Light, Sleep, & Circadian Rhythm

Heather Sandison, ND
with Jason Prall

Heather Sandison, ND
Welcome to this episode of the Reverse Alzheimer's Summit. I'm so excited to have Jason Prall here today. He is a good friend of mine and also a health educator, practitioner, author, and filmmaker. In 2018, his independent research and experience as a practitioner led him to create the Human Longevity Project, which I'm a huge fan of. It is a nine part film series that uncovers the true nature of chronic disease in our modern world. He is currently working on his next film, a series that explores ancient methods of healing, mind, body, and soul from indigenous cultures around the world and he recently released his bestselling new book titled Beyond Longevity: A Proven Plan for Healing Faster, Feeling Better, and Thriving at Any Age. You can see why I am excited to introduce you to him here today. Thanks for joining us.

Jason Prall
Oh, thanks for having me. Good to be here.

Heather Sandison, ND
Today, we want to dive into connecting sleep and brain health and what happens in Alzheimer's and talk a bit about the pathophysiology and what is going on there. But before we do that, I really want people to understand like your depth of expertise in all of this through your work on the Human Longevity Project. You traveled around the world and really collected stories and delved deep into what helps people live healthy, long lives. What did you learn?

Jason Prall
Yeah, it was a fascinating project. It was an interesting exploration in the sense that I have never Been, I have traveled all around the world. I have done a lot of vacationing and am really curious about other cultures, but I have never dove into these cultures that are kind of isolated in these pockets. I have never really understood what their life was like 70, 80 years ago so that was a fascinating realization to hear. In 1960, in Ikaria, Greece, they did not have electricity in these little villages. They were living this lifestyle. This is in the sixties, right?

Heather Sandison, ND
Not too long ago.

Jason Prall
Exactly. We have parents or grandparents that are from that era. And these were people that were living their childhood or even adulthood without electricity for most of their life. That means no refrigeration. That means no, of course, no lighting, no electronics. They were truly operating in the way that we have for thousands of years. A lot of times we think about diet and what should we be doing and what should we be eating. And we go back to these sorts of Paleolithic times or what people were eating a thousand years ago, and we do not need to go back that far. We can go back into our recent history and even places right now around the world, there are people living like this. It is really interesting to kind of, as best you can, put yourself in the shoes of those people. What their life was like in that environment, in those conditions. They were living in a way that sort of nature dictated. We have largely isolated and created conditions in our Western world that have created circumstances that are both really beneficial like we are not subject to feast and famine to a large degree.

We have ambient temperatures. We can isolate ourselves from extreme cold and extreme hot. We have luxuries and conveniences that I mean, thank God we do and at the same time, what is really fascinating is that we are now faced with challenges that the people that I spoke with in Korea and Sardinia, in Okinawa that 50 years ago they did not have to face right. When we walked into a grocery store today, we had to actively say no to this cereal and those organic sweet bars over there and all the trappings that go along with that. It is not only the taste trappings that we are familiar with, the sweetness and the crunchiness and the saltiness and the fattiness that our brain just loves. We are wired to sort of for those tastes in those crunchies, but also the colors and the slick marketing. We have to actually navigate a world that is a little bit trickier. Whereas people that I spoke with, they did not have the luxury that we have but they also did not have to contend with all these things that we do in the modern world. So it is a very fascinating dichotomy to experience that almost directly.

Heather Sandison, ND
It sounds like one of the themes is this decision-making fatigue. As you mentioned, the extra work of saying no to things that we are programmed to want and we are going to talk a lot about like. But what comes up for me immediately is that decision to scroll on your phone until 2 a.m. or check email one more time before going to bed or stay up and watch the entire series and binge on the entire thing. We are wired to kind of want those dopamine hits. It is this active decision to get to bed on time and to not be exposed to blue light. So, I want to go into all of those details. And you traveled all around the world. So what are some of that like? Can you give us the top five things that you saw that were consistent across these blue zones?

Jason Prall
Yeah. So one of the most consistent things that we saw and heard about was the sense of community and connection. It is actually not the community itself, it is the things that the community provides. But community provides connection, its ability to feel connected to others

as well as safety. So when you have the feeling of safety and connection and security in that realm, then the community is really beneficial. We have a community today and you can actually feel totally disconnected from a community that you were supposedly a part of. You do not feel any safety or security or connection. It is those distinguishing factors that really make a difference. That sort of connection in the community is huge. Another big part is that they lived by the seasons and by the daylight. We will get into some of this and this is really tied into a circadian rhythm. They operated seasonally both with what they ate and how they behaved and what they did. Everything was guided by the seasons and by the day. The rhythms of nature were their clocks, so to speak. They do not have deadlines and alarm clocks and things like we have today. They operated at a different pace of life.

