



ALZHEIMER'S

THE SCIENCE OF PREVENTION

Episode 10: The Power of Sleep



- David Perlmutter, MD: Sleep seems like a relatively simple concept. It's what most of us look forward to at the end of a long day and it is what restores and rejuvenates our bodies and our brains.
- David Perlmutter, MD: And while we're still learning a lot about sleep, and why we need it, we're now beginning to understand the value of sleep from a scientific perspective as we never have before. We now understand that sleep greatly impacts the health and destiny of our brains.
- David Perlmutter, MD: Sleep has the power to influence how much we eat, how fast our metabolism runs. Whether we become overweight, or we stay slender, whether we can fight off infection, how creative we might be, how insightful we might be, and even how compassionate we can become.
- David Perlmutter, MD: Additionally our brains are literally being cleaned while we sleep. Both laboratory and clinical studies have shown that every system in the body is affected by the quality and the amount of sleep that we get, especially the brain.
- David Perlmutter, MD: With the hectic pace of our lives today, sleep can sometimes appear to be a luxury we can't afford. But let me tell you from a medical perspective, we really cannot afford a bad night's sleep. It's simply essential to get good sleep if we want to maintain optimal function of our bodies and our brains. Sleep seems to play a unique role in Alzheimer's disease, impacting our risk for developing this condition.
- David Perlmutter, MD: In this episode we're going to learn specifically about how sleep is actually linked to Alzheimer's disease risk, and ways we can achieve higher quality sleep. I'm Doctor David Perlmutter, and this is Alzheimer's - The Science of Prevention.
- David Perlmutter, MD: In previous episodes of this series, we've ~~now~~ learned that Alzheimer's is a disease for which we have no meaningful treatment.
- David Perlmutter, MD: But, we've also learned that our lifestyle choices are profoundly influential as it relates to Alzheimer's prevention. We've already reviewed some of the most important tools available to you in your Alzheimer's prevention tool kit to help you reduce your risk, including dietary strategies, exercise, avoiding various toxins in the environment, and avoiding and managing type II diabetes. And how these all focus on reducing inflammation.



David Perlmutter, MD:

Now we'll discuss another major player in preventing Alzheimer's disease. The powerful role of a good night's sleep. The sleep problem is all around us. We're living in a society where we've stopped valuing sleep and as a result day in and day out, our health is suffering.

David Perlmutter, MD:

We all know how even one night of poor sleep can affect our mood, and our ability to think clearly. But sleep deprivation has a far more devastating effect on brain health. Sleep is uniquely tied to the function of many parts of our physiology and this is why chronic sleep deprivation causes so many problems. For example, confusion, memory loss, brain fog, a weakened immune system, obesity, cardiovascular disease, diabetes, depression, and memory loss are all linked to poor quality sleep. And poor sleep has become far too common.

David Perlmutter, MD:

There are many reasons why we struggle to get good sleep in our modern age. The ability to skip sleep in favor of doing work is looked upon as a characteristic of success. We go to bed late and try our best to wake up early, burning the candle at both ends. The Center for Disease Control found that one third of Americans report not getting enough sleep. Simply put, Americans have not made sleep a priority, and they should. The effects of this lifestyle may run much deeper than we knew.

David Perlmutter, MD:

For example, when we miss out on good sleep for just one week, it appears to impact the expression of genes involved in stress, inflammation, immunity and metabolism. So yes, the whole body is affected by poor sleep. But most importantly for us, a lack of sleep could well spell disaster for brain health. In fact, sleep deprivation is directly linked to an increased risk of developing Alzheimer's disease. That's something you desperately need to know.

Michael J. Breus, PhD DABSM:

When you start to think about Alzheimer's and you start to look back at what was going on with that individual before we started to see the signs and the symptoms of this very serious situation, sleep turns out to be one of those big factors. And so when you're looking at people who have erratic sleep schedules, when you're looking at people who aren't getting enough sleep or the quality of sleep that's necessary, we really think that those are things that can be very preventative and something that people should be looking at very early on.



