

Talking Sleep Season 4

Episode 9

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NIH Sleep Research Plan

Dr. Marishka Brown, Guest

Episode Transcript

DR. KHOSLA: Thank you for joining us for Talking Sleep, a podcast of the American Academy of Sleep Medicine. I'm your host, Dr. Seema Khosla, medical director of the North Dakota Center for Sleep in Fargo.

The AHRQ report really shone a light on the importance of robust research in outcomes data. The NIH Sleep Research Plan outlines five strategic goals to demonstrate how sleep and circadian science can advance medicine and promote public health.

To talk with us today about the future of sleep and circadian research and the sleep research plan is Dr. Marishka Brown. Dr. Brown is director of the National Center on Sleep Disorders Research, located within the National Heart, Lung and Blood Institute at the NIH. The NCSDR supports research in sleep and circadian biology and sleep disorders. Her past research includes sleep in aging and neurodegeneration.

Thanks so much for joining us today, Dr. Brown. I've really been looking forward to this.

DR. BROWN: Thank you so much for the invitation, Seema. I really look forward to the conversation.

DR. KHOSLA: So let's jump into something I didn't realize. So the NIH has funded sleep and circadian research for over three decades. So for those of us who are unfamiliar with the structure of the NIH, can you please help me understand what the NIH is, and which components are involved in sleep and circadian research?

DR. BROWN: Absolutely. So the NIH is the largest funder of biomedical research in the world. And so the NIH is comprised of 27 institutes, centers and offices, the National Heart, Lung and Blood Institute of being one, and that's where the NCSDR is located. So a little bit of background for the NCSDR to hopefully orient the audience is that the center is congressionally mandated and our mission includes the support of research, as well as research training, growing the pipeline, coordination of the activities of the center with similar activities across NIH, but also across the federal government. And kind of the third bent or component for our mission is education of the public and the research communities. And so the NCSDR exists because of the very strong advocacy of the and essentially the relentless efforts of the sleep community.

We exist because our community leaned on Congress to make sleep and sleep disorders a national discussion. And so with that, our sleep and circadian research is funded by about 21 of the institutes and centers and offices across NIH. And since the inception of the NCSDR, NIH has supported over \$3 billion for sleep and circadian research.

DR. KHOSLA: Wow. That's a lot of money.

DR. BROWN: Yes. Yes. And we're about up to at this point about 500 million a year. It's been steadily increasing because the sleep and circadian research portfolios have been evolving. The research is evolving. And so even though we're supporting, we continue to support the area in, you know, the neurosciences and things of that nature, we're also growing to support sleep in the immune system, sleep in the health of women, sleep and substance use disorder. And so it really is a growing opportunity for sleep in the space of sleep medicine, but also in the space of public health.

DR. KHOSLA: So did I hear you correctly when you said 21 out of 27 are involved in sleep research?

DR. BROWN: Yes. So of the 27 centers, 24 of them actually fund research. And so we have a center such as the Fogarty International Center, the Center for Scientific Review and the Center

for New Information Technology where they don't fund research but of the 24 that do fund research, 21 of them do support sleep and circadian research.

DR. KHOSLA: Wow. So I was on your web site which actually I think outlines this really, really well. And I saw that your institute had outlined five strategic goals as well as tactics as they relate to sleep research. And so when I was reading this, you know, these are really broad and ambitious, and I see that they're not necessarily about sleep sort of in a silo, right. But they look at how sleep and circadian disturbances can impact a host of medical disorders. And so this is something that we have talked about a lot about how do we communicate the importance of sleep to our non-sleep colleagues. So I'm very impressed by that. And I'm wondering if you think non sleep people have been receptive to this conversation.

DR. BROWN: So I'll back up a little bit. So even though the sleep research plan exists on the pages of the National Heart, Lung and Blood Institute, you know, again, we talked about the support of sleep circadian research across NIH. And so this plan is not the NHLBI NCSDR plan, right? It's the NIH-wide Sleep Research Plan. And it was developed with the input from our Sleep Disorders Research Advisory Board, which is our faculty committee, from the NIHY Sleep Research Coordinating Committee, which is comprised of program officials across NIH that hold sleep and circadian biology in their portfolios, as well as NIH leadership, the medical and research communities, and the public stakeholders. And so this plan was not a plan that NCSDR staff kind of sat down and wrote and came up with the priorities ourselves. It really was an effort from these many different stakeholders. And so, yes, the goals are broad and a little bit encompassing of things. And they are, you know, touching on all of these different spaces outside of sleep and circadian. And so I think I like to think that sleep is essentially as the great integrator, for lack of a better term. Because it touches on so many different things. And when you talk about the opportunity for sleep is not just in the sleep community, It's in the cardiovascular community. It's in the immune community. It's in not only basic research and medicine, but in the public health community. It's important for safety and transportation and housing. So sleep touches on again all of these different things.

