

ADA: Ask the Experts Access Live Full Transcription
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Carla Cox:

Hello, and thanks for joining us. Welcome to the 2023 American Diabetes Association Living with Diabetes Ask the Expert series. Today's topic is Trouble Sleeping at Night? Lack of Sleep Can Impact Your Health. My name is Carla Cox, Diabetes Care and Education Specialist, registered dietician, nutritionist, and your host for today's program. Our Ask the Expert Series is all about answering questions from our listeners, so start getting your questions ready. For those of you on the phone, press star three. That's star three on your keypad, and an operator will collect your question and place you in a queue so that you may have the opportunity to ask your question live. To participate online, type in your name and question in the fields below the streaming player. Press the submit question button and your question will come directly to us.

Okay. Now a little bit about why we're here today. Because of the link between diabetes and heart health, the American Diabetes Association in collaboration with the American Heart Association has launched Know Diabetes by Heart with support from founding sponsor Novo Nordisk, as well as national sponsor, Bayer, the Know Diabetes by Heart Initiative provides tools and resources for people living with type two diabetes to learn how to reduce their risk of cardiovascular disease. As part of the initiative, the ADA is holding this free educational Q&A once a month. We'll cover information and tips to help you take charge of your health. When you have diabetes, it increases your risk of heart disease, stroke, and kidney disease. Make sure when you see your doctor, you talk about your risk and work towards prevention and visit [knowdiabetesbyheart.org](https://www.knowdiabetesbyheart.org) for more information and resources.

I am happy now to introduce our guest speaker for today, Dr. Grandner. Dr. Grandner is an internationally recognized expert on sleep and health. He researches how sleep impacts health, like diet and exercise have an impact. His work includes studying poor quality sleep and sleep disorders, as well as real world solutions for sleep problems. He is the director of the Sleep and Health Research Program at the University of Arizona, Associate Professor of Psychiatry and Medicine in the School of Medicine, as well as other associated positions. He is director of the Arizona Behavioral Sleep Medicine Clinic at the Banner University Medical Center in Tucson, which oversees the diagnosis and treatment of sleep disorders using non-medication approaches. Hello, Dr. Grandner, do you have some other things to add at this point?

Michael Grandner:

No, thanks for having me. I'm glad to be here and I really hope that I can be helpful. Sleep is universal. It's something a lot of people are struggling with.

Carla Cox:

Thank you. As we're waiting for our callers and online listeners to chime in, I'm going to go ahead and kick off the first question.

Michael Grandner:

Sure.

Carla Cox:

What a great topic. What percent of persons in the US have problems sleeping?

Michael Grandner:

You'd think something that every human has done every day forever would be something we would be better at by now. But sleep problems are very common. It looks like about a third of the US population isn't getting the recommended seven to eight hours of sleep at night for optimal health and functioning, and that is a separate group from also about a third of the US population reports some sort of insomnia symptoms, either difficulty falling asleep at the beginning of the night or difficulty maintaining sleep during the night or waking up too early and not being able to get back to sleep. And also, another really common set of sleep problems are sleep-related breathing issues or anywhere between 10 and 30% of the US population might have some degree of sleep-related breathing problems including sleep apnea. So, these are very common issues that lots of people are struggling with, especially people with diabetes.

Carla Cox:

Thank you. If you're just joining us, welcome to today's ask the experts Q&A. Trouble sleeping at night, lack of sleep can impact your health. As a reminder, for those of you on the phone, press star three, that's star three on your keypad, and an operator will collect your question and place you in the queue so that you can have the opportunity to ask the question live. To participate online, type in your name and question the fields below the streaming player. Press the submit question button and your question will come directly to us. Let's remember to focus on our topic today when asking questions. Now, let's take the first question. We have an online question coming in from Jen. Jen says, "I work on third shift and sleep very sporadically. I never feel truly rested even if I do sleep well that day. What can I do to get more solid sleep but also feel better rested overall?"

Michael Grandner:

Yeah. That's a tough one because shift workers struggle with sleep. Especially there's data showing that people who work regular shifts during the time when their body wants to be sleeping instead, not only does that interfere with sleep, that interferes with all kinds of things. It increases risk for a number of health conditions, including diabetes specifically. So, it's a problem. This isn't something that humans were built to be able to do, but our society kind of demands it. And so, it's a health risk factor in general. But then the next question is what do you do about it? Just telling people, well, don't work a night shift isn't a workable solution. Instead, a few things that I can recommend.

So, number one, the first thing I would say is the more regular you can keep your schedule, the better your body is trying to regulate its rhythms. And the more reliable those rhythms can be, the better it can handle things like immune function, metabolism, and cellular repair and recovery during sleep. If your biological night is moving around, around the 24 hours and becomes a moving target, it makes that recovery more difficult. So, if you are working a regular shift, try and keep a regular window of sleep that you keep all seven days. Another thing is if you're sleeping during a time and it isn't ideal for your body to sleep, you have to work a little extra harder to insulate your sleep a little bit. What I mean by that is you're going to be a little more sensitive to light and noise and other disturbances during that time because your brain may be looking for signs that it's daytime.