- David Perlmutter, MD: We're hearing more and more these days about the importance of sleep. It's really come onto the radar as being really important for health. How does that relate to the brain and brain vitality?
- Mark Hyman, MD: Well, as a doctor, I thought MD stood for medical deity and that sleep was an option. Surgeons told us in my residency that sleep was really not for surgeons. That lunch was really for weaklings. We shouldn't worry about it. And so I went for years and years with limited sleep. I would stay up all night in the emergency room delivering babies. And I noticed that my cognitive function started to decline, in fact where we know that when you are sleep deprived and they've done studies looking at, for example, cognitive function. It's like you're drunk. They've taken sharpshooters from the military, snipers who are 99.9% accurate with eight hours of sleep. And then with seven hours they're maybe 90% and six hours, they've dropped down to maybe 60% and five hours or less they basically, it's like shooting darts at, you know, you're going to miss most of the time and they miss most of the time.
- Mark Hyman, MD: And so if someone who has that skill has that level of cognitive impairment from lack of sleep, imagine the rest of us.
- David Ludwig, MD: Quality sleep is critical, it's becoming increasingly difficult in our modern, fast-paced life. There are many resources one can find to help design a sleep sanctuary in the home that can place quality sleep at its rightful place in our life.
- David Perlmutter, MD: The lack of consistent, good quality sleep increases the risk of developing Alzheimer's, but why exactly? Let's take a deeper look and explore the mechanisms in terms of exactly how sleep deprivation can be so detrimental and how optimal sleep can be so protective and healing for your brain.
- David Perlmutter, MD: To understand why sleep is so fundamental for brain health there are two main concepts to understand. The first is that our circadian rhythm, the cycle that takes place in our body to help enable sleep is closely linked to our hormones and microbiomes.
- David Perlmutter, MD: The second is the glymphatic system, an incredible new discovery that appears to play an essential role in maintaining a healthy brain. Our sleep cycle is governed by an internal program called the circadian rhythm.



David Perlmutter, MD:

For example, the rise and fall of our bodies hormones and the fluctuations in our body temperature are all significantly directed by our circadian rhythms.

David Perlmutter, MD:

Remember, the microbiome is the collection of microbes as well as their genetic material and the metabolic products that they manufacture from the bacteria that live within our bodies. And their metabolism helps determine how we process our food and even influences our hormones and our neurotransmitters. But of course, when we ignore our circadian rhythms and neglect to get the sleep that our bodies need all of these processes are thrown into disarray.

Michael J. Breus, PhD DABSM:

One of the things that we've learned is that there's some very specific reasons why people can't lose weight when they're sleep deprived. And this actually has to do with two specific hormones. One is called leptin and the other is called ghrelin. So when your body becomes sleep deprived, here's what happens. This hormone called ghrelin increases. Now people might not know what ghrelin does. Ghrelin is what I call the go hormone. This is the hormone that makes you want to eat. You actually have 20% more ghrelin when you're sleep deprived. And then leptin is the stop hormone which tells your brain, "Hey, I'm full." You have 15% less leptin. So when you're sleep deprived, it's basically a recipe for weight gain.

Michael J. Breus, PhD DABSM:

When we're looking at things like sleep and appetite, we also know that there are a couple of other things that are going on, which is an elevation of cortisol. And cortisol is the stimulant of all stimulants and it gets you ready to fight or fly. And so the problem is that it also stimulates appetite. And so, again, more sleep deprived you are ... We know that ghrelin affects your hunger. We know that cortisol affects your appetite. Turns out those are two different things.

Sarah Gottfried, MD:

Cortisol is one of the most important hormones in the body and we know that it's released in a circadian rhythm. In fact, most hormones are. So what happens with cortisol is that its highest within 30 minutes of waking up in the morning. Then there's this gradual diminishing of cortisol levels over the course of the day. If it drops too fast or it stays elevated, that can cause problems in the body.

Sarah Gottfried, MD:

High cortisol over a long period of time shrinks the brain. The other problem with high cortisol is that we know it pokes holes

in the gut. So this is super important because high cortisol disrupts the gut integrity, and this is what then kicks off dysfunction of the gut-brain axis. So it triggers disruption of the blood brain barrier, it can trigger neuroinflammation

Emeran Mayer, MD:

The interaction between sleep and the microbiome is a very interesting one. The circadian rhythms, that are associated basically with sleep patterns, have recently been found in the last five or six years to play a major role. That during the daytime when people are awake and eat several times, the microbiome composition and the metabolites, their gene expression, is very different from what happens at nighttime. So, this oscillating pattern that is pretty driven by food intake during the daytime has a major effect on the host, on the brain, and in the regulation of sleep. So, a big effect of the microbes to the brain. On the other hand, we know that sleep has a major role as an anti-inflammatory activity that decreases levels of inflammatory molecules in the body. It has very distinct patterns of sending signals to the gut.

