The Importance of Light and Sleep to Your Health:
A Special Interview with Dan Pardi

By Dr. Joseph Mercola

JM: Dr. Joseph Mercola
DP: Dan Pardi

Introduction:

JM: Light is crucial to your health, and it may be one of the most important things that you can do to stay healthy. Hi, this is Dr. Mercola, helping you take control of your health. Today we are joined by Dan Pardi, who is going to enlighten us on this topic – no pun intended.

So, welcome and thank you for joining us, Dan.

DP: Thank you so much for having me on the show, Dr. Mercola. It’s a pleasure to be here.

JM: Sleep is such a crucial area of health. I’ve always believed that you could have the ideal lifestyle with respect to the food that you’re eating, the water you’re drinking, and exercise. But if you don’t have your sleep right, you’re just not going to be healthy, and inevitably you’ll get sick. Is that something that you’ve concluded also?

DP: I couldn’t agree more. I started to become more familiar with sleep about ten years ago, and it remains an endlessly fascinating topic. The more I learn, the more I understand how much of an impact sleep has on our well-being, our health, and really the type of person that we are on a day-to-day basis.

JM: Well, why don’t you provide our viewers with some of your background and your research on sleep? That will help us understand why you believe that getting proper amount of sleep is so important.

DP: Sure. I’m a researcher. I work with the departments of neurology and endocrinology at Leiden University in the Netherlands, and I work at the Behavioral Sciences Department at Stanford. I look at how sleep deprivation or not getting enough sleep or the amount of sleep that you need can influence decision making and cognitive processes like reaction time, memory, impulsivity, and how that relates to food choice. That’s my research.

I’m also the CEO of a company called Dan’s Plan. It’s a 10-person health startup. We look at trying to help people maintain good sleep habits. We consider sleep to be one of the things that we call the “mundane but meaningful.” It’s easy to overlook, but it’s also one of those things that have a very important impact on our health.
JM: Perhaps you could give us the general range of the amount of sleep that people would need, and maybe touch on some of the variables that would change those requirements.

DP: Sure. Sleep changes across the lifespan. In 1960, Professor [inaudible 02:55] published a study that looked at the amount of average sleep time that we do get across the lifespan. We do see when you’re an infant to a toddler, that the amount of sleep that you need changes. You actually sleep a good percentage of the day. Most people know that, having been around young children (if you have been). And then by adulthood, it usually settles somewhere between seven and nine hours.

If you look at a sample or a population, you’ll see that the average tends to be about eight hours of sleep that people get. But you can’t apply population averages prescriptively to individuals. You can’t say, “Well, because this group needed eight hours, therefore you do,” because if you need seven hours, and you tried to get eight, it could actually mess up your sleep and vice versa. If you need nine and you’re prescribed eight, you’re not getting enough.

We all have our own individual sleep need. That sleep need can also change even though your average might be, let’s say, eight hours. There may be times when you need a little bit less or a little bit more depending on what’s happening in your life. If you’re dealing with a heavy amount of stress from physical activity, if you perform a physical activity like a sport or you if compete heavily, you might need a little bit more sleep. If you’re fighting an infection, you might need a little bit more sleep.

It’s kind of a moving target. But generally, a good place to start for most people is to try to get eight hours, and see how they feel. You can’t really prescribe to get somebody to, you know. “Get eight hours of sleep.” It’s really not the time in bed. Try to get eight and a half hours of time in bed, and maybe you’ll sleep eight hours. That’s a good place to start.

JM: I’m wondering if you can provide us with some guidelines on how to understand if we’ve achieved enough sleep for that night. Just relating to my own personal experience, I know when I don’t (I fail to do that for whatever reason, certainly not by design, it’s just circumstances) that when I’m reading on my computer or a book, and it’s not particularly engaging, I notice that I start to doze off. That’s been a good tool for me. But I’m wondering… That is probably a reliable one. But are there other guidelines that you can use to know other than the general ranges that you just mentioned earlier?

DP: Yes. Maybe I’ll start by mentioning that the things that matter about sleep in terms of allowing sleep to do the things that it does to make you feel better the next day is timing, intensity, and duration. The duration is easy. That’s what we just spoke about. That’s the amount of time that you get sleep over a 24-hour period. Eight hours. That can even be a six-hour chunk and then a two-hour nap. It doesn’t have to be consolidated into one eight-hour period. But the total amount of time or the total duration will be what matters.
The timing is when that sleep occurs. For example, if you’re used to sleeping from, let’s say, midnight to 8:00 in most days. You go to bed at 2:00, and then you wake up at 10:00, that’s not going to provide… Even though the duration is the same, because the timing of the sleep shifted, it’s not going to be as restorative.

And then also, the intensity. This speaks to a few concepts. It has to do with the different stages that your brain and body goes through over the course of the night and how those can catenate to one another. The sequence of those stages really matters as well. There are some medications that will actually suppress certain phases of sleep. There are certain conditions like sleep apnea, where, again, you might be getting eight hours of time in bed, and you might be sleeping in the same time period, but you have very fragmented sleep. All of these things matter in having the quality of sleep be really good.

All right, how do you know if you’re not getting enough if we all have our own individual amounts? Interestingly, subjective assessment of your own sleepiness is one way to do that. You can think about how sleepy you are. A good way to understand that is [to ask yourself]: do you have bouts of sleepiness during the course of the day? Would you be able to take a nap if the opportunity was there? Do you feel like you need a lot of caffeine?

But very interestingly, what’s been shown is that our own subjective rating of our sleepiness is not always a perfect way to assess our own sleep. The reason why is that after a few days of insufficient sleep or not getting enough sleep on a daily basis, the amount of sleepiness that we experience tends to (it’s called) saturate. It doesn’t get much worse; it gets pretty bad over a few days, and then it actually levels out.

If you were to measure objective measures of cognitive performance like reaction time, you would see that those would continue to get worse if you maintained an insufficient sleep pattern on a day-by-day basis. That’s one of the big problems in our society today. It’s that we basically accommodate feeling sleepy that that feeling starts to feel normal. But then we have continual impairment in how well our brain is performing. You have this situation where you overestimate your readiness to perform tasks, and you underestimate your impairment. Sleep loss has been associated with some really major catastrophes like Chernobyl and Exxon Valdez, and a lot of loss of life from car accidents year by year.

**JM:** Probably tens of thousands of people a year from that one.

**DP:** Yeah, that’s right. And then there’s also just performance at work. Like you’ve mentioned if you are reading a book, it’ll be harder to focus. There’s a lot of attention deficit hyperactivity disorder (ADHD) that is diagnosed, which is actually really just related to poor sleep or insufficient sleep.

Children who are of teenage years, they have something called delayed sleep phase syndrome (DSPS). It’s more natural for them to want to go to bed later, and then want to get up later. But because of school times, they have to go and get up at, let’s say, 7:00
to be at school by 7:45. They’re sleepy all day long. At night, they get this alertness drive. That keeps them up. This cycle perpetuates. They underperform at school. They’re not getting good sleep.

The mind requires proper sleep to be able to focus the attention on one particular task. If you think about the attention deficit, that is the idea that you can’t focus for very long, whether it’s something that somebody is saying or whether it’s reading a book. You can focus for maybe a line or two, and then your mind jumps off to another topic. The mind doesn’t have the mental energy to sustain focus. That is one of the cardinal aspects of attention deficit disorder. That can happen to adults and children.