I would say another big thing is that they constantly moved. This was where they had to do this and none of them exercised. None of them did yoga. None of them did breathwork. None of them did the things that we are valuing in our society today. And it does not make them bad. But their whole life was movement. They got up and they were immediately working in the farm, in the garden with the animals as shepherds, whatever the case was. But their whole life was moving. And this did not stop when they were in their eighties, nineties, and beyond. I met a 105-year-old Julio in Sardinia, who is still riding his bike. This idea, especially as we get older, we talk about Alzheimer's and dementia, and this neurodegeneration. The movement is a huge factor in this. We need to keep moving after retirement age. And that means more than just going out and golfing or what have you. It is constantly engaging the body and as much as we can, it does not have to be high-intensity interval training. It just means that walking and moving and lifting and twisting and all the ways that our body can move, continue that as much as possible.

We are fortunate to have things like yoga and tai chi and qigong and pilates and all these sorts of new ways that we can move that are really conducive to elderly populations when we get in our 50, 60, 70, and 80s. This is really good stuff. So keeping the body moving is critical. And the last one is fundamentally without getting into the weeds too much, eating a whole foods diet that is hopefully organic is possible. For them, everything was organic. It was not a not organic and there were a lot of plants. So that does not mean do not eat meat, does not mean you should eat meat. It just means a lot of plant food, a lot of plant matter that is organic. I think those are really huge factors. And if we can do those things throughout most of our life, we are going to stand a really good chance to avoid these sorts of diseases that are associated with getting older.

Heather Sandison, ND
I just got back from Costa Rica, which was in one of the blue zones on the coast there, and I remembered it somewhere in the back of my mind. One of the things about blue zones is that there is a lot of stairs and so the thigh muscles, they stay really strong. And as you mentioned, it is not because people are signing up for a class and like getting their 200 minutes a week of exercise. But because it is just ingrained in their day-to-day life, they have got to go up and down

a lot of stairs. I think this is true in Sardinia, too. It can. Can you confirm or deny that I am on the right track there?

Jason Prall
Yeah. Totally. it is the stairs for sure, so they climbed. Look, there is actually a funny photo online you can find. It is like an escalator going up into the 24-hour fitness. In my 24-hour fitness that I go to there is an elevator. And I see these are for good reasons, right? We have handicapped disabilities or disabled kinds of situations that require this. And yet it is a good example and it shows us that we might try to find the closest parking spot to the gym so that we do not have to walk too far before we go to work out. This is our mindset that we have to kind of bring awareness to and hopefully deconditioned a little bit. The idea of walking a little bit extra into the grocery store, walking a little bit extra to your house, walking to the bus stop. Now, we see this a lot in places like New York or in Europe. It is more geared toward walking. So it is interesting how we have set up our environment out here in the West such that it is really car driven. It is based on having a car and driving everywhere. So it is partially a result of our environment in the way that we have set things up. But whenever we can, it is about moving. They were moving, they were lifting. They were forced to do difficult things on a day to day because it was part of their life. It is hard to separate it from that. Like you talk to them and they literally would say, we do not do leisure that is not a thing. As kids they do but when you get into adolescence and beyond leisure was not a thing. It was just part of their day-to-day work. Everything was a grind.

Heather Sandison, ND
That is fascinating because a lot of people, as they approach the Western world, as we approach retirement we think we are going to kick our feet up, watch TV, have cocktails and happy hour, and eat whatever we want because we have worked hard and we deserve it. And then what happens is that slippery slope. We get the aging that we sort of expect now in the Western world. If you do not use it, you lose it. So whether that is not cognitive function, you are not doing anything challenging, not physically or mentally. So your body just kind of shuts down in these ways. Really fascinating how as people age, they think of aging in place and they want a single storey. You know that stairs, nothing where I might fall or trip or nothing that is going to. I do not want to have to lift anything over my head because it might fall on me. I might lose my strength. But if you kind of set your life up to have that life of leisure, then you are not going to have the ability to engage in the things that keep us healthy.

Jason Prall
Yeah. And the reality is, as far as I can tell, there is no way around this. We are all going to degenerate like we all get older. That is the process that is associated with life. However, it can look different. I mentioned a 105-year-old who is capable of riding a bike which means that the balance of the right leg's vestibular function has to be really good. He has to have enough muscularity to hold himself into the pedal and yet he was not his former self. So it is just a matter of can we maintain some capacity and there is a lot of research to look at. Walking backward is one of the most beneficial things to preserve leg strength and knee strength. And so these

things walking up stairs, walking backward, balancing exercise is unbelievable for maintaining that neuromuscular coordination. That is a big part of it. It is not about building muscle per se, although we do know that maintaining some muscle mass and avoiding that sarcopenia is really critical for avoiding falls and protecting the joints and bones and everything and hormonal balance. And it is more than that, it is the neuromuscular adaptations that we maintain or lose when we start changing our day-to-day operations. So can we move in multiple directions? Walking is probably the most beneficial thing that we can do. And the people that I spoke with, they walked 30, to 40 kilometers a day when they were adults. I mean, that is unbelievable.

Heather Sandison, ND
Add miles.