Leo Galland, MD:

Sleep and the microbiome have a fascinating relationship. First of all, the normal pattern of sleep depends upon the microbiome

Leo Galland, MD:

What creates the normal pattern of your sleep is the relationship between the immune system and your adrenal glands.

Leo Galland, MD:

Your adrenal glands produce a hormone called cortisol,

Leo Galland, MD:

Cortisol has anti-inflammatory effects. At midnight, when you're going into deep sleep, your adrenals are very inactive..

Leo Galland, MD:

It's the interaction between the microbiome, the immune system and the adrenal glands that creates this architecture to sleep where early sleep, so called beauty sleep, is really deep and very restful, and late sleep is full of dreaming.

Leo Galland, MD:

Now, if you're not sleeping, lack of sleep begins to impact immune function and it throws the whole architecture of sleep off. That begins to create a stress response in your body, which then starts to alter the composition of the microbiome.

David Perlmutter, MD:

The circadian rhythm and how it relates to hormones and the microbiome is a big reason why sleep is important for brain health. And as we mentioned before, sleep also influences our



brain through the glymphatic system. The glymphatic system is our brain's way of cleaning house and getting rid of the metabolic waste products that accumulate while we're awake.

David Perlmutter, MD:

Many of you have heard of the lymphatic system, well just like the lymphatic system functioning to remove waste from our bodies, the glymphatic system removes waste that accumulates within our brains.

David Perlmutter, MD:

Let's explore this relationship between the quality of our sleep and the action of the glymphatic system.

Sarah Gottfried, MD:

I love the glymphatic system. I'm a huge fan. So what happens every night when you sleep, is that spaces open up in your brain and this shampoo happens for your brain. So toxins get removed. It's an innate system designed to get rid of the gunk in your brain. So we want the full brain shampoo every single night. So you need the duration, you need 7 to 8.5 hours.

Michael J. Breus, PhD DABSM:

I consider the glymphatic system like the garbage truck of the brain. It takes all the waste, all the stuff that's been building up, and it flushes it out, specifically within the central nervous system.

Mark Hyman, MD:

So we know for example, at night that your brain cleans itself, that there's a new system that's been discovered, which is like the lymph system for your brain that clears that all the waste. It's called the glymphatic system, like the lymphatic system. And without that functioning well, your brain builds up toxins and waste and can't clear out all the metabolic processes that happen during the day. And you need to sleep in order to clean all that out and refresh that. And it's the repair and healing time of day as well. So getting enough sleep is critical if you want to have a healthy, happy brain.

Dale Bredesen, MD:

The glymphatic system. Literally, you change the microanatomy of your brain while you are sleeping, and you literally flush out some of the various toxins and various damaged components during that time, when you're getting the sleep, you also reduce the production of amyloid beta. In fact, there is more produced while you are awake, there is less produced while you're asleep.

Amy Berger, MS, CNS:

The glymphatic system is a fascinating thing that was just discovered a few years ago, actually. It's sort of the brain's way of house cleaning. I like to think of it as the sanitation crew for the brain. It's how metabolic waste products and toxins are

cleared away from the brain and central nervous system. It appears that it's more active at night, or it's more active while we sleep than it is during the day. This is why we know sleep is important. Just about every single living organism that has been studied has some type of circadian rhythm, some type of diurnal pattern, and scientists have never been sure why. Why does every organism seem to have some type of need for sleep or some type of senescence period, and some researchers believe that it's due to this glymphatic system, that that's the time when all of that toxic stuff is cleared away.

David Perlmutter, MD:

We've learned that our hormones and microbiome are influenced by our circadian rhythms. We've also learned the incredible role of the glymphatic system in cleansing our brains while we sleep.

David Perlmutter, MD:

When we think about this information there is no doubt that great sleep is wonderfully rejuvenating for the brain. Let's further explore the role of sleep in brain health.

Michael J. Breus, PhD DABSM:

You can actually, believe it or not, turn somebody into an insulin resistant individual within less than 36 hours of sleep deprivation, which is truly amazing when you start to think about something like that.

Michael J. Breus, PhD DABSM:

Sleep deprivation isn't just about minutes, it can also be about the quality of the sleep that you're getting.

Michael J. Breus, PhD DABSM:

How does sleep affect our metabolism? It's a big, big factor. We now know that basically you can't lose weight if you're not getting good sleep. So weight loss turns out to be a big one. We know that sleep affects us cognitively as well. When we're sleep deprived, we don't think quickly. We make poor decisions. Studies out of, for example, the University of Las Vegas say that we make riskier decisions when we're sleep deprived. Not necessarily a good thing to be doing.