We’re getting 20 percent less sleep on average as a population than we were in 1960s. That’s equivalent to one whole night of sleep loss, which is also clinically meaningful, meaning, at that level of sleep loss we experience very significant issues.

**JM:** Well, thank you for enlightening us on the time requirements or at least the guidelines for that. But I’d like to delve now into some of the factors that can really improve the quality of the sleep. As we mentioned in the introduction, that really has a lot to do with the lighting, which I found particularly intriguing when I first heard of your work. Because it’s not well understood by the majority of people and certainly even the clinicians the crucial importance that light plays in sleep – or the lack of light or the light in the daytime. I’m wondering if you can expand on this topic, because I think it really has such a tremendous potential for improving the quality of sleep.

**DP:** It really does to a surprising degree. When you first hear that “light impacts health,” it almost sounds like, “Woah,” you know, it’s not really scientifically-based, but it absolutely is. The reason why it’s important is that light serves as the major synchronizer of something called the master clock. The master clock is a group of cells in the brain called the suprachiasmatic nucleus (SCN). What they, this group of cells, do is they will synchronize to the light-dark cycle of our environment. We have clocks throughout our body. Those clocks will then synchronize to the master clock.

There are two levels of synchronizations that are taking place: the master clock with the environment and our body clocks with the master clock. So many different physiological factors will maintain a 24-hour pattern whether that is eating behaviors, whether it’s cell cycle, growth, and repair process, or whether it’s hormone patterns.

In the non-artificial light environment of our history, we would basically experience light according to when the sun rose and when it set, and then there was a little bit of, you know. We would experience light from fire. That would basically maintain a fairly regular pattern of light exposure and darkness exposure as well, that the body could set its rhythms, too. Now with the advent of the light bulb, artificial light, high-definition televisions, and iPads, we are getting a lot more light in total over a 24-hour period and a lot less darkness. We’re also telling our brain that it is daytime when it’s actually night time. That throws off all of those rhythms.

There are some very significant consequences of a mistimed lighting environment. We have temperature alterations. We have behavioral alterations. Ultimately, we know that
people who do a lot of shift work, where they work normal schedules several days a week, and then they might flip flop and work a night shift. They’ll have rates of cancer that are four to five-folds higher than the average population. We also know that things like diabetes and obesity also have drastically increased rates when people maintain a classic shift work.

Classic shift work is just as I described. You’re working a shift that’s late at night. But there’s a new type of shift work, where people go to work in the morning, they come home, they spend a little bit of time with their families, and then they go back to work on their computers because it’s the time of the day where it’s quiet. They are getting less email perhaps. This is a pattern that a lot of people in the modern workplace maintain. Again, this new type of shift work is also throwing off our rhythms very significantly.

There are both behavioral problems (which is lack of concentration), and then there’s also physiological problems, which then can result in things like cancer. Behavioral problems can result in accidents but also poor performance at work. So, really, what we want to do if you think about it is… My advice is to try to maintain a natural rhythm as [much as] we can, but in the reality of a modern lifestyle just so it’s practical for people.

If we think about it, most people wake up, they go to work, and they’re in an indoor environment all day. They’re not getting significant or sufficient light exposure during the day, because if you look at a light intensity scale, outdoor light is far more intense than indoor light. If you measure it in something called a lux unit, which is considered illuminance… If you go outside during the day, the lux unit outside is about 100,000 lux units at noon. Indoors, it’s somewhere between maybe a 100 and 2,000 lux units. It’s an order of magnitude less – two orders in fact.

We’re not getting enough bright light exposure during the day, and then in the evening, we’re getting too much artificial light exposure. Both of those have the consequence of causing our rhythms to get out of sync.

JM: Perfect. Now, can you provide us some comment on strategies to block out the light to achieve this ideal sleeping environment? You know, personally I found that light-blocking shades paying particular attention to the sides (there are runners coming up on both sides, so that light doesn’t leak through the sides of the shades), have been particularly helpful.

Do you think it’s necessary or even wise to achieve an environment where you’re pretty much in total darkness and where you really cannot see your hand in front of your face? Do you think that there’s more value to following more of an ancestral pattern? Typically, our ancestors slept outside frequently or in an environment where they were reflected by moonlight or starlight. There was a relatively low level of illumination.

DP: Yes. If you look at the sensitivity curve of the effect of light on melatonin rhythms – melatonin is a marker of circadian phase or our biological timing, right, what time of the day our body thinks that it is. You will see that somewhere around 50 to 1,000 lux, that’s the activation range that light will have on suppressing the melatonin production. Less than that, you don’t really see that much change in melatonin rhythms. But light can
penetrate our translucent eyelids. Even if you’re sleeping in a lit room, it can still enter into the brain, and it can affect your circadian timing.

In fact, there are certain strategies where you use light therapeutically at certain times of the night to help people get the rhythms back on track, for example, with teenagers. Teenagers, who have their rhythms shift, so they can’t go to bed until 1:00 in the morning because they’re just not tired.

[----- 20:00 -----]

**JM:** Or later.

**DP:** Or later, right, yeah. You could have one of those light alarms, where the light turns on at 4:00 A.M. The teenager will sleep through it, but the light will still enter the brain, and it’ll shift the rhythm, so that they’re more likely to wake up at a time that is conducive to them going to school. They’re also more likely to go to bed at a time that’s going to allow them to get a full night’s sleep. That’s just one way that you can utilize the light.

**JM:** Interesting. With that light coming on at 4:00 A.M… I love those alarms. I used to use them when I had to get up at a certain time. Now I just pretty much allow my body to wake up when I want to. But with that strategy to reset the cycle, would you leave the light on continuously? Or would it go off after a time?

**DP:** Once it goes on, it would stay on.

**JM:** Okay.

**DP:** But the things that matter for light affecting circadian timing is timing, intensity, duration of exposure, and the wavelength. All of those things matter. Timing makes sense. If you’re getting light at 4:00 A.M., it’s going to pull your rhythm. It’s going to pull that sinusoidal rhythm that’s maintained from circadian rhythms in one direction. When you have light late at night from televisions and iPhones, it’s going to pull it in another direction.

What ends up happening, the most common scenario, is that we’re using technology late at night, and that’s causing us to basically be in this perpetual state of jetlag. Our body’s always… We’re giving it the signal to adjust. At night, you’re telling the brain, “Hey, it’s daytime,” when it’s night. You wake up in the morning, and you’re giving in a different signal. “No, it’s actually daytime now.” All these different rhythms – whether it’s hormone, body temperature, or behavioral patterns – they will all resynchronize on their own timeframe. What ends up happening is that, because of this modern environment, instead of having really synchronized rhythms throughout the body…

By the way, at 10:00 A.M., you might have high cortisol, low melatonin, low growth hormone, and your body temperature’s what it is. That will basically provide a very specific signal, almost like a key into a lock, that tells your cells a very specific message. When all those rhythms are off, you can see how things like cancer can develop more readily. Because again, the signal to maintaining normal processing – cell cycle repair,
growth, and repair process – is not getting the right signals, right? When you start to think of it that way, it makes a lot of sense.

Under the exquisite regulation of the circadian system is our endocrine system. It really controls most of the hormones in our body because a lot of, you know. Whether certain glands are producing hormones that are not within the central nervous system, they’re certainly getting the original signal that’s coming from there.