So, what you want to do is maybe keep the room extra dark, extra quiet, earplugs, eye mask, other things that can insulate your sleep. Also, it should be noted that all of this is in the context of sleep disorders. I'm only going to mention this here I think, but it'll probably apply to almost any question that comes in. Sleep disorders, especially sleep apnea and insomnia disorder are highly underdiagnosed in the population. And if you have an untreated sleep disorder or a sleep disorder that's maybe diagnosed but not sufficiently treated, or if you're not using your CPAP if you have sleep apnea, or you're not getting the right treatment if you have insomnia, any of these sleep tips aren't going to be ideal because

you've got a sleep disorder in the way that needs treating. So, anyone who comes in with a sleep problem, we usually check them out for undiagnosed or untreated sleep disorders to make sure we can get those out of the way.

Carla Cox:

Great, thank you. This question is coming in from Carrie and Carrie is from Pennsylvania. Carrie, you're on the line.

Carrie:

Hi. My question's about taking melatonin. I take melatonin three milligrams every night like an hour before I go to bed, and I sleep all night most nights. But I read that melatonin could have issues. Is it better to stop taking it and just not sleep that well or is it safer to take melatonin every night? At least I sleep well. So, which is worse, not sleeping well or taking melatonin?

Michael Grandner:

Yeah. The melatonin is actually pretty harmless. The data on risks associated with melatonin have been very much overblown in the media. Actually, melatonin is quite safe. Your body produces it anyway. A lot of the problems with melatonin are twofold. One is people are using it for things that it doesn't do and so they get very frustrated with it. And related to that is people sometimes take doses that are much too high, in which case they're causing more problems than they're fixing. Your body produces melatonin on its own anyway, melatonin itself isn't harmful and there's no evidence that I've ever been able to find showing that if you take melatonin over a period of time, your body stops producing it naturally or it interferes with your natural production in any way. I've never seen any evidence of that. Some people talk about that, but I don't think there's any suggestion that that's something that really happens in a real-world setting. So that out of the way.

One of the things that melatonin does, and it's a hormone, it does lots of things in your body, one of the things that melatonin does is it essentially tells your body it's nighttime. Now that's a good thing for people. So, for people who have trouble winding down, for people who are working shifts or are jet-lagged or are trying to sleep at a time when their body might not want to sleep, maybe you're more of a night owl, but you need to get to sleep a little earlier. Melatonin is a great way to send your body a nighttime signal to help it prepare for sleep. It can help you fall asleep faster. It can help you sleep a little bit better during the night, especially as you're getting older because people's natural melatonin decline as they get older. Often, not always, but often, and this can help supplement that.

However, the sort of paradox is melatonin tends to do the best, the better your actual sleep is. So, if you have insomnia, melatonin usually doesn't work well because it's not a sedative, it just tells your body it's nighttime. And a lot of people who have insomnia, their body already knows it's nighttime, they still can't sleep. And so what ends up happening is they take melatonin thinking it's some sort of herbal sleeping pill, which it's not and it doesn't knock them out, or maybe it works great for a day or two, but that really wasn't their problem and their body adjusts to it and they still have insomnia. So, they escalate the dose and escalate the dose and escalate the dose. If you want to fix the nighttime signal of a blind person who has no reception to light, because melatonin is involved in the light system, it takes a half a milligram, that's it.

A half a milligram of melatonin is all it takes to adjust the system. A half to three milligrams is seen as a normal dose, and actually it doesn't really seem to matter in there where it's all in the same range. Three to five, that's sort of what we would consider a higher dose melatonin. You would maybe take that about where you're taking it a little closer to bedtime to send that nighttime signal. It's a lot higher

of a concentration of melatonin than your body's producing, but it can send that nighttime signal. People who are taking a lot more than that, like 10 milligrams or even sometimes even more than that, what can happen is it can actually just cause more problems than it fixes, especially next day grogginess or drowsiness, which gives people the sense that maybe they didn't sleep very well.

So, I would actually say the dose that you're taking and the time that you're taking are probably fine. I don't know how much good it's doing. It might be doing some good, especially if you don't have severe sleep problems, especially if you feel like you're sleeping generally well, I don't think there's any reason not to. But a lot of people who are turning to melatonin as a solution to their sleep problem usually end up disappointed usually after they escalate doses to a point where it's not even reasonable anymore. So yeah, so hopefully that answers the question.

Carla Cox:

Thank you. That was great. So, we have a question. It's interesting because you mentioned blindness and we have a question coming in that regard. So, this comes in from Jenise Wilson from Florida. You're on the line.

Jenise Wilson:

Hello. I am blind and I sleep better during the daytime than I do at night. Why is that? Sometimes I can't [inaudible 00:12:54]-

Michael Grandner:

Well, everyone has-

Jenise Wilson:

Go ahead.

Michael Grandner:

Sure. Well, everyone has a part in their 24 hours that's their biological night, and for most people it exists at night aligned with the clock, but for some people it could be different. So, people have a natural rhythm that's not exactly 24 hours. It's actually a little more than 24 hours, closer to 25 hours, maybe more like 24 and a half. So, what happens is when you go through your day, your body uses the environmental light to synchronize your clock to instead of a 24 point something hour rhythm, to have 24.0-hour rhythm. And that's what gets everyone on the same time. Now, when people are blind and they're not able to perceive light, that system of using light to balance the clock stops working the way it's supposed to. And so, a lot of times blind people can get into one of two different situations.

