



**The Good Clean Nutrition Podcast
Episode 8 Transcript**

The Connection Between Diet, Sleep & Health with Marie-Pierre St-Onge, PhD, FAHA, CCSH

Mary Purdy:

Welcome to The Good Clean Nutrition Podcast, where healthcare professionals and health minded consumers are provided with practical and helpful information on current and trending topics from subject matter experts. I'm your host, Mary Purdy, integrative dietitian and nutrition educator.

Now, while we know sleep is necessary, few of us are aware of how essential it is for physical and mental health. According to national statistics, approximately 50 to 70 million Americans suffer from sleep or wakefulness disorders. And this has probably increased considering the pandemic-related stressors that have weighed very heavily on us these past couple of years. Now, what you might not know is that one crucial factor that influences sleep is nutrition. With certain dietary habits, foods, or drinks, making it easier or harder to get the sleep that we need.

Now on a personal level, I'm actually one of those many who experience some sleep issues. And even with everything that I know and everything that I do, I am always seeking more information about how to get better zzz's. So, I am particularly interested in today's episode, which is the connection between diet, sleep, and health. And to talk more on this, I am joined by associate professor of nutritional medicine at Columbia University's Irving Medical Center, Dr. Marie-Pierre St-Onge.

In addition to having a bachelor's, master's, and PhD in human nutrition, Dr. St-Onge completed a fellowship at Columbia University and went on to join the New York Obesity and Nutrition Research Center and the Institute of Human Nutrition as a post-doctoral fellow to further her knowledge in the area of energy metabolism and body composition. In her current role at Columbia University's Irving Medical Center in New York City, she has had the opportunity to fuel her passion for research related to food and its influence on disease risk and continues to focus heavily on sleep and its association with obesity and cardiometabolic risk factors. Welcome, Dr. St-Onge. It's so great to meet you.

Dr. Marie-Pierre St-Onge:

It's really nice to be here too. I'm excited to speak with you about sleep and diet today.

Mary Purdy:

Me too. And before we launch into our questions, I want to learn a little bit more about your background in nutrition research and what led you to focus on sleep habits and ultimately that connection between sleep, nutrition, and disease risk.

Dr. Marie-Pierre St-Onge:

So, I started out as a nutrition major at McGill University. I went on to do my master's and my PhD as you mentioned in nutrition also at McGill. My passion was to assess the influence of various foods, which we call functional foods on cardiovascular disease risk and obesity, and then moved on for our fellowship and focused more and more on body composition, energy balance regulation. So, what types



of foods can you eat that will increase the number of calories that you burn, and that will help you eat less to achieve weight loss and reduce your risk of obesity.

And then after I completed my postdoctoral fellowship, I moved on to my first faculty position. This was at the University of Alabama at Birmingham. And while I was there still interested on studying the role of functional foods on weight management and energy balance, there was a call from the NIH to receive grant applications to assess the influence of sleep on energy balance. And the sleep researchers didn't really know how to measure energy balance. So, they came to the nutrition department and met with a couple of faculty members there. And at the end of the meeting, I thought this would be a great opportunity to take my expertise in the measurement of energy balance and combine it with their knowledge of sleep. And so that's where that's where it all started. And I moved back to Columbia and really that's where it all took off.

Mary Purdy:

Amazing. Yeah, it's so incredible to hear how the beginning of your research started off with functional foods and then that went over to how does that affect energy balance and then how does energy balance affect sleep and how does sleep affect energy balance? So clearly there's a lot of passion about how foods can influence disease risk and the role that sleep plays as well. And since you've got so many different areas of research that are all connecting to human health, let's just take a bit of time to focus on the sleep component. So, let's start off with a real basic and simple question which is, what is the ideal number of hours everyone should be sleeping each night and how does this differ by age?

Dr. Marie-Pierre St-Onge:

All right. So, everybody knows right that young children need much more sleep than adults. And so obviously infants require 12 to 16 hours of sleep over a 24-hour period. It's not consolidated at night. As children age, this goes down up to in 6 to 12-year-olds, we'd recommend 9 to 12 hours of sleep. Teenagers need 8 to 10 hours of sleep, right? So, teenagers I'm talking 13 to 18-year-olds should get at least 8 to 10 hours of sleep per night. But then once you reach adulthood, the recommended number of hours is at least 7 hours of sleep per day. And that recommendation does not change through adulthood. So sometimes you have that preconceived notion that perhaps you need even less sleep as you get into older age, but that's not the case. Everybody in adulthood is recommended to sleep at least seven hours per day.