To kind of go back and give some practical advice, you want to get bright light exposure during the day. That makes sense. We evolved in an outdoor environment, and right now we’re indoors. The light intensity is not enough. What anchor light does is it will anchor our rhythm. It causes it to be less fragile, so that light at night has less strength at being able to cause havoc on our rhythms. So, you want to get outside.

We did an experiment where if you look at a six-hour period [spent] outdoors, and you look at the total amount of anchoring effect that that amount of light outdoors has on anchoring your circadian rhythms. If you were to take every one of those hours out of the six, and you were to analyze it individually, what you find is that the first half an hour of light exposure creates about 80 percent of the anchoring effect.

JM: Wow.

DP: Yeah.

JM: A classic Pareto principle.

DP: Yeah, exactly. It’s very useful. And it’s actually nice to know, because if you go outside for half an hour a day – go for a walk, do an exercise, or even just have lunch – you’re going to have a much more stable circadian rhythm, right?

JM: Yeah. I would assume that keeping the variable constant, where it’s basically not cloudy, that the ideal time would be around solar noon, so that you’re getting the maximum number of wavelengths. If not, of course, 2:00 P.M. is better if it’s sunny; 12:00 noon if it’s cloudy.

DP: Yes. That’s right. The peak intensity of illumininescence during the day is around noon. But any time between sunrise and sunset is good. Some people might just be able to get their walking in the morning or in the evening. Yeah, you’re right. Midday is ideal. But within the day, being outdoors is going to have a much stronger impact. The light outside then is going to be much more powerful at anchoring those rhythms than indoor light.

JM: Is it true that the contrast or the absolute difference between the most amount of light exposure you’re giving your body in the day and the least amount is crucial for determining the concentration of melatonin your pineal gland’s able to generate?

DP: Yes. Bright light exposure during the day will increase melatonin and will be released by about 50 percent at night. It does. It’s funny because the absence of light in the evening is what will trigger melatonin release. But also the amount of light that you
get during the day is another factor that increases melatonin rhythms at night as well. We talked about having smart light rhythms across a 24-hour period. That means trying to get outside for about half an hour a day.

In the evening, you want to change the light. You want it to be more amber toned and dimmer. What we do in my house is we turn off lights that aren’t being used. There is this program, f.lux, which is a free computer program, that will pull out the blue wavelengths. The way that this synchronization happens is that there are… Most of your listeners have probably heard of rods and cones in the eye. These are specialized cells that can transduce a photo signal into a nerve signal. But with those cells, that will go back to the primary visual cortex where we can turn light into images that we can understand and see.

A different type of cell in the mid90s was discovered, which actually does the same sort of thing. It’s also in the eye. It’s also in the retina. It’s got a long scientific name. It’s intrinsically photosensitive Retinal Ganglion Cell (ipRGC). But it does the same thing. It actually will transduce light. But instead of going to the visual cortex, it goes to the master clock. Those cells are most responsive to blue light.

If you can block blue light, you can actually create something called circadian darkness or virtual darkness. What that means is that you can see, but your brain doesn’t think that it’s daytime; your brain thinks that it’s dark out. That is actually a practical solution for living with artificial light in our modern world. That is going to allow you to basically be up at night and have even more television. If you can block that light, you’re going to be in a really good place to not have your rhythms be shifted on a day-by-day basis.

JM: I have another question about light at night. It’s my understanding, too, that the red light (you hadn’t mentioned that) is specifically the least disturbing of the melatonin production. In fact, it may not have an influence at all. It may be wise… I personally have clocks in my bedroom because, you know, if it’s dark out, especially in the winter, you don’t know if it’s 2:00, 5:00, or 7:00 in the morning. It’s helpful for me, at least personally, to root myself to reality for time, but paying attention to the red and not the blue light on your clock. Is that correct?

DP: It is. It’s ironic because so many alarm clocks have this bright blue glaring light. In fact, I test and evaluate different sort of devices that help with aspects of lifestyle, whether they be monitoring your sleeping or walking. That’s an important part to my company. Several of the sleep clocks that have been designed to try to measure sleep in a variety of ways have this bright blue light that is being emitted from the clock portion of the device, which is a real irony.

JM: Which is an ignorance of the importance of this wavelength.

DP: That’s right. Yeah, that’s all… It’s certainly not… I mean, with more awareness, future devices will have red light. So, yes, red or amber-toned light is going to be much, much better. But even then, I also try to dim the brightness because… I’m not going to make things overcomplicated. But there’s a chance that just light intensity overall, even if it’s amber or red, could still potentially have an influence on the circadian system.
JM: Sure.

DP: The two things that you want to think about in the evening are maintaining the right light tone – that’s kind of like red or amber tone – and also just keeping the lights dim.

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JM: I also go to the additional step of putting the clock actually in a place where I can’t see it unless I physically sit up on the bed, so it’s not shining on my eyes directly when I’m laying down. You could have your side of the bed. But you know, there’s this other issue of the electromagnetic fields (EMFs) from the clock itself. You want to keep it somewhat remote from your body, so you can diminish that influence.

DP: Yeah. During the day, you want to get about half an hour of outdoor sun exposure. During the evening you want to keep the lights dim as possible. You want to also make sure that the spectrum is correct. There are also even blue light-blocking glasses and light bulbs that you can buy. We use both, and we keep the blue-blocking light bulbs by our bed. If we’re doing any reading in bed, it’s like we’re reading in darkness but we can see.

In the evening, I also use blackout shades. We’re getting a lot less darkness than we were. For us human animals, we need both light and dark. We need activity and rest. We need good food. Sometimes it’s strange to think that we need darkness, but yeah.

Melatonin is… I know you’ve written about and spoken about it. It’s a very important hormone in the body. It does a lot of things. We’ve been speaking about the importance of circadian rhythms. One thing that happens… Melatonin is produced by… It’s a hormone. It’s produced by something called dim-light melatonin onset (DLMO).

When the intensity of light will drop below a certain degree, the absence of a strong light signal entering into the brain through this multi-synaptic loop (which goes from that master clock, the suprachiasmatic nucleus, down to the level of the thoracic spine, superior cervical ganglion (SCG), up to the pineal gland) will start to produce melatonin. What melatonin does is it will actually reinforce the dark phase. What I mean by that is that it will go down, and it will actually affect the transcription and translation aspects of these clock genes within the master clock. It basically says, “Yes, it is dark out right now.”

With artificial light, not only are we getting less sleep than we used to, but now instead of getting, during [certain] periods of the year, 10 to 14 hours of darkness, we basically are always getting around six or seven hours of darkness only. When we’re up, we’re going to be sitting in light. We haven’t even begun to ever really understand the effects of seasonality, if that has any effects on our health. But overall, maintaining and getting enough darkness in our world is important because it does affect hormones that have a really significant effect on our health.

JM: What’s your position on melatonin supplementation? I’ve believed, and I’ve taught that ideally you want to avoid that, and really encourage your body to do it, because you’re involved in a feedback loop. You just don’t know what the right dose is. If your
body does it, it has the intuition to figure that out. Comment on your beliefs on the supplementation? If you do recommend it at any time, and if you do, what the dosages are.

**DP:** Yeah, sure. I think it's promising actually. I'm not anti-medication. I think that there's just an appropriate place, and try to use them as little as possible really. But I think the approach that we're taking, where we're trying to manipulate our light environment, is probably the best approach to take. The utility of melatonin supplementation after that will be conditional on what population you are looking at and what the scenario is.

