Colibri Healthcare

Podcast Transcript

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Guest: Shelly Denes, PT, C/NDT, CFPS, CGCP

Shelly Denes is an expert in fall prevention and neuro-rehab with more than 30 years of experience treating patients with hemiplegia, neurological diseases, neuromuscular disorders, TBI, and SCI. She has a special interest in Long COVID, autoimmunity and the impact of chronic inflammation and sleep deprivation in rehab. She has been involved extensively with neuroprosthetic devices, lower extremity orthotics, and exoskeleton devices at the Rehab Institute of Michigan. Mrs. Denes travels nationally to present seminars on fall prevention, Long COVID and geriatric rehabilitation. Additionally, her expertise has been presented through expert witness work and consulting both nationally and locally. She also sits on the State of Michigan Fall Prevention Coalition committee. Shelly Denes is a graduate of University of Michigan's PT program, and she earned her certification in Neurodevelopmental Treatment for Adult Hemiplegia (NDT) at the Rehab Institute of Chicago. She helped create the certifications for 'Fall Prevention Specialist' and 'Geriatric Care Professional' with Evergreen Certifications, holds these two certifications and sits on their advisory board. She also has a company called Denes Physical Therapy Consulting LLC.

Host: Candace Pierce: DNP, MSN, RN, CNE

Dr. Candace Pierce is a nurse leader committed to ensuring nurses are well prepared and offered abundant opportunities and resources to enhance their skills acquisition and confidence at the bedside. With 15 years in nursing, she has worked at the bedside, in management, and in nursing education. She has demonstrated expertise and scholarship in innovation and design thinking in healthcare and education, and collaborative efforts within and outside of healthcare. Scholarship endeavors include funded grants, publications, and presentations. As a leader, Dr. PIERCE: strives to empower others to create and deploy ideas and embrace their professional roles as leaders, change agents, and problem solvers. In her position as the Sr. Course Development Manager for Elite, she works as a project engineer with subject matter experts to develop evidence-based best practices in continuing education for nurses and other healthcare professionals.

Episode 1: The Power of Sleep on Health and Wellness

Transcript

Candace Pierce: Welcome to our podcast series, The Power of Sleep on Health and Wellness. I'm Dr. Candace Pierce with Elite Learning by Calibri Healthcare, and you are listening to our Elite Learning podcast where we share the most up-to-date education for healthcare professionals. Now we know that sleep plays a critical role in physical and

mental health. Poor sleep quality or sleep disorders can really exacerbate chronic conditions like diabetes, cardiovascular disease, and even obesity. And it really affects our mental health with issues like anxiety and depression. So, in this first episode, we're going to explore the fundamental role of sleep in maintaining physical and mental health. Our goal through this episode is to provide healthcare professionals with a deeper understanding of how sleep really impacts our overall wellness and why it is such a critical component of patient care. Now joining me for this discussion, I would love to introduce you to Dr. Shelly Denes, who is joining us to talk about sleep. Shelly, welcome.

Shelly Denes: Thank you very much. Glad to be here.

PIERCE: Yes, now your background is physical therapy, correct?

DENES: That's correct.

PIERCE: So, what really drew your interest into understanding sleep?

DENES: Well, I've been doing rehab and PT for several years, over 30 years. Most of my work has been in, neurorehab. I have done a lot with brain injury, so sleep came into that impact a lot. I've worked a lot with people with strokes and car accidents. All of these conditions are impacted by sleep or lack of sleep-in different situations. But my main reason that I got interested in sleep was COVID, long COVID. I got very interested when I was, and I also do a lot of stuff with fall prevention, and that is also impacted by sleep or sleep deprivation. So, when I was doing a lot of research on that, several people talked about patients with long COVID having sleep issues. I also have a couple of friends that had long COVID who had sleep issues. So, I started delving into more information about sleep and how it impacts health. So that's kind of how the interest came about. It's been coming for many years, but COVID really was the kicker. That was my trigger.

PIERCE: That was your catalyst. And you're right. I know quite a few people who have been struggling with long COVID, and that's one of the issues — getting good rest in that healing process. So, I can see how you linked it together.

Now, why is sleep considered a cornerstone in health and wellness? And really, it's an ignored cornerstone, I feel like because we think, "It's okay." The phrase that I always hear around here is, "I can sleep when I'm dead."

DENES: Do you know what? A lot of people think that way, especially athletes who think, "My God, I got to go, go, go, go." Or if you're an A-type personality, it's always go, go, go with little regard for sleep. But sleep is so integral, and it's integral from early on.

Here's a perfect example. If you have a kid who's not sleeping through the night, are they going to progress? Are they going to do well? Probably not. It goes back to infancy. We need sleep throughout our entire life.

First of all, it's essential for cognitive function. You spend the day doing a lot of activities, whether it's physical, mental, or educational. As the day progresses, number one, the memories need to get consolidated. And guess when they're consolidated? When you sleep, because you have to have quality sleep. If you don't, those memories are not consolidated.

Even for the immune system, for example, if you have COVID or the flu, the body's trying to fight that off. The body learns how to do antibodies, right? Or how to take care of the medicine it's taking. And when do they go to sleep, the brain, and the body work to remember how to do this, so the immune system works. And also, the brain needs to rid itself of waste so that you're anew for the next morning. So besides just providing rest, sleep helps cleanse the brain. You get DNA repair, which gets the brain ready for learning and creativity, and maintains glucose levels. People can become pre-diabetic and diabetic just from sleep deprivation, even without other comorbidities in their body. Sleep also keeps your blood pressure under control. Tons and tons of stuff.

PIERCE: Interesting. There is a lot that you don't realize is happening when you sleep, and it's funny that you mentioned children, because my youngest is now nine, but I can tell when she hasn't had enough sleep because she will wake up crying and she says, "I don't know why I'm crying."

She has no idea why she's crying, but if I make sure that she has enough sleep, if I get her to bed on time, she doesn't wake up crying. So, it's very interesting that you're pointing out all of the things that are happening when we're sleeping. And if we're not sleeping, it's the reverse, right?

DENES: So, I'm going to add one more thing. Like you mentioned with your daughter, number one, mood. If you haven't slept, you're not going to be in a good mood. And then you may not be in a good mood because you're worried about not sleeping. So, worrying about sleep adds more stress to the situation. As an adult and a parent, you experience this more than your child does, because she probably doesn't think, "I didn’t sleep," but you do.

