Talking Sleep Season 4

Episode 1
Obstructive Sleep Apnea and Cardiovascular Disease
Dr. Susan Redline, 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. Welcome to season four of Talking Sleep. It's my honor to kick off the new year with a very special guest, Dr. Susan Redline.

Dr. Redline is a professor of sleep medicine and professor of epidemiology at Harvard. She directs programs in sleep and cardiovascular medicine and sleep medicine epidemiology at Brigham and Women's Hospital and Beth Israel Deaconess Medical Center. Dr. Redline is a legend in our field and has managed not only to further sleep research but has extensively evaluated how sleep intersects with other disorders. She has harnessed big data and looks at environmental and socio-economic issues related to sleep apnea and works to address sleep health disparities. She'll be the keynote speaker at SLEEP 2022 and recently was part of a paper from the American Heart Association on screening for obstructive sleep apnea in cardiovascular patients. Thank you for joining us today, Dr. Redline.

DR. REDLINE: Well, thank you for the invitation and thank you for that awfully generous and kind comments. I really appreciate it. I hope I could live up to some of those comments during the next few minutes.

DR. KHOSLA: They're actually really toned down from my first draft. So, you were part of a paper published by the AHA that talked about the importance of screening for OSA and cardiology patients. Tell me about this.

DR. REDLINE: The American Heart Association has shown a specific level of interest and commitment to educate their members, that is, our colleagues in cardiology, on the links between sleep apnea and heart disease. And in that way, they have interest, they are very committed to publishing state of the art reviews, reviewing the biologic, physiologic links

between sleep apnea and a variety of heart disease, as well as providing overviews of what the spectrum of diagnostic and screening modalities are. And also overviews and statements regarding the role of screening and treatment. And it was all those areas that were addressed in that recent American Heart Association statement.

DR. KHOSLA: So, the message to me seems to be that cardiology should be more intentional about screening for OSA in their patients. So, is your impression that this would be sort of under the umbrella of the cardiology program or is this in collaboration with sleep medicine?

DR. REDLINE: That is a fantastic question, the impression and of course, I think it's an evolving landscape. My understanding is that the cardiologists understand that it is their role to identify risk factors that can be intervened to improve the patient's heart disease. So, I think they do understand that just as they are to screen out and identify lipid disorders, obesity and high blood pressure in their patients, they also are committed to having the cardiologist to understand that sleep apnea is an established risk factor for heart disease. So, my understanding is really to increase that sensitivity and that understanding and potentially start to empower cardiologists to more effectively minimally refer patients for appropriate sleep studies or potentially to do some screening in the cardiology setting itself.

DR. KHOSLA: So, it sounds like it would maybe be a collaborative effort then, you know, in terms of we have that education piece, as you've mentioned, to identify the risk factors. How can we be better about collaborating with our cardiology colleagues?

DR. REDLINE: Yeah, I think you're right, it is a collaboration, and my understanding is that specialists outside of sleep realize recognize that the management of sleep apnea takes a team and it's a specialty team. It's your respiratory therapist, your behavioral interventionists, as well as your sleep specialists and cardiologists. As other specialists recognize that takes an enormous amount of skill, coordination and effort. And I don't believe that this is that level of management of sleep apnea is something that the cardiology practice is likely to see. So again, where I see the collaboration is in cardiologist initiating more efficient and effective screening programs for sleep apnea and in patients who are most likely to be at risk and then benefit from intervention and then working side by side with sleep centers to ensure that the appropriate series of home or full on sleep studies, or home based sleep studies are done and most importantly, that

management is done appropriately, and with the appropriate interventions and support for ensuring that those interventions are successful and patients benefit from them.

DR. KHOSLA: So, it sounds like sleep referral early, but do you think we'll ever get to the point where it becomes algorithmic, where maybe they deploy the HSAT from their clinic in a patient with a high pretest probability? The interp is done by sleep, maybe the CPAP orders written by cardiology, maybe or sleep, and then they follow up with sleep?