We do know, for example, that half a milligram of melatonin at the right time can help people adjust to time zone travel much more quickly. It will speed it up by about, let's see, I think maybe three hours a day. The way that you would do that is you would start to... Let's say, you're flying from here to London. In order to adjust to that time zone more quickly, start to take melatonin at the time where you would be going to bed or actually the time where the sun would be going down at the location where you are going. You can also take it again when you do go to bed.

It's often taken as a sleep-inducing substance. The soporific or the sleep-inducing effects of melatonin are actually fairly... They're fairly weak, but they're measurable. For a lot of people, it does help them go to sleep. Just for insomnia, for people who have a hard time initiating sleep, the placebo effect is very, very powerful. That makes sense. Because oftentimes with insomnia, it's really the anxiety around going to bed that is preventing the mind from relaxing enough to entering into a sleep phase.

Taking something that you believe is going to work can actually really make a huge difference. Usually for pharmaceutical trials, for a drug to show or demonstrate efficacy, it has to surpass a very, very high placebo level in order for it to say that, “Yeah, we exceeded placebo.” But yes, melatonin is probably having some legitimate, just physiological effect, a meaningful placebo effect. That's just on sleep induction.

I think what I'm describing here is the ability of melatonin to affect your biological timing when you're doing time zone travel, and then I moved over to it being used specifically as a sleep aid. The third category is does it have other beneficial effects as well? We're not getting enough light during the day, which is going to suppress melatonin at night. We're getting too much light at night. And overall, we're getting less darkness overall. Is there a place? I think that there might be. It's being investigated in cancer trials. It's being investigated for diabetes and other conditions.

**JM:** Dr. Russel Reiter was a big proponent of that for cancer I believe.

**DP:** Yeah. And Alan Lewis has been looking at this at Oregon Health Science Center for 30 years. He's a big fan of taking melatonin. It's a little controversial.

**JM:** Sure.

**DP:** I think the dose is also dependent on... Certain neurological conditions are looking at very high doses of melatonin up to gram dosages, really high.
JM: Wow. Because typically more than a milligram, I think, may be the highest I’ve had for some of the sleeping benefits.

DP: Yeah. That pretty much saturated around, I think, you know. Well, I actually don’t know. Melatonin is not really the area that I look into too much. The amount that you take, and obviously, the method of absorption are going to affect how that appears in the system.

JM: Right.

DP: Sublingual is going to bypass first-pass metabolism in the liver. You’re going to get a lot more. Let’s say, one milligram [sublingual melatonin] versus one milligram [oral melatonin]. At one milligram sublingual, you’re going to get a lot more exposure to your system than one milligram oral, which you have to swallow and kind of metabolize by the liver. The route of administration does matter.

JM: Okay, perfect. I’m still a little bit confused on your position on the light leaking through these blocking drapes or shades. Is it okay from your perspective? Or even taking it to the next extent if you want to optimize things, is it wise to consider some type of lunar cycle, where some portion of the month, you go to the new moon to full moon phase, where you’re getting a little light to no light?

DP: Yes. It’s a difficult question because of the kind of light collusion that we experience if we live in a city and how that influences the equation. I mean, the mind is not really detecting whether that light is coming from a street lamp or the moon.

JM: Right.

DP: But it would detect potential variation. There is such a thing as seasonally obese animals. The reason I bring that up is that is an example of an animal, which depending on the amount of light that they’re exposed to in a natural environment at a certain time of the year significantly affects their metabolism.

For example, the Syrian hamster, when it becomes winter, with no additional calories, they will begin to become obese. They’re not eating anymore, but because the suprachiasmatic nucleus is receiving less light, it knows that it’s now winter time. That initiates this cascade. The suprachiasmatic nucleus is within the area of the brain called the hypothalamus. A lot of regulatory centers exist in that portion of the brain – things that control thirst levels, body fat levels, and temperature.

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What you see (it’s a little technical) is that you have diminished dopaminergic signaling within the SCN. That increases the activity in the feeding center. Well, it’s related to a feeding center, an energy regulation center, the ventromedial hypothalamus. Again, as I was saying, without any additional calories, just because the light is being read by the brain, all of a sudden metabolic syndrome is actually induced, so that they gain fat. They can maintain essentially enough energy if there’s less energy available during the winter period. It’s a protective mechanism.
JM: It’s a survival adaptive strategy.

DP: Yeah. Whether or not we have similar mechanisms, which we’re not attuned to and which are maybe not as obvious, I would say, is likely. To go back to your question about what do I think about maintaining a dark environment in your room: I don’t think that you need to block out all light completely, so you can’t see in order for you to get good sleep. But I don’t necessarily think that it’s a bad thing if you do. I actually maintain a very, very dark… I wear an eye mask at night.

JM: Sorry for the quick tangent, but comment on that. That’s the easiest way to do it and certainly the least expensive. But do you think that there are cell receptors other than your retina that make a difference?

DP: You mean outside of the eye?

JM: Right. Because I remember reading stuff 10 to 15 years ago that light exposure on the back of the knee could have some negative influence at night.

DP: Yeah, that has been looked at. There’s been criticism of those studies. There have been several that have looked at non-ocular light exposure and the influence of light on the circadian rhythm that is basically hitting the skin. There have been some studies that have shown that it actually does matter. There’s been some criticism. I’m not really familiar with them as much. But the preponderance of evidence suggests that it’s really the eye. The overwhelming majority of the effect is that it’s really the eye that really matters. Light entering the eye is what really, really makes a difference.

Like I said, I feel like I sleep better when I sleep with an eye mask. That could just be some sort of confirmation bias or not accurate, but that’s been my personal experience. It’s comfortable, and I enjoy it.

JM: And it’s really inexpensive.

DP: Yeah.

JM: We actually sell these on our site, too. But I didn’t realize them, at least from your perspective, to be potentially as effective as light-blocking shades, which can be costly, I mean, several thousand dollars in many cases.

DP: Yeah, that is expensive. Right, these eye masks, when you get a good one, the cost difference is, you know.

JM: Orders of magnitude.

DP: Exactly. And you could take that anywhere with you. If you end up doing any travel, that can certainly make a difference. You can basically maintain a very dark environment wherever you go.

JM: Well, that’s a really good hint. Thanks for that. I guess I’m going to throw that in my travel pack, too. Usually, I’m in hotels. But occasionally, you wind up somewhere where that’s not the case. I’m wondering what your thoughts are on some of these tools, 21st
century tools, that are available to assess the quality of the sleep, because obviously there’s a subjective component. But it’s interesting that there are some interesting objective tools.

The most recent one I’m thinking of (I’m actually disappointed that it doesn’t exist anymore) is Zeo, which I’m sure you’re familiar with. Maybe you can enlighten us as to why they don’t exist anymore. It was like a hundred dollar device, and essentially you’ve got a sleep lab every night. It objectively measures the time of sleep, obviously when you go to sleep, when you wake up, how many times you wake up, the REM sleep, non-REM sleep, deep sleep, and light sleep. It was just a phenomenal tool.

DP: Yes, that is one of the first. That’s a field called Quantified Self. It’s not necessarily new but the current version is gaining a lot of popularity. The reason being is that there’s a convergence of things like cloud-computing wireless technologies. All of these things that can enable us to have these devices that are either on our body (we instrument ourselves with these devices that possibly collect data), or they can be, let’s say, for example, on the bedside table that can monitor an activity like sleep remotely as long as you’re within a certain distance.

