



EXPERT INTERVIEW

Dan Pardi

Sleep Researcher



DISCLAIMER AND TERMS OF USE AGREEMENT

You have purchased Sleep Well Solution for your personal use. When you purchased Sleep Well Solution Program you agreed to the following Copyright, Legal Notice and Disclaimer:

This publication is protected under the US Copyright Act of 1976 and all other applicable international, federal, state and local laws, and all rights are reserved, including resale rights: you are not allowed to give or sell this Guide to anyone else. If you received this publication from anyone other than Media Partners, Inc. you've received a pirated copy. Please contact us via e-mail at info@sleepwellsolution.com and notify us of the situation.

Although the contributors and publisher have made every reasonable attempt to achieve complete accuracy of the content in this Guide, they assume no responsibility for errors or omissions. Also, you should use this information at your own risk. Your particular situation may not be exactly suited to the examples illustrated here; you should adjust your use of the information and recommendations accordingly.

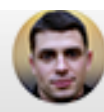
Finally, use your head. Nothing in this Guide is intended to replace common sense, legal, medical or other professional advice, and is meant to inform and entertain the reader. So have fun and get the best sleep ever!

Copyright © 2013 Halcyon Publishing LLC. All rights reserved worldwide. This document has been coded to the original purchaser for tracking copyright infringement.

Dan: My name is Dan Pardi and I'm a sleep researcher. I work with the Neurology Department and Endocrinology Department at Leiden University in The Netherlands and with the Behavioral Sciences Department at Stanford University. My research looks at how sleep will influence certain hormones that are related to feeding behavior and energy regulation. Then I also look at the effects of sleep loss on cognition, including how we process information, how we make decisions and the effects of sleep wealth on mood. I also examine how all of that relates to certain lifestyles features like diet or decisions of food choice. It's really interesting stuff. Then I'm also the CEO of a company called Dan's Plan. The company's objective is helping people simplify their daily health practices. What that means is if you want to live a healthy lifestyle how do you use technology and information to help you get into this healthy zone and stay there consistently. So, a lot of what we do is centered around food, movement and sleep. We use new technology products help maintain certain behaviors that keep you in your healthy zone. So, I kind of have two different worlds, entrepreneurial and research.

Larry: How do you view the problem?

Dan: What are the problems of sleep? Well, it can be broken down in a lot of different ways. Some of it can be clinically oriented, meaning you have an organic sleep problem. There's a large variety of both parasomnia and dyssomnia, which are types of sleep issues. These issues can range from things such as insomnia or narcolepsy or sleep apnea and that entire spectrum. There are entire textbooks on the different types of



sleep disorders and the variations of those disorders. But a big problem most people face today is reduced sleep time and sleep quality. I'll give you an example. On average, we're sleeping 20% less than we were in 1950. In 1950, the average person reported getting about eight and a half hours of sleep per night. Since that time other surveys show people are reporting less and less sleep time. In the most recent survey by the National Sleep Foundation, people reported getting about six and a half hours of sleep per night during the week and seven hours and twenty minutes on the weekend. We catch up a little bit. When you look at that attitude of sleep reduction and compare it to literature about the way people do chronicle studies where they'd say, "Okay. We're going to give you extra amount of sleep." If you're getting only six and a half hours per night, that has pretty significant ramifications for a lot of things. So, why is sleep important? Well, that is a really huge question but basically you can think of sleep has having some sort of a complementary or compensatory relationship to daytime activity. As you use your brain and your body during the day, things will happen during the night that will refresh your body's immune system following that physical activity and prepare it for the next day's activity. And mentally, sleep has a very significant impact on all levels of cognition. That's how we process information. So, when you're sleep-deprived, it takes longer for your mind to process information. It's like where you're tired and somebody is talking, it takes longer for you to take in that information and make sense of it. Memory is ineffective. So, at night, the brain goes through a very discrete pattern of activity and different stages in each day. During each one of those stages, we're doing important things but as your brain goes through the patterns of activity, it's reinforcing different nerve connections



around memory. So, for example, if you remember, there are a variety of things that happened during your day. You meet new people, you learn to get new information. At night, that new information will be played over and over again and those connections are strengthened. So, sleep does two things. It actually gets rid of memory the brain has determined is no longer that important. It makes room for new memory formation, for the next day. Then it also strengthens memory of the information that you want to retain. So, a good memory is actually an active benefit of forgetting things that are not important and then strengthening memories of things that are important. And sleep does all of this. Another interesting thing around cognition is when you don't get a lot of sleep, then the next day you tend to be more impulsive. So, a lot of my research has revolved around that area, and looking at how impulsivity from sleep loss influences certain decisions. What you see is that in certain tasks in the lab people would tend to be more risky when they lack sleep. So, if you think about a casino, they make a lot of their money at 4 a.m. when people are artificially stimulated by that kind of active light environment. There's a lot going on but people are also more likely to take more frequent risks. They also will make larger bets. So, a lot of things happen beyond their consciousness. They don't necessarily perceive them but if you study them, you can actually, really clearly see it. So, sleep is just absolutely fundamental and important to our health. It is very diverse in terms of the effects, good or bad, sleep has on our brain and our body and our immune system. And lastly, we know the consequences of not getting enough sleep and then also something called Circadian Misalignment. Over a 24 hour period, your body has these rhythms that it goes through. And those rhythms are controlled by the light cycle of the



environment actually entering your eye and affecting what's called your central clock. The central clock is in the area of the brain that responds to light and then influences clocks throughout your body. And so, when you're living a more natural rhythm then all of these patterns are orchestrated to a light/dark cycle of the 24 hour period. But these days, we're living in a not so natural rhythm. So, instead of having sunrise and sunset, we are having alarm clocks and late night television determining our sleep times and also our sleeping period. And so, the problem is when these rhythms get out of balance and paused, we start to really increase the rate of a lot of diseases such as cancer, cardiovascular disease and diabetes because these rhythms affect all body processes. So if these rhythms are off long enough and severely enough, they can lead to very significant health consequences.