Mary Purdy:

I think some people wish they needed less sleep so they could do more with their lives. But it's good to know that 7 to 9 hours is a pretty standard recommendation for most adults. And I have a feeling there's a lot of kids and teenagers and adults who are likely not getting the recommended amount as you just mentioned. So, this is probably eye-opening for a lot of folks. And we hear these terms, sleep-deprived and sleep deficiency. Can you define what those two are and the impact that they each have on our health, both physically and mentally?

Dr. Marie-Pierre St-Onge:

Right. So, when we talk about sleep deprivation, we're really talking about lacking sleep in duration, right? So not having a sufficient number of hours of sleep at night, that would be sleep deprivation. Or



sometimes you could say sleep restriction, you're reducing your sleep. When we're talking about sleep deficiency, this is a broader concept that encompasses insufficient sleep. So not enough sleep duration, but also low-quality sleep. So that means that you may get short sleep, or you can also have an adequate number of hours of sleep, but that sleep is of poor quality either because it occurs at the wrong time of day, either because it's disrupted often in the middle of the night or you have difficulty falling asleep, or you're waking up too early. So, there are many different ways that sleep quality can be disturbed. And that is what we talk about when we're referring to sleep deficiency. It's not necessarily just in duration, but also in quality.

Mary Purdy:

So quality is key... and a lack of that has health effects. Talk a little bit about the physical impacts and also about the mental impacts because I know after a poor night's sleep, we're just not quite as sharp as we think we are.

Dr. Marie-Pierre St-Onge:

Well, so that's exactly it, right? If you talk to people and you ask them about what impact does insufficient sleep have on your body, they will readily say that they're not as sharp. It might take them longer to react to different things. They're not remembering things as clearly if they're not getting enough sleep. Learning is impaired. So, we know the cognitive aspects. We also know we're feeling sleepy. We have a harder time remaining alert and awake during the day, more difficulty paying attention, remaining focused. So those are all mental cognitive components of sleep, right, that we are well aware of. But there are other things that occur within our body that we may not feel. So, for example, there's an increased risk of high blood pressure with insufficient or poor-quality sleep. And we don't necessarily feel elevated blood pressure, or we don't necessarily feel the higher risk factors for cardiovascular disease or type two diabetes that are associated with poor sleep quality and short sleep duration.

Mary Purdy:

So not only are we kind of grumpy and less alert and less able to respond quickly, but there are really serious health implications, even as serious as something like increased risk for diabetes and heart disease. And I know a lot of people go to bed at 10 and they wake up at six and they think, "Okay great, I got eight hours, I've met the recommendation. But how do we actually know? I know there's a lot of sleep tracking devices, and I got to tell you, I have used one of them in the past. And I feel like that thing was way off. So how accurate and effective are these wearable devices, for example, like Apple Watch or Aura Ring? How effective are they in terms of measuring actual time spent in bed and total sleep?

Dr. Marie-Pierre St-Onge:

So, the good news is that there are some good consumer devices that can track your sleep. Those devices generally do a good job at tracking the amount of sleep that you get or tracking the amount of time that you're awake, but they're not going to give you more detailed information. I don't really rely on my watch for example to tell me I got enough deep sleep, right? So, it's pretty good with duration of sleep, but not so much related to sleep disorders and sleep stages. And also, these watches tend to do a better job with good sleepers than poor sleepers. So, people that have better consolidated sleep, so



they don't get awakened frequently in the middle of the night, for those people, watches are more accurate than for people who wake up more frequently in the middle of the night. So that might not be as useful as you think if you're trying to determine if you're getting good sleep or not so good sleep.

Mary Purdy:

So how do we actually know? I mean, how do I wake up in the morning and tell that I've had a really great sleep?

Dr. Marie-Pierre St-Onge:

Because you should feel good.