The other thing is that you can't block out negative things. So your threshold for just handling the day changes—it covers so many things. For me as a PT working in rehab, you have a patient that has to recover. How are they going to recover if they can't even do the normal stuff that sleep would help them do?

PIERCE: So, when we're talking about mental health and sleep, some of the conditions that you and I have mentioned are anxiety and depression.

Now, is that link one where sleep deprivation can cause anxiety and depression, or is it more of a link where it worsens anxiety and depression? Or can it be both?

DENES: Guess what? It's both. Research has shown that, over time, you get cognitive decline and you're more apt to have dementia. People who have poor sleep habits or poor-quality sleep throughout their life probably will love a shorter life.

So, lack of sleep can cause these conditions, but it can also worsen them if you already have them. Now, using good sleep hygiene, which we'll be talking about, I'm sure throughout this podcast — strategies that help us get quality sleep — can reverse some of that.

PIERCE: So, it's not necessarily permanent damage; it's damage that we could potentially reverse if we prioritize sleep and change our habits and make sleep higher on the priority list.

DENES: Sleep affects so many areas of medicine — nursing, PT, OT, social work, and physicians. When a PCP sees a patient, they should be asking about sleep. This has often been ignored. It's a little bit more relevant now because you see it in the news. Sleep should be a priority in healthcare; it should be one of the key health indicators a physician, nurse practitioner, or nurse asks about when assessing a patient during an appointment.

PIERCE: Right. And I know this is probably more of an opinion question, but why do you think that sleep hasn't really gotten the highlight that it should in healthcare and in our assessments?

Because I do feel like people can have what looks like a manic episode if they are sleep deprived. That doesn't necessarily mean that they are bipolar or have another mental issues, it could be that they are simply sleep-deprived, right?

DENES: Correct. Do you know what? I think it's our era. We're are24-7. Work, work, work, work. You're at home doing remote work. Okay? So even in the evening, you're still working instead of winding down for sleep. So, it's not seen as really important.

And what does the workforce promote? Work, work, work, have a good work ethic. Well, does the work ethic have sleep in it? It should. But no, does it? It really doesn't. It's coming that way. I think you see it in the media and you see in medical research, and as I say, I've been doing research on it. They're seeing how important that is.

How many hours are there in a day? You have 24 hours. How many of those do you sleep? A third, maybe. So, it must be important.

PIERCE: It's so interesting that we're talking about sleep because one of the things that I've done with my kids is, you know, I have a 14-years old, and she still has a bedtime. She is in high school, and she still has a bedtime of 9:30. And, you know, a lot of parents who have high schoolers are like, "Oh, my daughter or child was up til midnight," or whatever.

For us, though, I have really tried to prioritize their sleep. So, my middle schooler has a bedtime of 8:30. My elementary school child has one of 8:00. I don't really budge on those very often because I feel like they are better—I'm not going to say better people, but their moods and how easy it is to get along with them are so much easier when I stick to the bedtimes, and they actually get rest.

DENES: So, what you've said is talking about good sleep quality. Okay? So, you've instilled, you're instilling that in your children. We should be doing this with our kids as we go along.

Okay? Because now they're on a good, they're on a good pattern for circadian rhythms. Okay? Which is the cycle of our life, how it goes.

That's excellent. It's very, very—you're knowledgeable, but how many of your friends and your family members are doing that with their kids? They think it's hip that they're up till midnight. It ain't hip. It's not good for them.

PIERCE: Yes, I have so many friends who don't have a bedtime at all. I'm like, "What do you mean they don't have a bedtime?"

DENES: So how are they going to do when stress hits them or they get to high school and they have to study for exams and whatever, and they have midterms and whatever. They don't know when to put sleep in there. It's very positive that you set up a nice, good, schedule for your children, so that they learn kind of what they need to do. It's very, very important.

PIERCE: Yes. Now, when we're talking about sleep, how does sleep affect that neuroplasticity and the brain's ability to adapt and learn? Because I think that's going to be really important for children, but also college students and even us as healthcare professionals. We're constantly having to adapt and learn. So how does sleep affect that neuroplasticity?

DENES: Well, hopefully people understand what neuroplasticity is—it is where the brain and the central nervous system have to adapt to some change that has happened, either intrinsic or extrinsic. So how neuroplasticity works is that it helps ensure your brain can adapt. Like you said, your kids are in a better mood, so they're able to adapt.

So, there are four key things of neuroplasticity that are important. Neuroplasticity makes our brain very plastic, and makes our body very plastic, so we can adapt. We need exercise. We need sleep, quality sleep. We need good nutrition, and we need our stress level to be down. Those are the four. So that's where sleep fits into it, okay? From early days, neuroplasticity is throughout our life.

PIERCE: Now, does it change as we get older?

DENES: It changes as we get older. Does neuroplasticity change? Is that what you're asking?

PIERCE: Yes

DENES: Okay, well, neuroplasticity only changes because we're older and things aren't changing as quickly. But the key thing is that as we age, it continues because it's through the life cycle. It's not just one day, or one thing.

If something happens to us, for example, we have a stroke or we lose a family member or whatever, then we have actually, you have a new window of opportunity because the body says, "My God, I need to take care of this." So, during that time it's the most important time to make sure that we are enabling neuroplasticity.

The key thing of neuroplasticity is BDNF, brain-derived neurotrophic factor, which is a chemical in our brain that is produced in order for our body and our brain and our central nervous system to adapt.

It actually increases when there's trauma. When something happens, we get this new window of opportunity. For example, when somebody has a stroke, their rehab is super important right after that because the body's ready. If we wait six months, neuroplasticity isn't going to be so great.

Now, one other thing—neuroplasticity, I named the four key aspects for neuroplasticity. But neuroplasticity is also behavior. You have to want to do it. You have to have a positive attitude in order for neuroplasticity to work. It kind of helps stimulate the BDNF that exists.

PIERCE: Right. So, we're talking about that neuroplasticity and how it affects the brain's ability to adapt and learn. Now, can you take us to the other end of that where you have chronic sleep deprivation? How does that deprivation really contribute to our aging, our cognitive decline, and our physical health?

DENES: Okay, so what happens is if you have sleep deprivation, your glucose level will probably increase. Okay, you might have hypertension, and your heart has to work harder. You may become obese. This is over time, you know, sleep deprivation, not over one day or two days. However, it actually can affect you in a day or two. So, there is cognitive decline, all contributing to diseases that happen as we age.

So yes, it has a huge, huge impact on that. And there's been research that shows that cognitive decline and less learning in people who have sleep deprivation, making them more apt to develop dementia at an earlier age, even if they don't have other comorbidities—just because of sleep deprivation.