The Zeo was a device, as you described, where you’d wear a unipolar lead on a headband that would measure brainwave activity. We know that Hans Berger, in the early 1900s, discovered that the brain does read electrical activity from the brain by putting electrodes on it. That’s what basically gave rise to modern-day polysomnography. If you get a sleep study done, you get these electrodes put on your brain. Scientists can triangulate signals like breathing rates and heart rate with the occurrence of this brainwave activity, know what sleep stage you’re in, and can try and find where the sleep issue is. They can diagnose sleep issues like sleep apnea, narcolepsy, and things like that.

Anyway, this was basically the most modern version of it. It was trying to look at instead of having 27 leads, which are these electrodes put all over your brain and on your body, can you just do it with this one unipolar lead? One problem with its adoption was that it wasn’t validated. If it had a very good scientific advisory board, I think, that could have happened overtime. But that does take time. It’s adoption within sleep clinics was not as good as it could have been.

But for the end user, you know. I’m very interested on things that can modify human behavior. When you give somebody a lot of feedback that is not actionable, it can be confusing. It can be interesting but to me, that can be more like a toy versus a really useful dashboard, right?

JM: Sure.

DP: The dashboard on cars is really useful because it tells you your oil levels, your gas levels, and your speed. Those are all things that you know you can take action around. But if it’s starting to give you more information that you have somewhat a dubious understanding of whether or not you could do anything with it, it would, first of all, dilute your attention for the things that matter. It would also, you know. It’s not really providing
any insight or value. It can be interesting for a few weeks, and then eventually you stop using it. When you give somebody a lot of feedback on their sleep, what does it mean? If you can’t generate insight from that feedback, it’s actually not that useful.

What we do with Dan’s Plan is we look at timing and duration. Those are two things that are actionable, which you can actually take action on. The duration is how much time you have spent in bed. You’re not going to get eight hours of sleep if you’re in bed for six.

**JM:** Right.

**DP:** And then timing is when does that sleep occur? Some research by Dr. Dinges, you know. He’s the editor of the *Journal of Sleep*. He works at the University of Pennsylvania. He works at every major organization from NASA to the Department of Transportation. He’s like the go-to person for helping implement sleep as a policy in these organizations.

One of the most important things you could do is identify a time to go to bed and to try to meet that time. People usually have less flexibility around the time that they wake up because usually they’ve got a fixed work schedule, or they got to get their children to school. The time to really operationalize around is the time you go to bed. Forming an intention like, “To feel my best, I want to be in bed for eight hours. If I need to be (let’s just keep it simple) by eight, I need to go to bed by 12:00.” Just having that clear in your mind is really valuable. That’s the approach that we take.

Beyond that, there are some things that you could do where maybe you analyze aspects of sleep, and overtime, you could generate insights. But nobody’s doing that yet. So, yeah, we’re looking into doing some premium analytics, where you could say, “Okay, we’ve been managing your sleep for a year. Here’s what we can tell you about your sleep, when you perform well, and things like that.

**JM:** So, no inside scoop on why Zeo went dark?

**DP:** Well, I don’t think that they were getting, you know. They got a level of adoption from people who were kind of wonks around Quantified Selves. They were the geeks. They were like doing self-tracking. But it didn’t crossover that chasm of making it more user-friendly.

**JM:** Oh, yeah.

**DP:** First of all, there was a friction in having to wear the device on your head. A lot of people don’t want to do that. There’s also a 50 percent failure rate. If you’d wear it at night, more likely than not, it would fall off as you would roll around the bed, right?

[----- 50:00 -----]

**JM:** Yeah.

**DP:** If you’re not getting consistent feedback, how much can you trust it?
JM: True.

DP: What I do is I wear a Fitbit. Fitbit is a device that is mostly thought of for counting steps, but you can also wear it at night. It acts like an actograph. An actograph is a well-validated measure to analyze movement and then try to use algorithms to figure out what stage of sleep you’re in, etc. I just use that… I’m sorry. Go ahead.

JM: Does that work pretty well? Does it actually differentiate between REM, non-REM, and deep sleep?

DP: Well, what it can do is it can give you a good idea about how many awakenings you’ve had and your sleep efficiency. But again, I think the most important aspect of it is that it can give you a time series record of what time did you go to bed, and how long were you in bed.

JM: Okay.

DP: It’s addressing two of the three most important aspects of sleep: timing and duration. It’s timing, intensity, and duration. So, it’s timing and duration.

JM: Those are the two most important that you should have control over.

DP: That you have control over. You can’t necessarily get more intense sleep by squinting harder, right?

JM: Right.

DP: But you can affect intensity by daytime activity – physical activity and also getting enough outdoor light. It’s non-direct. But then, for example, you might be in bed for eight hours a night and get a terrible night’s sleep. That’s going to happen occasionally. But again, that’s what we’re trying to prevent against. You’re not going to get eight hours if you’re in bed for six. Give yourself the opportunity to get as good a sleep that you can, and just keep track of those things that you can control. That’s the best that you can do.

JM: You mentioned physical activity. Of course, you’d have to be living under a rock to not believe and understand that it’s useful for sleeping. If you could expand on that, specifically with the timing because that’s the crucial aspect. I mean, obviously you can exercise in the morning, afternoon, or evening. I think there are some concerns by some people, which I’ve read, that if you exercise too late, that could be counterproductive to your sleep.

DP: Yes, that is true. Exercise will release hormones that are activating – catecholamines, epinephrine, and norepinephrine – things that will activate the mind. Intense physical activity that is significant in duration and that will be done late at night can disrupt sleep. It can. That has been shown. It’s probably better to try to get intense activity earlier in the day, not within two to three hours before you sleep.

I think that because of light, the discussion that we’ve had around light, we know that exercising outdoors… There’s a suggestion that doing the same amount of exercise outdoors versus indoors, the outdoor activity is healthier for you. I think that a lot of that
has to do with anchoring your circadian rhythm. If you work inside, and you go to an indoor gym and workout, you’re getting the benefit of physical stimulation but it’s not optimal, I think.

**JM:** Do you think that there’s another synergy to some other variables that interact with your physiology while you’re exercising and if you’re exposed to intense light from outside?

**DP:** Yes, physical activity does act as a minor [inaudible 53:46] or time giver to your circadian clock, the same with food consumption. For example, eating late at night is something that can decouple something called food-entrainable oscillator (FEO) from the master clock. Basically, your feeding patterns are in a rhythm that is orchestrated by the master clock. But you can decouple those rhythms by eating at a time that you usually don’t eat – eating late at night.

There’s some work by Fred Turek, out of Chicago, that fed mice basically isocalorically the same amount of calories – two groups of mice and the exact same amount of calories. They monitored energy expenditure, and they have roughly the same amount of energy expenditure. The group that was fed during a time where they usually sleep became obese within six weeks, whereas the other group did not.

**JM:** That’s interesting. One of the best tools I’ve learned in the recent past to optimize your body fat was this concept of structured eating or, as some would call it, intermittent fasting, where you’re essentially allowing your glycogen stores to be depleted. Part of that phase, you could skip any meals. The easiest, of course, to skip is breakfast. In conjunction with that, not eating three hours before you go to bed seems to be a really helpful strategy to deplete those stores. Do you think that’s a wise, from a sleep perspective and from your understanding of sleep, pattern to follow?