One is what we call a non-24-hour circadian rhythm where because their day is following their biological day, not the environment because they can't respond to that light in the environment, they're essentially living in a 24, 25-hour day. So, let's say just as a round number, think if it's 25 hours. If you look at the clock now and it says here in Arizona, it's 11:15 in the morning. Now this same time tomorrow if I were blind, the clock might say 11:15, but to me it's only 10:15 and then it's only 9:15 and then it's only 8:15 because my day is misaligned with the clock now. And so that's one thing that can happen and you can treat that actually with melatonin or medications that work on the melatonin system to mimic what light would be doing to that system to get yourself regularized.

The other thing that can happen is because you're not using environmental light to set where your biological day and night are, they can settle somewhere else in the 24 hours and that might be what's

happening. The good news is there doesn't seem to be anything medically too harmful about that, but it could just be inconvenient. And if it is, it is shiftable. So if it's something that you would want to change, there are those of us out there who treat, we would call this either an advanced or delayed circadian rhythm disorder where it just basically means that where your 24-hour cycle is and where you want it to be are out of sync with each other. So, we have strategies for moving them back together. Usually without medications, we can realign some of these rhythms.

Carla Cox:

Great. So, we have a question coming in from Shekar from Tampa. Shekar, you're on the line.

Shekar:

Hello.

Carla Cox:

Shekar, are you on the line? There you go.

Shekar:

Yeah, yeah, yeah. I didn't know. My question is that when you're trying to sleep, and your mind is full of thoughts and it's very difficult to get rid of those thoughts to enable you to sleep. So, is there something that you can do to calm your racing thoughts and to put your mind at rest so that you can sleep? That's my question.

Michael Grandner:

That's an excellent question. That's an excellent question. And it's very common that people come into the clinic and say, "I just can't turn my mind off. My mind won't slow down. My mind is just very active when I get into bed." And there's a couple of causes for that and there's a number of solutions. The main causes for that are twofold. First of all, before we get into bed, it's best to be ready for it. So, a lot of times what happens is people don't take the time and the space that their brain and their body need to be ready for bed. So, what happens is your mind is still going, you haven't finished processing everything you need to think about and process maybe because you've been watching TV or reading or doing something that was distracting but not necessarily relaxing. And so, you still haven't processed everything you need to for the day.

So, you get into bed and your brain says, "Okay, well, now I have your attention. I don't have any of these distractions. Here's all the things that you haven't done yet. Here's all the thoughts you haven't processed yet, all the things you're thinking about that I need to process first before I can get to bed." So that's why it's better to do all that before bed and you want to give yourself enough time and space to do that. Otherwise, you're going to take it into bed with you. It's going to be there whether you like it or not. You want to give it the time and space it needs to before bed, otherwise you're going to take it into bed with you. Usually, and that's because people do things that they think is relaxing, but it's actually just distracting and they're not actually giving their mind time to process these things to make their lists, to worry about what they need to worry about or even physically relax.

So that's one, is actually looking at the nighttime routine a little bit and seeing if we can make it so that you're ready by the time you get into bed. The other thing that happens is if you do that enough, if getting into bed and thinking becomes predictable where you get into bed, your mind is going, you're still processing your thinking. You get into bed, you're thinking, you get into bed, you're thinking, get

into bed, you're thinking, and then that becomes a learned pattern. You give your brain a pattern to recognize, and it recognizes it. So even if you are exhausted and falling asleep on the couch, you get into bed and you start thinking because the bed becomes the thinking place. And so, you've accidentally trained that to happen. Then the solution is to untrain it.

Now, there's lots of strategies for doing that. Part of that is all part of what we call cognitive behavior therapy for insomnia. So, a lot of people don't realize is that the recommended treatment for an insomnia disorder is not medications. Medications are seen as second line. They are less effective and have more side effects than actually CBTI, which has been studied for decades and involves reprogramming the brain to be awake or to be asleep during the night instead of awake. And for people who are interested in that, you can Google it, you can learn more about it, maybe find someone who lives near you who specializes in it. But that's part of what we do in CBTI is help reprogram that process of what we call conditioned arousal where you trained yourself to be awake inadvertently. And so, we deprogram that.

If I was going to give you some advice now in terms of how to set the stage to either prevent that or to deal with it, two things I would say. First is give yourself time before going to bed to think of all of those things. So at least clear the decks so that there's nothing waiting to happen. The next thing I would say is when you get into bed, and this is going to sound counterintuitive, but it's actually extremely effective if you are rigorous about it. But if you are in bed and you're not falling asleep within 15 or 20 minutes. You reset, you get up, you get out of bed. And what you do is you break that cycle where being in bed is not reliably tied with wakefulness. You don't get back into bed until you think sleep is potentially imminent. Then you get back into bed and if you fall asleep, great. If not, you get up again and you keep doing it until you break this cycle.

Eventually you'll get tired enough where you fall asleep. And then if you keep doing this over and over again, you eventually get to the point where getting in bed is not reliably tied with being awake. It's reliably tied with either falling asleep or getting up. Where you make the bed, the sleeping place instead of making the bed the waking place. Another way to think about it is this. I've got to give credit to Lindsay Shaw, who's a colleague of mine who came up with this analogy, which I think is brilliant. One of the things she says is sleep isn't something you do. Sleep is something that happens to you when the situation allows for it. And what she means by that is the more you try and control sleep, knowing back to sleep faster by trying harder.

And if you are in a place where there's something you can do that can change the situation to allow for sleep, like relaxing or doing an exercise or reading a book or taking some breaths or whatever, do that thing. But if your mind and body are not in a place where they can sleep right now, don't try. You're just going to add stress and energy into the system and make sleep even harder at that point. If your body is not in a place where it can sleep, it's like you're sitting down to eat. And if you're not hungry, there's nothing you can do to make yourself hungry. You just have to wait until you're hungry. Even if you eat a little bit less this time, your body will sort it out later. You'll be a little hungrier next time. But trying to control it a little too much actually adds more stress.