Because remember all that key stuff—you're not cleaning so they can't learn. The DNA is not recovering. The cells aren't recovering. You're not getting rid of waste. The immune system isn't working. So, it affects a lot of stuff. And then you add meds.

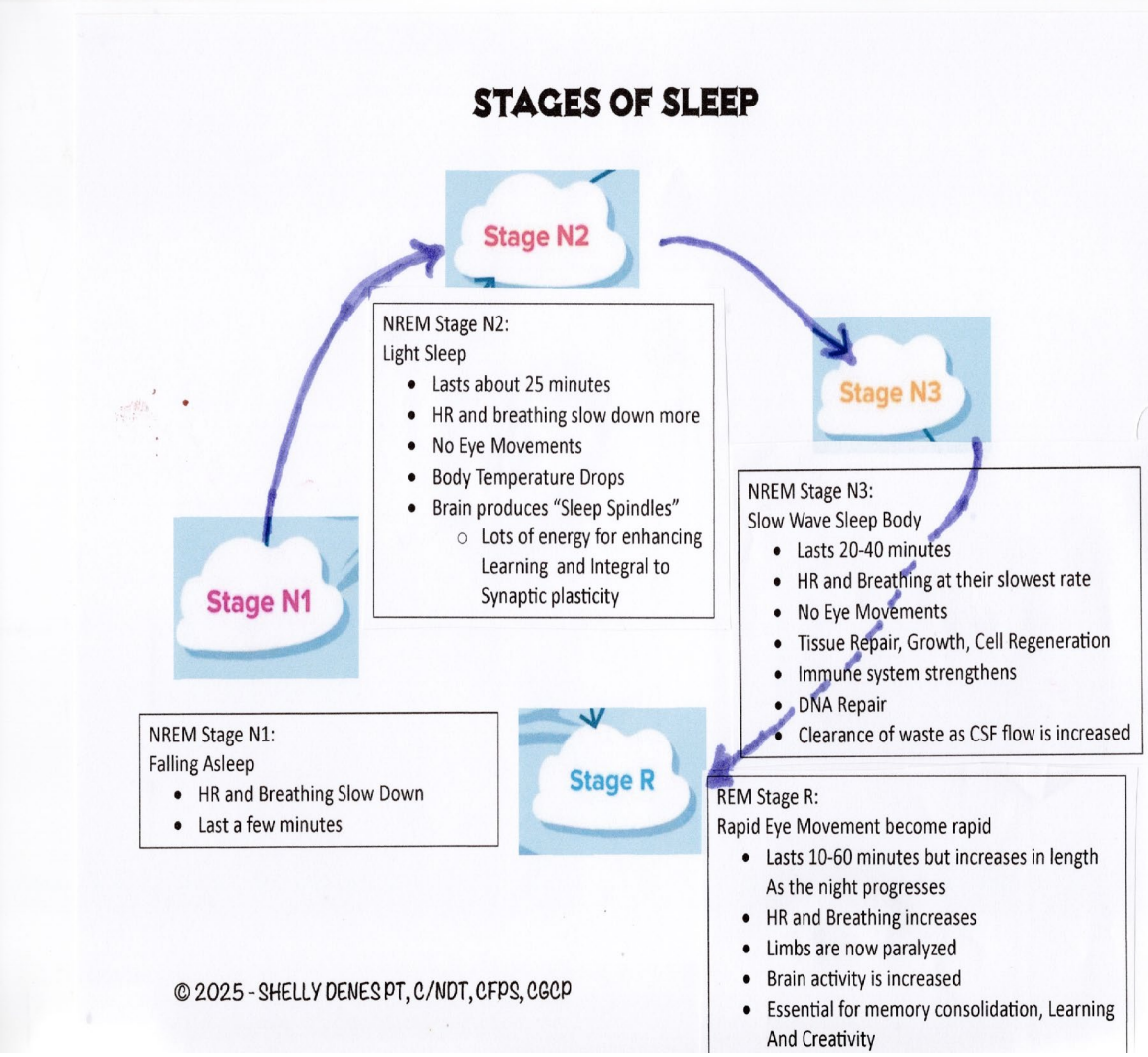
PIERCE: Yes. Do you want to kind of do a quick walkthrough of what happens in the different stages of sleep within our body so that we can understand really why quality sleep is so important?

DENES: It's an excellent thing to do. The stages—no, no, it's great. And I love that you're saying that because it just—and it doesn't mean that whoever is listening, that you have to memorize what the stages are, just to kind of understand how they go.

PIERCE: Right, that was back when we were in school. We had to memorize what the stages were, but did we really understand what was happening to the body in those stages and why they were so important?

DENES: Very much so. So, there are four stages, and those stages are stage N1, which means non-REM sleep, non-REM 1. REM is rapid eye movement, which is the fourth stage. So, everything is related to eye movement, which I'll explain in a moment.

So, there's stage N1, N2, N3, and then REM sleep, rapid eye movement sleep. I have a wonderful chart that I will share with your participants to show the different stages because I think that's really important.



So, you fall asleep, just like lights-out fall asleep—this is non-REM sleep. The heartbeat and your breathing slow down, your muscles relax, that's just for a few minutes.

Then you go into stage N2, which is light sleep, which might last for 25 minutes. Here, the heart rate still is decreasing, your breathing slows down, so the body's relaxing, the body temperature drops, and the brain produces what's called sleep spindles, which are these high-energy cells. And what that does is that helps for the powerful transfer from the hippocampus, which is where your early recent memories are stored, to your cortex. Remember I talked about memory? So that's how that starts, okay? So, in this stage, you're enhancing learning. Your synaptic plasticity improves, like we were talking about neuroplasticity. It lasts about 25 minutes.

Then the third stage, non-REM sleep three, is slow-wave sleep. This is where you start going into deep sleep. It lasts for maybe 20 to 40 minutes. This is where the DNA repair happens. Now here, your heart rate and your breathing are at their lowest level. The body becomes

fully relaxed. This is where you have tissue repair, growth, cell regeneration. This is where the immune system starts strengthening.

