Promoting Sleep By Optimizing Vitamin D Levels: A Special Interview With Dr. Stasha Gominak

By Dr. Joseph Mercola

JM: Dr. Joseph Mercola
SG: Dr. Stasha Gominak

JM: Welcome, everyone. This is Dr. Mercola, helping you take control of your health. Today we are joined by Dr. Stasha Gominak, who is going to enlighten us about a synergy of two epidemics. One is the vitamin D epidemic, the other is the sleep epidemic and how they connect. I believe I was probably one of the first physician-journalist to catalyze the interest in vitamin D in about the year 2000. I thought I knew a lot about it, but I wasn't aware of this connection. I met Dr. Gominak at an ACAM event late in 2019. ACAM is the American College for the Advancement in Medicine. Her topic was "Ways to Improve Your Sleep." I thought I knew most of those ways, but she really surprised me. She's going to present some novel information here. Welcome and thank you for joining us.

SG: My pleasure. Thanks for inviting me.

JM: I think the crux of your argument – research, not argument – your research revolves around the connection between vitamin D and sleep and the impairment in the brain stem when one is vitamin D-deficient. You're a neurologist by training too. I neglected to mention that, an M.D.

SG: I am.

JM: This is not just a hypothesis you formulated, but you actually, I think, treated over 5,000 or 7,000 patients with this?

SG: Yes.

JM: Which is quite a substantial number, and you've published papers on it. Why don't you tell us your journey? You're a very good story teller. I was very impressed with your ability to present a compelling presentation that was really one of the best at the whole event. That's why I invited you to come on.

SG: Great. I'm glad you thought so.

JM: Why don't you go and tell your story?

SG: It *is* an interesting story. One of the really difficult parts of this is that most of us MD's feel like we stay up with current publications and that we read a lot of articles, therefore we think that we know all there is to know about vitamin D. Frankly, I was never interested in vitamin D. I was interested in sleep, and I entered the D literature looking for something to help my patients sleep better, One of my headache patients had a complete cure of her headaches by wearing a

CPAP mask, and I started sending young, relatively healthy women with daily headache for sleep studies.

Over a period of years, what came out of those studies was that most of them didn't have sleep apnea, but they didn't have enough rapid eye movement (REM) sleep. There was nobody publishing anything about that. Why didn't they have normal REM sleep? And frankly, at first I had to learn to read more than just the sleep study **report** because that lack of deep sleep was not on the front page, it was hidden within the study. My pulmonologist pointed out to me that the younger females I was sending him had an unusual but consistent finding: Little or no REM sleep.

Over time, I did a lot of sleep studies in teenagers, kids and relatively healthy people suffering from daily headache. Most didn't have sleep apnea, but they all had lower amounts of deep sleep than what they needed. The presumption was, "Oh, they're complaining of being tired, *and* they have epilepsy or daily headache but the two were not linked. Once seeing their sleep studies I began to think differently; they developed neurologic illness *because* of an inability to repair their brain every night."

Once finding that they had no REM, I was pretty much stuck with the treatments we had; continuous positive airway pressure (CPAP) devices for those who had apnea and sleeping pills for those with insomnia. That was very unsatisfying for myself and the patients. And then pretty much by accident, I stepped into an interesting finding; One of my young headache patients who was extremely tired, had absolutely no deep sleep on her sleep study. She slept for 10 hours, but she did not get into the healing phases of sleep, and she had a B12 deficiency. Could that be related to her abnormal sleep, a deficiency that we could fix?

I began to measure B12 levels in all of my daily headache sufferers. Later I started measuring vitamin D levels. Over a period of time, it turned out that the B12 was rarely low but everybody's vitamin D was low. That, in and of itself, would not be enough to get excited about, except that it turned out there were numerous articles showing vitamin D receptors in the brainstem sleep switches. That was already published by Dr. Walter Stumpf in the 1980s but no one paid attention.

The next struggle was, "How is it that this guy named Walter Stumpf has already published an entire context in which to understand why vitamin D is linked to hibernation, sleep, reproduction and metabolism? And, why isn't that recognized as *the* way we should think about vitamin D?'' If D runs hibernation then moving indoors and having a low D is going to have an effect on our sleep.

For two years my patients and I supplemented vitamin D and improved our sleep. In 2012 Walter Stumpf and I published the first article suggesting that the epidemic of sleep disorders of many kinds, not just sleep apnea, but insomnia, waking tired, movement disorders in sleep, all of the sleep disorders are linked to vitamin D deficiency. That was actually our first discovery. Any questions or comments about that piece?

JM: Yeah. The one where you had the initial observations on the electroencephalogram (EEG) that you were doing, was it just a deficiency in deep sleep or was it deficiency in deep and REM sleep?

SG: Both. I think that the mildest form, (and this part is not completely clear to me yet, this part I think needs more scientific study) is just reduced REM. Most of my patients, who I thought had relatively mild disease, (young, healthy females in their 30s) had reduced REM. Now that I've been doing this for over 10 years, there are also patients with reduced deep sleep as well.

Now, I'm practicing as a sleep coach, and I have a lot of clients who have nightly monitoring of their phases of sleep using a Fitbit, (which I didn't have when I was originally doing this work) Their sleep trackers show reduced deep sleep *and* REM sleep. Both are affected by this D deficiency. But as I said we don't really have good scientific study of this yet.

JM: Okay. If you wouldn't mind just taking a short tangent on this because I think it's appropriate, there are fitness trackers out there and you mentioned Fitbit, but there's also Oura ring, which I'm sure you're familiar with, which can monitor and give us an assessment of sleep. I'm wondering as a neurologist how you would compare the quality of the sleep data that's generated as to tracking stages of sleep relative to an EEG.

SG: I actually think they're pretty good. My patients started to come in with Fitbits that measured paralysis during sleep. Because my protocol was wrapped into getting properly paralyzed, (the most important part of using vitamin D is that it and other components come together to make acetylcholine which is the neurotransmitter that allows us to get paralyzed correctly) most of what I was interested in about the person's sleep was, "When are they paralyzed?" Because the only time we get paralyzed is when we're in deep sleep(slow-wave sleep or REM sleep) recordings of paralysis track sleep stages pretty well.

The Fitbit and the Oura ring and most of the other trackers refer to slow-wave sleep as "deep sleep" and refer to the other phase of deep sleep as ''REM sleep''.That's a little confusing when you look at the formal sleep literature, because the sleep literature calls both slow-wave sleep and REM sleep, ''deep sleep''. In both of those phases we get paralyzed. Now, I don't really care what you call it. What I do care is, "Is the recording device accurate in being able to say that this person is paralyzed?" As far as I can tell, the movement measurements used in most of the tracking devices are actually pretty accurate.

JM: That's good to know. Just for those listening, I would strongly discourage using a Fitbit for two primary reasons. One is that it emits a green light, which can interfere with your sleep quality. But more importantly, it was purchased by Google, and we know that Google is evil. They are going to use that data.

SG: Everything, including your sleep.