So, to summarize, I know I talked a lot, to summarize, if you get into bed and your mind is really active, the first thing is did you give yourself enough mental time and space before getting into bed? Did you write your to-do list? Did you process all this stuff before getting into bed or did you carry it into bed with you? If you did, have you accidentally trained yourself to wake up in bed? If so, you got to break that cycle, either with a therapist who does CBTI, but if you're going to do it on your own, you want to make it so that you're in bed awake as little as possible. You wait until you're ready for sleep before you get into bed. So hopefully that's helpful.

Carla Cox:

Thank you. And I guess if you get up every hour because you can't sleep, you'll get more steps in. So, there's an advantage there. So, we have a lot of questions coming in online. So, we have a question from Denise. And she wants to know how many hours of sleep a senior should get.

Michael Grandner:

Great question. Well, if you look at the data in terms of how many hours of sleep people get and you track them over time in health outcomes, it looks like it doesn't in general, adults, especially adults over say 25, need about seven to eight hours. It's probably closer to the seven than the eight as you get a little bit older, but you still need seven when you're older. Well, it's hard to answer that question yet. It does look like seniors who are getting six or less are still at increased likelihood for undesirable outcomes. But I need to clarify. Being at increased risk doesn't mean bad things are going to happen to you. It just means that the likelihood that something is going to happen gets tweaked a little bit. So, let's say you add a 10% likelihood of say, developing an immune condition. Well, that 10% might get increased by a few percentage points if you're not getting the sleep that you need.

So, it won't go from 10% to 90%. It might go from 10% to 15% or 16%, whatever. I'm just using a theoretical example. And I want to clarify this because I got people coming into clinic a lot saying, if I don't get the X amount of sleep that I need, bad things are going to happen. My world's going to fall apart. I'm going to get these terrible diseases. I'm like, well, no, this isn't destiny. It's just tweaking the odds, first of all. The stress about not getting sleep if you're really worried about it, might be just as bad. So, who knows? But that said, I would still shoot for seven. Though there's a gray area between six and seven that we don't really know that much about. We do know that as people get older, their expectations about sleep should likely change. So, for example, as we get older, the main thing that happens to sleep is it tends to become shallower and more broken up.

That seems to be kind of normal. You get less deep sleep; your body may need less deep sleep. You're not growing in the same way you were when you were 20. You're not healing and repairing in the same way you were when you were 20. Your body isn't built to get the same amount of deep sleep. Your sleep is a little more shallow. It's more broken up during the night. You might have a harder time getting back to sleep toward the end of the night. You might be more likely to benefit from a nap during the day if it helps with your performance during the day, and that counts toward the total as well.

That said, if you ask people about is your sleep bothering you, it actually declines with age. It's actually nobody complains more about their sleep and their dissatisfaction with sleep than say 18- to 30-year-olds. They're the ones who are the most dissatisfied. So, there's this paradox whereas we get older, sleep might get shallower and more broken up and more likely to be objectively worse, but especially people over 65, sleep shouldn't be interfering with your ability to function and do what you need to do during the day. Part of that comes with resilience, experience, changes in needs, changes in expectations, but also it might also be different amounts of control over time and being retired. You might have more control over your schedule, for example. So, it's complicated. So, if you're over 65 and you think your sleep is a problem for you, it's probably something fixable.

There's probably some issue that could be fixed. Even if you're over 65, you're like, I'm sleeping a little bit less, my sleep's a little more shallow, but I feel fine. Maybe you're fine. I wouldn't worry about that too much. But if there's something that's interfering with your health or ability to function, problems are still solvable. We have a lot of older adults in our clinic who come in and say, I've had sleep problems forever, nothing has ever worked. And then within a few weeks without even medications, we tend to get them sleeping a lot better. So, I don't know, I don't want to make a prescription of what you should be doing. I would think seven's a good target, and by seven, I mean, seven by your recollection. If you're

looking at wearable data, wearable data will show up usually as less than what you remember, and that's okay. If you say, I slept about seven hours, but my watch says I slept about six, six and a half, you're probably fine. That seven hours recollection is what all the guidelines are based on it.

Carla Cox:

It sounds like if you are not bothered by your time in bed and you're feeling okay, then no worries. If it is bothering you and you feel like you're sleepy or you're upset, probably you should go get a referral and see someone that might help you. Is that kind of where we are?

Michael Grandner:

Especially if you're in that gray zone between six-ish to seven-ish. If you're getting three, four, four and a half, maybe even five hours of sleep and that's all you're able to manage and you feel totally okay, I'd still get that looked at because the likelihood that that's all you body needs to be optimally functioning is small. It's possible that you're fine, but the likelihood goes down the further you deviate from those six to seven hours. But if you're getting six, six and a half hours and you're feeling okay and it's not interfering with your health or ability to function in any way, I wouldn't worry too much.

Carla Cox:

Great, thanks. Okay. We have a question coming in about sleeplessness coming in from Judy, and Judy is from Philadelphia. Judy, you are on the line.

Judy:

Oh, okay. I'm also a senior citizen. I do not have any problem initially falling asleep. However, afterwards in the middle of the night between usually 2:00 and 4:00 a.m. I can wake up sometimes to go to the bathroom, then go back to bed, and then I have lots of problems falling back to sleep. So, I was wondering if you had any advice.