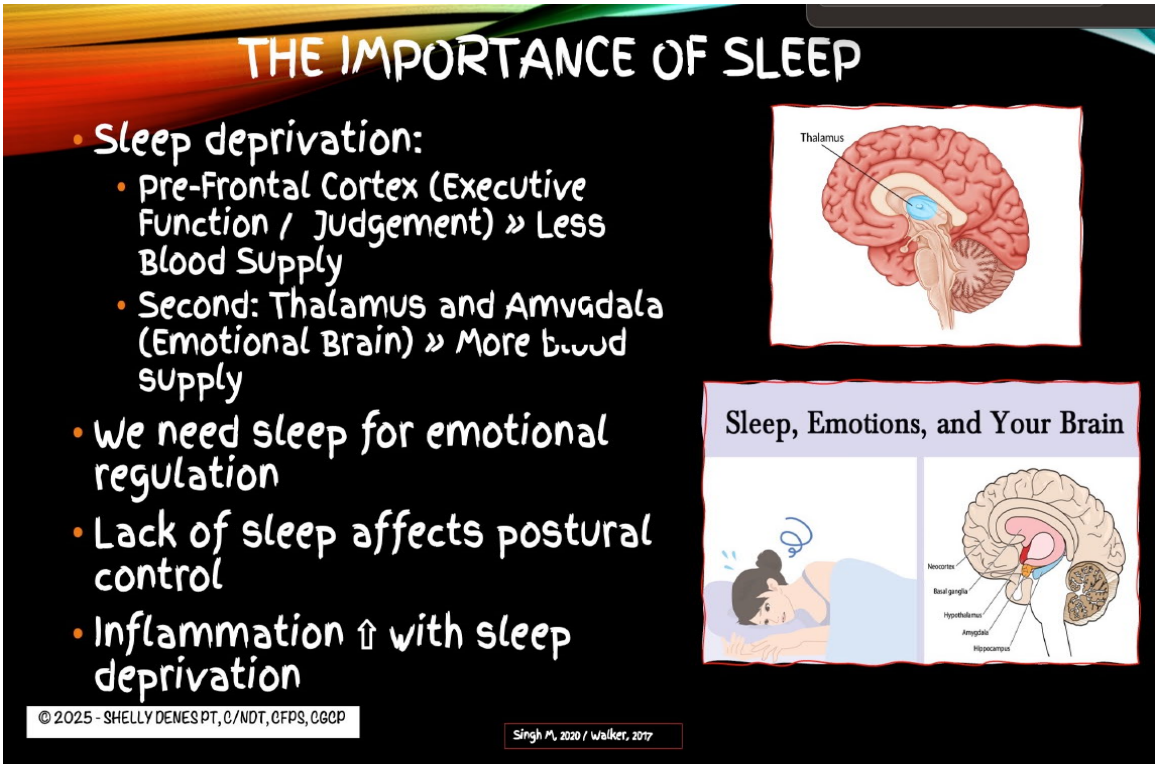
Now, the fourth stage is REM sleep, rapid eye movement sleep. So, your eyes are kind of twitchy, twitchy, twitchy, okay? We don't know it, but if we put you in a sleep lab, we see this. This is where the full body is actually paralyzed. The limbs are paralyzed, except for the eyes moving. And this is where you dream. This is where you have creativity. This is where the memories are more consolidated.

I'm sorry, the third stage—I just want to mention is where the cerebrospinal fluid starts flowing a bit more. So that's where you get your cleansing.

So back to stage four—the fourth stage is where you have memory consolidation, dreaming, creativity. You make sense of what happened during the day. It can last anywhere from 10 minutes to an hour. The cycle's about 90 minutes to go through the stages. So, in a night, you should go through four to five of those.

You can't make them go; it's just part of—we can't say, "Oh, My God," there's no way to make it go through the cycles. You want to go through all the cycles. They're all important. So that's what's key about the cycles.

So, it also involves—I may suggest—which parts of the brain are kind of working in terms of this. So, the hippocampus is what I mentioned, where the memories, your recent memories, start, okay? The brain's using everything. The hypothalamus is where the master clock is, which is what controls your circadian rhythm. You get up in the morning. You do your creativity. Melatonin decreases, which puts you to sleep. Your cortisol increases in the morning, and whatever. And the amygdala, which is part of your emotional brain or your limbic brain, also will start working because that's what helps with your creativity in REM sleep. And then I've got two more—the thalamus prevents sensory signals from reaching the cortex so that the cortex is not doing a lot of thinking. Now it's working on the wonderful things of sleep. And the reticular formation, which is in the brain stem, regulates the transition between sleep and then being able to wake up in the morning. And the pons—and I have a picture that I can add to the transcript that will help—shows all these parts of the brain. The pons, which is another deep structure of the brain, helps to initiate REM sleep.



We hear a lot about REM sleep, but it's only one of the four stages that's important.

PIERCE: Okay. So, when just listening to all of that, it's a lot to digest because the brain is so busy, even when we're sleeping, but everything it is doing is so important. And I wanted to kind of go back to illness. When we are sick, we seem to want to sleep more. So, what is that? What is going on and helping our body as far as recovering from illness with sleep?

DENES: Well, because we're worn out from whatever the illness has been, the body is trying to recover. So that's really okay. Except you don't want to go to normal sleep, even for kids, eight to nine hours. And as we get older, still eight to nine hours. If somebody's sleeping 10, 12 hours, that's too much. That's going to be bad because the body needs to be awake. Something's kind of not working well. And the other thing is when they're ill, your glucose could be different. You might be more hypertensive. Your heart might be working differently. And then you might be taking some meds that will affect the sleep and different cycles of the sleep.

PIERCE: Mm-hmm. Yes, the meds that like to make you drowsy. If I have a cold or something, I do not mind those. So, I do end up sleeping a little bit more than probably what you would want me to be sleeping, but I would rather sleep through it while my body heals than to be up feeling miserable. Now, a couple of times you mentioned the circadian rhythm. So, can you kind of talk to us about the circadian rhythms and really how they influence our sleep patterns?

DENES: Okay, so the circadian rhythm is the cycle of your body. Actually, it's handled by the master clock. The master clock is in your hypothalamus. So, let's just start. In order for you to wake up, the key thing that's going to help you wake up is light. So, in the morning, you should not wear sunglasses, open up the shades. And you should do this with your older

patients when you go to see them. How many times do people go to home care and they go to see a patient at 11 o'clock in the morning, the shades are down, they got their non-glare glasses on, they're walking around, no lights in the room, and then they're wondering why they're not up and about and going. They haven't kicked in their circadian rhythms, okay? Light, okay? So, let's say six o'clock, eight o'clock, 10 o'clock, whenever they wake up. That's when the light starts. It decreases melatonin, which is what may help you, and makes you sleep. Okay. Cortisol is the chemical that will kind of help wake you up, but the light will set that off. Okay. Then morning time is generally the time when you're going to be the most active and maybe the most creative and whatever. Now that depends. All of us are a little different. Some of us are morning people. Some of us are night people. Then you have lunch. Okay.