JM: Yeah. So you do not want to give this data to Google. Do not use Fitbit. Just make the investment and get an Oura ring, which I think is a superior device and certainly much more convenient. Anyway, I'm sorry for the interruption. I thought it was an important point. Why

don't you continue with this amazing observations that you had? Because it really is incredibly intriguing.

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SG:

My patients and I spent two years using vitamin D alone. There's a lot to know about vitamin D. We could spend several hours discussing vitamin D dosing and vitamin D levels. By at the end of the second year, we could easily track what their blood level was, corresponding to when their sleep was better, and it was clear that a vitamin D level of 60-80 ng/ml produced an improvement in sleep These were clinical observations based on the patient saying, "You know, I'm sleeping better."

Now, one thing I'd like to comment on is that we neurologists have taught people that the only way we can know about their sleep is by doing a supervised sleep study. That's not true. Human beings can talk. They have very valuable information, I think what they say about their body is infinitely more valuable than a single night of a supervised sleep study. They can't tell about everything; they cannot tell if they're apneic. They cannot tell what their oxygen levels are. So, it's not that I believe that sleep studies are not of use. They are of great use, but they are not the only valuable information we have. We can ask the patient how they feel.

The D supplementation alone worked for two years, but at the end of two years, we were all failing again. Sleep was getting worse, pain was getting worse, lots of different kinds of pain, musculoskeletal pain, joint pain, and then two of my patients with daily headache, started to have burning in their hands and feet within a month of each other. That was a creepy thing; within a month of one another. They're both using vitamin D for the same period of time. They have nothing else to do with each other. They both start to complain of burning in their hands and feet, which is a very uncommon complaint. The one cause I know is B12 deficiency, but they were both already on B12. I was kind of stuck not knowing what to say to them, but wondering if it had something to do with the D supplementation.
At this point a patient brought me a book about B5, pantothenic acid. At the time I was not very open-minded. Unlike you, Joe, I was not very interested in vitamins. I was a little frightened of them because I didn't really feel like I was knowledgeable. It took me a while to read that book, but it was about using B5, pantothenic acid, to help with the pain of rheumatoid arthritis, written in the '90s.

But luckily, the patient brought it to me because the author commented that not only did the pain get better, but their sleep got better. She was really bringing it to me because "there's another vitamin that helps sleep". In the meantime, I'm reading everything I can about sleep and nobody's publishing anything about; "How is our brain actually running this?" Everyone's focused on the airway. How does our brain transition between these sleep phases? If there are multiple neurotransmitters that are involved, how is it that around the planet, not just in the U.S., but around the planet, humans are failing in droves in a specific timeframe, 1980s and after. B5 turns out to be a major player in why this epidemic has occurred.

I started to look at the references in the book about pantothenic acid. They are these really wacky scientists who are next-door to the Iowa State Prison and they're doing these creepy experiments on convicts blocking the pantothenic acid in their diet by tube feeding them. What they published was if you blocked the B5 completely from the GI tract, in two weeks they got four things; burning in their hands and feet, a funny, puppet-like gait, stomach issues and insomnia.

I thought: "Wow. This is amazing. This is another vitamin that has to do with sleep." I really didn't have any idea of the etiology but I, myself had some peculiar pain. It would hurt me to sit at the end of the day. So, I ran down to the Drug Emporium and bought 400 milligrams of pantothenic acid, the recommended dose. And, I only remembered one thing about the B vitamins from medical school, which was ''if you give one B vitamin, you should give all of them''so I also bought B100, a B complex which has all eight B's, 100 milligrams or 100 micrograms of each.

Over a period of one week I took 400 mg of B5 and B100, and recommended the same to the patients who were coming back with re-emerging sleep issues and pain, about 40 people in a week.

By the Friday of that week, I had restless legs from morning until night. My sleep disorder is restless legs, and I realized that I had just made everything about my sleep worse. But why? Taking the recommended dose of pantothenic acid did affect my sleep, but it made it worse! I stopped the 400 milligrams and moved to just B100,(100 milligrams pantothenic acid). In a day, I felt totally different. It was the weirdest experience. My pain went away. My sleep got better. Then my patients started to come back with similar reports about 400 mg of B5;"I was so revved up and felt so tense and jumpy and I couldn't sleep at all, so I stopped it in two days." I'm giving the recommended dose of this chemical and it's causing insomnia and agitation, instead of helping their sleep. Why?

JM: Vitamin.

SG: Yes. It's a chemical though.

JM: But it's identical to the vitamin in the body.

SG: Your point is well-taken. This supplement is is acting immediately, like my drugs do. That's not the way we usually think about vitamins.What does this mean? Every single reference book published since the 1980's says "there is no such thing as pantothenic acid deficiency because it's in every food". Well, if it's in every food in this form it would give us all insomnia. Also, after two years of sleeping better using vitamin D we all started to run low in something else that we needed to sleep normally. Why did it take two years, and why did we develop a B deficiency without a change in diet?

At this point I had no idea how B5 might change sleep. All I knew, came from the book I mentioned; which was "pantothenic acid becomes coenzyme A that makes cortisol". For a year or so, I'm thinking, "Gee, maybe this has a direct connection to all the inflammatory disorders

that we're seeing more and more of." Not only are autoimmune diseases linked to the ''inflammatory state'', but now we think that heart disease, stroke, et cetera, are also related to an underlying inflammatory state. Vitamin D deficiency directly affects the immune system in many ways and if vitamin D deficiency is somehow linked to B5 deficiency the cortisol could be low, and that might be playing a role in this too.

For the first couple years, I struggled to understand the B5 dosing and the mechanism of this sleep effect. It turned out that B100 was exactly the right dose for me and everybody who'd been on D for two years. Those two women with the burning in the hands and feet got better in a couple of days. It appeared that they had developed a secondary deficiency that affected their sleep and caused burning, why ? Had they run out of B5 stores? But we've been taught that there aren't any B vitamin stores.

Backing up just a little bit, what I was stuck with at that point was, "Gee. These books and everything I can find on the internet says that 400 milligrams of B5 is the right dose." But all of us felt really awful on 400 milligrams. We felt magically better on 100. That leaves us with, "Well, what's the *right* dose?"Remember, I had just spent several years supplementing vitamin D in my patients, realizing that no one really knew the ''right dose'' of this hormone we've known about for 80 years. The literature about D dosing was, and is terribly flawed.

My first question was, "Why is it that it took two years for all of these people who are on D to look like they're now developing some other syndrome?" It felt to me like I was inducing some new symptoms of pain, especially that burning-type pain. I was inducing a B vitamin deficiency state without a change in diet. So then I start to read articles about the B vitamins that said, "the B's come partially from the intestinal bacteria." I thought, "Wait a minute. These guys are just not willing to actually come out and say, ''What if the B's always have come from the microbiome, and not the food?''

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If you think about other animals that lie in the ground for four months or six months, like bears, clearly if we need a source of B's every day, and they're not eating every day they need a daily source. That kind of implies that the microbiome has been an important – maybe not the only source, but a very important source of B's.