Jason Prall
And some of them would walk 15, 20 miles just to go to get milk or to get fish or do whatever the kid chooses. Whatever the case was, depending on their situation because they did not have everything at the tip of their fingers. This was a different lifestyle. It is not about trying to mimic that. It is about understanding the conditions that they were sort of forced to be in and how we can apply that wisdom to our modern life and keep things moving. Again, the movement of the body has tremendous neuroprotective effects. We know this with Alzheimer's and dementia, Parkinson's, and ALS. I mean, all the neurodegenerative conditions really respond well to a life of movement.

Heather Sandison, ND
Amazing. Okay. Well, if you are not inspired to exercise yet, I do not know what is going to save you. So, Let us go to sleep. So many people get caught in that. I'm so tired and I do not have time to exercise. Part of that can be because they are not getting great sleep. So, it is like where to start sometimes and prioritizing sleep, getting that circadian rhythm balanced, that is a phenomenal place to start because then you get that energy for your day. So what did you learn about circadian rhythm chronobiology? The best sleep for brain health?

Jason Prall
Well, I mean, this is something we actually all have intimate familiarity with. I'm going to go back to a recent story of mine. I have got a 3-year-old now, but he did not sleep much for the first year of his life. He was all over the place. Now, in that first year of life, it is to be expected. And we worked with it. But my sleep is horrible and so there are interesting things here because I know all about circadian rhythm and sleep and the benefits and the detriments and all these things. And yet because I was waking up, because my circadian rhythm in my sleep was dysfunctional during that year and a half, all of my habits changed. So I started eating more foods, more sugary, more sweet, more processed foods, even though I knew better meat. So the fact that I was not sleeping had a good impact on my decision-making, impacted my judgment, impacted my willpower, and impacted everything about what I will be doing the next day. So when I'm more tired, I do not feel like working out. And in fact, it may not even be that good of an idea

because my nervous system balance may not be able to support a really heavy or intense workout. So when we do not sleep well, then everything about our day suffers from our mood, our decision-making, our food choices, and our exercise habits. Everything starts to suffer. And then as our habits suffer because of this chronic sort of sleep deprivation or poor sleep, now our habits get ingrained.

I'm more likely to eat this certain crappy food. Then as that habit develops, it actually fortifies itself in my day to day. Not exercising starts to fortify itself. Now I'm living in this certain way that becomes my lifestyle that is very difficult to change. The ability for your willpower to overcome that is very challenging. The lack of sleep itself causes a huge downstream effect when it comes to your habits, your decision-making, your feelings, and everything that you are doing. But then there is a different part of this as well, and that is the circadian rhythm. This idea of circadian rhythm is intimately tied to sleep, but it is very different in and of itself. Everybody's familiar with circadian rhythms if they have traveled across time zones. If you skipped three time zones or five time zones, we call it jet lag. But essentially, your body is in Pacific Time and now usually your physiology is on your activity time, but your physical body is in the Eastern Time zone. Now the solar cycle that you are in is actually different from what your body is expecting. So that is the easiest way I can describe what circadian rhythm is, but it is essentially your body that has predictive programming.

It is anticipating when the sun is coming up and when the sun is going down and it is going to determine all of its functions based on that timing. We are guided by the light. And when you experience jet lag, it is usually pretty bad at first. And then over a few days, you start to normalize that your body is actually acclimating to the change in the solar in the light cycle. When the light cycle starts to shift, the body has the adaptive capacity to now change its function based on that. So what am I talking about? I'm talking about not only sleep, not only the melatonin rhythm that you might measure on it, on a certain test, or your cortisol rhythm. We know that cortisol is high, is supposed to peak in the morning and then decline throughout the day and below at about 9 p.m.. 10 p.m. is when it is lowest, and then it starts to peak back up again during the night and it wakes you up in the morning. Melatonin is the opposite. Melatonin is going to start to peak right around 11, midnight or so, maybe one, and then it starts to decline.

So those are the two primary sorts of sleep hormones that we track. But everything is affected. What happens is as the light comes into the eye and the light, the eye is actually capable of detecting the different frequencies. So at night when you are during the day, it is very bright. We have blue light, green light, and UV light. We have all the short spectrum and long spectrum, light, orange, red, yellow, and red, the whole colors of the rainbow coming through the atmosphere during the day. Then, as the sun starts to set, we actually only see the orange and red, and yellow spectrum come through. That is why it is not as bright as we can actually be. If the sun's low toward the horizon, we can actually look at it directly, and have no impact on our eyes. In fact, it is actually a practice that is been done for thousands of years, sun gazing, and it does have some benefits. But all the other spectrums, the green, the blue, the purple, the UV are

reflected back into space. This is why you do not get a sunburn at 6 pm. Most of the year, all those are reflected back into space and our eye is detecting the changes in this light in our skin to some degree as well. Our eyes then transfer that information, that light information, through an electrical signal to the super charismatic nucleus. This bundle of nerve cells essentially acts as the master clock of our body and brain. It is detecting what time of day this is, and then it is passing that information to the hypothalamus, to the pituitary, to the pineal gland, and to a lot of different parts of the brain.