DR. REDLINE: I think that's a really interesting model, and it remains to be seen how those pieces fall together, in part, they may be dictated by third party payors and other regulatory issues, which likely will change as the field demands that change and develops evidence that such changes will not impact care, but in fact potentially improve both access and quality of care. So, I think those things would be evolving. I do think there is a real need to streamline the process and improve coordination. We know patients do poorly when there are too many handoffs and there are too many opportunities to fall through the cracks.

DR. KHOSLA: Well, you're exactly right. You know, I think our current algorithm, it is time consuming, and it is it is fragmented. And so how can we maybe tighten up some of those gaps, right? So, it sounds like maybe this evolution to maybe where we'll get to the point where it, you know, people are a little bit more comfortable talking about sleep within the confines of a of a cardiology visit right before they hand off to sleep, so they understand the importance of following up with sleep. And that is not just another test.

DR. REDLINE: Exactly, I mean, I think one of the ways that a cardiologist can really also improve the potential outcomes of a sleep intervention in their patients is to communicate why they're asking about sleep. The potential impact of sleep apnea and sleep disorders on the heart. And the potential benefit because in fact, that cardiologists may be that patient's most trusted physician at that point in time. And in fact, is committed to seeing that that patient's heart disease improves. So, developing that having that type of communication, that trust and that support to pursue a sleep diagnosis and then initiate that journey to get adequately treated with the support of that trusted cardiologist, I believe could be really important.

DR. KHOSLA: Well, if I love how you know, it seems like a lot of your work is on the intersection of sleep disorders and other disease states. You know, we talk about this quite a bit

on this need to break down information silos because sleep impacts every field. And so, I really appreciate to me when I read, there's a ton of stuff on you, by the way, on Google. But when I read about all of the things that you've done, you have really worked toward breaking down these information silos. So, do you think people are receptive to learning about how sleep relates to their organ system?

DR. REDLINE: Oh, absolutely. one of the most gratifying things of actually living and breathing sleep over so many years is to see how excited multiple individuals across disciplines are about sleep. When I when my career started out, you really had to justify the importance of sleep. In fact, I remember very early on in my career I was at a NIH meeting. It was actually the division of lung disease, and I made a few comments to actually group a pulmonologist of all people about sleep apnea, and a very senior pulmonologist turned to me and said, is sleep apnea a real disease? And so just. And so, you just think about so this was an over 20 years ago, and you think what's happened in the last 20 years where not only do we have to not justify that sleep apnea is a real disease and it has significant consequences, and its treatment leads to benefit. But in fact, I see just the opposite where I see all sorts of specialists approach me regularly gastroenterologists, oncologists, endocrinologists who understand that the importance of sleep. And in fact, that sleep, poor sleep and sleep apnea are not infrequent problems among their patients, and they are looking for ways to improve the patient's quality of life. So, I've really seen sleep be embraced by so many medical subspecialists.

I also see sleep is really an area that a lot of social scientists are also super excited about getting involved with. Because, as you alluded to, its sleep is so pervasive as a phenomenon that we experience every day. And social scientists realize that sleep disturbances really aggregate those indicators of socioeconomic status of community indicators of health. So, in fact, there's also this great excitement by this other group of individuals. So, we have excitement both in the medical area as well as in the social sciences area. And that, frankly, was not the case 20 years ago. So, I applaud the American Academy of Sleep Medicine. I applaud folks like you and all my colleagues in really getting the word out and helping patients feel better and also helping generate the evidence that I think has resulted in, I believe, a general community interest in sleep and overall acceptance that sleep is that fourth pillar of health. We diet physical activity,

stress and sleep. And I do feel that we don't have to argue so much anymore. I think that's getting more and more accepted.

DR. KHOSLA: I love that too. And hasn't it been great? I've seen that change since, you know, since fellowship. And my favorite one is when the ophthalmologist refers a patient. We have one that lives in Grand Forks, North Dakota, and he refers his patients when they have floppy eyelid syndrome and every single one has had sleep apnea. Everyone. It was just it's amazing to hear those stories, too.