Michael Grandner:

Sure. So, one of the reasons this happens is the systems that control whether you're able to sleep or not, there's actually two of them that work in parallel. One is your natural sleep drive, your hunger for sleep, and the other one would be your 24-hour rhythm of alertness. Now, that 24-hour rhythm starts relatively low in the morning, peaks during the day, and then drops. It's at its lowest point in the later part of the night. That's important to remember because the main force though that's driving your ability to sleep is the sleep wake rhythm or the sleep wake drive. This is sort of like a hunger for sleep. Where let's say you wake up feeling with a full night of sleep, think of it like a meal, you just ate. There's no hunger right there, but then it builds across the day. It builds and builds and builds slowly, and then as you sleep, it dissipates like hunger does. But it doesn't build or dissipate in a linear way. It's not minute for minute.

It builds quickly during the day and then levels off in the evening. So, what that means is you can extend your day a little bit and you're not that much more. If you added 30, 40, 60 minutes to your day, it wouldn't really make a difference in how sleepy or tired you were. That's just how it is. You can stay up a little bit. It's a survival thing. But what that also means is as your sleep pressure is dissipating across the night, it also dissipates in a non-linear way where halfway into the night, three, four, or five hours into the night, way more than half of your sleep pressure is gone. More like 75 to 80 to 90% of your sleep pressure is dissipated after four or five, six hours. So, what's happening at that time is ... Oh, the other

thing that's happening at that time is you have these cycles you go through during the night of deeper to lighter sleep and REM cycles.

Usually at those stage transitions, there's lots of awakenings. A typical adult actually wakes up 10, 20 times a night or more. That you wake up actually isn't the problem. That's normal. Everyone wakes up lots of times more than they remember. But what happens is, so you have these awakenings scattered across the night, especially around these state transitions. Then what happens is you're towards the end of the night, you're after the deepest parts of your sleep, you're at the end of one of these cycles that triggers an awakening instead of falling right back to sleep, your body is like, "Well, I'm up. Might as well go to the bathroom now." And then you try going back to sleep. Your sleep pressure is mostly dissipated. And what's supposed to happen, remember at the beginning I talked about your 24-hour wake drive is at its lowest point, so there's nothing really keeping you awake.

So, what most people would do is they fall back asleep, not because they have a lot of sleep hunger and pressure, because there's nothing keeping them awake. But what happens often as people get older is there's more things that create activation in the background, whether it's chronic pain, whether it's a treated sleep apnea, whether it's changes to circadian rhythms, whether it's decreased melatonin production during the night. There's all kinds of things that can make it so that what's supposed to happen is you have low sleep drive, but you also have low activation, which allows you to get back to sleep, but there's just enough activation to overpower that resumption of sleep, and so your body's just not physically able to get back to sleep at that point. And then you default to what I was saying before of sleep isn't something you do, it's something that happens when the situation allows for it and you've just now entered a situation that's not allowing for sleep.

Your body is not able to sleep right now. It doesn't have enough sleep pressure to overcome whatever activation is going on at this time. So, the only thing you can do at that point is wait. It's sort of like you've eaten half your meal, you took a break, you just got back to the table and now you're not hungry anymore, but you know haven't eaten enough to make it all the way to the next meal, but now you're not hungry anymore. What are you going to do? Force-feed yourself for a little bit? And if you do that often enough, again, that's just going to make mealtime stressful, make all food taste bad and increase stress. Maybe what you need to do is eat smaller meals a little more frequently. So, in that case, actually the suggested thing to do is don't try and go back to sleep.

Take a break. You might need to sleep in two shifts. A lot of people tend to do that where you might just not have enough gas, enough of a gas tank to take you from one side of the night to the other. You might need to make a pit stop. And you can make that stressful time, or you can kind of embrace that time and say, look, I'm going to be up in the middle of the night for maybe an hour, maybe two hours, maybe a half an hour, I don't know. But maybe your body just needs that time to just build up a little extra sleep pressure to get you back to bed and carry you through the rest of the night. I would say in that time, just don't do anything too mentally activating that will prolong it but do what you want.

A lot of people actually end up loving that time because no one bothers them. It's nice and quiet. They get to read, they get to do whatever, and then they take their sleep part two, especially if they don't have to get up early in the morning and have that time pressure. But again, if it's a problem. So that's also the difference between a minor issue and insomnia disorder. If it's a minor issue, maybe work with it and see if you can find a way around it. If it becomes really stressful and it's interfering with your ability to function during the day, that might cross the line into an insomnia disorder where you might need some bigger guns. You might need an actual specialist with training to try and smooth this over.

Carla Cox:

Okay. We have a question coming in from Raj. And Raj is from New York. Raj, you're on the line.

Raj:

Yes, hi. Hi. Thanks, Dr. Grandner. This is Raj from New York. My question is pretty much around why is even a small deviation in sleep or the sleep pattern having such a big impact on blood sugar spikes in the morning? There's kind of like, if I have my normal six-to-seven-hour sleep, there's not much of a deviation, but even some days when you don't fall asleep, even a small deviation like an hour or two causes a huge blood spike. Not just a small, but it's a big spike. And I was trying to understand the reason and what can I do about it?