David Perlmutter, MD:

Dr. Bland, why is sleep so important for the brain?

Jeffrey Bland, PhD:

Boy, that's a really exciting topic, isn't it? This whole sleep physiology and its relationship to brain cleansing and to rejuvenation. So it turns out that the brain, because it's so rich in oxygen and is so involved with using oxygen to produce energy, oxygen has kind of a dark side too, which is to produce oxidants. And these can be innocent bystanders in our brain, that were damaged by the availability of certain forms of

oxygen, they're called peroxide or superoxide or hydrogen peroxide. And these can cause injury that needs to be, either cleansed, removed, gobbled up and taken away or prevented, through a whole series of defensive mechanisms that the brain has, that are called antioxidants. And these are enzymes like superoxide dismutase, catalyst, glutathione, peroxidase and so forth. Glutathione, reductase, there's a whole assembly of a group of genes that regulate the production of proteins in our brain that actually soak up these damaging oxygen producing materials.

Jeffrey Bland, PhD:

And, so when you're asleep, your busy warriors run out from your antioxidant to scavenging system, and start really doing work to kind of a house clean and restore a cellular redox potential, is what a chemist would call it. So that you're ready for the next day when you're gonna start. Once again, putting a lot of stuff through those cells and start processing oxygen. So it's a constant kind of rhythmic balance in which you have this buddy system working for you, particularly when you're at sleep, to kind of pick up the stuff that might have happened throughout the day where you had high oxygen activity.

Michael J. Breus, PhD DABSM:

We are very concerned at this point that sleep deprivation is causing an increase in inflammation. And believe it or not, the data is becoming very, very consistent that that's true.

David Perlmutter, MD:

Activity is clearly important. Where we direct our focus, what we engage in. But, equally important, we are learning, is sleep. What can you tell us about its importance?

Michael Merzenich, PhD:

Well, sleep is important in several ways. One is that when you engage the brain to change, basically the brain generates this change in a kind of preliminary form. It's not completely consolidated or completely solidly embedded in the brain. And then in the quiet periods of your day and then into sleep, the brain basically rehearses the changes that have occurred in a way and strengthens them. So this occurs specifically in particular phases of sleep. It's not just that you sleep. It's that sleep has to be quality sleep.

Michael J. Breus, PhD DABSM:

During that process of sleep, one of the things that happens is that also these proteins get pulled out of your brain, specifically during stage three/four sleep and during REM. Proteins turn out to be incredibly important in the Alzheimer's process. And something that we've really learned fairly recently is there's two different proteins. One is called amyloid, the other is called tau.

These have to actually be removed, otherwise they seem to circle the neurons and almost begin to strangle them. And that's where we're starting to see a lot of the symptoms that we see in Alzheimer's and these neurodegenerative diseases. So sleep turns out to be an incredibly important process to actually pull those proteins away to allow for better cognition.

David Perlmutter, MD:

Did you catch that? It is during sleep that we remove amyloid and tau from our brains, two proteins that are associated with Alzheimer's disease. Sleep deprivation also increases insulin resistance, slows metabolism and increases, you guessed it, inflammation.

David Perlmutter, MD:

All of which are linked to Alzheimer's disease risk. This is so incredibly important to understand, it's amazing how many different ways sleep impacts our bodies and our brains. The next time you're feeling uncharacteristically tired, moody, hungry, or mentally slow and forgetful, take a moment to think about the quality of your recent sleep. You might be surprised at how closely these symptoms lineup with your recent sleep habits.

David Perlmutter, MD:

But more than how we feel today, we want to do everything we possibly can to prevent Alzheimer's disease for which we have no meaningful treatment whatsoever. And consistent high quality sleep is a critical component in an Alzheimer's prevention protocol.

David Perlmutter, MD:

When it comes to sleep there are a lot of practical easy steps you could take to improve both quality and quantity. Making these changes will help ensure you get the essential benefits of sleep.

David Perlmutter, MD:

You'll be supporting healthy metabolism, lowering inflammation, improving your ability to fight off infections, supporting your microbiome and even getting help in coping with stress and increasing creativity. You'll also be helping your brain to process information, learn new things, store information, store memories, and wash itself from the waste buildup from the previous days activities. All of these wonderfully beneficial effects of good sleep work in harmony to help reduce your risk of developing Alzheimer's disease.