So, if you had good sleep, you should wake up feeling refreshed. You should wake up feeling alert. You should wake up feeling like you can tackle the day and just get up and go. If you wake up and you're still tired, you're not feeling great, you probably didn't get as good a night's sleep as you should have gotten.

Mary Purdy:

And talk a little bit more about the research around some of the health implications. Aside from just feeling good, which we all enjoy when we wake up, this idea of really putting ourselves at risk for all kinds of chronic diseases, tell us a little bit more about the research behind that and the implications for how to prevent some of these diseases with better quality sleeps.

Dr. Marie-Pierre St-Onge:

So, I like to think about approach research systematically and start with the big picture and the big population studies that provide a lot of questions and associations. So, from those large population studies, we can track the associations between various sleep parameters and risk factors for cardiovascular disease, type two diabetes, obesity, hypertension, those chronic diseases. So, we know that people who report having shorter sleep or having sleep disorders are those that are at higher risk of cardiovascular disease, higher risk of type two diabetes and hypertension, obesity. When we track these people over time, those who have poor sleep tend to be the ones who develop more heart disease, type two diabetes and hypertension. So, we know that those sleep factors precede the development of those disorders.

There's also a lot of clinical intervention studies that have been done that restrict sleep in good sleepers and look at various risk factors. And from those studies and part of the evidence that we've provided from our lab show that if you restrict sleep duration in people who have good sleep to begin with, they'll tend to eat more than they would when we give them a sufficient time in bed. Their glycemic control is reduced. Their ability to handle glucose loads is reduced when they're undergoing short sleep compared to adequate sleep. Blood pressure increases. So, we have evidence that by restricting sleep or inducing poor sleep, in individuals who have good sleep to begin with, we can have adverse effects on those risk factors for chronic diseases.

Mary Purdy:

Wow. So that lack of sleep really leads to metabolic changes in the body that make us less effective at utilizing glucose or burning calories for instance. I remember I had a patient who felt like she was not



eating an excess amount of calories and couldn't figure out why she wasn't losing weight. And then we started talking about her sleep patterns. That's where we were able to connect the dots, it wasn't just about the calories, but it was how her body was utilizing those calories as a result of her sleep deficit. So really interesting. And let's talk about this area of research that you are so well-versed in, which is the role of nutrition in supporting a restful slumber. I don't think people think of food as helping us to sleep but tell us about the connection between sleep and what we eat.

Dr. Marie-Pierre St-Onge:

So could you believe this is actually something that I hadn't even started thinking about until a committee from the Dietary Guidelines Advisory contacted me to ask about diet and sleep when they were developing guidelines for Americans. And they were asking me about sleep and diet. And I had done quite a bit of research looking at the influence of sleep on food intake, but they were interested in knowing about how diet. Could we make recommendations about diet to improve people's sleep? And I thought, why didn't I think of that?

So, I started digging into some of the research that we had done and started analyzing our data in different ways to really find out that, yes, there was actually an association between what you eat during the day and your sleep at night. And again, like I mentioned, I like to start off with population studies and we went back to larger scale population studies to look at dietary patterns and see if dietary patterns in individuals was related to their risk of sleep disorders. And one of them was from the Multi-Ethnic Study of Atherosclerosis, where we looked at the population's diet and their adherence to a Mediterranean diet and their risk of reporting insomnia symptoms and short sleep. And we found cross external associations.

So just looking at baseline at one point in time, there were associations between diet and a better diet with reduced risk of insomnia symptoms. And we also looked at it longitudinally. So, what is your diet at baseline? And does it predict sleep at a later time? So, to see if there is a time factor in there. And we also did find that there was an association between adherence to a Mediterranean diet and better sleep at a follow-up period. In a shorter study in women that we conducted here at Columbia, we also showed similar findings that adherence to a Mediterranean diet was associated with better sleep quality, better sleep efficiency, fewer sleep disturbances when we evaluated sleep one year later.

Mary Purdy:

Interesting. So, Mediterranean diet sounds like it has some beneficial qualities for sleep. Although not everyone can adhere to the Mediterranean diet because it may not be with everyone's culture or within everyone's culture to adhere to all of those specific food groups.