And then they transmit that information to the rest of the body. If the pituitary gland is functioning based on that time then that means all the hormones that are regulated throughout the body, through all the different organ systems, are being tamed by the pituitary, by the super charismatic nucleus, and by the light. Now, what is even more fascinating, it is not just the hormones that are guided by this, but every cell in the body has clock genes. In 2017, there was a Nobel Prize awarded to the mechanism of three gentlemen from I think both of us from the US studying these mechanisms, the cellular mechanism of chronobiology, of our biology to function based on the timing. This is a tremendous discovery at the cellular level that we have these clock genes, period genes, and BMR, and they are gating and controlling function at the cellular level.

This means cellular metabolism, this means detoxification, these means are you burning fat or you adding all of the things that you can think of down into the bone cells, every cell of your body has these clock genes. So they all need to know what time it is essentially. And based on what time it is, they are going to do certain things right. And this is how we get the expression of cortisol rhythms, melatonin rhythms, and testosterone rhythms. Prolactin, you name it, all these things have these rhythms throughout the body. Your digestion is peaking during the day. You have really strong digestion and it is weaker at 9 p.m., right? You have a greater ability to metabolize sugars. You have different insulin sensitivities during parts of the day. So everything is guided by this. So why does this matter? This means that everything is dependent on this master regulator known as circadian rhythm.

And if your circadian rhythm is dysregulated, everything starts to fall apart essentially. Not only does it impact cellular function directly your inflammation goes up, and poor blood flow to the brain starts to occur. When your circadian rhythms are disrupted, you have less melatonin it does not peak as high and it does not stay on as long. There is not as much area under the curb. You have insulin dysregulation and metabolic dysfunction. You have poor, poor lymphatic clearance rates. And we talk about Alzheimer's, dementia, right? The buildup of tau proteins, beta-amyloid. Jason Prall, we are unable to clear that through the lymphatic system because we are not sleeping well because the circadian rhythm is off.

Heather Sandison, ND
I think a lot of people do not realize that we all make beta-amyloid plaques, but there are studies that show if you do not get good sleep, if you are jet lagged, or if you stay up all night partying, or

if something happens that disrupts your sleep. Even if you are in your twenties, thirties, or forties, you have an accumulation of amyloid plaques in the morning. Significant accumulation compared to the day before. And so if you do not give your body that opportunity to that lymphatic system to flush that out at night, you over time are going to put yourself at risk for Alzheimer's. And we see that there is a correlation between sleep deprivation in our thirties, forties, and fifties, and an increased risk of Alzheimer's later in life. So sleep is of the utmost importance. And it is so nice to hear you sort of describing the nuts and bolts of how that is working at a cellular level.

Jason Prall
If we are having this excess inflammation, I mean, the body's always ebbing and flowing. This buildup of things generally during the day, it is essentially the day is a destructive time for our bodies. Like everything breaks down. It is just a complete mess.

Heather Sandison, ND
We need it to stimulate.

Jason Prall
That good. And that is how we engage with the world. Right? And then ideally, we go to sleep, we shut down and the body goes, okay, this human's finally resting. Let us go ahead and clean things up. Right. We are going to take out the trash. The maid comes in and starts to clean up the house. So this is what we need. And this build-up, it really is very much like the operation of living in a house. So you make a mess during the day, then you wipe your counters, you clean the dishes, and you put things into the trash bins. And eventually, the trash bins need to be taken out. If you do not take out the trash bins you can shove them in the closet for a while. You can shove them under the bed. You can put them around your house and hide them. And then eventually it will build up too much and then it will start affecting the rest of the household. You will start to smell. You will have infections. You will start getting and this is exactly what happens at the cellular level as well as in the interstitial space right throughout the body and the lymphatic system is the primary sort of waste clearance system, which affects the brain to it. We call it the glymphatic system, but it is essentially the same thing. It is the ability to take out this metabolic waste, this activity that builds up at the cellular level. And we flushed that out in our data.

They call it asthma. It is just this buildup of gunk that is a natural result of living, of cellular metabolism. Fortunately, we have mechanisms to clear that out, to wash that out, to flush it out. But if those systems get backed up, if they do not get what they need, then they start breaking down. And then we get the buildup of this, the tau proteins of the beta-amyloid. I do not think those are bad things. I do think they are sort of protective in their own right until they become accumulative and the body is unable to communicate at that level, neuroinflammation rates and we get into this sort of vicious cycle. We need to clear that stuff out. The body will build it up again. This is a natural process. But if our circadian rhythm is not on point, let me put it this way,

you can be sleeping 9 hours a day, but if you are sleeping those 9 hours at the wrong time of day if you are aware of your swing shift. If you are working nights, now we have a problem. It is not about the amount of time per se. Are you timing it with the light cycle? So we should be sleeping roughly from 10 p.m. to at least 4 a.m. That is the crucial window again, which is going to vary depending on your latitude.