David Perlmutter, MD:

Let's review some easy steps you can implement now to improve your sleep tonight.

Michael J. Breus, PhD DABSM:

The easiest way to determine if you're getting good sleep is how do you feel when you wake up. If you wake up ... And I get it, you got to clear the cobwebs for about 25, 30 seconds. That's good. But if you are just dragging and you're thinking, "Oh my gosh, I can't wait for my first cup of coffee. I got to slug that back just to feel alive," you're not getting good quality sleep.

Michael J. Breus, PhD DABSM:

If I was going to give you, let's say, five steps to get a better night's sleep, here's what I would do. Step number one is to have a consistent wake-up time, even on the weekends. I know that stinks for a lot of people because a lot of people say, "Oh, I get to catch up on my sleep on the weekends and that's awesome." But remember, when you wake up the light comes into your eyes and resets that circadian rhythm every single morning. If it does it very consistently, then your brain knows what to do and when to do it. So having one sleep schedule is step number one.

Michael J. Breus, PhD DABSM:

Step number two has to do with caffeine. And I would say you want to stop caffeine by about 2:00 PM. Remember, half life of six to eight hours. We don't want it to affect the quality of the sleep that you're getting at night. So step number two, stop caffeine by 2:00 PM.

Michael J. Breus, PhD DABSM:

Step number three has to do with alcohol. What I tell people all the time is if you're going to have alcohol, which I don't have a problem with, you want to give yourself about three hours before lights out. That way alcohol has been digested, won't have a major effect on your sleep.

Michael J. Breus, PhD DABSM:

Step number four would be exercise. And that would be I would ask you to exercise. But you've got to be careful. You don't want to exercise too close to bedtime because in some ways that can be disruptive. If it raises your core body temperature. Your core body temperature has to drop in order to fall asleep. So stop exercise about four hours before bed.

Michael J. Breus, PhD DABSM:

And step number five would be to get sunlight every morning. I say give the sun a high five every morning. Within 30 minutes of waking up, if you can walk to the window and get some direct sunlight. Believe it or not, sunlight turns off the melatonin faucet in your brain, and that can be really helpful.

Michael J. Breus, PhD DABSM:

When you're looking at lifestyle factors for good sleep, there's really several different areas that I like to talk about. Of course

nutrition turns out to be very, very important. What we put in our bodies has a dramatic effect on what goes on in our bodies.

Michael J. Breus, PhD DABSM:

When you're looking at sleep environment, there's a lot of different factors that you can think about. When I look at sleep environment, I think of the five senses. So I think about light, or rather sight, sound, touch, taste and smell. And one of the big ones that everybody always wants to know about is touch, and that has a lot to do with temperature. So when you look at the ambient temperature in the room, it's also different than the temperature that's under the covers. Because some people have got this big, fluffy covers and they've got all this different ... Almost like a microclimate seems to occur down there.

Michael J. Breus, PhD DABSM:

Also, the sleep cycle follows the core body temperature cycle. So what happens is your body has a rise in temperature until about 10:30. And then when it peaks and falls, believe it or not, that fall is a signal to your brain to release melatonin. Remember, melatonin's that key that starts the engine for sleep. So you want to sleep in a cooler environment to allow for that fall to occur. If the room is too hot, you're really not going to be able to get into that whole sleep process. If I had to make a recommendation, what the data would suggest is somewhere between 65 and 75 degrees as an ambient room temperature would probably work out quite well. But I'll be honest with you, I used to live in Scottsdale, Arizona. If I could cool my house to 75 degrees in the summer it would've been a miracle. So you really want to stay about 30 to 35 degrees off the daily high, especially during the summertime.

Michael J. Breus, PhD DABSM:

One of the other things that we've noticed now is we all have a tremendous amount of blue light exposure. Blue light, if it hits very particular cells in your eye called melanopsin cells, it turns off the melatonin faucet. You got to have melatonin to have sleep. So blue light exposure at night turns out to be not such a great idea.

Dale Bredesen, MD:

About 70% of people with sleep apnea go undiagnosed. We want to know not only, do you get enough sleep, but do you get high quality sleep? You want to have both the REM sleep and the non-REM sleep, because they both are actually helpful with memory formation and consolidation in different ways.

Sarah Gottfried, MD:

Do some form of mind-body exercise before where they go to bed. A way of kind of taking all that happened during the day and putting it in the parking lot. So there's many ways to do

that. You could do a guided meditation, you could develop your own form of meditation, you could listen to Headspace, 10% happier. There's lots of different ways to do that.