Dr. Marie-Pierre St-Onge:

Yeah, but also, we looked at various food groups within the Mediterranean diet, right? So, fruits and vegetables were came out as being significantly associated with better sleep quality, higher intake of legumes, so your beans, right? So red beans, chickpeas, kidney beans, black beans, those types of protein sources were associated with better sleep quality. And there was also a trend for dark breads. So whole grain breads being associated with better sleep quality.



Mary Purdy:

Ok so, fruits and vegetables, whole grain breads, I mean whole grains in general and legumes all helping with sleep patterns. So, if someone has a patient out there or someone is struggling with sleep issues, what are some foods or some food combinations that you might recommend to them?

Dr. Marie-Pierre St-Onge:

Yeah. So, I would be recommending a diet that's higher in fiber and lower in saturated fat. So that's rich in plant-based proteins with beans and seeds and tofu and fish and also plenty of fruits and vegetables.

Mary Purdy:

Excellent. And those are going to have beneficial effects on those cardiometabolic factors that we're talking about as well. And digging more into your research a bit about the effects of nutritional patterns on sleep, tell us a little bit more of some of the results that you learned.

Dr. Marie-Pierre St-Onge:

Yeah, so when I started thinking about how diet could influence sleep at night, we looked at some of the research that we had done where we had given our study participants a controlled diet for a few days, and then let them self-select their food intake for one day. And we have very, very precise measures of their sleep at night. So, my first idea was is there a difference in sleep between the night when we're giving them a diet and the night when they're self-selecting their diet? Because we know that the diet that we provided for our research had a healthier profile than the diet that they self-selected when we let them eat whatever they wanted. And we actually did find that on the night that the self-selected their diet, they took twice as long to fall asleep than when we gave them our research food, right, healthy diet.

So, the next question then was, okay, there are differences in sleep between those two days, what is it about the diet that they chose that related to their sleep at night? And there were three specific nutrients that we found that were related to their sleep at night: sugar, saturated fat, and fiber. And participants who consumed more fiber during the day had more deep sleep and less light sleep at night. When they consumed less saturated fat, they also had more deep sleep. And when they had more sugar during the day, they had more arousals at night. So, they had these micro awakenings in the middle of the night that were more frequent when they had more sugar during the day. So, these are the three nutrients that kind of stood out for us in terms of that relation between diet and sleep.

Mary Purdy:

That is such key information because not only do we know that that's going to be beneficial for sleep, but those are recommendations that we're making for our optimal health in any case. So, we really are feeding two birds with one stone here.

One thing that I have found to be effective with patients is to making sure that their breakfast is actually protein rich, that somehow helps to create a positive glycemic response that keeps them more balanced throughout the day that sets them up for a better circadian rhythm that helps with sleeping at night. What do you know about that?



Dr. Marie-Pierre St-Onge:

Yeah. So, it's possible as well that the timing of what you eat can influence your sleep at night, but there's also different properties of foods. You were mentioning specifically protein-rich, right? So, proteins contain amino acids. And one of those amino acids, tryptophan, is the basis for the production of melatonin, which is your main hormone that stimulates or that triggers sleep onset. So, consuming more tryptophan early in the day may be providing the building blocks for melatonin later in the day and helping you get that amount of melatonin to stimulate sleep onset and better sleep.

Mary Purdy:

Excellent. And I know a lot of folks take melatonin as a supplement. I actually have taken that myself. It's been very helpful. But I understand that there are also food sources of melatonin. I don't know if it's just the tryptophan or if there are other foods out there that may also be a good source of melatonin to help people fall asleep.

Dr. Marie-Pierre St-Onge:

Well, absolutely. Melatonin is found in many, many different foods. If you think about it, animals also produce melatonin, right? So there have actually been studies where they milk cows in the middle of the night where their melatonin is higher and give melatonin-enriched milk and assessed whether that could improve sleep in people drinking that type of milk. I don't think we're there yet, but melatonin is also found in various fruits and vegetables. It's an antioxidant. And so, it's a protectant for various plant foods. So, it's also found in various fruits and vegetables, and there have been studies that have shown that consuming various fruits and vegetables can actually increase melatonin levels in the blood in humans.

