unprocessed foods
- Low-glycemic carbohydrates like leafy greens, kale, cruciferous vegetables like broccoli and cauliflower, beans, and even blueberries and apples
- Healthy fats from plant sources like olives, and of course, olive oil, avocados, nuts, and seeds.
- Consider including fatty fishes, including SMASH fish. What does that mean? Salmon, mackerel, anchovies, sardines, and herring.
- Organic, full fat dairy products, if tolerated. And if you choose to get fat from animal products, consider free range, organic chicken and pastured eggs.

David Perlmutter, MD:

There are multiple ways to implement fasting:

- One popular and easy to apply option is called time-restricted eating. This means limiting your calorie intake to a specific period in the day. To this end, I recommend that you don't eat within three hours, for example, of going to sleep at night.
- And fast for 12 out of 24 hours each day.
- You may also want to consider a Ketogenic diet and fasting for longer periods of time, like 24 to 48 hours. If you're trying any of these fasting protocols, make sure that you're in consultation with a medical professional.

David Perlmutter, MD:

If you make these changes to your diet, I'm confident you will see positive changes in your health right away and you will be taking the right steps towards preventing Alzheimer's disease.

Dean Sherzai, MD, PhD:

Your brain health is in your own hand and it takes one small step. We have patients that have started with one thing, sugar. And they've reduced their sugar level by 50% and although initially, they say it's terrible, it's horrible because that's withdrawal. And in three months, almost every single patient comes to us and says, "The fog has lifted," every single patient. So one small behavior change would have that much effect. Imagine you change one meal, one meal of the three meals in the day to a healthy meal, which would reduce your risk by 40%. So it's not an all or none. It's small steps such as stress management, a walk in the morning and one good meal, and



you will have significantly reduced your risk for Alzheimer's. That's how simple it is.

Valter Longo, PhD:

There is no doubt that diet, particularly nutrition, done the correct way can revolutionize your life and your disease state, and your disease incidence. I think that the main thing that needs to be done is figure out exactly what this means for you and what this means for your age. I think there is no doubt that most people have to change their diet, and that selection of diet and dietary pattern will have a tremendous effect on Alzheimer's Disease, but you just need to find out what that is for you.

Max Lugavere:

And at the end of the day, it's not a one meal or one blueberry for that matter that's going to avert or even make a dent on your risk for Alzheimer's disease. And in the same vein, it's not one meal that's going to give you dementia or Alzheimer's disease. So go easy on yourself, do the best you can and start today. It doesn't get more empowering than that. At any moment, you can change the direction of your cognitive destiny. And you're always one meal away from getting right back on track. So if you find yourself falling off the wagon, well, it's not easy. It's going to be overwhelming, especially at first, but eventually you'll get into a rhythm and it'll become habit, and you'll be shocked that you lived in any other way. So, yeah, just don't wait. Start today.

David Perlmutter, MD:

The foods you choose to eat is one of the most important ways to take control over the health of your brain and body. As we just learned, diet impacts brain health in a multitude of ways. You can start to harness the benefits of a diet that benefits your brain with your very next meal.

David Perlmutter, MD:

Our food choices either increase or decrease inflammation throughout the body, and that includes the brain. When it comes to Alzheimer's disease, every bite matters.

David Perlmutter, MD:

Your fork sets you on a path that either leads towards disease or back to health.

David Perlmutter, MD:

In our next episode, we're going to examine the importance of nurturing the microbiome. We will see that our microbiomes are closely connected to our brain's health and play an important role in preventing Alzheimer's disease.



David Perlmutter, MD:

I can't wait to share this fascinating new information with you.
I'll see you in our next episode: The Gut-Brain Connection, How
Microbes Influence Your Brain Health.