**DP:** Yeah, I think that the intermittent fasting is very promising. One idea is that it will trigger a process called autophagy. Autophagy research by Beth Levine down at UT Southwestern has shown that it affects cancer rates, longevity, and the ability for the body to cleanup bacteria and viruses. It’s a very promising area for research. Fasting is one trigger for stimulating autophagy; exercise is another. Basically, not having food or not consuming food for certain periods of time is one trigger to stimulate this helpful process in the body. There are different strategies about when to fast. Not eating breakfast, as you mentioned, is one. The risk to that is that you then have more hunger late at night, right?

**JM:** Yeah.

**DP:** That can be problematic actually. You could completely negate the positive effects by eating too late.

**JM:** Well, in my experience, that’s a short-term challenge as you make the transition from using carbohydrates as your primary fuel to fat. But when you’re able to burn fat and upregulate those enzymes… That typically takes a few weeks to a few months for some people who really have a significant insulin-leptin resistance. But really one of the beauties of this is that that hunger and those cravings for sugar or junk food, they’re
gone. I mean, there’s no willpower, no self-discipline required. It’s just not there because you’re burning fat, whereas previously, you couldn’t. You really have a 100 pounds maybe. You couldn’t burn it.

DP: Yeah. And you know, another type of strategy is to just eat. Jeff Rothschild presented at the Ancestral Health Symposium on this last year. You just eat during daylight hours. You would eat in the morning, but you just wouldn’t eat after darkness. That is very promising, too. There are a lot of things you can look at. It’s the window in which you are allowing food into your system. It’s the timing of that food exposure. I think that there’s more research to be done there. I think it’s a very promising area.

I know of some people who are experimenting with intermittent fasting have benefitted. If you do skip breakfast, I would also put to have a rule where you don’t eat after a certain period of time within three hours of bed. We know that when you do eat food, you will suppress a stomach-derived hormone called ghrelin. This is a hormone that I’ve done research on. I recently published a paper on it on whether or not it was affecting subjects with narcolepsy. I won’t get into the reasons why it was an interesting population to look at just because it’s a longer story.

But this hormone will trigger hunger. Usually, it’s released in an episodic fashion, meaning, that it will wax and wane across the days. It rises before meal time. After a meal, it subsides again for a period of time before it again rises before the next meal. Before the substance was identified, the receptor for it was identified in the brain. It was called growth hormone secretagogue. It is one of the most potent growth hormone secretion nodules within the body. If you have a large meal before bed, you are going to be potentially suppressing or altering the amount of growth hormone that you release. Growth hormone, as you know, is a very restorative substance. It helps to kind of regenerate the tissue and just to keep that, you know.

JM: Well, it’s also a hormone that decreases quite dramatically as you age. I mean, by 80 to 90 percent after the age of 30 or 40. These issues become far more important the older you get.

DP: The majority of growth hormone is released slowly at sleep particularly in men. I think that not eating within three hours is smart to make sure that you’re getting the maximum growth hormone released every night.

JM: Perfect. And then, of course, the Peak Fitness or high-intensity exercises tend to be another component to that to also maximize growth hormone excretion. I’m wondering, you know, we’re getting close to the closing, if you have any words of wisdom or insights that you’d like to share, which we haven’t discussed already.

DP: Well, sure. I think that to kind of synthesize… We talked about the importance of both sleep and sleep timing or circadian rhythms on the benefits of really more than just sleep but particularly getting good sleep.

[----- 1:00:00 -----]
If you want to get good sleep, you have to have properly aligned circadian rhythms, because if you don’t, you end up having aspects of your alerting system that are working at the wrong time. They’re underperforming during the day. They’re overperforming at night. That means being sleepy during the day. It makes you have disrupted sleep at night or even insomnia. First thing I would say to have good sleep is to maintain smart, light rhythms. You want to get half an hour of light exposure. Be outside for half an hour every day.

By the way, what I did not mention is that if you’re in an environment where it’s really cold, and you can’t go outside, you can also get a blue-light emitter that you can keep on your desk. Philips makes something called the goLITE BLU. I’m not sure if you carry one of these as well.

**JM:** I don’t think we do, but yeah, if you can just give some guidelines on how to find a good light. These are obviously also good for seasonal affective disorder (SAD).

**DP:** That’s right, yeah. Light is also a direct stimulator of cognition. Getting blue light can be like having a cup of coffee actually. You can keep it on your desk. It’ll be on for about 15 minutes. That blue light will enter your eye during the day. It’s one thing that could anchor your circadian rhythms. An interesting work that I’ll mention (which I think you’ll like hearing), is some work that was done in Concordia, which is a research station down in Antarctica. It’s a good place to do research on light because at certain times of the year, it’s 24 hours of darkness. You can really look at the effects of artificial light on our rhythms.

What they did is they had two weeks where they just had the researchers under normal room light during daytime hours. They monitored cognitive performance, mood, and the alignments of their circadian rhythms. What they found is that there was basically impairment. Reaction time was slower. Mood was not optimal; it was basically subdued. Also, their circadian rhythms were shifting. They were wanting to get up later every day and wanting to go to bed later every night.

And then they did two weeks where they had blue-enriched white lights. They got more blue light during the day, and all of their rhythms were just completely aligned. Their movement stabled. Their reaction time was good. Their rhythms weren’t shifting. They went back and forth – two weeks, two weeks, two weeks. Every time, you’re in normal room light, you saw the shifting and the mood impairments. When you’re with white light, you saw the anchoring, stable moods, good reaction time. Really, it was a very clear evidence that enough blue light during the day is important.

If you’re in an environment right now, where it’s winter time, and it’s hard to go outside, I would consider getting one of these. Philips makes something called the goLITE BLU. It’s a small device that you can keep on your desk. Use it twice a day for about 15 minutes.

**JM:** I’m assuming in the research you mentioned that when you say “room light,” you would probably be referring to the traditional incandescent light, the spectrum produced by that, which is a type of a yellow light almost, not white. But one of the other things
that you can do, which are really very energy-efficient, is LED lights. They have come in

different colors. But the cool white version does emit a lot of blue light. It almost looks
blue actually. They’re getting less and less expensive. They last 50,000 hours. It’s a
phenomenal benefit to you and your family if you can install them, especially in the
winter.

**DP:** To wear my futurist hat for a moment, in the future, I think our homes will be a lot

smarter. Instead of us having to make a lot of behavioral adjustments, the lighting tone

will adjust automatically. During the day, it will emit more blue light, which is going to

mimic a more outdoor experience. At night, the lights will dim, and the tone will adjust

automatically, so that it’s mimicking more of a dusk-type of light in intensity. That will

then continue to diminish, of course, bed time, so there will be very low light by bed.

That’s going to have, I think, innumerable benefits on our health.

In the meantime, you can do that but it’s going to take a little bit of effort. That is either
getting outside during the day, using one of these blue lights in the evening, installing
these amber-toned light bulbs around your bed or even wearing the amber glasses, and
then maintaining the dark, a cool, quiet, and dark bedroom environment.