DR. REDLINE: Yeah, and when you could go down the list of the different health conditions, we there is a sleep connection and the excitement of subspecialist primary care docs, social scientists, cetera really beginning to accept that connection and look for these disorders and look for opportunities to make their patients better. We still have a long way to go, but it's clearly going in the right direction.

DR. KHOSLA: So, what do you think our biggest blind spot is? I mean, how can we do better as sleep clinicians?

DR. REDLINE: I think there's still so many ways that we can do better. There's tremendous progress we've made. You know, we have many more tools out there. At one point we wouldn't even consider approaches like home sleep apnea tests. Everything was fairly rigid and very protocolized because of early concerns of poor-quality data and not following appropriate protocols. I feel that we now understand the there is a growing role of technology and there's different types of technologies out there that may be better or less well suited for making diagnoses. There are complicated patients that may need more sophisticated approaches for diagnosis and even treatment. There are the simpler patients who may be more readily diagnosed with, you know, fairly simple measures. Potentially even I would love to see even finger pulse oximetry be used in individuals with a high pretest probability of sleep apnea. So, I think we are moving into the use of technology, and I think that is good. There's obviously a lot of challenges for its appropriate use and systematic use. So, one area, so I think we're getting over the blind spots of use of technology and understand we need to embrace a wide spectrum of technology that a lot of our traditional approaches for manually scoring and annotating that actually may not provide the most reproducible or even the most predictive data. And of course,

that opens up all the machine learning artificial intelligence. And again, the academy has been a leader in the last couple years in trying to understand the role of that. That new technology.

Where I actually feel we're doing less well is how we engage our patients in shared decision making. I think we're still pretty much it in a mindset specifically for sleep apnea of offering CPAP, which we have the most experience and data on as a first line therapy and then only going to additional interventions once CPAP fails. And I don't know if that's really what's best for our patients. We know from other diseases that patients have strong preferences in what types of therapies are most acceptable to them and their lifestyle and the blind spot of the era. I'd really love to see now that I think some of the technology issues are being addressed is really more shared decision making so that patients and physicians have discussions on really what you know, how you know, what their level symptoms are, what are their expectations, what would be the burden of using a device versus one type of device or another, or engaging in surgical intervention or even engaging a long term weight management program? So that's one area. I still see some emerging work, but I feel that we don't have as a field a complete mindset about the integrating that shared decision making and getting the appropriate also reimbursement. So, you don't have to show you fail this before you go to that.

So that's an area. I have a couple of thoughts, but that's something I would love to see. Develop more.

DR. KHOSLA: Well, let's take a short break, and when we come back, we'll talk about how you're using data to inform your research and our understanding of sleep disorders. You're listening to Talk of Sleep from the American Academy of Sleep Medicine.

AD BREAK: Your membership in the AASM demonstrates your commitment to advancing sleep care and enhancing sleep health to improve lives. Stay connected to thousands of colleagues that share your passion for healthy sleep. Renew your membership today at aasm.org.

DR. KHOSLA: Welcome back to Talking Sleep. We're talking with Dr. Susan Redline about just a few of her contributions to the sleep field. So, you are really kind of ahead of your time when you started collecting DNA as part of your research 30 years ago. How did you even think of this? Like, how did that even come about?