If you are living in Sweden or you are living in Costa Rica, those are very different situations and they have different seasonality to them. It is going to vary depending on seasons and location. But generally speaking, that sort of 10 p.m. to 4 a.m. window is the critical window. Even if we are in our thirties or twenties, a lot of times we stay up past 10 p.m. because we are young, we are youthful, we are full of vitality, we are social that is causing damage, that is creating the conditions to set us up for Alzheimer's, dementia, autoimmune conditions, cancers, all the things that we might think of in the sort of the disease realm. It is this sort of lack of good sleep during the right times of day that creates the conditions in the body that then have manifested in what we might term a disease. It is a really complex mechanism, but the circadian rhythm is the thing that governs all the functions in the body.

Heather Sandison, ND
I love that visual that you shared about the house. We can all relate to that. But if the trash does not get taken out, it builds up and it creates a pathology eventually. We need this opportunity to do that. I'm sure that our listeners are convinced that they need better sleep. What's the first step? I also think of you as a tech guy. Heather Sandison, ND Do you use a tracker? Do you have a tracker that you recommend? Is there a healthy way to interact with the tech around this? Or are you like no wifi off every night? What are your opinions here?

Jason Prall
The aura ring is probably my favorite piece of tech overall. I think wearables and tech can get you into a little bit of hot water sometimes. Some of them are not that healthy. And sometimes we are monitoring things that are not really about most important and something like the aura ring. And I wish I got pitched. I wish I get paid to pitch this, but the Aura Ring is fantastic. It measures heart rate variability. So that is your nervous system, your autonomic nervous system balance. In other words, can you get into a good parasympathetic tone, which is your rest and digestion? And if you are in that early phase of dementia or Alzheimer's or you are worried about it, let us say you live 40 years recklessly and you are like, I did not know. Now you can use something like that to track your autonomic balance. And are you able to get into good regenerative capacity? It is a fantastic tool for that. It also tracks your sleep and gives you, are you in deep sleep? Are you getting REM sleep? Are you getting light sleep or are you waking up? It tracks that throughout the night and just at a simple ring very easy to wear. Probably like I said, I do not own a lot of devices. That is probably my favorite device that you can use and it gives you a lot of information about the most fundamental aspects of healing, which is sleep. This is the most critical piece of our healing journey. That is part of my favorite healing.

Heather Sandison, ND
And it tracks exercise or movement as well. Steps at least.

Jason Prall
And the interaction between, these is what is important. Bodybuilders know this or people who are intense exercisers and athletes know this, that you actually do not want to have a vigorous workout unless you get really good sleep. They call it in the Aura Ring as your readiness score. Is your nervous system ready to handle a heavy workout? Athletes want to work out hard, but if they are nervous systems are not ready, then not that hard work out that they can do will just cause more damage. We are the same way, and especially if we have a chronic disease or illness, then our nervous system is actually going to be less ready for intense exercise. But the idea with exercise is that the most beneficial thing you can do is to go as intense as possible for you as long as your nervous system is capable. That may only be walking and that is fine, but you are going to get the most benefits by reaching that hermetic stress response. Just enough of a stressor to allow the body to adapt so long as it has the repair and the regenerative capacity and the resource to respond.

Heather Sandison, ND
Great. And then there are people where this is not right for them. I have had patients, where they are so attached to that readiness score or how much sleep they got last night, and then kind of stuck in their heads. We want to use it as a tool that is supportive, not as something that we start to hyper-focus on achieving over that relationship with it.

Jason Prall
This is the achievement personality type that gets locked into that totally. The best way you can use that is to learn from it. At first, you just checked. Why is my sleep really bad? I thought I got a really good sleep. Then maybe next time before bed you try meditating. Or you try this like red light therapy or you try going into a sauna or you try reading a book or taking a bath. You try something and then you see your sleep, then you say, that did not work. Maybe I need to black out my curtains a little bit, to make the room darker.

Heather Sandison, ND
I almost want you to slow down. What are the things that you would do? I have a patient. He has a sleep tracker and was not getting great sleep. Really prioritized it because he had the experience that I think all of us have. It is like you do not get enough sleep and your brain does not work the next day. He is an executive tech and the executive needs his sleep. So, he was setting aside like 10 hours to get enough sleep because he was not getting good sleep. Changed his mattress and his sleep scores changed profoundly. It was the biggest shift in his sleep in years, despite him trying a lot of things that you had just listed. This is that opportunity to get that feedback, to know what is really impacting your sleep. Tell us everything. Go through the list. If you do not feel like you are getting a good sleep, where do you start? What do you do?

Jason Prall
This is actually a big problem with dementia and Alzheimer's patients is that because the neuroinflammation in the condition that they are in actually disrupts the circadian neurons. This is part of the reason why they are actually not getting good sleep. It is because of brain degeneration. This is an intimate relationship we have the circadian rhythm, light, and Alzheimer's and one affects the other. We can reverse things from both ends. So I'm going to start there is a lot of things that affect sleep. I probably can not name them all, but I'm going to name the most important ones that are almost always overlooked. The most important aspect of getting good sleep at night is getting light during the day, particularly in the morning. So it has to do with circadian timing. So again, our body is always reading and responding to the environmental cues. So when you get up in the morning, assuming that the sun has risen, but essentially once the sun's risen and you are up, you want to get 20 to 30 minutes outside and the light is going to enter your eyes and your body's going to say, It is morning. Cool.