Early afternoon sometimes is more creative for other people. At two, three, and four o'clock in the afternoon, we have to make sure we stop drinking caffeine so that melatonin can start increasing. And we get into a windup cycle going towards sleep. Eight o'clock, 10 o'clock, 12 o'clock. Melatonin increases. We just got a hand. The key there is in order for, if we're doing well and everything is working, our circadian rhythm is working great. So that's our cycle. But if it's not, we need to do something different. And as I say, maybe you shouldn't have light in the room at night. Because melatonin is not going to work with light in the room. Okay?

PIERCE: Now, and I really want to say when you're talking about melatonin, we are talking about the naturally occurring hormone in our body, not the medication that we can take to help us sleep.

DENES: Correct. That's right. No, Candace, very valid point because the TV advertisers say take melatonin. I'm not saying you can't. We're not getting into that right this moment. The thing is, absolutely. We want to key in the natural stuff. Okay. In the morning cortisol, which is the stress hormone helps us get—that’s okay. Stress hormones are okay to get us rolling. Absolutely.

PIERCE: Yes, I just wanted to clear that up. Yes, we can talk about that in the next episode. Something I learned about cortisol too is, so one of the things that I have struggled with over the last couple of years is really high cortisol levels. And so, I just casually mentioned to a functional med doctor, and I said, in the mornings I just feel something running through my veins. And that was cortisol. She was like, Cortisol helps you to wake up, but you shouldn't feel it in such a way that it feels like something warm is running through your veins. That means that you have too much cortisol waking you up. So, lifestyle changes are important in that circumstance.

DENES: Absolutely. Or let's say don't have a heavy meal at the end of the night in the evening. Okay. That's, you know, that doesn't help melatonin kind of create itself and for you to rest and sleep. Okay. For sure. Turn down the lights. Less noise. And I'm just going to add one more thing in the new, in the new, in the new world—iPhones with blue lights, computers with blue lights, iPads. You know, 24-7, all that. Looking at email at 10 o'clock at night is not going to help you go to sleep. So that's kind of what the circadian rhythm is.

PIERCE: Thank you for sharing. We are at the end of our time for episode one. And I did want to just remind, I know you mentioned a couple of graphics that you were going to share and we are going to put those in our transcript, which you'll be able to find with the episodes. So, thank you for joining us in this episode of The Power of Sleep on health and wellness. Dr. Denes, thank you for being here to really walk us through this knowledge and really just a good reminder of the importance of sleep and that we really should be prioritizing this and all the things that are happening in our body and why they are so important, not only for us as busy healthcare providers, but also for our patients and their health and their recovery from every type of illness, fractures, anything that is going on in their body, we really need to start prioritizing the rest and the sleep of our patients as well. So, thank you, Dr. Denes, for being here. And we hope you now have a better understanding of the essential role that sleep plays in health and wellness and be sure to check out our next episode where we are going to still be talking with Dr. Denes on how to focus more on practical strategies for improving sleep quality and addressing sleep disorders in patients.

DENES: Thank you.

Episode 2: The Power of Sleep on Health and Wellness

Transcript

Candace Pierce: Welcome back to The Power of Sleep on health and wellness. In our first episode, we explored the critical role sleep plays in maintaining physical and mental health. And in this episode, Dr. Shelly Denes is back, and we are going to be discussing practical strategies for improving sleep quality and managing sleep disorders. Our goal is really to equip you with actionable tools to support not only yourself but also your patients. Dr. Denes, thank you for joining us. Welcome back.

DENES: Thank you. Glad to be here.

PIERCE: All right, are you ready to jump back in?

DENES: Sure, I am! I'm here, ready to roll.

PIERCE: All right. Well, we covered a lot in the first episode, and I just wanted to ask you before we jump into these strategies, was there anything you wanted to just reiterate or maybe you didn't get to touch on in the first episode that you want to just kind of throw out there?

DENES: Well, just one key little thing. I think we did a really good job of covering the topic. But there was a study done by Dr. Singh here in Michigan, actually, who's a sleep specialist. She's a psychiatrist. What they did is they did probes on the brain to see where the

electrical activity was after somebody had sleep deprivation. There were two areas they looked at that really stood out. The prefrontal cortex—you know, the part in the front of your brain, which is where you do executive functioning—had less blood supply after somebody was sleep deprived for several days. This was somebody, a normal person without comorbidities, young—I believe most of the subjects were in their 20s or 30s. The second area that showed up was the thalamus and the amygdala, which are areas of emotion. They had more blood supply to that area.

PIERCE: So, you're more emotional when you don't have enough sleep.

DENES: Exactly. With sleep deprivation, you're more emotional, and guess what? Your executive functioning or your judgment's going to be off. So, making a critical decision during a time when you're sleep deprived is not a good idea because you're running on emotion, and you might not be making a good judgment. And you may be a very prolific, wonderful person who can do really well, but in sleep deprivation, there's going to be a problem. Here's a perfect example, somebody gets into the car and they're sleepy. “I'm okay. I can do it.” Why? Because they want to get home or go where they want. Okay. So, their judgment is impaired for them to get in the car. And then when they drive, what are they going to drive like? Fast. Because they want to get home. I mean, there's a perfect example.

PIERCE: You're not wrong. And your example really hits home for me personally, because when I was working night shift as a nurse, I lived an hour away from the hospital. And so, when I would get in the car in the morning to drive home, the longer I had to drive home, the madder I would get. Like, I was just—I was not nice. Leave me alone. I just want to go. I want to get home. I just want to go to bed. So, I can relate to exactly what you're saying.

DENES: How did you drive? Be honest.

PIERCE: I was probably driving faster than I should have. Yes.

DENES: Okay, this is such a perfect example. Here's another one: You're working all day, you're sleep deprived, you're going up on a ladder, okay? You got to reach that last little piece. If you're not sleep deprived, you're not going to reach for that because you're going to make a good judgment. But when you're tired, you might take that risk. So right there, you're asking for an accident. Or take fall prevention—something I do a lot of work with. People who are sleep deprived go outside, there are shadows, they’ve got the wrong glasses on, and they’re thinking, "I’m tired, but I got to go to the mailbox." They're much more prone to fall because they made the judgment of going out while they were sleep deprived. So, this study—ding, ding, ding—hits so many things, and it's so right.