Michael Grandner:

Yeah, that's a good question. Where sleep isn't just a state of rest. It's not just you're out of gas and you're like a phone plugged into the wall recharging. That's not what sleep is. Sleep is actually a collection of very active processes that are in the body. I mean, yes, your body is earning fewer calories asleep than awake, but not a lot fewer. It's sort of the equivalent of a slice of bread every hour or two worth of time, worth of calories. So, your body is actually quite active. And one of the things that's happening during the night is a lot of regulation and coordination among a bunch of different systems, in particular systems that have to do with the insulin secreting cells of the pancreas. Also, immune system systems like cytokines and processes in the liver and cholesterol synthesis and cellular regeneration, all of these sorts of things are highly sleep dependent.

Hormone systems are highly sleep dependent. And anything that involves regulation and balance. And when you're not able to get the sleep, not just duration, but also quality, sleep isn't just about amount. It's like with nutrition, if you don't consume enough calories, it's not enough. But if you consume enough calories but there's not enough nutrition, that's also a problem. So, if your sleep is of poor quality or if it's just not enough time, your body's not able to do those regulatory processes and you've got to start another day and you haven't finished stocking the shelves, sweeping the floors and doing everything you need to. And now imagine you're running a store and you had that time set aside to do those things. Now it's opening time and you're not done yet, but you can't do it anymore. You're trying to balance that while also running the store and the systems just don't work as well. They're not quite as efficient, they're not quite as well managed.

I mean, it doesn't happen the same way with everybody. There are so many moving parts, but what you're describing sounds like that system is just sensitive to the regulatory processes of what are going on in sleep. And when you're not getting the sleep that your body needs, it's trying to make up the difference. It's trying to limp along, but it's doing so with a bit of a handicap where it wasn't able to be prepared, it wasn't able to do everything it needed to do and is trying to make up for that. So that might explain why. It might just be, again, everyone's so different. It's hard to know exactly for an individual person what's causing what specific problem. But my guess is there's so many moving parts around the immune system, the liver, the lipid system, and the beta cells in the pancreas. And insulin also is highly sleep dependent and glucose regulation is sleep dependent that when you throw sleep off, you can throw these systems off.

Carla Cox:

Great. Thanks. That really keys us into Mary's question, and Mary's has a question online. "Why are those with diabetes more prone to lack of sleep and does it impact blood glucose?"

Michael Grandner:

Yeah. So, there's a few reasons why people with diabetes are more prone to lack of sleep. So one is that I should mention is sleep apnea, where sleep apnea as a condition involves people being unable to

maintain deep sleep because they're struggling to breathe during the night. It could also cause insomnia because it causes lots of awakenings, especially awakenings that are triggered by respiratory events that make it really hard to fall back asleep because you just sort of got shot with adrenaline and there's no way you can resume sleep for a little while. So, this can be going on for years and years and years. The existing data, when you go into diabetes clinics, it looks like somewhere between 65 and 85% of everyone in the waiting room has sleep apnea, whether they know it or not. So, there's just very high rates of sleep apnea among diabetes patients and most sleep apnea cases are untreated or not well treated.

So that itself will probably cause a lot of sleep problems. Insomnia also is very common in diabetes patients for a number of reasons. One is that insomnia can be caused and triggered by stress. And a lot of people with diabetes have a lot of stress, whether it's physiologic, whether it's discomfort, pain, but also emotional stuff and other life stress around managing their condition or even what caused some of these problems in the first place in terms of eating patterns and stress management and other things lead to insomnia. On top of that, there's lots of physical discomforts that come with diabetes. And anytime you have this activation in the body that persists across 24 hours, you get these situations like I was talking about, where maybe you're sleepy and then you're sleeping during the night, but then in the middle of the night you have an awakening because you have this activation and you don't have enough sleep pressure to overcome it.

So that's one thing. And then just on the physiologic level, there's lots of stuff. I mean, diabetes is so complicated because there's so many different moving parts, and all of them could potentially be related to arousal and activation in the body. And anytime you have activation where it doesn't belong can cause sleep issues. So that's one of the reasons why you see it a lot. So, I think part of it is the things that created the diabetes in the first place could also lead to sleep problems. The diabetes itself could lead to biological activation, which can lead to more sleep problems. Sleep disorders are often co-occurring in diabetes and are often untreated, and that could be contributing to the issue. So, there's a number of different pathways. And the good thing is, a lot of these are manageable and treatable, especially if you find a sleep person who knows what they're doing to work maybe with your endocrinologist or whoever to help manage some of these issues.

Carla Cox:

Thank you. And I might also put in that many people are now on technology and some of the technologies can also cause sleep interruption such as either a false low alarm or a low alarm or something. So, the technologies are a wonderful blessing, but they can also cause sleep disturbances.

Michael Grandner:

Yeah.

Carla Cox:

I have a write-in question from Cynthia. Cynthia says, "I have sleep apnea and stopped using my CPAP. Could that have caused my A1C to go up? And also, second question, can daytime naps make up for lost sleep?"

Michael Grandner:

So, to answer the second question first, yeah, kind of. There are three different kinds of naps. First of all, naps, I'm a sleep person. My definition of a nap is sleep that occurs outside of the main sleep window. So, when do you go to bed if you get up, how much sleep is in there? Any sleep outside of that is what I

would call a nap. That could be when you lay down to rest in the afternoon, but that could also be inadvertently falling asleep on the couch at night. Those are all naps. Also laying down where you don't actually fall asleep, that doesn't count as a nap. To count as a nap, you have to be unconscious. You have to actually fall asleep even if it's for a short amount of time. Now when you do fall asleep, it does count as sleep. Daytime sleep might not be as efficient as nighttime sleep at performing all those functions, but it can do it.