In the 1980s, there was very good science about the B vitamins. There were several articles about giving oral doses of B5 or B6 and following the urinary excretion, versus the blood level, and it turns out that there *are* body stores of Bs. There are body stores of B6, B5, thiamin and vitamin C.

Now, I have an idea forming in the background; , "Maybe when giving vitamin D I've actually made their sleep better and helped them make more repairs. But, as they made more repairs, they used up these building blocks, these B vitamins. They've used up their stores.''

It was my feeling that the vitamin D that I was giving should have fixed everything. I had this very simplistic idea ; “We went indoors. We’re all vitamin D-deficient. We’re going to give it back and everything will get fixed.” But there were two or three things that were not fixed. The irritable bowel syndrome (IBS) was definitely not fixed by giving D supplement.

Joe, you and I are in the same time-frame in terms of our training. There were four things that were not taught in my medical school classes; sleep apnea, fibromyalgia, chronic fatigue and IBS.
When they started to be reported in the ‘80s, a lot of us in my age group thought, “Oh, we don’t really know if they’re real diseases.” But, in retrospect, it looks like those disorders were all increasing in parallel, related to increasing incidence of D deficiency.

Because IBS appeared with vitamin D deficiency I had assumed that vitamin D was a growth factor for the gut bacteria, and when I gave it, they would come back, but they didn’t. Aftertwo years of D IBS was still there, (despite our probiotics). And then I thought, “Gee, if there are four species that make eight B vitamins, maybe they’ve always hung out as a symbiotic foursome, feeding each other these Bs. And if that’s true, they are really the only ones on this planet who know the normal doses of these eight, very important chemicals, and if we can get them to grow back the B dosing issue will be fixed.”

But here was the next problem: if those bacteria grow back, they’re going to start making the normal doses of these eight B vitamins that we’ve lived on for the last 50,000 years, And if we keep taking the B100 we’re going to have a double dose and not be able to sleep again.

So then I started to tell my patients, “You know, I’m thrilled that your pain is better and your sleep is better since adding the B100, but I’m a little concerned that if I’m right in my thinking, this B100 is going to bring back the bacteria. We’re creating an environment in the GI tract that is supportive of the four species that used to be there. They’ll grow back as the healthy foursome again and make all the B’s again and we’ll have to stop the B100. ” Sure enough, three months later, the sleep interruption and the pain come back and we had to stop the B100. Ultimately, my reasoning was “I don’t really care about the bugs so much. What I care about is that they appear to make the exactly right doses of B’s to feed into the brain to make the brain sleep better.” That was the piece that was really interesting to me. Any questions about that?

JM: Yeah. I just want to highlight some of the aspects of your studies that you didn’t mention and to commend you at the same time that you just didn’t give an arbitrary vitamin D dose. You gave a dose and then monitored the patients as well as you should have, and probably the vast majority of clinical researchers fail to do. They instead decide that some magical dose, like 2,000 units and say, “That’s the dose.” But you know, you actually monitored your patients to get them to 60 to 80 nanograms per ml. I couldn’t agree more. I think that was the sweet spot. Sadly, you didn’t do that for vitamin B5, pantothenic acid.

The reason being is that – and you can go into it – but I believe that the blood levels or the serum levels, the urine levels, are not that accurate. You really can’t get that fine-tuning. There certainly isn’t a recognized sweet spot of pantothenic acid level. Maybe you can comment on

that. And then actually another question because you had mentioned that the vitamin D improves the sleep centers in the –

SG: Brain stem.

JM: Yeah. I was thinking of the midbrain but it's the brain stem. I'm wondering – About a year or two ago, we had the Nobel Prize awarded to a few researchers for the circadian clock within the cell. I'm wondering if you've looked at that and done any investigation about the vitamin D having an influence on the receptors in the cells, not just the brain stem.

SG: I have a lot to say about that, actually.

JM: Okay.

SG: The first piece is that the B5 levels are not accurate because they don't reflect the body stores. There's also something extremely peculiar and interesting about B5. We now have a huge amount of knowledge about the B5 pump. The pump that pumps it in at the GI tract pumps in three things; alpha lipoic acid, biotin and pantothenic acid. They're competitive inhibitors. The next important thing is that the same exact pump is used to pump B5 into the cerebrospinal fluid (CSF). Now, the interesting part about B5 is that when it goes into the head it becomes coenzyme A, which then helps make acetylcholine. In the adrenal coenzyme A makes cortisol but in the brain it makes acetylcholine.

I was still struggling with "Why would my patients need 100 milligrams of B5 when this book recommended 400 milligrams? Why does every other publication say 400 milligrams is the right dose of pantothenic acid?" Clearly, I and my patients were chemically different. Now, that would suggest that having vitamin D around in the brain for two years somehow changed the dose of B5 that our brain wanted.

It took me several years to put it all together, but ultimately, it's about the brain's use of acetylcholine. B5 is absorbed from the GI tract in that form, comes into the brain as B5, and is then incorporated into coenzyme A. Coenzyme A is the donor for the acetyl group that makes acetylcholine. So there's choline, there's coenzyme A that has the acetyl group on it, and then the enzyme Choline Acetyl Transferase is the final enzyme that makes acetylcholine. There is one article that was published based on Walter Stumpf's original information, that shows that when D hits the receptors in the sleep switches it expresses the enzyme Choline Acetyl Transferase. So, it turns out that vitamin D is one of three components that must come together to make acetylcholine.

Now, why would we care about acetylcholine and how it's formed in the brain? The brain just makes it when it needs it, right?

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But if you were just to open a text book about sleep and the autonomic nervous system, you'll find that the parasympathetic nervous system is run completely on acetylcholine and the Parasympathetic is called "rest and digest'' because the it runs sleep. We have lots of publications that show everybody with a sleep disorder has sympathetic tone that's too high. We assumed that their sleep disorder had caused them to be ''stressed''and therefore their epinephrine and norepinephrine, (sympathetic side) were too high. But what if it's really an acetylcholine deficiency? What if when we lose our microbiome we lose the primary source of acetylcholine for the brain?

That implies a lot of things. When you open up the animal research sleep textbooks they say: "Acetylcholine manages our level of alertness during the day and allows us to sleep at night. It allows us to fall asleep, to transition through multiple phases of sleep at night, and to get perfectly paralyzed." The thing that's weird about this whole story is that the clinical ''sleep experts'' never talk about acetylcholine and sleep.

It turns out that one of the reasons why we don't talk about acetylcholine much is we have no drugs that duplicate its actions, except nicotine. When you and I were originally in pharmacology, what we were taught was acetylcholine has nicotinic receptors or muscarinic receptors. This is very important in understanding the etiology of neurologic illness for a couple of reasons. One, there are some interesting connections between nicotine and neurologic illness. Patients with Parkinson's who smoked have always done better, and we now know that the first phase of Parkinson's disease is probably an acetylcholine deficiency state that over time moprhs into dopamine deficiency. Two, attention deficit disorder (ADD), and autism have become epidemic over the same 40 year time span, and the articles about etiology are all about nicotinic acetylcholine receptors. They're now trying nicotine patches in autistic kids because they lack the right amount of acetylcholine in their brain.