The other thing that I would say about sleep is that we have a concept of helping people
live as an intelligent eater, an enduring mover, and a restorative sleeper. The idea is if
you want to live like a restorative sleeper, you’re going to maintain smart light

environments, and then you’re also going to form an intention. “Okay, I want to get
really good sleep, so I’m going to understand how much time I need to be in bed to get
my maximum amount of sleep, and therefore, I need to know what time I need to go to
bed.” You set an intention, and you track, so you know how you’re actually doing. “Am I
meeting my goal or not?”

That, like a dashboard in a car, helps you stay aware of how you’re living right now.
That can have really powerful effects. Because going to bed, you’re more impulsive in
the evening anyways. It’s a lot easier to watch one more episode of maybe a television
show or engage with a book that you like. Having a little gamification aspect of like, “Oh,
I really want to make sure that my score stays good,” has shown to be very beneficial. I
would say think about tracking. It’s a real benefit to keep us again mindful of what we’re
actually doing. It also helps you form goals around, “Specifically what time do I want to
aim to be in bed?”

Do the smart light, and you’re going to be at a huge advantage towards most people in
our modern world who are getting less sleep and have mistimed lighting environment.
That’s going to significantly pay off in your health.

**JM:** Are there any particularly useful recording strategies? Have you found any apps
that are particularly helpful? Does Fitbit have one?

**DP:** I have to say I prefer the Dan’s Plan tracking.

**JM:** Okay.
DP: We created something called the Zone of Health, because we focus on things that matter. But then we integrate with devices like Fitbit, and we’re going to be integrating with others that collect the data. We just create the insights. It’s free.

JM: All right. If people are interested in learning more about Dan’s Plan and participating in the program you offer, how would they do that?

DP: You can go to the website. You can sign up. Essentially, what we created is called the Zone of Health. It’s tracking things like (for physical activity) steps and exercise, and (for sleep) bed time and in-bed duration. It’s always looking at the last seven days of activity. It helps you know by giving you a score (it’s color-coded) how well you are meeting your health goals on a day-by-day basis. Just like I was saying, just like a dashboard on a car, it keeps you operating in a healthy place.

I’ll tell you this. A good personal anecdote is that before I started to track, I was still lecturing on the importance of sleep. When asked how much sleep I get, I said eight hours. But when I tracked for three months, I was actually getting seven hours. It wasn’t that I didn’t appreciate the value; it was just that my own perception of what I was doing was different from my reality.

As soon as I started to track, which is very easy to do with these devices… I mean, essentially, with my Fitbit, I wear it on my wrist, I hit one button right at bed and one button when I wake up, and that’s it. It wirelessly transmits the data, etc. I was able to have more informed decisions. I understood what I was really doing. I was able to make adjustments, so that I was getting the sleep that I needed. I really recommend it for everyone, because it just helps keep you in your health zone.

JM: Okay, great. Well, it sounds like a good strategy and something that can be really useful. Because as we mentioned at the beginning, sleep is an absolutely essential part of the equation of maintaining optimal health. You cannot be healthy without good sleep. You provided us with a really great variety of resources to achieve that. We thank you for providing that and for all the work that you’re doing and will continue to do, because obviously, this is an area of great passion for you.

DP: Thanks. It is. I wouldn’t say it’s the tip of the iceberg, because we’ve really covered some of the fundamental areas. But there are so many interesting stories to tell about sleep. I look forward to continuing to be involved in generating information and also learning from others. I really implore everyone who’s listening now to make it a priority. It will pay off. It’s worth the effort.

JM: How is the Dan’s Plan? I’d like to look at that. Is it something you subscribe to? How does that work?

[----- 1:10:00 -----]

DP: Yes. It’s free. The first thing that I did is I created a model to sustain health behaviors with a professor of behavioral economics who was working with a Nobel Prize winner, Elinor “Lin” Ostrom, at the time. From that, we started to create tools around the model. This Zone of Health dashboard, we give that away for free. There are two
aspects to that. It’s using quantification strategies like a Fitbit. There’s only going to be more and more of these types of devices.

**JM:** Sure.

**DP:** But I think they better be pretty ubiquitous soon.

**JM:** They’re the leader now, aren’t they? Fitbit?

**DP:** I think so. I mean, Jawbone, Fitbit, and Nike have devices. Fitbit does it better than anybody else, I think. They seem to get it more than trying to create an attractive commercial product. Their stuff is really good. That’s one thing that we do. As I described, it’s just to help you stay aware and stay mindful of your lifestyle. We also give daily triggers. We give a recipe and then two different workouts every day. I created a workout strategy called InTUNE Training. It stands for integrative and opportunistic training. Our modern conception of physical activity is to cluster it into a workout, where you do all of our physical activity in one half an hour or 45 minutes.

**JM:** Or an hour or whatever.

**DP:** Yeah. A more ancestral pattern was to have these bursts of activity, which may or may not be necessarily better, but it provides an opportunity for us to get bursts here and there. Instead of looking for the hour to do your workout, you can say, “Hey, do I have a minute here and there?”

**JM:** It’s absolutely targeted. I first became aware of this a few years ago when they had these studies showing that people, phenomenally fit athletes, who are sitting down eight to 12 hours a day, are prematurely dying. Because you’ve got to engage in activity all day long! Actually, that’s one of my passions for next year: to develop a really practical program for people to stand up every 15 minutes and do something, because you got to break that pattern. Exercise or workouts are great but you got to do something all day long.

**DP:** Yeah. We do corporate wellness just for revenue purposes. We have something called the Ideal Weight Program. What we sell is a weight-loss program. Are you familiar with Stephan Guyenet? He’s a writer at Whole Health Source.

**JM:** Yeah, I’ve heard of him. I think I’ve seen some of his videos.

**DP:** Yeah, he’s very sharp. He and I created a weight-loss program. I have masters in exercise physiology. I studied its effects on weight regulation, and now I’m looking at sleep. Together, we have created this, which what we think is a really cutting-edge weight-loss program. We have international…

**JM:** That’s different from Dan’s Plan?

**DP:** No, it’s a part of it.

**JM:** Oh, it’s a part of Dan’s Plan.
DP: Yeah.

JM: I look forward to reviewing that.

DP: Oh, yeah. I can give you access. I’d love to get you set up with it. I mean, it’s something that I personally feel I benefit from every day.

JM: Yeah, I definitely want to try it. I was so bummed when Zeo went out, because I got it downwards. I got the data 95 percent of the time. I mean, with the iOS 7 update, oh, my gosh, it destroyed the app. It absolutely destroyed it. The only thing you can see is last night. You can’t see anything else.

DP: Really?

JM: That’s like four years of data.

DP: Oh, no!

JM: Yeah, it was crazy.

DP: Have you used a Fitbit before?

JM: No. I’ve been toying with it. After listening to you, I think I’ll order today as soon as we hung up. I really want to thank you for the sleep mask. I didn’t really appreciate how simple of a strategy that is. It’s kind of foolish not to travel with it. It’s going to be in my bed from now on.

DP: It’s funny. When I get less sleep, I will take melatonin. It’s really not based off of a great scientific evidence. But I do feel a little bit better. For some reason, if I’m really allowing myself six hours of time in bed, which just happens occasionally, if I take melatonin, I think I feel better than if I didn’t. I’ll take about five milligrams orally. That’s my pattern. I don’t necessarily recommend that because, you know. I’d only recommend something that I felt had a lot of support buying it. But that’s just something that I’m testing. But yeah, did you see? This is a Fitbit I just got.

JM: Oh, is that a new version?