I can say that there are some audiences that have been more receptive than others. But as the research advances and as the awareness of sleep has grown, so has that interest. And so when you think about the public, right, the public has bought in to sleep hook, line and sinker. Right. The public the public spends billions of dollars of their own money every year to go to sleep and to have quality wakefulness. But medicine has been a little bit more of a challenge.

DR. KHOSLA: But you hit on an important point. I mean, we joke about it, right, that some people are more receptive than others. You know, my my husband is a nurse in the cardiac cath lab. And so I'm forever talking about how important it is for sleep and cardiovascular disease and so on and so forth. And depending on the cardiologist, it's either embraced or dismissed entirely.

DR. BROWN: Yes. You're you have hit on the point, Seema. Exactly. And so how do we change that? How do we move this conversation? Because the research is there, the science is there, decades of epidemiological research, so much of a deep literature, of the mechanistic research, of the importance of sleep, but that translation into broader medicine. So is this something for the sleep medicine community to start thinking about? What is the position of sleep medicine on the importance of sleep, not only for sleep medicine, but for overall global health?

DR. KHOSLA: So is that, so I'm looking at your first goal, the sleep and circadian mechanisms underlying health and disease. So tell me more about this. Is this kind of what you're getting at?

DR. BROWN: So not really. So part of that with the first goal essentially is a mechanistic goal. That is, again, additional research into understanding what these the underlying mechanisms and their connection to health and disease. But the conversation that we're having about the translation of that isn't necessarily about more research but how can the existing research be then moved to inform the minds of the medical community within the sleep medicine community, as well as outside the sleep medicine community? As you mentioned, your husband, you know, in talking to the cardiologist. It depends on what cardiologist you get. Right. Right. So how do we move that conversation from it depends on who you get to, everyone is on the same page.

DR. KHOSLA: But I love, you've hit on something really important. You know, whenever we bring up something, everyone's always like, yeah, we need more research. We need more research. But you're bringing up that we need to look at our existing research and explain it and translate it in a way that is meaningful.

DR. BROWN: Yes, Seema, because we will always need more research. There will always be more questions that should be answered. There will always be new discoveries to be made. But how do you take those fantastic foundational discoveries. And it is so exciting. The research and sleeping circadian biology is really, really exciting. But how do we move, how do we overcome that barrier of taking those really, really exciting foundational findings to actually the health of people in the clinic?

DR. KHOSLA: So so let's go to goal number two then. Risk reduction and treatment of sleep and circadian disorders. Tell me about that one.

DR. BROWN: So actually, before we go to goal number three, and one of the things that, you know, I certainly want to impress on everyone. So goal number five we have is foster the development of a strong and diverse workforce for sleep and circadian research. And even though we talk about it essentially or it's in quote unquote fit place, I want to talk about it because it's actually probably one of the most important goals, because if you don't have that research workforce, if you don't have the people to do the work, then none of the other goals matter.

DR. KHOSLA: Well, and I'm glad you said that. So they're not meant to be, this is not a hierarchy of goals.

DR. BROWN: It is not a hierarchy of goals. And so when I was presenting this in the public conversations, I actually had them side by side. And even though they are listed as one, two, three, four, five, it really is the way to probably visualize it is like a pyramid. And at the bottom, the base is the workforce.

DR. KHOSLA: And they are side by side on the website. You're right. OK, so let's talk about that one. Foster the development of a strong and diverse workforce for sleep and circadian research.

DR. BROWN: Absolutely. And that could be boiled down to you need the people, you need the expertise. But when we talk about the development of a strong and diverse workforce for sleep and circadian research, we don't necessarily mean just the people who are trained in sleep and circadian medicine or biology. Because the opportunity, as we spoke about earlier, is much bigger than that. And so, again, when we're talking about moving the conversation and moving these foundational findings, pulling in other people or is part of that, but also the findings, getting them out there. And so having the conversation with, you know, cardiologists and even though they're not necessarily a sleep or circadian research that they're actually considering sleep in their studies and maybe pulling in a sleep researcher to advance that study or just getting educated and understanding that their studies or the things that they do are impacted by sleep. Because, again, we talked about sleep as an integrator of all of these different things. And so when we talk about bioinformatics, when we talk about physician scientists are one, but also clinicians science, and nursing research, when we talk about implementation research, all of these people, the research that we're developing for sleep and circadian biology, all of these components are in need of that research, whether they know it or not.