The authors of primary research about ADD teach that frontal lobe nicotinic acetylcholine receptors are what directs our attention during the day. The most bizarre concept is that acetylcholine makes us awake and focused during the day, then a switch flips, we become asleep,(and it's not gradual, it is day-night, boom) now we're asleep, and then acetylcholine, the exact same chemical, allows us to sleep. To transition between the phases of sleep and get normally paralyzed.

After the improvement of sleep with vitamin D and the recovery of the normal microbiome with D plus B100, there is a third phase, of Recovery Sleep that is even more surprising:

It appears that the brain actually pays attention to the fact that while we were not sleeping normally there were 10 years of deferred repairs, repairs that didn't get accomplished. Now, when we're sleeping really, really well the brain goes into a repair phase that requires longer time spent in sleep, to go back and make-up those deferred repairs. The brain appears to have a memory of everything that did not get done, and an intention to fix itself, to turn back time if you will.

It turns out that the brain is actually designed to say, "You know, you really weren't sleeping well for the last 15 years, and I had to put off all these things that I needed to do.''If the vitamin

D stays 60 to 80, everything must be perfect, so I'm actually going to switch into sleeping longer and if you will just give me a few more of the building blocks, (B vitamins, minerals, A and C) the things that we use to make these repairs, I will sleep longer than eight hours and spend more than the normal amount of time in deep sleep and REM sleep and I will actually make those deferred repairs for you."

You had another question that I could jump to about the use of these in the brain stem. Would you like me to go to that?

JM: Yeah. I had a question about vitamin D. But if it was the B vitamins in conjunction with it, that's fine too. I'm curious if it affects other cells, because the new evidence suggests that each cell indeed has a circadian clock.

SG: Absolutely. Here's the part that fits with that, building off what you said about the cellular clock. We now have evidence that, (and I use the fat cell as an example because we think of it as useless) if you take a fat cell, a single fat cell, and you grow it in a petri dish and you grow a whole bunch of them, so there's this huge mound of fat cells, if you're paying attention and you actually record what these cells secrete, you'll see that they do something different during the day than they do at night.

In every other cell that we've looked at, like oligodendrocytes, cells which are one of the support cells in the brain, they make different things during the day than they make at night. That also will imply that when the brain is sending out signals to the cells throughout the brain or the body, there may be a particular chemical signal that has one effect during the day, because the cell hears that effect and it knows that it's day time, but a different effect during the night.

Because we've left sleep for last , we're just beginning to understand that even when single cells are not connected to the body or the brain, they are still, absolutely entrained to the day-night cycle of our planet. That means that if you never get into the repair phase, you won't get the messages that tell the cells to do the repairs that they need. You slowly, over time, are prevented from keeping up your nightly maintenance, and you age faster than normal. If you don't get into deep sleep, you can be asleep for 12 hours and still not do a single repair. When you don't get into deep sleep, you do not get the "refreshment" the feeling that you've awakened rested and repaired.

There are several other things important to mention about vitamin D. One of the things that's all over the internet is vitamin D needs to be taken with vitamin K. Well, vitamin D is a very complex hormone that has a "'heterodimer'' receptor. The receptor is like a two-seater convertible. But it has two different seats. In order to get the action it has to have two (dimer) different (hetero) occupants sitting in it. That means when the vitamin D arrives, it can't do the job by itself. It needs something else. Vitamin K is the second occupant for bone. If you're low in D and low in K, then just giving one will not do the job.

JM: That's K2 just to be specific.

SG: Yes. By the way, it is my belief that the normal microbiome was the primary source of that K2. Bringing back the normal microbiome, you're doing many other things, but one of the reasons why I don't make a big deal out of the K is that if you bring back the microbiome you bring back the bacteria who were the normal K supply. It's true that you don't know what the dose is, but that is what most of us were running on before vitamin stores existed. –

JM: You don't need a lot. You only make microgram quantities, about 150 micrograms.

SG: Yeah.

JM: It's not a lot.

SG: And the bacteria have been known to make K2 for many, many years.

You asked a question about entrainment to the day-night cycle. There's a huge body of literature that talks about light perception through the eye, using retinoids like vitamin A.
Because there's a lot of literature about vitamin A and sleep I believe that vitamin A is probably the second occupant of that heterodimer receptor in all of vitamin D uses in the brain that have to do with the sleep-wake cycle.Vitamin D is a hormone, by definition, it has hundreds of effects throughout the body and may, in each separate organ, actually express different things. It is my belief that there are hundreds of different locations where D is active in the brain. I think it may well have a second occupant that's different in those locations. No one's ever paid any attention. No one's had the presence of mind to explore that.

For instance, vitamin D entered into neurology through the MS literature, four or five years before I ever got into it, (after you've been already doing it for 10 years)

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JM: It was actually Classon or Clawson. I think it was Classon, maybe I'm wrong. But there was epidemiological research that suggested the association. Obviously, correlation, not causation. But at least that got people to think that there may be a connection here. It was clearly related to latitude.

SG: Yes. And so all of us who heard that, I remember very clearly sitting in this lecture hall and there were thousands of us in there, who just went, "Oh. That's why it doesn't happen at the equator." The thing that we missed, because we were so focused on T-cells in multiple sclerosis (MS), is that Walter Stumpf had published in the '80s that vitamin D receptors ring the lateral ventricles. Vitamin D is pivotal for normal function of the blood-brain barrier and the blood-nerve barrier.

That means D directly affects the ability of our own white cells to penetrate (or infectious organisms to penetrate) through the blood brain barrier. Many of the diseaseswhere we see the lateral ventricles ringed with white marks on MRI scans in elderly people are probably directly vitamin D-related. I think what we'll find is that vitamin D plays an important role in the actions of the astrocytes. The astrocytes are the cells that make up the blood-brain barrier. They have a

little process that hooks around the blood vessel and then transmits messages that come through the blood to 80 or 90 nerve cells or neurons that they connect to. D will play a role in that interaction.

I think that the major take-away from my study of vitamin D is that it's actions are extraordinarily complex. If we try to over-simplify it and we focus only on D2, (the original D that was discovered, which is still the recommended pharmaceutical treatment recommended for D deficiency) we are lost!

JM: 50,000 units. That's the only prescription of vitamin D. It's not D3, which your body makes, but D2.

SG: Yeah. That's completely crazy. Seventy years after the discovery of this hormone, we're still giving out a chemical that no human, bird, reptile or insect makes on their skin. None of us make D2. D2 is the chemical that rats use, because they're nocturnal and don't go out in the sun, they get it from the fungus that grows on the grain that they eat. We are still giving that out as a prescription, it is the most bizarre thing that I've ever seen in medicine.

JM: And it's still prescribed today.

SG: Yes. That is still the recommendation, and it's not that the caregiver is uninformed or is not caring, it's that the recommendation is still 50,000 of D2 once a week. I gave it to four of my patients and they all came back and said, "You nearly killed me with that stuff." They were the most D deficient , and it made them worse.

JM: But fortunately D3 is one of the cheapest supplements in the market. It's almost free.