DR. REDLINE: Yeah, so it's interesting looking in the retrospect, but I was I was very fortunate. You know, I was very fortunate in working with a very strong respiratory epidemiology group. And one of the first projects that they assigned me to was to understand the genetics of asthma as a pulmonologist so that I had that sort of background. And then I had the good fortune of working with Kingman Strohl shortly after he returned from Australia and where he was introduced to CPAP, which back then was a brand-new therapy. that Colin Sullivan developed, and it came and came back all excited about it, and then Kingman himself had actually described the very first family. This was as what he was in training where there were multiple generations with sleep apnea. So, I was very intrigued with this one family report. I was very intrigued with sleep apnea, but a lot of my research had been actually in the family aggregation of asthma. It just happened to be one of the projects I was working on, and I basically started thinking about that one patient, that one family of Kingman's and that there is what there was likely a genetic basis that Kingman had stumbled upon and thought, shouldn't we study this more systematically to know the extent to which genetics does influence sleep apnea and then potentially identifying what might be some molecular targets that we can intervene on to improve sleep apnea? And so, I thought I was trained in epidemiology as well, and I said, well, let's start by quantifying the family aggregation of sleep apnea. And I wrote a grant, and we wrote the grant and we got funded. Incidentally, I proposed to collect DNA, and this was back in 1990. And the review group said, why in the world are you collecting DNA? And they recommended that it not be included in the funding of my study. But thankfully, I went ahead and found some resources and collected DNA anyway. It's almost absurd. Now this is again a, you know, a sort of a reflection of changing time who would not collect DNA in a family study sleep stage, but that you get of change. So, it really was an inspiration from Kingman Strohl and then, you know, connecting it was what I was learning elsewhere in the sort of genetic studies of other pulmonary disease.

DR. KHOSLA: And they're still using that right with the Cleveland family study, they're still using that genetic data.

DR. REDLINE: Oh, yeah. The Cleveland family study was, you know, my baby, and for anyone who's listening, who's a new researcher, it's such a special time in your career when you actually get an opportunity to develop your first study or if you're interested in epidemiology your first

cohort. And that's what the Cleveland family study was. In fact, when I started that study, I did a lot of the home visits myself. I really, up until recently, I was getting Christmas cards from a lot of the **family** members of this study, and it really was an extraordinary opportunity to collect data in a very interesting setting and get to know people and then also learn a lot about how you do genetic analysis using pedigree structures and ultimately genetics and molecular mechanisms. So, we ultimately enrolled more than 2000 individuals and we had DNA in about 15 hundred people. And so, we had it was a fairly big study for the time these days. You know, people talk about hundreds of thousands of people, but they were carefully phenotyped and we followed people longitudinally. And then about six years ago, NIH had an opportunity where they made resources available to do what's called whole genome sequencing for samples that had been stored and were available and linked to good phenotypes. So, we applied and we, you know, we got almost 15 hundred samples fully sequenced through this resource, and that was then integrated into a large national heart, lung and blood institute data resource called Top End of the Trans-Omics Medicine initiative, which ultimately sequenced more than 150,000 people. But up until just recently, the Cleveland family study was the only study specifically designed to look at sleep apnea. So we're a big part of that initiative, and all those data are publicly available and have you can you get them to NHLBI's data repository And it's really continued to generate a lot of interesting work about genetics and non-genetics, in fact, we hope to publish shortly our newest re analysis of Cleveland families using some of the sequence data that now we're combining with data from other, many other unrelated people. You know, we can. And what we do is because the Cleveland family is a pedigree**-based** study, and in these families, there is the greater the likelihood of identifying what we call weird genetic variants that segregate, and we use that information to sort of focus in on areas of the genome where there may be a overrepresentation of disease alleles and then test those areas in much larger samples. So, it's a way of improving the efficiency of the study, and we just did this with using some of that TopMed data and we're very excited. We are hoping that reviewers will agree, and we think we have some new insights into a novel genetic mechanism.

DR. KHOSLA: Oh wow. So, you're obviously very well known for your use of big data. And I'm going to ask you a loaded question. Should we be mining our EMRs for sleep disorders?