PIERCE: And those are really great points to talk about—how sleep deprivation affects us. And I definitely see it, even in the story I shared in episode one about when my daughter wakes up. I can tell she hasn’t had enough sleep because she's crying. Again, emotions. Very emotional. Can't make decisions. Doesn't understand why she's crying. So, you see it at all ages, it just shows differently, but it affects the same areas. So, good point.

DENES: I will take it to the next level. You're seeing a patient or working with somebody, and you know they're sleep deprived. You've got to let them know this: "Look, I want you to be extra careful. You need to be present at the moment because here's what's going on. We're going to try and work on your sleep, it has to be a key thing—but in the meantime, I want you to be careful. Make an extra effort to think about what your decision's going to be or how you're going to react. Maybe just take a rest.

PIERCE: Yes. So, that really leads us into—kind of bridges us into—what are some of the evidence-based strategies to help with improving sleep quality in ourselves and in our patients?

DENES: Okay, excellent. So, you want to establish a nighttime routine like I mentioned before. As the evening comes on—six, seven o'clock—by that time you should have limited your caffeine. Make sure you're not eating a heavy meal. The light should go down. You don't want bright lights. Try and go to bed at the same time or around the same time and wake up at the same time so that you get that—remember that circadian rhythm—you get that working well.

You want to have a healthy sleep environment. It should be cooler. You should be in a comfortable bed. You don't really want to drink too much if you have issues with getting up to pee in the middle of the night, maybe don't drink so much so you don't have to get up. Make sure the room is dark. Turn off electronics so you don't get emails and messages. Avoid large, fatty meals. Maybe try meditation, reading a book, white noise—whatever works for you. Maybe do a little stretching before you go to bed. Should you exercise—have a big "bing, bing, bing" exercise—right before sleep? No, absolutely not. That should be early morning or early afternoon, depending on how your schedule goes—or both, whatever works. So those are key things we want to do. Control breathing. Mindfulness. Tai Chi. Different things that fit into your schedule. And it should be a fairly regular schedule. Doesn't mean you can't stray from it at all, but when your body gets into the circadian rhythm, melatonin—remember, that natural chemical—knows when to start increasing.

PIERCE: Right. Now, one of the things I was going to ask you, too, is—I know we talked about not doing heavy workouts, but in terms of helping with the circadian rhythm—what about if you ended your evening, maybe after dinner, with a walk outside? Would that help increase melatonin or help with the circadian rhythm?

DENES: That's an excellent idea. Maybe not super close to bedtime, but let's say right after dinner. You probably want to wait a little bit because you don't want to be walking a lot on a full stomach, but that's very good. You don't want to be out running and jogging at eight, nine, or ten o'clock, no—but a nice, casual walk? That would be terrific. Also, you're out in the fresh air, breathing good air instead of being stuck inside. Plus, you're moving around. Sunset—go with the sunset. Sunsets are part of the circadian rhythm.

Another interesting thing—this has been studied and was noted in just the last several years—is that each of our organs has its own little clock. Your liver has a clock, your pancreas—each one has its own internal timing for how it works. So, keeping it on a pretty rigorous schedule is important. And that's also crucial when it comes to taking medications.

I'm sure you deal with that a lot as a nurse—should the medication be taken at night? In the morning? That's become a much more important topic. There are actually now specialists—circadian rhythm specialists—not just sleep disorder specialists, because this is so key to health.

And think about the baby boomers, they have comorbidities, they're taking meds to stay alive and do well. So, when's the best time for them to take their meds? Or what combinations work best?

PIERCE: And, you know, really with that patient education too, something we were taught in nursing school is to think about when you take medications and really help your patients understand. Like, you don't take a diuretic right before you go to bed. You take that in the morning so that you can get some sleep—that's a fall risk, right? All of those things—really helping your patients understand what is going to affect their sleep rhythms.

Something else I wanted to ask you is, how can we as healthcare professionals do a better job of assessing and identifying sleep disorders in our patients? And sometimes—I don't know if "disorder" is the right word I want to use—because a lot of times it's just education. It's that they didn't know. They haven't been taught sleep hygiene. They haven't been taught how important this is and the types of routines they should have.

DENES: Well, I think I just ask them, "How are you sleeping?" And they go, "Eh, not so good." Then delve in—what's kind of going on? How long has this been happening? Do you get up during the night? Are they doing things like one night going to bed at midnight, another time early in the morning? Are they drinking a lot of fluids, so they get up to go to the toilet? Are they taking their medicine at the wrong time?

For example, multivitamins—most vitamins shouldn't be taken at night. Most multivitamins should be taken in the morning. You have to see what they're like. B vitamins are not good to take at night, okay? So even over-the-counter stuff will affect sleep. Just ask how they're doing, and they might say, *"Eh, I'm not sleeping well, but it's not that important."* And that's because in medicine, sleep hasn't always been treated as important. But just look at what we've talked about today—how important it really is. Look at how it affects your daughter.

PIERCE: Yes. Where can we find these circadian rhythm specialists that you mentioned a few minutes ago? I've never heard of them.

DENES: Well, yes. The National Sleep Foundation is a key, key, key resource. Patients and professionals like yourself can find tons of information there, and they also list specialists who work with sleep. I happen to be very friendly with a sleep specialist here in Detroit, that's where I learned quite a bit about this stuff. She works with athletes—like, say, basketball players who live in New York but have to play in California at 9:30 at night. That three-hour time difference really affects them. They're doing high-intensity activity late at night, so she figures out when they need to nap or maybe take melatonin to help them adjust and get good sleep.

Now, your average patient isn't going through stuff like that, but these are key examples. There's also Matthew Walker, have you ever heard of him? He's at the University of California, Berkeley. He has quite a few TED Talks about sleep. He's a great resource, Matthew Walker, University of California, Berkeley.

Another one is the University of Chicago. They do a lot of work on this. Dr. Turek—T-U-R-E-K—I think his first name is Jeffrey, is another circadian rhythm expert I've found a lot of information from. I think he's based in Chicago. So, there's quite a bit out there, and it's all so, so important.

PIERCE: Yes, I mean, for our overall health and for our patients' overall health. Because, you know, one of the things that happens in the hospital is that we go into patients' rooms a lot through the night. Patients really don't get much sleep in the hospital. And then we have patients who become delirious, they fall, they can become combative.

PIERCE: And talking to you today, it makes me wonder—when that happens, the first thing we usually think of is maybe it's a UTI, but maybe they just need sleep.