We are going to mark this as morning. The sun's up. Now turn on all these functions. Now, it may not happen right away because it takes time for your body to adapt. Just like if you were to cross time zones and you are halfway around the world, 12 hours difference. It is going to take you probably two weeks for your body to get back on function. The same thing in your modern day is if your body's off rhythm, then it is going to take a couple of days, a couple of weeks perhaps to get you back into optimal function. But go outside first thing in the morning, go for a ten or 15-minute walk, even if it is cloudy, even if it is dark, even if it is raining, the light filters through the clouds. It is such an intensity that your body will pick it up, your eyes will pick it up and your body knows. Now, if you can get light during the day, that is even better, too.

So this has to do with peak melatonin. So the peak cortisol will rise because of the light and also your brain will essentially program the timing such that you will make more melatonin at night and you will make it at the right times. So one of the big issues with sleep latency, the ability to fall asleep, how long it takes us, was going to take you 5 minutes to take you. 45 minutes has to do with that melatonin peak. Are you able to make good, strong, high melatonin peaks and maintain that throughout the night? The daylight is the most important factor when it comes to your ability to make melatonin at night and your ability for cortisol to drop. We want to see really sharp, nice curves if we were to do testing. Usually, what we find is that things are flat, they are kind of dull.

We do not get a good cortisol peak in the morning, we do not get a good melatonin peak at night, or sometimes we even see flip-flops. We see melatonin starting to rise at 4 p.m. It starts to rise at 1 a.m. It can be all over the place or it can be double humps. It can really get chaotic. So getting good light signaling during the day is the number one thing. And almost everybody forgets that. Another huge factor exercise, I'm going to go back to this. But that part of the reason and the reason coffee is an effective sort of keeping us from sleeping is because of the adenosine receptor. So the caffeine attaches to that adenosine receptor and blocks it. We want

adenosine to go into that receptor and that helps us fall asleep. Caffeine does not actually give you energy. It sure kicks on cortisol and adrenaline, but it also blocks adenosine preventing you from sleeping. So, if you have trouble sleeping at night, either cut out coffee, cut it down, way down, and limit your intake before, say, noon. That'll help a lot. Then if you exercise, you are actually getting more Dennison in the system that'll attach to the adenosine receptors and help us sleep.

So if you have a really good workout kind of mid-afternoon, you will fall asleep pretty well at night. But you do not want to exercise too late either. Again, you see what I'm pointing to? It is all timing. If you are exercising at 9 p.m. and you are eating your post-exercise meal at 930 or whatever, this is a disaster for hormonal fluctuations and the ability to fall asleep, leptin, ghrelin, all these sorts of neuropeptide Y. There are various hormones that start to shift and that are really important for sleep. We want to exercise during the day. We want to eat our biggest meals during the day. We want to get good light signaling during the day and then at night, we want the opposite. We want to slow things down. We want to not eat a huge meal at 7 p.m. and I have been on the East Coast enough and that is what they do. They go out to dinner at eight or 9 p.m., eat massive meals, and then it is a super activity.

Heather Sandison, ND
So we double-click on that because like Italy. People eat later in the evening, but there is still a blue zone there. So what is with the disconnect?

Jason Prall
There is a big difference between Italy and Sardinia. Sardinia is an island. And even on the island of Sardinia, Cagliari is the main city. They are not a blue zone. They are not particularly healthy. But you go up into the mountains where there is hardly any street lighting, where they are walking all day, where at night they are basically going to bed when the sun goes down because there is not much else to do. Very different lifestyles there. But some of the habits are the same. They take a siesta and that is beneficial. They might have a 45-minute or hour rest between 1:00, and 2:00 when the sun is the highest. They rest metabolize their food. They may push their sleep a little bit later, but they get up as well. It is very different.

There are a lot of factors with all of this when it comes to trying to restore somebody's good sleep and getting good sleep scores and seeing good deep sleep and good REM sleep. These are the factors that we really want to stick to. As we get into that sort of 9 p.m. range, we do not want food. No eating of food. After about 7:38 p.m. is ideal. You want your body to fully digest, so it is not taking its energy to digest the food again. Your neural hormones will start to regulate better. Then at night, everything has to do with slowing down and relaxing. You do not want to be thinking a bunch watching TV, the blue light, the green light from the TVs, the computer screens, and the phones from the iPads. This is all impacting through the optic chiasm to the suprachiasmatic nucleus. Those light signals are telling your brain it is morning when really it is 9:30. They are not as strong as what is coming from the sun, but they are still there. There is still

more than what you would get from a fire or candle, or the stars or the moon or sunset. Think about what nature's doing. And this is what we find when you take people, insomniacs out into nature and you basically have them go camping for three weeks. They are no longer insomniacs. The stimulus and the light and the temperature. This is another big one. Temperature regulation, our natural body temperature starts to dip. Our core body temperature and our brain temperature start to dip early in the night. And it actually fluctuates during sleep. Brain temperature starts to fluctuate. It is really bizarre how all that works. But nevertheless, we want a colder room during sleep. When you are even really cold it is better than hot. Your body will adapt to that cold temperature a lot better than if it is 75 or above. Your body's going to struggle to get to reduce its temperature and induce sleep. So cold temperatures at night are really effective.