DP: It just came out. I’m not sure if you can see this but it’s got...

JM: No, I can see it really well. Yeah, it’s very elegant.

DP: Yeah, it’s very… It just came out. It’s got your steps. You were it on your wrist 24 hours a day. It tracks the…

JM: It looks like a 21st century watch.

DP: I get compliments on it. I’ve only had it for two weeks, and I get a lot of compliments.

JM: Wow.
DP: Yeah. Are you familiar with wireless scales as well?

JM: Yeah, I am. I don’t use them. My weight’s pretty stable, especially since I’ve learned about this structured intermittent fasting. During the holidays, I went back home, so I gained like five pounds. I couldn’t lose it like in a heartbeat. But with the structured eating, it’s just… Man, is that a powerful tool.

DP: What’s your schedule?

JM: The bulk of the time, I’m only eating one meal. But I’ll snack on Macadamia nuts or pecans.

DP: Okay.

JM: I have a pretty big meal. And I keep the protein low. I keep it down to about four to six ounces a day of meat.

DP: Okay.

JM: I think that’s another mistake that a lot of Paleo people make: they’re eating too much protein. Because they can convert it to carbs, of course, but it has its own intrinsic challenges. I think that’s one of the reasons why vegetarians, as a whole group, I think, are particularly healthier than non-vegetarians: they’re not eating a lot of protein.

DP: Yeah, I think you’re right. The Paleo… It’s funny because I do participate in the Paleo community, but I don’t agree with all of it. I think the thing that makes Paleo good is just the fact that it’s trying to encourage more whole food consumption.

Stephan and I talk a lot about palatability and palatability drivers of food consumption. Our model is that highly palatable foods can shift your diet in very considerable ways. They will make you eat more, any one meal about 50 percent more. They will also reinforce their own consumption. The more of these highly palatable foods you eat, the more you eat them. The more you eat them, the more it changes your eating habit or style. You now eat differently no matter what you’re eating.

Lastly, there does seem to be some early and very interesting science that overstimulation of the reward pathways will… There’s direct connection between the hypothalamus, the kind of the thermostat for fat, and these reward centers. That might be what’s allowing our body fat levels to rise without getting sufficiently driven down as they should be. If you gained fat, your body should react in a way to increase metabolic rate, energy expenditure, and thermogenesis to make your body weight go back down. But it doesn’t seem to be doing that. There are modern food environments, that with food queues and highly processed foods, you’re more likely to eat more calories before you even feel full. I know that you are very whole-food oriented.

JM: Oh, sure. That’s the key to staying healthy – high-quality whole foods. My new passion is biological farming: to improve the quality of the soil, so you can get the highest nutrient-dense food. And really, we’re seeking to catalyze a movement to
emulate what we did before World War II, where 40 percent of the vegetables grown in the US were from people's backyards.

**DP:** Yeah.

**JM:** Now it’s probably under one percent.

**DP:** Yeah, I know it’s almost like… It’s strange. It’s now the province of, you know.

**JM:** Industrial agriculture.

**DP:** Only really wealthy people have the luxury to have some space to grow vegetables.

[----- 1:20:00 -----]

**JM:** Yeah, but you can do sprouting. I don't know if you’ve looked at sprouting in soil, not in Mason jars. It’s phenomenal, inexpensive, and easy to do. You can harvest in a week. That’s really cool stuff.

**DP:** Wow. That’s great. We’ve done a little bit of that but not a ton.

**JM:** Interestingly, it’s one of the most nutrient-dense foods you can get, because it’s 30 times more nutrient dense than fully matured, harvested organic vegetables, because it’s all concentrated in the sprout.

**DP:** Oh, wow. Interesting.

**JM:** Yeah, it’s really cool. That’s one of our big movements: to encourage people in that direction. You buy these sprouts at Whole Foods, you’re paying 20 to 30 dollars a pound. You grow them yourself, and you’re paying 70 cents a pound.

**DP:** Right.

**JM:** A huge difference.

**DP:** You said it’s a big mission of yours next year to help with finding new ways for finding physical activity for people?

**JM:** Well, integrating it more into your lifestyle. Essentially, Joan Vernikos, who was a NASA scientist, figured this out, that if you stand up 35 times a day, that can counteract some of the effects of microgravity that you experience when you sit. But you can improve it. I think you can do at least a little 30 to 60-second exercises that really increase your movements and flexibility, and give you a lot of physiological benefits. But you got to interrupt that sitting cycle. It’s like destruction to your body.

**DP:** Yeah. I’ve been exploring InTUNE Training. I was a strength and conditioning coach for a Division I college. I have a background in performance improvement. But I really feel that performance has been overemphasized. It has marginalized the “mundane and meaningful,” the term that I used earlier. It makes things like standing and walking like, “They’re not really going to make you a better athlete, so who cares?”
JM: Right.

DP: That’s been a really big disservice, I think to our own health. It’s not to say that physical activity and trying to achieve a goal towards being a better athlete is bad. But when people think that that’s the only thing that matters, it does more harm than good. I’ve been doing InTUNE Training for probably 18 months now.

JM: Is that something you developed?

DP: Yeah.

JM: Okay.

DP: It’s the most sustainable approach to physical activity that I’ve ever tried. It’s very simple. We put out one workout a day. It’s like today is lunges. I created something called Type A and Type B conditioning. Type A is a minute of warm up and 20 seconds of sprints. It doesn’t matter what you do. You could be running in place with fast feet. Type B is basically three minutes of continuous movement. And then the strength move is like lunges [today]; tomorrow, it might be sit-ups. I’ve created a bunch of exercises for our corporate clients where it’s just all things that they can do at their desk. Every day, I have physical activity in it instead of like, “Oh, here’s my workout day.”

JM: Sure.

DP: I don’t really belong to a gym but if I want to do a full workout, I still do that, too.

JM: Perfect.

DP: But I don’t rely on it.

JM: Yeah, that’s great. That sounds like a great process. I look forward to reviewing your plan. I’ll just go to DansPlan.com?

DP: Yeah. If there’s a way, maybe I’ll just send it to Blake. But I’ll give you an access code for something called Daily Yoga.

JM: Okay.

DP: The Daily Yoga is similar to five to 10-minute yoga workout videos. If you’ve got a break at your desk, you could do some mobility work. And then also the Ideal Weight Program. For that, we wrote a 60-page, 175-reference E-book that I think you’d really enjoy. It talks about various determinants of body fat and analyzes the Paleo Diet and things like that. I think you’ll enjoy it. It talks about sleep, too.

JM: Excellent. Well, I’m going to go out, and engage in my exposure to sunshine in only shorts because it’s 70 degrees here.

DP: Oh, that’s good.

JM: I just came back from Chicago two days ago. It was like below, way below. I left when it got down to like 10 below. But it’s fine. It’s up to single digits, at least today.
DP: You are where now?
JM: I’m down in Florida.
DP: Oh, you are. Okay.
JM: Yeah, which is one of the only warm places at this time of the year. My sunshine. All right, it was really a pleasure to connect with you virtually and meet you.
DP: Thanks.
JM: Thanks for all your work. You’re really doing an awesome job.
DP: It’s a pleasure to meet you, too. I hope we get to meet in person one of these days.
JM: Yeah, I’m sure our paths will cross one day. Thanks a lot, Dan. I appreciate it.
DP: You got it, Dr. Mercola. Thank you.

[END]