DENES: Yes. I think hospitals, especially in research areas or big cities, not so much, maybe in rural hospitals, are starting to focus more on the importance of sleep and trying to implement that into hospital care. For example, like you mentioned, in intensive care units, it's crucial. You've got to do those vitals every two hours, but maybe you don't have to turn on the light every single time.

PIERCE: Yes, yes, we just hit a button. Just hit a button and it takes it for you.

DENES: Maybe you don't need to turn on the light for the whole room, you know what I mean? And get it done without disturbing them so much. That might be very helpful. Let them stay in the dark through the night. Or maybe put a mask over their eyes so they get that darkness. Yes, you still have to check on them because it's critical for whatever their intensive care needs are but take into consideration how important sleep is for their recovery. How is their immune system going to work well if they're not sleeping?

PIERCE: You know, one of the things that I just thought would be appropriate to point out is a lot of times people think that when you have a patient who is sedated, they're sleeping—that their body is resting. That's not actually true. That's not the case/ A lot of people, even healthcare professionals, don't realize that their body isn't necessarily resting even though they're sedated.

DENES: Very, very valid point—absolutely, for sure.

PIERCE: So, going back, I know in episode one, you were talking about sleep hygiene. Can you help us really understand the role of sleep hygiene and what the key components of sleep hygiene are?

DENES: Okay, well, I mentioned some of them. Getting a regular pattern, not eating heavy, you know, heavy fatty meals just before going to sleep. Finding some way to calm down after dinner—meditation, reading a book, breathing exercises.

PIERCE: Yes, and so all of that—all of those components—come into sleep hygiene.

DENES: That's correct, all of that. Now, an added thing to sleep hygiene is worryingness. Okay, it's eight o'clock at night, and I'm worried because my sister is very ill. That's just an example. The worst thing you can do is lie down when you're worried. Are you going to go to sleep if you're thinking about her or whatever else? Probably not.

Think about what's going on, maybe call her, do what you need to do, and then say, "I've done what I can for today." The bed shouldn't become a place of worrying there trying to figure out all your problems. The bedroom and the bed should be for sleeping and intimacy, not for worrying.

So, if you're laying there and you can't sleep—how many times has this happened to you? Get up, get out of the bed. Don't go to your phone—that blue light isn't helpful. Go to another room, get some water, go to the bathroom, do some breathing exercises, walk around a little, and get your body ready to sleep again. Then go back to bed.

Laying there worrying and then worrying about the fact that you're not sleeping, that's all part of poor sleep hygiene.

PIERCE: Yes. Now, I know that we have—go ahead.

DENES: I'm going to add one more point. Worrying that you didn't get your eight or nine hours of sleep adds to your frustration. Let's say you went to bed at eight o'clock because you were tired and then woke up at four. Guess what? You got your eight hours, right? You might not go back to sleep, and that's okay. Lay there, read a book, you know what I mean? Take a breather. Because your whole pattern has shifted—you've already slept eight hours. Don't even count it—that only adds to the stress.

PIERCE: Yes, one of the things I've found really interesting is I have an app on my phone that connects to my watch and tracks my sleep. It monitors how long I'm in different stages of sleep and my heart rate through the night. But what I find most interesting is that it looks at your routine over time and tells you, "Okay, this is how much sleep you've gotten, and this is how much of a sleep debt you have." Like, if I only sleep six hours one night, it'll say I have a sleep debt of two hours. Seeing that information in real time has been really helpful.

DENES: But here's the thing, Candace—and this is important—people shouldn't go too crazy with that. The apps are pretty accurate, but worrying about "Oh my God, I've got a two-hour sleep debt" isn't going to help you tomorrow—or tonight, for that matter.

PIERCE: [laughs] Right, like "I've got to make up for those two hours tomorrow."

DENES: Right. Don't get too crazy about all of that. That doesn't help the situation. Now another thing that happens with the sleep cycle, which is interesting in the circadian rhythm, your REM sleep gets longer as the night goes on. Okay? So that 90-minute cycle will have more REM sleep closer to the early morning hours. So that's when you're going to be

dreaming. That's why you can remember your dreams in the morning sometimes or whatever.

PIERCE: Yeah, I've never been able to remember mine. I don't know why. I don't. And I'm like, no, I don't remember anything. Really.

DENES: And those are very important. No? Okay. Do you have nightmares? Really? Okay.

PIERCE: It's very, very rare that I ever remember. And if I do remember a piece of a dream, I won't be able to remember it 10 minutes later. It will go away.

DENES: Did your app say that you were in REM sleep any length of time?

PIERCE: No, I wasn't looking at that at the time, but yes.

DENES: Okay, be interesting to know. Be interesting to know. That's when, that's, you know, they're, look, all the cycles are important, but you want to get to REM sleep or whatever. So, or you may be dreaming and not knowing it.

PIERCE: Mm-hmm. Yes. But that has been interesting to see. Yeah, and I think that's probably what's happening. I'm dreaming, but I just don't wake up and remember them. And if I do remember them, my brain doesn't hold on to them. They're like, all right, fly away. You don't need to remember that. Yes.

DENES: And that's okay. And worrying about it isn't going to help it. It's a biological behavior. We can't make it work. It's not something we should push to work. The sleep hygiene is the idea to make it have the most potential for it to happen. It happens. Let it just happen. It's okay. Like people getting up in the middle of the night, it's okay. It's nothing wrong with that. That'll happen.

PIERCE: Yes, and as you get older, you know, you're potentially going to have to get up and go to the bathroom and that is a normal sign of aging, unfortunately.

DENES: Okay. And then what happens also with aging is you go to bed earlier; the whole circadian rhythm shifts so that you're going to bed earlier and then you're getting up earlier. And maybe the quality isn't as good. And part of that is BDNF, the neuroplasticity. It's not the growth hormone. Your growth hormone isn't the same at the age of 80 as it is at 25. So that's affecting it. Plus, you have comorbidities that are affecting it.

PIERCE: Right, yes. And so, I really want to hit on cognitive behavioral therapy for insomnia. How can CBTI be used to treat the sleep disorders?