Ask any shift worker and they will tell you how they get by on sleep during the day. It's not quite the same as sleep at night, but it still works. So, it does generally count toward the total. Now, there's three kinds of naps like I mentioned before. So, the first kind is the inadvertent naps. The naps by accident, the naps you didn't intend, that's where you're nodding off without meaning to. Those are usually associated with poor sleep at night where untreated sleep apnea is probably the most common cause of this, but there are other causes as well, like chronic pain and hypersomnia disorders. There are all kinds of things that can cause sleepiness during the day where you're falling asleep, even if you don't want. It's usually a sign that there's a problem. The naps themselves probably aren't harmful, it's just they're a sign that you're not getting the sleep you need.

It's sort of like, why are you snacking during the day? Are you not getting adequate nutrition? Think of a nap like a snack in that way. If you're snacking without meaning to, that's a sign that something's wrong, not the snacks themselves may or may not be unhealthy. The second type of nap is a power nap. This is where you're napping for a brief amount of time. What you're doing here is you're napping and you're staying in light sleep. You're waking up before you drop into that deep sleep. You know you've napped for too long if you wake up and you feel terrible because you napped and you dropped into deep sleep and your body hates waking up out of deep sleep. So that's why you keep these naps relatively brief. But you do get a lot of the work of sleep done here. These power naps, they're not really recuperative.

They're not going to replace nighttime sleep, but if you take a short nap during the day, it can improve learning, memory, reaction time, attention, fatigue, all of these things. It's actually seemed to be good. It's like having a light snack in the afternoon can be a good thing. It reduces overeating and improves your energy and focus during the day, et cetera. The third kind of map is what I would call a sleep replacement nap. Think of it like a meal replacement shake where no one's going to mistake it for an actual meal, but it can sometimes do the job in a pinch. This is a lot like what shift workers are doing when they're sleeping during the day where you are actually making it through a full cycle and you're getting all of the benefits of that sleep during the day. It might be a little more tenuous, it might be more a little shallower, and it might take a little bit longer.

So, for example, you might go through a full cycle in 90 minutes at night, but it might take two hours or more during the day to get that far. But yeah, naps do count. And there's actually quite a bit of data that shows that if you take a sleep-deprived person, there's actually metabolic data showing that you take an otherwise young healthy person, drop them down to five hours a night for a few days, they start looking pre-diabetic where it throws off their glucose metabolism right away. I mean, sleep is a big part of this, but then when you give them a nap during the day, a long nap during the day without even increasing that time at night, it does help rescue that metabolic effect. So those naps, those daytime naps, at least from a metabolism and insulin glucose perspective, did seem to have a profound benefit to making up for some of that lost sleep at night. So yes, I forgot if I answered both the questions. That was the second one. What was the first one?

Carla Cox:

The first one was about a CPAP machine that she stopped using the CPAP a machine and wondered if it would change her A1C.

Michael Grandner:

Yeah. So, the short answer is yes. Because think about, what the CPAP does, all a CPAP is, is your airway at night. You can breathe when you're awake, but at night it sort of relaxes. Now, what happens with sleep apnea that sometimes relaxes too much, and air can't get in and it causes your O₂ to drop, your cellular stress to increase, especially those cells in the pancreas. Those beta cells can be very sensitive to these respiratory events and the oxidative stress that they cause. And so, every time that happens, your body sends off these alerts and eventually it opens the airway back up either by stimulating those muscles in the airway or just waking you up and so your sleep becomes a little shallower and more broken up. Every time that happens, your heart gets a little kicked and your cells get a little more stressed out.

And so, people who have sleep apnea, this is happening 5, 10, 20, 30, 50 times an hour depending on what your sleep apnea-hypopnea index was. The minimum amount for sleep apnea is five times an hour on average across the night, but severe sleep apnea, which is where the biggest worries are 30 times an hour across a whole night. That's an average of once every two minutes all night. Now, if that's happening that often, imagine the stress that that's putting on your body. Now what CPAP does is all it is it creates a pillow of air so that even if your airway wants to collapse, it can't because the CPAP is creating this pillow of air. So that you don't get this interruption in airflow, so that these respiratory events don't occur, so that this oxidative stress and this cellular stress that's happening all over your body, including in your heart and in your pancreas and in your liver, the cellular stress doesn't happen because the airway stays open. And that's theoretically how CPAP is supposed to work, and that's why not using it can lead to some of these worse outcomes.

Carla Cox:

Great, thank you. That wraps up our last question for this session. We have a whole lot left, so you're going to have to come back. But could you give us the most important key takeaway point for our listeners today?

Michael Grandner:

Yeah. A thing that I want to point out about sleep is sleep isn't something we all do because we enjoy it, that it's just a coincidence that it's something that we do. It's a biological requirement for life. We sleep for the same reason we breathe air, drink water, eat food. We're built to. Evolution figured this out a long time ago, we can't just be awake all the time. There's a reason why we study sleep in microscopic organisms to teach us more about human sleep because their sleep wake control systems are shockingly similar to ours. These are things that have survived lots of changes on Earth, billions of years. These systems are still there. Most of the advances in human sleep genetics come from studying fruit flies. It's so similar. Sleep is foundational to our biology. The problem is we have this dissonance with society where our society sees sleep as unproductive time.