Heather Sandison, ND
Is there a general temperature? I woke up in the middle of the night because my feet are freezing. And it is disrupting my sleep because it is too cold. And then I also woke up because it is the middle of summer and I'm sweating. It is too hot. If I'm looking to optimize the temperature in my room for sleep, where do you start? Like 68 or like.

Jason Prall
Good question. It is individualized.

Heather Sandison, ND
So your sleep tracker, you get your ring or your watch.

Jason Prall
But just the idea is to pay attention to temperature. Sometimes it can even be something like the temperatures. Generally speaking, 65 is about right for most people. 68 I was a mechanical engineer and we had to deal with temperatures inside buildings and typically 68 to 71 is your typical indoor temperature during the day. At night, you want it to be about 65 to 68, somewhere in that range. Some people like it colder. But the other thing you can do is you can have overhead bands that can change the dynamics. Ultimately, just pay attention to temperature and you do not want to be too hot. That is the primary issue that most people have. I slept in the Himalayas at 14,000 feet, where there were holes in the wall. We were inside a sleeping bag with multiple layers on and like snow jackets and gloves and everything. It was so cold, my nose was freezing but I slept like a baby. It is really interesting what happens with regard to temperature.

Whereas I have also been in Costa Rica and other really hot places, basically sleeping with nothing on top of the covers and having a horrible time sleeping. So temperature plays a big role and it is because of the circadian rhythm. And then other things you can look at Wi-Fi, Bluetooth, some of these sorts of EMF signals. And the way that really works is that it impacts the calcium channels, the voltage-gated calcium channels in various cells. And so that is going to influence melatonin production. Are you producing enough melatonin? They have even

looked at some of the status lights, even some lighting in the room that you might see from alarm clocks or whatever else you might have in your room. We are super sensitive to some of these lights. They will put some of these lights on somebody's skin and they will detect neural changes. Brainwave patterns shift just with a light on your arm.

Heather Sandison, ND
If you need to for kids or as people age and they are getting up to pee in the middle of the night, would you recommend having a red light or a different one? An orange kind of makes sure it does not have, it is not LED with a lot of blues. It is not a really bright night light.

Jason Prall
You got it. Exactly. And it can even be somewhat bright as long as it is in that red range, that the red is the ideal. We have four for my three-year-old as well. So when he wakes up and gets up, he is not sure what to do, he can see. But that red light is ideal for not impacting sleep as much.

Heather Sandison, ND
And can you sleep with a little bit of red light on this? I have actually heard somebody suggest that that was beneficial when I was under the impression that you want complete darkness.

Jason Prall
Typically, it is a good question. I think about historically, what would we have seen? We probably would have seen fires, sleeping by the fire. Cold night, a little bit of warmth, a little bit of noise, a little bit of fire. Probably throughout human history, we have experienced that quite a bit so we are probably fairly adapted to that type of setting. I do not think it would be that problematic. That said, darkness is our friend when it comes to sleep. And so if you are going to do light, make sure it is as I would say, as deep red as you can get. That is the best way to do it. But, it is all pretty intuitive if you just kind of slow down and think about what is happening. And again, this is why I'm pointing to circadian rhythm. If you understand circadian rhythm and sort of Ayurvedic Chinese medicine, even the most fundamental way of thinking about it, you already understand jet lag. You already understand that digestion and exercise are probably going to be better during the day.

You may not know exactly when, but certainly better during the day than at 9 p.m. You know that it is not natural to be looking at screens, bright screens and bright lights and overhead lights at night because just look outside. We already understand some of these things. If we are having a very big, difficult-to-digest meal like ice cream. But if we have that at 8 p.m. or 9 p.m. it is not ideal. The body has to take so much energy to metabolize, digest, process, and store, all that food that it can not do what it wants to do at 9 p.m. or 10 p.m., which is clean up. Which is to take out the trash, which clears the system. It is having to do other things. So we have limited resources in our bodies to do the functions that we need to do. That sort of ten-to-midnight window is absolutely critical for taking out the trash, cleaning things up, restoring function, for making new mitochondria, for all the things that we really want. That window really matters. So

if we can just start to flow with this rhythm and what is cool is that without getting too deep into this, that circadian rhythm actually changes based on the seasons. So during the summer, in most places, we have a longer summer unless you are directly on the equator the days during the summer are longer. So our body day by day as the light cycle starts to shift slowly.