DR. REDLINE: Yeah. I don't think it's a loaded question, but I actually think there's a question that may need to be asked that question. And that is, you know, the real power, I think is not necessarily in having ICD based codes for sleep apnea, insomnia or obesity or even what's called V codes, which are a little more sophisticated groupings of data from the EMR. But it's really getting the physiologic signal data in a format that we could begin to tease apart the heterogeneity in sleep apnea that I believe exists. And then we often, I think, skim over. So, I think the real opportunity is for all the clinical, every clinical sleep lab to actually follow and standardize best practices in how they get sleep study data both at home and in the laboratory and get those into the EMR in a format that can be mined. And this sounds simple, but what is really very apparent when you look across laboratories and you try to harmonize data from different sleep devices, you realize the tremendous variation in how filters are used , how sampling rate are used, the variation in sensors, the variation in how we even label channels and in order to really make data, to pull that out in a way that we could really use it as a field. I think we need to commit to collecting somewhat more standardized and purer signals and then make them what we call findable in the EMR so that they actually can be linked to the other data, demographic data, health data and so forth.

DR. KHOSLA: So now switching a little bit. I really appreciated your work on underserved communities and in about how environmental factors are out there and that we need to consider them. And so, I really liked that study from USC that showed that when you have homeless adults and you move them into housing, that their insomnia goes away and kind of stays away for a year. So, can you tell me about the study? I understand you've got a personal connection there.

DR. REDLINE: I was so tickled to death that you found that study…

DR. KHOSLA: you tweeted that my study that you tweeted, and I was just intrigued by…

DR. REDLINE: I tweeted that my son was the person behind in Bahrain Red Line. I it is, so it is one of the, you know, there are many joys we have in life. I talked a little bit about how the Cleveland family was really, in some sense, my baby. But in fact, Brian is my real baby and he is, you know, after many years of potentially being bored by me talking about sleep, something must have stopped because he went out to California and got a job with a fantastic read that you

see, I mean USC, headed by a sociology sociologist, by the name of Ben Henwood, who was very interested in the problems of homeless youths in Los Angeles. And Dr Henwood interest was in, in fact, the impact of what they call structured housing first, that you really can't make an impact in an individual's life unless you get a roof over their head. And the group that my son joined was predominantly interested in issues about mental health and addiction. And as he started working with this group, I think one of those dinner time conversations probably came to the surface, and he realized the opportunity for the group he was working with to study sleep. And so, we had some conversations about how you would do that, and it was my son that took it into this cohort and I think got his boss so excited...but I didn't do it. I just was an inspiration.

DR. KHOSLA: Well, but you see how far your reach, you know, you can stretch. I'm actually really excited that you're going to be the keynote speaker at the sleep conference in 2022. You know, congratulations. Can you give us a sneak? Can you give us a sneak peek? What are you going to talk about?

DR. REDLINE: Well, I've been asked to talk about a cardiovascular disease and sleep apnea, and I am and it's a challenging area. It's an area because we have a lot of fantastic studies showing the links between sleep apnea and cardiovascular disease, but we have much less data showing the impact of treatment on attenuating those cardiovascular disease risks. So, I'm going to try to take this know, take a high and a deep view of why this may be some discrepancies between our observational data and our intervention data and reviews, in particular, some of the newer ways to characterize sleep apnea that may be better at identifying people with sleep apnea who may most benefit in terms of the cardiovascular outcomes from intervention. And then a special interest of mine is gender and sex differences in sleep apnea and really take a dove into how sleep apnea, how the pathophysiology of sleep apnea differs in men and woman, and how some of those mechanisms may be relevant for risk of cardiovascular disease.

DR. KHOSLA: Oh, wow, I bet that'll be amazing.

DR. REDLINE: I'm not sure about that, but I think it'll be a challenge, a challenge. And I hope, I hope I don't bore anybody and don't overstate anything either.

DR. KHOSLA: No. Well, thank you so much for spending time with us today. You know, you've had this incredible career and I'm not sure you realize how many people you've impacted, you

know, not necessarily directly, but indirectly through a lot of your work. So, I really appreciate you being here today.

DR. REDLINE: Well, thank you very much for your time and the excellent and provocative questions. It was really a lot of fun talking to you, so you stay healthy and hope to see you in person at the sleep meeting.

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.