DR. KHOSLA: Well, I think that's it. I think this is something that is a little bit, you know, to me. So I'm a clinician, I'm not a researcher at all. And so for me to learn more about this, it's really astonishing how how deep it is, right? Like it's that you've been doing it for so long and there's this incredible amount of money behind it and that you've hit on so many different areas. You know, you've mentioned you've mentioned sleep and women and cardiovascular disease and, you know, dependance and all of these other things. And so I appreciate what you're saying about growing this workforce and that it's not limited to sleep clinicians and sleep researchers, but rather we are sort of including maybe cardiologists and other people to consider sleep in whatever they're doing.

DR. BROWN: Right. And that's how you grow the field. And when you talk about not only just the field, but how you move the science forward, how you advance the science into both medicine as well as public health.

DR. KHOSLA: Mm hmm. So then does this take us back then to goal number three, clinical implementation of sleep and circadian research?

DR. BROWN: It does take us back to goal number three. So so you have that right. So we have all of this information again and I think we can even hit on this a little bit more. We're talk about data science, big data. And you hear about this, you know, the electronic health records and and telemedicine in and how we're delivering these new delivery systems. And maybe some are not necessarily new, but certainly since the pandemic they are more ubiquitous in our environment. And all of these kind of all of these things really hold a great promise in addressing the need for quality health care for all, for everyone, right. It's just not the people who have easy access or live in communities where they only have to walk a couple of blocks to see their physician or drive 10 minutes. I use an example as a former member of our Sleep Disorders Research Advisory Board who was representing the Restless Leg Foundation, where in order to see her specialist, she was driving two and a half to 3 hours for her appointment.

DR. KHOSLA: Oh, my gosh. Wow.

DR. BROWN: And so how could we use these existing technologies to address those barriers or to accelerate the clinical implementation of the research into those spaces?

DR. KHOSLA: Hmm. So let's take a quick break before we talk about the final sleep research goal. You're listening to Talking Sleep from the American Academy of Sleep Medicine.

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DR. KHOSLA: Welcome back to Talking Sleep. Today's guest is Dr. Marishka Brown, director of the National Center on Sleep Disorders Research. And we're talking about the NIH's sleep research goals for the coming years. So we've hit on goal five, one, two and three. And you kind

of, I think, we're leading into goal number four about sleep and circadian disruptions and health disparities. You were telling us a story about a patient that had to travel two and a half hours for medical care.

DR. BROWN: Absolutely. And so when we talk about disparities, I think we want to break that down just a little bit. And so health disparities or sleep health disparities actually has a specific definition that was developed of in combination with several of the extramural research communities. And so I spoke a little bit earlier about the conference and 2018 about sleep and health disparities. And so we brought in investigators from around the U.S., some that worked in sleep health, some that worked in circadian biology and investigators who also worked in health disparities. We also had some investigators who worked in sleep health disparities. But what we realized in that conference is that even though there was some synergy in the disciplines, some of these investigators were speaking in a different language.

DR. KHOSLA: Oh, sure. Yeah, I bet. I bet that's true.

DR. BROWN: And so how can you explore something or research something if you can't really define it? And so after that workshop, one of the first things that we did was define what a sleep health disparity was. And so essentially the sleep health disparity, sleep health disparities are differences and one or more dimensions of sleep health. And that includes duration, efficiency, timing, regularity, alertness and quality on a consistent basis that actually adversely impact designated disadvantaged populations. And so the designated health disparity populations actually is a specific, are specific groups, and that includes American Indian, Alaska Natives, Asian-Americans, even though we understand that there are challenges that because that's a very large umbrella when you talk about Asian-Americans, but right now it's kind of the space that we're working in. It also includes Black, African American, Hispanic, Latinos, Native Hawaiians and other Pacific Islanders. But it not only includes racial and ethnic minoritized populations, it also includes sex and gender minorities and the socio economically disadvantage such as those living in rural population and those who are living in rural population areas. And so I wanted to clarify that, because even though we know that there are groups that experience disadvantage or

health disparities that we are talking about very specific populations and you're right, when we talk about the person who had to drive two and a half to 3 hours to get access to quality care, that person was living in the underserved rural area.