We're trying to spend more time awake, and we devalue it. Because of that, we have a lot of pressures to how do I get by in as little sleep as possible? Then I would challenge people to think about sleep just in the same way they think about anything else that's important. It's important to breathe clean air. It's important to eat well. It's important to drink clean water, but it doesn't have to be perfect to be perfectly fine. You don't have to have the absolutely perfect diet to be healthy enough to live a long and happy life.

You don't have to only live at the top of a mountain and breathe perfect air in order to live a perfectly long and healthy and happy life. Your sleep doesn't have to be perfect either, but it is something that you should think about. And if you're not sleeping well, I would say, what if you have an untreated sleep

disorder that you don't even know about? And that's why all the sleep tips you've been trying to follow don't work. I would encourage you to reach out to someone like me who's a sleep person. We're trained for this. We help people with sleep problems all the time. Every week I get at least someone coming into my clinic who says, "I'm the worst patient you've ever had. I've had these problems for so long, I'm hopeless."

And then I get to tell them, "Actually, you're not hopeless and you're not the worst patient I've ever seen. And trust me, it's very unusual for someone to come in and not leave at least significantly better." And then they'll say, "Man, I wish I came in here 10 years ago." And I say, "Me too, but I'm glad you found me now." And this isn't about me. There's nothing I'm doing that's that unique compared to other sleep people. It's just as a field, we get used as a last resort instead of a first line of defense when there's sleep problems. So, I want to encourage people to reach out to your local sleep provider and say, "Here's the problems I'm struggling with," and add that to your list of providers that you're seeing because it may just help.

Carla Cox:

Great. To help you feel confident about your ability to manage your diabetes and heart health and kidney disease and sleep, we encourage you and your loved ones to talk to your doctor and dietician about your risk for heart disease, stroke, and kidney disease. Go to knowdiabetesbyheart.org and learn more. Register for the next event at diabetes.org/experts or sign up for the diabetes education class near you. Links to these resources can be found on our registration webpage at diabetes.org/experts. Thank you for all of your great questions you called in with. We're sorry we were unable to get to all of them for this live Q&A event. If you have questions about this event, you're welcome to contact us at askada@diabetes.org or by calling 1-800-342-2383. Please stay on the line for our survey to help us with future planning. Thriving with diabetes takes a team and we're here to support you.

Special thanks to our expert, Dr. Michael Grandner. I am Carla Cox. On behalf of the ADA team, we want to thank you for joining us today and we look forward to connecting with you in the future. Join us for more Know Diabetes by Heart Events, November 14, Technology and Diabetes Health. December 12, What Types of Medication Help with Your Diabetes Management. Please visit our website for more information at diabetes.org/experts and register today. If you have any questions about this event, please email askada@diabetes.org. Include, ask the experts QA, in your subject line, and thank you for joining the ATE today. And now to our survey. Please on the line.

Thank you for participating in our American Diabetes Association Ask the Experts Event. We hope you can stay online for the next five to seven minutes to share your valuable feedback to help us improve upcoming events. All responses will remain confidential. Please let us know if you agree with the following statements. This event met my expectation today. For yes press one, for no press two, for unsure press three. Once again, question number one, this event met my expectation today. For yes press one, for no press two, and for unsure press three. If you feel you could use some support for managing your diabetes, check out, the diabetes.org website. There are lots of links to information that can help you with your diabetes journey.

Question number two, I will attend another Ask the Experts Event. For yes press one, for no press two, and for unsure press three. Question number two, again, I will attend another Ask the Experts Event. For yes press one, for no press two, and for unsure press three. You can find delicious and healthy recipes and menus to enhance your eating. Check out the website www.diabetesfoodhub.org. Question number three, this event improved my knowledge of getting a good night's sleep. For yes press one, for no press two, and for unsure press three. Question number three, again, this event improved my knowledge of

getting a good night's sleep. For yes press one, for no press two, and for unsure press three. Did you know that there are approximately 37 million people with diabetes? You are certainly not alone.

Question number four, I intend to use the knowledge I gained in my loved one's next appointment with a healthcare professional. For yes press one, for no press two, and for unsure press three. Question number four, again, I intend to use the knowledge I gained in my loved one's next appointment with a healthcare professional. For yes press one, for no press two, and for unsure, press three. Keeping your glucose within target range of 71, 80 milligrams per deciliter, 70% or more of the time is the international recommendation for diabetes management. Consider asking your provider about getting a continuous glucose monitor to help you manage your diabetes.

Question five. Before this event, I felt confident talking to a healthcare professional about my loved one's increased risk of heart disease and stroke. For yes press one, for no press two, and for unsure press three. Question number five. Before this event, I felt confident talking to a healthcare professional about my loved one's increased risk of heart disease and stroke. For yes press one, for no press two, and for unsure press three. Check out the heart disease risk calculator at <https://www.cvriskcalculator.com> and discover if you are at risk for heart disease.

In our final question. After this event, I feel confident talking to a healthcare professional about my loved one's increased risk of heart disease and stroke. For yes press one, for no press two, and for unsure press three. And again, our last question number six. After this event, I feel confident talking to a healthcare professional about my loved one's increased risk of heart disease and stroke. For yes press one, for no press two, and for unsure press three. We sincerely appreciate your time and look forward to engaging with you on a future Ask the Experts event. Please visit diabetes.org/experts to learn about upcoming events.