Mary Purdy:

Fascinating. You just blew my mind with milking cows in the middle of the night. Not that we suggest waking cows up in the middle of the night to milk them necessarily, but that is a very interesting fact there. And you're talking about fruits and vegetables, all the nutrients in there. Are there specific vitamins or mineral deficiencies that can have an impact on sleep quality?

Dr. Marie-Pierre St-Onge:

Right. So there have been some studies that show that magnesium deficiencies or iron deficiencies, some vitamin D deficiencies can be related to poor sleep quality and sleep disorders. So, in that sense, perhaps, making sure that you have a well-balanced diet that provides all of the nutrients that are essential for health to prevent potential poor sleep as a result of nutrient deficiencies.

Mary Purdy:

So, magnesium, vitamin D, iron, I know I've recommended to patients to take some magnesium before bed, but obviously food sources of that would include beans and nuts and seeds and dark leafy greens. And you're talking about getting all of those foods in during the day, is that right?

Dr. Marie-Pierre St-Onge:

Correct.



Mary Purdy:

Excellent. And I would imagine, on the topic of foods, since people eat in various different ways, there are also food cravings that come up for many of us, which can be the result of a variety of factors from emotions to deficiencies, to all different kinds of things. But talk a little bit about how sleep deprivation or sleep deficiency can intensify or provoke those kinds of cravings.

Dr. Marie-Pierre St-Onge:

Yeah. So we've actually looked at brain activity in response to various types of foods after a period of sleep restriction and shown that when people are not getting enough sleep and they're being shown pictures of foods and pictures of less healthy foods in particular, the brain regions that are associated with reward, motivation, food-seeking behaviors get activated to a greater extent than when we give them plenty of time to sleep and get their full night's rest. And so that could be one way where getting insufficient sleep then can set you up for making poor choices, right? So, you already know that your decision making is impaired because you're not sleeping well enough. And then now you also have reward networks in the brain that are upregulated due to insufficient sleep, fatigue that sets in, in terms of mental power to make those helpful food decisions. And when you're being given a choice between a salad for lunch or something else, that's not so healthy, perhaps then you'll fall more for the unhealthy food choice rather than the healthier option.

Mary Purdy:

I think that can be so validating for people to hear because many people see their food choices as a lack of willpower and thinking, "Oh, I made this decision because I have no willpower" when ultimately, it's coming from this lack of something in the brain, some kind of energy deficiency or sleep deficiency that's causing us or maybe contributing to our different choices. So really, really helpful for people to hear that.

Dr. Marie-Pierre St-Onge:

Yeah. And sometimes when you're faced between at a restaurant in front of the menu and you're debating what to have for lunch or dinner, just taking a step back, checking in, am I wanting this dish because I really am really hungry because I really want it, or is it because I didn't have enough sleep last night? And then just knowing this can maybe help you or tip you over to make the healthier decision.

Mary Purdy:

Yes, just taking a step back, being mindful about what's going on. And actually, you're making me think of another question here, which is some people choose to go to bed at 10 and wake at six. Some people choose to go to bed at 12 and they wake up at eight. What's the difference between the timeframe in which you decide to get those 7 to 9 hours?

Dr. Marie-Pierre St-Onge:

Right. So, it's better to get the 7 to 9 hours at night earlier in the night rather than later in the night. So, I would say the 10 to midnight is a better go to bed window than the midnight to 2AM, because then you're starting to extend into the early morning hours where bright light starts to be up and out, and you would want to get as much daylight as possible and bright light in the morning to get better sleep.



So, maximizing that time where you're in bed when it's dark outside rather than being in bed when there's more daylight available.

Mary Purdy:

And I would imagine that would probably switch from season to season. I know in the Pacific Northwest, it stays pretty light until about 10 o'clock here in the summertime so, it's hard to go to bed at that time, in July. And there's some conflicting information about eating too close to bedtime. So, what are your thoughts about how long before bed one should stop eating? And of course, knowing that everyone's a little bit different, what are some general thoughts about this?

Dr. Marie-Pierre St-Onge:

Right. So generally speaking, we like to make recommendations to stop eating about at least three hours before going to bed just so that you have enough time to process the food. For some people, having a large meal very close to bedtime can cause gastric reflux, can be uncomfortable. So usually just having a last meal a few hours before going to bed would be preferable than eating right up close to bedtime.