DR. KHOSLA: Well, and it's so funny because I never thought about that, you know, to me, it's just I feel like it's something that we sort of understand inherently what disparity means and sleep health disparity. But the way that you've articulated it, I recognize that now it is important to speak the same language. That's a great definition.

DR. BROWN: Well, it took a while to get to it. And we realized that, you know, not everything is perfect. But what I will say is that once we had the definition, we started to see more and more and more applications come in, focusing on the stated definition of sleep health disparities. So we have this mechanism for researchers to apply to grants, and it's called Mechanism and Consequences of Sleep and Health Disparities in the U.S. And so we developed that funding opportunity in 2017 because we wanted to stimulate this area. We had very, very little going on outside of a few sleep researchers who were looking into the space. But once we developed that funding opportunity announcement, now we are not only seeing a number of applications coming through that funding opportunity announcement, then we have applications coming in every cycle essentially, looking at sleep health disparities. And I will say that personally, you know, this is something that we're very excited about because we were able to grow essentially a new scientific area.

DR. KHOSLA: Oh, I suppose I never thought of it that way. So let's talk about some of these tactics that you have outlined online. And personally, I love that you have included wearables and AI to improve disease surveillance. So talk to me a little bit about these tactics and how they could potentially change the way our field of sleep medicine looks over the next decade.

DR. BROWN: Seema, that is a great question. And I will say I want to reiterate that the plan and the development of the plan was from many different stakeholders. It was from our sleep and circadian research communities, the professional medical societies, our Sleep Disorders Research Advisory Board, the NIH leadership and the interest of the public. And so all of these

stakeholders thought that it really was important to address and have these tactics put in the plan because they realize that there were several methodological and technical barriers that could not only delay innovation, but essentially medicine, care in medicine as well as public health. And so when we talk about how these tactics could change the field and what they and what the field will look like in the next decade, I want to focus essentially on one thing, and that's AI and machine learning and utilizing these techniques to enable whether it's predictive modeling and the interoperability of these multidimensional sleep and circadian rhythm data that's being collected in all of these spaces. When we talk about wearables, because the collection of data is one thing, right? And we can collect data until the end of time. But how do you analyze, how do you process, how do you meaningfully interpret that data? And that's when you go into like this AI and machine learning and developing new algorithms in new ways to look at the data. And so it really can change or really will lead to changes in the field over the next decade. And I want to give an explicit example in the space of AHI or the apnea-hypopnea index.

DR. KHOSLA: Oh, yes. Yes.

DR. BROWN: So we have been seeing more and more, it has really been a noticeable increase, in the number of applications that are looking to address the AHI with machine learning. And so the sleep community, the sleep medicine community in particular, is very well-versed in sleep studies and the amount of data that is collected during a sleep study. But for, even though there's a massive amount of data collected, essentially it's all boiled down to this one measure, which is an AHI to diagnose obstructive sleep apnea. But what happens with the rest of that data? What are we overlooking by not processing that data?

DR. KHOSLA: Well, that's exactly it. That's exactly it. That's such an important topic, right? Because you're right, we're distilling it down to the sort of magical AHI. And my cardiology colleagues kind of tease me about it because it's like an echo, right? That if all you get out of an echo is the EF you're missing this huge chunk of it, right. And so look at all the data. We collect all this EEG data. And, you know, can we look at EEG fingerprinting and can we look at identifying people at risk of Alzheimer's and, you know, so on and so forth. Like there's, it just

seems to me and I'm a pulmonologist, I'm not a neurologist, and so maybe I'm, you know, making it out to be more than it is. But I feel like there's so much data in the EEG that we're just kind of, you know, disregarding because we're focused on the AHI.

DR. BROWN: You are not making it up. And and that is what has happened. That is what has happened up till now. And so based on the conversations and seeing the uptick in applications and really the seminars and panels, it appears that the researchers in sleep medicine are now at a place where there is serious consideration of moving beyond the AHI to more robust and precise diagnostics for not only sleep-disordered breathing, but other sleep disorders.

DR. KHOSLA: Well, and that's it, right? Because we've talked about the AHI for as long as I think I've been in sleep medicine. So let's say ten, 15 years. Do you think we're going to still be having this conversation in like five or ten years and and, you know, what do you think is going to change? Will we have a different measure of AHI? Will we have sort of like a smart AHI that incorporates maybe you know, the hypoxic burden and arousal and that sort of thing?