SG: It's free. You can go outside and let it happen on your skin.

JM: Yeah, yeah. I haven't taken vitamin D supplements well over 10 years. My last D level was, I think, 83 nanograms.

SG: Yeah.

JM: In December.

SG: The dosing of vitamin D is extremely complex. Most of what is written about it on the internet and in most or all of the studies are opinion studies in my view. My patients on average needed 10,000 a day to keep their blood level the same in the first winter. In the second winter, almost all of us had to go down a little bit to 7,500. Now I cannot take more than 1,000 in summer.

That implies that it is really a matter of having many "vitamin D holes''. Deficiencies in hundreds of areas where D was needed but we didn't have enough. In my experience we use

more at the beginning of supplementing. Slowly, over time (I'm in my 10th year) the amount that we need to supplement to keep the blood level the same, goes down. It's possible that when the U.S. Food and Drug Administration (FDA) was asked to make dosing recommendations in the '60s, for a population that was not D-deficient yet, (because we didn't have sunscreen, and we still lived in the sun) that 1,000 IU of D was actually an appropriate dose.

JM: There were also fear studies based on obscure studies published in India that 2,000 units of vitamin D was toxic. Those studies have since been debunked. Because obviously, as you just quoted, 10,000 units is a pretty typical dose that gets people healthy.

SG: Yeah.

JM: Well, at least initially. That's the point that you brought out, that it tends to come down with time. You don't want to still be on the same dose, which highlights the importance of regular monitoring. You just cannot take this fruitlessly or carelessly. You have to monitor yourself.

SG: That's absolutely true. The other interesting thing for me was to know that because I entered this whole vitamin field from the point of view of sleeping better, I was thinking of the vitamins as building blocks of repair. Sleep is not about being unconscious, it's about making repairs. I care about sleep because when I see my patients go on a CPAP device and they stay in deep sleep longer, they start to feel better. They have to take fewer pills. Their blood pressure comes down. They're actually healing better. That concept then means anything that I can do to make someone enter and stay in deep sleep longer is a good thing. If we stay in deep sleep longer we make more repairs and in order to do so we may use more vitamins, so the dose may be related to the success of sleep. There may not be a single dose recommendation for any one person.

If you remember, I said at three months we had to come off the big doses of B's (B100) because we were using our bacterial B production plus supplement. And when I stopped B100 I threw away all the vitamins except for vitamin D. I thought, "Hey. I've got my microbiome back. I should be good to go." But after about six months of really, really good sleep I started to feel stiff and old in the morning. I started adding back a multivitamin that had 5 milligrams of pantothenic acid, and it made no difference. Three months later, I still woke stiff in the morning so I went on two of the mvi's and in a day, the pain and stiffness went away again.

How do I explain this? I had started on 500 milligrams of B5 got restless legs from it, decided the dose was too big, then I went to 100 mg and was great for three months, and now, apparently my body can tell the difference in 5 milligrams of this stuff. Apparently, I need more B5 now than I did a few months ago. Why? Why would there be any variation in that? What doses should I recommend for my patients?

There are all these different recommendations on the dosing of the B vitamins. And I don't know who to believe so I went back to the original articles, the historical articles about the B vitamins.

Inhe 1920s, and 1930s how did they discover the B vitamins? The original ability to purify them is a fascinating story.They came from the yeast mixtures we use to make beer or bread. Using brewer's yeast that we use to make beer, or baker's yeast to make bread, we add water

and we sit it on the counter. You let it sit at a specific temperature. You can't boil it and you can't make it too cold.What you're really doing is you're letting all these bacteria grow in that solution. The bacteriafrom the water are using the D2 that's being made by the yeast and they are making those eight B vitamins we talked about. They're feeding the yeast the 8 B's. That original solution was also called the ''anti-polyneuritic factor''. The healers of the late 1800s or early 1900s were using that same liquid, just like I'm doing it today, to cure burning in the feet.

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Now, the interesting part about that is nobody has published, as far as I can find –(it might have come out this year) – studies of our microbiome to see if vitamin D is a cofactor for bacterial growth.I It looks like the microbiome changed, globally when the D went low. There are many articles that document that even though we know the names of the 200 species that live in our small intestine (I happen to believe the small intestine is really the pivotal place) and we have their DNA footprints only 2%, have been grown in a petri dish. That means that no one knows what their growth factors are and therefore they haven't been successful in growing them.

But if you go back, what you find is "all eight B's were finally purified from this yeast bacteria mixture, the broth used to make beer and bread.

And then in the '40s, we started to have this concept that humans needed growth factors too. So we called them "vitamins". We realized that these are eight chemicals that are pivotal for our body to have the correct biochemical production of many, many things. But we kind of forgot the concept that they're made by the bacteria and then shared with us. I happen to believe that in probably the 1920s and 1930s, the people who were doing the original microbiology probably did think that the B vitamins might have been produced in the small intestine but that idea got lost over time. There are now two or three articles that substantiate the view that the primary source of B's is the intestine, not the food.

It turns out, now that I've been doing this for a long time, it's not hard to get the healthy foursome of bacteria to grow back. Really, all you have to do is have a D level over 40 and B 50 or B 100 for three months. Your microbiome will be back. If you never let your D fall below 40, you'll never lose them again. That's my belief.

JM: Well, unless you take antibiotics or eating food loaded with glyphosate. There's a lot of things that decimate your microbiome other than –

SG: Let me comment on that. Thank you for bringing that up. I am completely freaked out by glyphosate. I've seen several lectures, and I'm totally freaked out about it.

JM: You should be.

SG: Yeah. I mean, it is frightening. But I can only stop using Roundup in my own yard. I cannot stop my neighbor from using it across the street. It's not that I don't believe that that's an important player, but if I just tell my patients, "Oh. The toxic environment has led to your microbiome going bad," I haven't really helped them. I've educated them, but their sleep is no

better. It is my belief that glyphosate is still really important. I'm really glad that people like you are on the bandwagon about getting it taken out. But I also got to see many of my patients get their microbiome back, live in the same environment, have the same eating habits and actually get better.

There are several things about the microbiome where I think differently than the current dogma: One, humans did not make antibiotics, bacteria made antibiotics and we stole their idea! Humans have made several antibiotics since they first discovered them, but they were originally discovered at that same time when we grew bacteria in a petri dish and we noticed that there was a clear area surrounding the bacterial colony. We discovered that they were secreting chemicals that killed their competitors, that was why there was a clear area surrounding their colony.

One of the really important concepts of having a normal microbiome is, it is not just in your small intestine and your colon. I actually smell different since my microbiome is back. It covers all parts of our body. Now, the literature is really strong to make the argument that we are actually more like the Charles Schultz character "'Pig pen''. We walk around in this cloud of bacteria, viruses and fungi that cover us, in our nose, in our mouth, in our skin, in our hair, all over us. And that those organisms are the ones that protect us from infections. Given a normal immune system, (which is admittedly much more complicated than what we're talking about), we are protected by our bugs. If you bring back the normal microbiome, our bugs are making antibiotics, they make chemicals that kill their competitors, other bad bacteria. They keep the clostridium difficile under control in our body.