David Perlmutter, MD:

As you likely know the sun emits the entire spectrum of colors in its light. But what you may not know is that this spectrum changes depending on the season and depending on the time of day. This is important because our bodies respond differently to different types of light.

David Perlmutter, MD:

For example, earlier in the day, we're exposed to much more blue light which helps tell our bodies to wake up. Later in the day, blue light tends to diminish and this sends a message to our brains that it's time to produce a chemical called melatonin that prepares us for sleep. But in our modern world blue light exposure doesn't stop at sunset. Our devices, including computer screens, tablets, cell phones, and even televisions emit blue light, and when we use these electronic devices, especially at night, it can significantly disrupt our production of melatonin and compromise our ability to get restorative sleep.

Max Lugavere:

One of my top sleep hacks is to wear blue light blocking glasses for about two to three hours before I go to sleep. I find that it really helps to allow my brain to wind down.

Max Lugavere:

Studies have shown that by wearing blue light blocking glasses, amber colored glasses, you can actually increase melatonin production before you go to sleep. And Melatonin is an incredibly valuable sleep hormone, and it's not just involved in sleep, actually. It's an antioxidant, it's involved in cancer prevention, DNA repair. So we really want to do everything we can to nurture the expression of melatonin.

David Perlmutter, MD:

I want to take a moment to say thank you to all of our guest experts who shared their knowledge with us in this episode. Getting good restorative sleep can help prevent Alzheimer's disease and we learned about so many great ways to improve our sleep.

David Perlmutter, MD:

These are some practical things you can start doing immediately to improve your sleep tonight:

- Create a bedtime that allows for seven to nine hours of sleep.
- Eat a nutrient dense diet.
- Exercise.
- Stick to one sleep schedule seven days a week.

- Stop caffeine by 2:00 PM.
- Avoid alcohol within three hours of your bedtime.
- Get some sunlight in the morning.
- Cool your room to between 65 and 75 degrees at night.
- And it's real important to avoid exposure to blue light at nighttime.
- Do a meditation practice before bed,
- And consider talking to your healthcare provider about various nutritional supplements that may very well help you with sleep.
- Get tested for sleep apnea.

David Perlmutter, MD:

These simple and effective steps will help improve the quantity and quality of your sleep. Apply these to your routine and I am confident you will start seeing improvements to your sleep right away.

Max Lugavere:

Sleep is sacred. It's medicine. It's critically important. It's the master regulator of our hormones. Dietary change is one of the most difficult things for your average person to accomplish, but it becomes exponentially more difficult when we are under slept. So sleep is something that really should probably be in the first one or two or three things that we look to really improve when making all of the other lifestyle modifications that support optimal brain health.

Michael Merzenich, PhD:

Sleep is controlled by a brain. If the brain is healthy, sleep will be healthy. It's a rule. And if the sleep is healthy, it will contribute to keeping the brain healthy. It's a circle. You want to be in the circle in which the brain is advantaging the sleep and the sleep is advantaging the brain.

Michael J. Breus, PhD DABSM:

I would say definitely people are overthinking falling asleep. Look, at the end of the day I've been doing this for 20 years, and here's what I can tell you. Everybody out there can get a better night's sleep. Nobody's sleep is perfect. My sleep's not perfect and I'm the sleep doctor. So don't worry so much about sleep. I tell people all the time, sleep's a lot like love, the less you look for it the more it shows up. So just relax. It's well within your grasp. I promise you, if you take those five steps that we were talking about, you'll sleep better tonight.

Michael J. Breus, PhD DABSM:

There's no question in my mind. If you make sleep changes today, it will absolutely promote brain health tomorrow.



- David Perlmutter, MD: The quantity and quality of the sleep that you experience is in your hands. And there is no question that the effects of a good night's sleep on your health are vast.
- David Perlmutter, MD: Start implementing these changes in your life right away, and your brain and your body are going to thank you for it.
- David Perlmutter, MD: And remember, great sleep will go a long way to helping you prevent Alzheimer's disease. In our next episode we're going to explore the various ways that environmental exposures may also threaten brain health and what you can do to avoid these exposures in the first place.
- David Perlmutter, MD: These environmental exposures include toxins like glyphosate, even medications greatly impact the health of our brains and play an important role in Alzheimer's disease. I can't wait to share with you why. I'll see you in our next episode, Avoiding Brain Toxins - The Role of Your Environment.