Mary Purdy:

Great. And these are a lot of nutritional ideas about food and sleep habits. What about lifestyle factors? I know there's lots of information about sleep hygiene, getting off your screens, being exposed to blue lights. So, tell us a little bit about some ideas there.

Dr. Marie-Pierre St-Onge:

Right. So, we hear about that quite a bit, right? So, trying to dim the lights, making sure that because bright light interferes with melatonin secretion. You want your melatonin to be released appropriately before bedtime. So, you would need to be, as much as possible, in dimmer light before bedtime, not shining bright light in your eyes before going to bed. But I think there's something else that people don't really think about too much either is regularity of sleep patterns. So, trying to make sure to go to bed and wake up at this same time roughly every night because there have been studies reporting associations between having highly variable sleep schedule and a higher risk of metabolic syndrome and cardiovascular disease.

Mary Purdy:

And continuing on this lifestyle factor front, what is an appropriate kind of sleep ritual that you would recommend an adult have before they go to sleep to ensure a better evening?

Dr. Marie-Pierre St-Onge:

Yeah. It's interesting that you ask about that specifically related to adults because we do this all the time with our children, right? We read them a bedtime story. We cuddle. Maybe have a warm bath, followed by a story, cuddling, go to bed. So, we calm them down, right? We don't start giving our children exciting toys right before going to bed. Right? So as adults, we should not be using exciting toys before going to bed. We should be doing the same thing, calming ourselves down, doing more calming activities, more calming rituals. Maybe that involves listening to more quiet music, doing some meditation or yoga or anything that could be more quiet and that helps to calm the mind, not opening up your work emails to



then get that email that's going to be just up there and nagging you all night long, preventing you from falling asleep. So, trying to get into a calming ritual before going to bed would be really good for sleep.

Mary Purdy:

Wonderful. Calming rituals, baths, and more cuddling even if that's just with your pillow.

Dr. Marie-Pierre St-Onge:

That's true.

Mary Purdy:

So, what would you recommend for all those who all are thinking, "Gosh, my sleep is not as optimal as I would like it to be," or a practitioner who's working with somebody who has made that kind of complaint? Where can people start to change their habits easily in order to improve their sleep?

Dr. Marie-Pierre St-Onge:

Easily. Well, I'm cleaning my lifestyle. Lifestyle changes seem to never be so easy. But I would say... So, we're talking about nutrition here. We like to talk about diet and improving diet. I think so looking back at what you're eating during the day. First, if you want to make one first step is what are you eating before bed? Are you eating too close to bedtime? Are you having high sugary foods, very high fat foods in the evening? If so, then trying to get more fiber, lighter foods, eating, stopping eating a few hours. So, stop eating before. Not eating after dinner could be one first thing to start with. And then making sure you have good breakfast in the morning, setting yourself up for having more calories earlier on during the day, rather than later at night. And then perhaps, that will help you get better sleep, which will help you make better dietary decisions, right?

So, I think it's a matter of interrupting a vicious cycle of having poor, bad sleep, and then making unhealthy diet and exercise choices during the day that then sets you up for more bad sleep, right? So, interrupting that cycle, getting better sleep to help you get a better diet that then helps you get better sleep and keep that cycle going.

Mary Purdy:

So better breakfast, more fruits and vegetables, less sugar, refined fats and oils and making sure you're not getting too much food too close to bedtime. These are great strategies that I think anyone can begin to think about incorporating.

Well, thank you so much Dr. St-Onge, this has been incredibly informative, and I imagine there is a lot of listeners out there who are very much looking forward to their sleep this evening and beyond. So, thank you for being here and giving us such wonderful ideas.

Dr. Marie-Pierre St-Onge:

Thank you for having me. It was great chatting with you.



Mary Purdy:

Given the undeniable connection between nutrition and sleep quality, it's important that we set good intentions daily toward eating nutrient-rich foods, limiting added sugars, and staying hydrated. Orgain's Clean Protein shakes contain 20 grams of grass-fed milk protein and just 130 calories and three grams of sugar per serving. The convenience of a high quality ready to drink protein shake helps you to get the power of good clean nutrition during the day, which may set you up for a restful night. Visit orgain.com to learn more.

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