One of the things that I've been able to see happen is that my clients can still take antibiotics. They actually will reconstitute their microbiome normally as long as they keep their D over 40, the healthy bugs will grow back after antibiotics without any additional intervention. I personally believe that the appendix is designed the way it is to be a little tiny library of all the bacteria.It's not that I don't believe that antibiotics change what's going on in there. They do. They absolutely do. However, I don't think we have to be as afraid of them.

I will mention one other thing. This was connected to what you said earlier. There are two things that are being proposed to be important in reconstituting the microbiome. One is probiotics. I personally have used them. I spent a lot of money on them. My patients did too. I think they're kind of worthless. If they did work, you would eat them for one month, and then you'd be self-sustaining for the rest of your life.

The second is about feeding your bacteria. There's another body of literature that I think is very important. Once you have a normal foursome, what we're really doing most of the time, even though we haven't thought of it this way, is we eat things that feed the bacteria. What we eat absolutely has an effect on who is living in that small intestine. So we eat, we feed the bacteria, and then the bacteria actually feeds us. That's not the way we've been looking at it. I would then say all the literature that's talking about the effect that diet has on who lives inside you is absolutely pivotal.

JM: So the other component though, with respect to choosing your food, is making sure that it's organic for two primary reasons. One is that most of the antibiotics are not given to humans.

They're given to animals. That's where the largest concentration is. It's not just the antibiotic but it's the antibiotic-resistant bacteria that are in there, plus the glyphosate. Although your perception is they may not have much influence on the microbiome, what it does have influence on the microbiome, what it does have influence on – I think what you should be really concerned about – is the mitochondria.

There's emerging evidence that mitochondrial function is really the core of health and chronic degenerative disease. Mitochondria, for those who aren't aware, are primitive bacteria inside your cells that are affected by antibiotics. That's the last thing you ever want to do. It's to impair your mitochondria.

Yes, there are strategies you can could do to upregulate with mitochondrial biogenesis and exercise and activating PGC-1α. But you want to limit the damage. That's why we would be ultra-cautious. I would personally not take an antibiotic unless my life depended on it.

SG: I second that entire statement. I think that's brilliant – Particularly, I'm very interested in the mitochondrial stuff. I really think – I haven't listened to whether or not you've done anything about deuterium in mitochondria, but I'm very, very interested in that piece.

JM: Yeah. Personally, I have the record, the U.S. record for the lowest deuterium level.

SG: Awesome.

JM: We don't have to go there because I'm somewhat skeptical now. I'm not convinced as I was when I initially started my journey in deuterium. And it's certainly way too expensive for anyone to consider unless they're dying of cancer. But another issue, partially related – But I think I want to get back to the central points, which are the vitamin D and the pantothenic acid. I'm particularly curious. You had mentioned you had restless leg syndrome. Do you perceive that as an artifact of your B experimentation? Or was it an independent symptom that seemed to improve with your process? Because there are some other B vitamins and B vitamin metabolites that might be a factor. It's something I'd like to discuss.

SG: Very good question. One, in most of my clients and my patients, restless legs went away just by doing the RightSleep protocol, which improves their sleep. But there were a few of us, including me, who were outliers, we never got rid of our restless legs. It's only in retrospect that it has become clear that the SNRIs or serotonin-norepinephrine reuptake inhibitors and selective serotonin reuptake inhibitors (SSRIs) are some of the causative drugs for restless legs. Those of us who didn't lose their RLS were usually on these drugs.

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About a year ago, there was a front page article in New York Times about how the psychiatrists are now admitting that they themselves, when they want to get off the SNRIs, have to reduce them by very tiny amounts, like 10 little balls out of those capsules, per month, very, very slowly. I had tried several times to come off my SNRI. This is really heartrending for me

because I gave out those medicines like candy, and I started taking them myself, and at first I felt so much better. But now, 20 years later, it appears to me that there are negative, long term effects effects, hopefully not absolutely permanent.

My feedback from my clients is it took them six months to a year after being off the SNRIs, before the restless legs completely went away. So one, I know my restless legs came at the same time when I started my SNRI. I'm currently, towards the end of tapering off mine over a one year span, and I'm interested in seeing what happens to me.

Ultimately, it is my hope that my restless legs will go away. Now, most of the people that I've treated, their restless leg syndrome went away pretty easily. It's not a single pathway to it. There's a connection in iron and ferritin. There's a connection to what other drugs you're on. Many sleep professionals attach it to the periodic limb movements of sleep, but I think that they're actually two separate things.

But ultimately, most of the people who were in my practice, who had restless legs, all they had to do was to get the D better, get the microbiome better, adjust the Bs, and their sleep became better. The cure is the sleep. The sleep gets better, the brain rearranges the ratios of the neurotransmitters.The brain knows how it should be working.

JM: Let me give you another point of information that you might consider investigating in your trials. One of my good friends is James Clement. He's one of the leading NAD clinical researchers in the United States, and one of the few researchers who actually has a mass spectrometer to measure NAD levels. He actually published the landmark study in early 2019 that documented the rapid decline in NAD levels.

Now, NAD, as you know, is a massively important coenzyme, but it's also – One of its precursors is vitamin B3. Yes, it can be derived from the diet through tryptophan, but that essentially is not going to work. Because for every milligram of NAD that you reconstruct from your de novo synthesis from tryptophan, you need 70 milligrams of tryptophan, so the average person is only going to get like 2 milligrams of NAD, which is absolutely insufficient. Most of it is recycled.

Actually, there's an interesting B3 deficiency. You probably well know that many people died in the early 20th century from pellagra. Pellagra was niacin, but they didn't die from niacin deficiency. They died from NAD deficiency. You could actually cure pellagra with relatively low doses of niacin and remove it, because you've got a little NAD. But your NAD levels are actually – It's just like vitamin D. You can get 20 units and probably abort or abolish rickets. But that doesn't mean you're healthy. You're still deficient. You need optimal levels.

The challenge here, as I implied earlier is that as you get older, your NAD levels fall quite dramatically. I mean really dramatically. The older you get, the worse it is, to the point that it's almost immeasurable by the time you're 80. There may be a strategy where providing some of the niacin as a supplement, maybe 25 milligrams twice a day –

SG: Can I take it as NAD?

JM: No. You can take NAD precursors. Actually, James and I are doing some research to see which the best ones are. There are typically two right now, nicotinamide riboside, NR, and NMN, or nicotinamide mononucleotide. Both of which are orally available. There are significant questions at higher doses which you may need and if they work well, if at all, because they get methylated in the river. But there are some other strategies like liposomal NMN that is just coming out in the market now, and actually NAD suppositories or transdermal. You can actually take NAD as an IV, but it costs over 1,000 dollars. There are some electrical battery patches that you can use transdermally that are much less expensive, closer to17 dollars than 1,000. There are some other strategies.

Anyway, the reason I mention this is this investigator, Clement, he has restless leg syndrome too. That is his biological parameter. When his NAD levels go below a certain threshold, his restless leg syndrome comes back.