DR. BROWN: Could be. I'm not going to say yes or no, but there's a strong indication. It's several ways, right? So there is one side of the conversation that says get rid of the AHI and there is one side that says no, there is some utility and usefulness in the AHI, but maybe we can add other measures or refine it. There's there was a paper that was published, what was it? 2020 or 2021 about redefining the AHI. And so whether we will still have it in ten years from now I don't know. But what I am pretty sure of or what I expect let me not say pretty sure but, but, but what, what it appears is happening is that ten years from now, five years from now, it won't look like what it looks like today.

DR. KHOSLA: Well you know, what is so funny is, is that for me, this really came to a head with this AHRQ report, you know, and so it really made me appreciate how important that research is. As I say, I'm a clinician I'm not a researcher, but I'm vested, right, because I need to understand more about the AHI and PAP outcomes and so on and so forth. And I'm and I'm wondering if you have advice for me in terms of how can clinicians better interface with our research colleagues?

DR. BROWN: That's a great question. And, you know, part of that is I kind of want to throw it back to you and maybe even toss it back to some of the sleep research communities and think because you as a clinician, you're at the forefront of sleep medicine in ways because you you're having that direct interaction with the patient and so we think about interfacing and working in that space. Again, in my mind, it's the conversations to start opening up between the clinician and the researchers. And in some ways, you know, that's already happening, right? So some of you belong to the same medical societies, right? There's an opportunity to then open up those conversations, maybe going beyond what you may do at a conference and maybe attend talks and and poster sessions. And, you know, even though the research that's being developed, some of the research may not necessarily be ready for prime time. Wouldn't it be great to talk to one of your colleagues in that space? Because there are, you know, things that you could do as a clinician that impacts the research or that could impact the research.

DR. KHOSLA: Well, and you're right. I mean, a few years ago, I had this opportunity to be part of this, you know, SRS-ASM workshop. And I think that was the first time I really saw the two groups and it's just of me as a clinician sort of making this observational thing. I'm not an academics and, you know, I'm in private practice and it was just such a cool experience to have all of these really smart people in the same room talking about the same thing, but from really very different vantage points. And I thought it was very fruitful. And so it made me think about, well, how can we make that sort of interaction more accessible to people? Because there has to be a certain amount of intention, right? Like you have to intentionally seek that out. And so is there a way to reduce that barrier to entry?

DR. BROWN: Right. And these are not overnight conversations that we're having. Right? So I'll give you an example. It took quite a number of years for the sleep and circadian communities to start talking to each other and really starting to see. I think there was a sense of how the science aligned, but they were they were separate...

DR. KHOSLA: I didn't know that.

DR. BROWN: ...for a long time and I will say that the first acting director of NCSDR, who is now the director of the Division of Lung Diseases, what I asked him about what his greatest accomplishment was as being the NCSDR director it was just that: getting the sleep circadian communities to actually interact and integrate at a higher level.

DR. KHOSLA: I didn't know that.

DR. BROWN: And so I put that out there because, you know, when we talk about moving the research into these different places or moving it into clinical practice, we understand that these things take time. But we also need to be in it for the long game or the long term in order to really impact medicine and really have an impact on public health.

DR. KHOSLA: Wow. So what would you like our colleagues to know?

DR. BROWN: That you do have a space and this conversation when it comes to research that you do have a voice being at the forefront of sleep medicine, actually engaging with the patients themselves, that you have something to offer. So get connected and offer it.

DR. KHOSLA: I love it. Just very, very straightforward advice. I love that. Thank you for your leadership at the NCSDR and your research into how sleep impacts health and safety. I really appreciate everything you've done for the field and bringing sleep to the forefront with federal agencies and other stakeholders.

DR. BROWN: And I really appreciate the invitation to have this conversation Seema, it's been great.

DR. KHOSLA: Thanks for listening to Talking Sleep, brought to you by the American Academy of Sleep Medicine. For more podcast episodes, please visit our website at aasm.org. You can also subscribe through your favorite podcast service. And if you enjoyed this episode, please take a moment to leave a rating or review. For more feedback or suggestions email us at podcast@aasm.org. I hope you'll join us again for more Talking Sleep. Until next time this is Seema Khosla, encouraging you to sleep well so you can live well.