DENES: Well, if you can't yourself be able to get through the sleep hygiene things that help, then you need some assistance. And an expert in cognitive behavioral therapy can help with that. And what they do is they figure out kind of how to reduce your stressors. That's the key thing they're working on so that you can relax and reframe everything, get your body to, and they teach them sleep hygiene. And cognitive behavioral therapy may include some medications. They do sometimes. And it's interesting because the GABA medications

like gabapentin and Lyrica, which are used for neuropathy, neuropathic pain, are really wonderful for sleep, for increasing sleep. So, people who are taking gabapentin, I'm not trying to prescribe, but I'm just mentioning, gabapentin and Lyrica are two medications. They're anti-anxiety, they're anti-epileptic, for epilepsy, but they found out it works for neuropathic pain, helps with sleep. Those two are just a couple of the medications that they will use. Sometimes certain antidepressants will be helpful and might be used with cognitive behavioral therapy. Like an anti-anxiety medication that might be taken at night, you know, low dose.

PIERCE: Right. Yes. Now, what are some of those risks and benefits of using pharmacological treatments to help with sleeping? Especially melatonin.

DENES: Well, melatonin, you have to be careful because melatonin needs to be prescribed by somebody that's an expert because you need to figure out when you need to take it. For example, if I'm going to go if I'm ready to go to sleep now and I take melatonin and that kind of works, I need to take it three hours before to try and help build it up and whatever the amount is. OK, so just taking it over the counter. You need to figure out what you're doing. There's also light therapy that can be done in the morning, which is also part of this cognitive behavioral thing. And sleep experts are using light therapy in order to get the cortisol going and get the melatonin decrease so they get into a good circadian rhythm for the pattern for sleeping. But the risk and benefits are some of the meds will have effects on cycles, certain stages of the sleep. So, people who are prescribing this, which would not be me, but a sleep expert, needs to know which of those medications and how that's working. Now, you also have to take into consideration some of the cardiovascular medicine like beta blockers, calcium channel blockers, they all affect sleep in different aspects or the combination of meds. So, the primary care physician or the provider needs to understand how all of that works. Now, if you're hypertensive, you need meds for hypertension, but maybe we need to pick one that isn't going to affect the sleep so much, you know, and a lot of the new ones are much less of a problem with that. Groggy in the morning isn't going to help somebody, okay, calcium channel blockers and you want to get quality sleep. So, the cognitive behavioral stuff will help. Just going to sleep. Okay, here's a perfect example. Ambien. You know about Ambien. Pretty dangerous. Okay? They may put somebody to sleep. It's not quality sleep. They may hallucinate.

PIERCE: It can also make you really sick when you wake up in the morning too.

DENES: Not quality sleep. Yes, absolutely. So, what kind of sleep is the med doing? Or over the counter, for example. A lot of them have antihistamines. How does that work on? That might actually make you more hyper, like Benadryl, if you took Benadryl over the counter. It might put you to sleep, but it also might make you hyper. So, you got to be really careful about that.

PIERCE: So, there's really a lot to think about. It's not just about taking a melatonin and I'm going to go sleep tonight. I do see a lot of, and I'm seeing it more and more with younger patients and children really where they take a melatonin every night to go to bed.

DENES: Well, it's pushed on TV. They probably see it on social media too. Yep. And the thing is, when are they taking it? It doesn't work like boom, okay, it's going to put me to sleep. Or I mean, sometimes I take melatonin, but what I'll do is I'll take it three or four hours before I go to bed, and I take a very low dose of it. If I get up in the middle of the night, I know people who do this. In fact, I have a cousin that does it. She has a spray; she has a melatonin spray. She gets up in the middle of the night and she can't go back to sleep, she gives herself a melatonin spray. Uh-uh, not a good idea because by midnight, at two o'clock your melatonin should start being decreased so that you can get to the morning part of your circadian rhythms.

PIERCE: So there really is a lot to think about.

DENES: Now there's another thing with sleep deprivation. Yes. You can have hyper-arousal with sleep deprivation. So, I am so sleep deprived that now I'm in fight or flight. My sympathetic system is like on overload. Okay. Your daughter might have it. Okay. No. So she's, so she's in fight or flight. My God. I don't feel well. I don’t know. Remember you said she was crying. I mean, this is very, very common. So, they're in a heightened stage of activity, even though they're sleep deprived. So, they're stressed, they're having anxiety, and then they're not going to sleep because they're all hyped. We can't stay inside fight or flight, right? Our body cannot stay in the sympathetic part of our autonomic nervous system. What do they need? They need to be calmed down in whatever way, or form, right? And cognitive behavioral might be part of it, depends.

PIERCE: So, we are running out of time. We are at the end of our time for episode two. Is there anything that you just want to just make sure you touch on again before we end?

DENES: Well, I think this needs to be an important part of medicine, rehab, health. And we need to start early with our kids. And when we as clinical people, clinicians, we need to think about it when we see our patients or our patients come to see us, we see them. We need to, I think it should be a general question. Somebody comes and they're doing well and everything's fine. Maybe you're not going to ask them. It's not a bad idea. I think it should be a key thing. How are you sleeping? They all say, not so good. Then maybe cue in what's going on. And maybe it isn't a huge problem. And maybe it's only the last couple of days. But if it's over long-term, we talk so much in our two episodes today, how over time what sleep deprivation can do. I think that.

PIERCE: It's very harmful. Absolutely. It plays a factor in basically every type of chronic disease that we have. Yeah, I think that's really important to understand. So, I'm going to wrap up this episode and just kind of share a little bit about why sleep is so important to our health and wellness. Up to 70 million Americans suffer from chronic sleep disorders like insomnia, sleep apnea, and poor sleep is actually linked to a 45% increase in developing cardiovascular disease and contributes to almost every condition you can think of: diabetes, obesity, depression, poor mental health, and sleep disorders unfortunately often go undiagnosed, with only one in five individuals actually seeking treatment. And this doesn't just affect our patients, it affects us too. As healthcare professionals, we are at risk of sleep deprivation due to demanding schedules and also that high-stress environment that we pretty much all work in. So, we have to understand the importance of sleep.

And I just really hope we can encourage you and you can bring this to your patients to prioritize sleep health. When we sleep well, we improve our performance, we improve our decision-making and just our overall wellbeing. Thank you, Dr. Denes, for joining me for this topic and sharing so much great insight into the benefits of sleep. I can just... I know you are so passionate about getting this information out there and I could really just...

PIERCE: hear that in everything that you were saying today. So, thank you for being here with us.

DENES: And thank you for the discussion. I think it was a two-way street, very, very well, very much so.

PIERCE: Yes. So, to our listeners, thank you for taking time to listen to this discussion. If you found this information valuable, please share it with your colleagues. And I really encourage you to explore many of the courses that we have available on elitelearning.com to help you continue to grow in your careers and earn CEs.