SG: That's fascinating. I have a few questions about that. One of the things that that speaks to is, as you get into this further, what you realize is the reason why you want to get all eight B's together is because, their actions are heavily intertwined.

When I'm trying to change the dosing, even though I may say B5 dose should be this, all eight should come along. That we've talked about is really the base groundwork, it doesn't really speak to all the other genetic variabilities that each one of us has as an individual. I personally think – (You're the pro in that area. I am definitely not). But if I get rid of my SNRI and my restless leg doesn't go away, I may actually try that as well. Because I still have to take a dopamine agonist for my RLS and , frankly, I don't want to have to take any pharmaceuticals.

JM: Right. That is the goal. As you've come to appreciate, as you've grown wiser in your clinical practice, that relying on drugs is not the solution because they only are symptomatic Band-Aids in almost every single case.

SG: I have to say that I was really healthy as a younger person. As soon as I got older and was anticipating having to take those drugs that I was giving, it completely changed my point of view. And then as I got further and further into sleep, I began to have a very difficult time being in the hospital. I really felt personally responsible, like I betrayed these other human beings. What you and I are discussing is, "How does the body repair itself? How do you show up on this planet and not ever need a doctor?" That concept is not being pushed right now by Medicine. I mean that's really part of what you've been doing. You're one of the first people to do that online. But that is not taught in Medicine.

JM: No. No it's not.

SG: And that is a tragedy.

JM: Yeah. And there are some sinister, behind-the-scenes variables that prevent people from applying this. That's why I went to the public and attempted to teach them. Thankfully, I catalyzed many others who had similar intentions. We're making a dent and people know,

fundamentally, that the pharmacological model is fatally flawed. The vast majority of the public appreciates that.

But I want to get back to the sleep thing. I don't want people to believe that you're pushing a magic bullet. Because in your presentation in Nashville, in ACAM, you had a pretty comprehensive list, which I agree with. It basically relates to sleep hygiene and restricting blue light exposure at night and making sure you get sunlight exposure in the day time, and all the other variables. Vitamin D, pantothenic acid, B complex, processing and improving your diet is part of that entire strategy.

SG: Absolutely. That material that I have on my website is limited, not because it's the only important information. I am not a health expert.The material on my site is what is not discussed on all the other sleep expert sites. What is important but has been overlooked.

JM: Yeah.

SG: I do consider myself a sleep expert. I don't consider myself a vitamin D expert and I don't think there is one on the planet. I think that the real reason why I'm a sleep expert is I have listened to thousands of people talking about their sleep.

JM: Yeah. Most physicians don't do that, so congratulations.

SG: It was so sad for me to be with people who, I just got them on CPAP, and they come back and they say, "Well, I just went to see my CPAP doctor. He or she said, 'You wear this or you die.'" That's it. That's the end of it. Or the poor patient who's had insomnia for 20 years, who nobody wants to talk to. They won't listen to them. And I was the same way. I'm not going to say that I was any different, those of us in the world who sleep well really don't understand what those people with sleep issues are complaining about. It is a slow, miserable death.

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Once you have your hands on anything that will help somebody sleep better you can make a life better. The ideas that I have on my site are things that were overlooked. It's not that they are the only important ideas about sleep, there are hundreds of sites that will tell you about circadian rhythms, taking away the EMF, the electromagnetic forces in your bedroom and the blue light. It's not that what I have is the be all, end all, it's that it's a really important piece that you need to add to make sense of why we don't sleep normally anymore. I also happen to think that it connects the epidemics of the sleep disorder to the weight gain and the IBS. Panda's work, I can't remember his first name –

JM: Satchin out of Salk Institute.

SG: Oh my God. That guy is brilliant.

JM: I love him.

SG: Brilliant. And such a logical step-by-step lecture. He's amazing. Everything he has said about when we eat is also playing a role in the background. After I added the B100 my patients started to come back with weight loss. The D by itself did not do that.

What I got to see when my patients got their microbiome back was amazing. I am making an assumption based on my patients coming back saying things like, "I haven't pooped daily since the day I was born, and now I have a regular BM every morning." (This is a 32-year-old who had one delivery and was a mess from then on,; on a million pills, a million things wrong with her. I'd been working with her for five years. We've been doing vitamin D and things are better but definitely not perfect) She gets on B100 with the D, and ''now I poop every day." I mean it's just phenomenal.

Now, the fascinating part of that recovery of the microbiome is that it is just the first step. You've brought back an organ of the body. It's like your liver went away and now you brought it back. Improving IBS was just the beginning. I had all these people who had all these things wrong with them. I kept wondering, "Are all those things related to vitamin D deficiency or poor sleep?" Many of them did not get better with just vitamin D, but they *did* get better several months after the microbiome returned.

For instance, iron deficiency anemia. I had some men, who were not menstruating obviously, who were getting iron infusions for iron deficiency. Their hematologist said, "Oh. You just can't absorb iron." I'm like, "That didn't happen when I was first in practice." Eight months after the microbiome comes back, those people start to trickle in saying, "Hey. I went to my hematologist yesterday to get my iron infusion and they won't give it to me because they say my iron levels are okay."

So it is my belief that many of the things that we are documenting – "Okay, this person is low in magnesium. This person has a selenium that's low.'' There had to be an organ of the body that was running that piece. As far as I know, nobody talks about that. But it appears to me that the microbiome has actually been responsible in the background for making sure that we absorb these elements in the right amounts and we have proper stores. The organ running that proper absorption was, I believe, the bugs inside us.

I was recommending a multivitamin as a routine, but not really thinking much about it until I realized in retrospect, that it was important; We're using this multivitamin to fill the manganese stores, the zinc stores, the copper stores, the iodine stores," all these little things that we're seeing deficiencies of in functional medicine as they're measuring blood levels, they are related to not having a normal microbiome.

I personally think that getting the microbiome back in most people who are pretty sick is just day one, the start of a process. Then they need to have some supplementation, not huge doses, but some supplementation for a year or two after that. And then keep an open mind about the fact that eventually, we'll get to a place where we don't need to supplement most things, unless you have a particular genetic weakness where you need to do something specific."

JM: Alright. Well, great. You've provided a pretty comprehensive story, which is really the characteristic of a good presenter. They tell it in the story format. You do a good job of that. We have the story. I'm wondering what resources you could recommend, books or papers you've written, your website that people can see a protocol that you've developed. How many patients do you have now? 5,000 or 7,000 patients?

SG: I think I'm up to 7,000. I'm a sleep coach now, I'm no longer a neurologist.

JM: You're not a neurologist. I mean, you always are a neurologist. You're board-certified, but you're not a practicing neurologist.

SG: Correct. As for resources, I have a website. It's www.drgominak.com. I have a protocol called RightSleep and a workbook that helps you work through RightSleep for a full year. You can order the Workbook right on the home page. Also there is a section on the home page called "Quick Start, Basics," which tells you which vitamins to buy, how to get your D levels done, why you may need extra B12.

The website is dedicated to the ''why''. I'm very invested in the ''why''.