Usually a minute or two at a time. Our bodies picking that up, our eyes going. It is different today. These little micro changes are why we are so attuned to the light because we can actually track the seasons in our biology down to your kidneys cells and spleen cells. They know what time of day it is so long as you are getting up and you are going outside during the day and you are getting a good shut down, slowing down darkness at night. But most of us stay in our little boxes with just enough ambient light to sort of kind of be like day. But you can light up a room and it is not nearly the same lux or same intensity of light as if you just go stand outside on a cloudy day. It is not the same as the spectrum of light that we get from the sun is very balanced. There is a lot of UV, there is a lot of infrared, and everything in between. If you look at the light spectrum of some of these lights, there is zero UV, there is hardly a spike of blue and then there is the random spikes of frequencies. It is not this big balanced spectrum of like a rainbow. It is like these weird spikes. It is totally artificial. And your biology understands this. Your mind may not, but your biology down to every cell understands this difference.

Heather Sandison, ND
Or does not understand this. Exactly.

Jason Prall
It is trying to adapt.

Heather Sandison, ND
Yeah. It is like that extra effort. Jason, this is so exciting. We have barely scratched the surface of what you have learned about health and longevity. I want people to know where they can find out more about what you have learned.

Jason Prall
Yeah. Of course. First, if they are interested in my new book, they can go to beyondlongevitybook.com, where you can find out more about that. And we have some really nice bonuses that actually that go along with that for your listeners and also they can go to awakenedhealthacademy.com which is where I have a bulk of my work as well as the Human Longevity Project docu-series. We get into all kinds of really important factors that we just did not have time to get into today. But this idea is that mitochondria play a huge role in brain health. Neurodegeneration and the avoidance of Alzheimer's, dementia microbiota, and the communication between those two, which is why the gut-brain connection is so critical. Again, circadian rhythm affects all of these things as well. So we explore all these complex topics, but we get into the deep science, we really do.

If you are a nerd and you like deep science, then we got you covered. But more importantly, it is about making everything practical. How do we get this to the point where we can apply these very simple lifestyle habits throughout our day and we do not need to know the science? When I walk around the world and talk to these people from Okinawa and Costa Rica and Sardinia, they understand the big life lessons. They understood what we were doing wrong in the West. They understood what they were doing right and what their ancestors and heritage and culture taught them and why they did that. But they did not know the mechanisms, so they could not talk to you about mitochondria-microbiota interaction and why producing short-chain fatty acids is so beneficial. They do not care. They know what to do. So that is really the biggest factor. And I think if we do not get down to that level, then we are just kind of playing in this sort of science world and not really getting it down to the ground level where it really makes a difference.

Heather Sandison, ND
If we are on our computer scrolling to learn about how to live this healthy lifestyle, but it is two and then we are not going to work and it is kind of defeating the purpose totally. Also just because I saw you recently and we were chatting, I know that you have some other really fun, exciting projects that you are kind of moving towards. And we have a lot of healthcare providers who listen to the summit and show up. Can we share a little bit about your offerings for people suffering from burnout?

Jason Prall
We have got a new retreat that we are doing in Costa Rica and the demand is actually very high. I will give you a link. And hopefully, by the time this comes out, we still have availability. But the idea here is that there are a lot of doctors that have gone into their field and have done extremely well. They have made money. They have done the best they can to help you. But they are stuck in a system that no longer feels congruent with where they are at. I have so much compassion for those people because I was one of those people. I was just doing it in the engineering field and I was stuck and I felt like I needed a way out, which is not to say that I was doing anything wrong. I just did not feel like I was living in a way that was in alignment with my soul and what I was here to do. I know there is a ton of doctors and practitioners of all kinds that are looking for a different way to do business. So, I partnered with Dr. Chang, Ron, who is a brilliant businessman first. He is a doctor, but he actually helps doctors find a new way to practice.

Heather, you are doing this. There are so many doctors that have found a way to do this, but it is not necessarily easy when you are coming from the traditional system and figuring it out. I do have to learn how to do business in a totally different way. How do I start? But there is actually a really cool thing. You can bill insurance companies in totally new ways now, so we can actually stay in kind of the old paradigm and use it in a new way that is a little bit more integrative, that is a little bit more therapeutic, that allows the doctor to be in touch with their patients and actually work with them instead of just rushing them out the door and be caught in this sort of system.

So that is really what, Dr. Ron and I are doing. Helping doctors find a new way to practice what they love to do, a new way to help people and a new way to feel like they are contributing to the health of their patients and their clients without getting so burned out and caught in the system.

Heather Sandison, ND
Getting that congruence back. I have so many friends who are kind of in that spot and I just so appreciate what you guys are doing to make that available for people. And I'm sure that the first one if there is no space for the first one, I can not imagine you guys want to do another one because it sounds like it is going to be a really wonderful, amazing offering.

Jason Prall
We have actually got one. We were going to do one and we may do back-to-back because the demand is so high.

Heather Sandison, ND
So it is not a surprise.

Jason Prall
Back-to-back weeks. And so because of that, hopefully, you could have planned another one in December or January of summer of 2023 or January 2024

Heather Sandison, ND
So that is the day.

Jason Prall
We are going to be doing this going forward because it is so, so beneficial.

Heather Sandison, ND
So valuable. Thank you for sharing and thank you for being here and taking the time. I know you are busy and got lots going on and so it is just really valuable and wonderful to have you here. I'm so grateful.

Jason Prall
Thanks for having me. Heather.