I feel like I saw these things happen to my patients. They can't be making it up. I mean five people come in in a week and they don't know each other. They don't even have the same disease. They all tell me the same thing. That means the basic truth is always what the patient says about their body. And then it's my job to see if I can find a scientific explanation for that, in animals and other humans.

There's a lot about the ''why'' on my website, under the menu tab called "See & Learn." I have lots of written material. I have free videos. I have a separate section that's called, "Webinars and Podcasts," if you learn better by video, that's for you. I have a RightSleep Workbook that you can buy, to help you with ''how'' to do the protocol. I also have one-on-one sessions at the menu tab "Work Together" if you need more personal help. I think many people who are not really very sick and just want to add this to their health regimen can actually do it easily with the RightSleep Workbook.

And I also have to comment that once you get better, from this D microbiome point of view, what we all want is to be healthy and have long lives. Sleep is one of the four basic pillars; sleep, diet, exercise and spirituality. You can't really short any of those and be a happy, fully healthy, content person. I don't spend a lot of time talking about the other parts, but they're very important as well.

JM: Well, great. Just curious, because you are a sleep coach, how many people who adopt your program, who come in using CPAP, are able to go off of it successfully?

SG: Wonderful question. In fact, I do not know the answer to that. What I'm hoping at the moment is that other practioners will answer that question:– Here's why I couldn't answer it. – When my patients got better, here's what I would hear;. "I've been wearing CPAP for four years. I forgot my CPAP when I went to the deer lease this year.'' (So I'm in Texas, guys go to the

‘deer lease’, to hang out with their buddies and hunt) and he says, “You know, before I started using CPAP, they would threaten to throw me off the balcony because I woke up the entire house snoring. Now, I forgot my CPAP and I actually felt really good, and nobody complained about my snoring” Now, can I get that person to pay 1,000 dollar co-pay to do another sleep study? No. I couldn’t. So I couldn’t do a before and after sleep study practicing within routine clinical practice.

What I’m hoping will happen is two things that will prove that we can reverse apnea by giving the brain what it needs to sleep better: One, through the sleep dentists (who really got into my stuff, that’s why I was at ACAM- AAPMD). The dentists have an amazing opportunity to do overnight oximetry before doing my protocol then repeat overnightoximetry a year later. They can do overnight sleep studies at home that are relatively cheap. The second thing is we’re going to have all this data generated by people on Fitbits, or Oura rings, while they are doing RightSleep.

The data being generated at home is actually brand new data. No one has ever taken someone who has been sleep deprived for years and given them the chemicals they were lacking and then watched what happened to their sleep. We don’t know what the normal amount of REM is during recovery. Doing a sleep study of a normal 16-year-old who’s been sleep-deprived by keeping him awake, then generalizing, “This is normal. This is not normal,” is not the same as “How is the brain going to react in the first year in a person who’s been given back the building blocks?” I think that data is not there yet.

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But I can tell you, I had patients who had been terribly affected who got better. I had one guy who was at the extreme, who actually couldn’t successfully use CPAP even while sitting upright because he couldn’t get the pressures up high enough, who fell asleep walking and fell and broke his jaw, who ultimately fixed himself to the point of being off of CPAP and sleeping normally. Importantly, this is not someone who has a tiny airway, this is in someone who has a problem with stopping breathing because they get too paralyzed based on abnormal brain chemistry. If you get the chemicals right, I believe that the brain is actually organized to say, “Okay. I know exactly what to do. I can fix this.” I think that CPAP is potentially able to be taken away. But I don’t think any of the studies have been done yet. I’m looking forward to that.

JM: That’s a good answer. Just another final question. The number of people who were on CPAP, if you could divide them into those who have central sleep apnea, where there’s not a mechanical physical obstruction or barrier, which is a big part of what was discussed in the meeting we’re at versus the ones where it’s in the brain.

SG: As I showed you during the lecture, I believe that obstructive sleep apnea is actually on a continuum with central apnea. If you look at the actual way that the nucleus is organized, this is a nucleus that runs our ability to get paralyzed while we’re sleeping.

JM: Yeah. It’s not a nucleus of a cell. It’s an area of the brain that’s responsible.

SG: Yeah. It's a clumping of multiple cells that do certain things. It turns out that all of us get paralyzed when we're in deep sleep.There are certain cells that are assigned to paralyzing the oral airway: the throat and the tongue. That means it makes the the throat and tongue weak and paralyzed during the time that we're sleeping. There's another set of cells right next to it that are responsible for paralyzing the diaphragm and the chest wall. And then there are a whole bunch of cells that are responsible for paralyzing our limbs.

To me, that means that if I can show that these cells are just screwing up in terms of their firing rate, because what's really happening when you get ''too paralyzed'' is that cell was firing at a certain rate, normally and it's goofing up. It's supposed to be a perfect rate, so you're perfectly paralyzed. We were really designed to be able to be paralyzed enough that we can't cry out but we can still swallow and keep our airway open. All animals get paralyzed. The dinosaurs got paralyzed when they were sleeping, this is extraordinarily old, it was engineered many millions of years ago. That means that when this process of paralysis screws up in humans throughout the planet within a 40-year span, something really important has just happened.
So it is my belief that obstructive apnea is tongue/ throat too paralyzed, but if you affect the cells in the brainstem, right next door and your chest wall and diaphragm get too paralyzed then you have central apnea.

Yes, it's true that there are people have small airways that lead to obstructive apnea. We can talk at length about how that might come about as part of the story. But my regimen is good for somebody who has insomnia. It's good for someone who has sleep apnea. It's good for central apnea. In fact, I think that this is the way that sudden infant death syndrome happens.We just have to think about the brainstem's effect on paralysis in sleep as *part* of what we do to help people sleep better.

JM: Yeah. I know a few friends who were physicians who testify as expert witnesses in those SIDS cases, where the parents are accused of neglect and even have their children taken away. Fortunately, they're able to successfully get them back with the help of these experts. It's a sad tragedy. D is important, there's no question, especially in SIDS.

You've really compiled some incredible information. I'm sure that if you're watching this you'll agree. Maybe you can give us your website name again so that people can go there for more information, to get this manual, and also if that doesn't work, to even consider consulting you for an appointment.

SG: Thank you for the opportunity. It's www.drgominak.com.

JM: Great. I really appreciate your novel approach, relatively unusual for a physician who was trained conventionally to really independently come to this conclusion and really have your patients' best interest at heart other than just perceiving it as a job. Almost every one of us go into medicine with altruistic reasons to serve humanity and help people. But sadly, that initial motivation gets eroded out of almost every one of us through time. I'm sure you've seen it in your colleagues. It's really a pleasant surprise to see someone who's kept it. Congratulations.

SG: I have to thank you very much for inviting me. You are a very important part of this piece. You always have been. You're kind of like the pinnacle of having an alternative way to look at medicine. I'm thrilled that you would invite me. You've been one of my heroes for a long time.

JM: Thank you. The purpose of the site really is to present novel approaches to health, and you certainly had one. Thank you for what you're doing and keep up the great work.

SG: Thanks a lot.

[END]