Larry: What symptoms should one look for?

Dan: A question I often get is, "How do I know if I'm getting enough sleep?" The answer to that is not very simple. It actually requires a little bit of subjective adjustment. So, you have to play with it a little to see what sleep need is. So, you can't apply population averages, it's an individual thing. What I mean by that is, let's say you took a sample of 100 people and you found out the group's average sleep time was eight hours. You can't use that average to say what amount you need. You often hear that because in that group there might be a range where some people needs seven or some people need nine. So if you prescribed eight to somebody but they need nine, or they need seven and you prescribed eight, you



actually can mess up their sleep that way as well. And so, a way to do it, I think, is not to start with an average as your baseline and then adjust. We can't control sleep. You know you can't sleep harder by squinting, right? But what we can control is timing and duration. The timing is when does sleep occur within a 24 hour period and duration is how much sleep did you get or how much time you are in bed. For example, you're not going to get eight hours of sleep if you are only in bed for a few hours. So, one good thing to do is just try controlling how much time in bed that you're getting. And then, you know, you're going to have some better sleep and some not so good sleep but at least you're giving yourself the opportunity to get sleep that you need. So, what should you look for? Well, one way to do it is a subjective assessment with how you are feeling during the day. All right, it's incomplete but it's not a bad place to start. Are you sleepy, right? And having some slight fluctuation on how sleepy you are across to the feeling normal. Generally, we tend to have good days and on the good days we feel pretty good all day. Then we have not so good days where we generally feel kind of sleepy all day. But there is also what are called Ultradian rhythms. So, even with the end of the full day period, there's going to be times, such as in the morning, and certainly in the mid-afternoon, when you might be a little bit sleepier. There are natural points in our day where we tend to feel sleepy. And so assess, "Do I need a lot of cups of coffee?" "Is it hard for me to pay attention to one thing at a time" "Is my mind shifting around a lot?" That's the mark of the entire mind. In fact, a lot of ADHD is thought to be integrated to just not getting enough sleep. And lesser problems include that subjectively saying how you'd feel is not complete. Well, it's a good place to start. There are, again, things that happen that



are beyond our consciousness. If you were to study somebody, they might feel okay but they might be depleted. And so, there are a lot of reasons for that. What can you do? Well, what I would say is try to play around that which is your bedtime. So, a lot of people have fixed times for waking up. So, it's like, "I've got to be at work by, let's say 8:30, you've got to get up by 7. So, a lot of people have a number in the morning. "I've got to be up by 7 every morning." And that means they have more flexibility around what time they go to bed. So, what I would do is count backwards. So, what is your wake up time? It starts with eight hours or eight and a half hours in bed. Then try every day to get into the dark part of the day at that time. Now, you really can't help your sleep pattern after one night, right? And interestingly, there is not one single objective measurement that you can do in a sleep log that is an accurate or consistent representation of subjective sleep quality the next day. In other words, you can't say that as long as somebody gets this type of sleep or goes to bed at this time, then they're going to feel really good. You don't really know what that is because we do such a dynamic process that your sleep tonight is not only going to be dependent on what you do today. It's going to be dependent on what you've done during the last week, or two weeks and maybe how you've been sleeping during the last month. Right? So, it has long range influences on sleep as well. So, a good way to get excess sleep is to say, "Okay, I'm going to try getting, you know, spending eight and a half hours in bed consistently for at least three weeks and then I'm going to see how I feel." And often times, people feel pretty good. When they sleep another half an hour, they give themselves another half hour each night, they've go from feeling "pretty good" to "Wow, I actually feel great." So, that's one way to



get the excess sleep you need. Play around with it. You're giving yourself eight and a half hours in bed and then you keep waking up at seven hours and 45 minutes. Then that might be somewhat indicative of your actual needs. At my company, Dan's Plan, we do sleep tracking. So, we do several things around sleep. We help people form intentions and we have a series of free tracking tools and I encourage people to use them. It's kind of really just thinking that we have gas gauges on our cars or lights and those things give us feedback about when we need to give those things attention. And we now have new technology where we can do it for certain aspects of lifestyle and sleep is a really great one for it. So, we help you form an intention about what time you should go to bed and then help you monitor both your timing and the duration so you know if you're actually meeting your goals. And because you're creating a timed series of records, it helps you actually answer that question, "How much sleep do I need?" Because you can look over a long period of time and say, "You know, actually, for the last six months, I averaged seven hours and 40 minutes." So, you can start to get a sense of how much sleep you actually need and how much you actually get. Because with a long stretch of time, it will probably be... if you can exist in a sleep deprived state but it is more likely to be somewhat indicative of your actions. Yeah, so I would say use some of the latest tracking tools which are an excellent way to be mindful of your sleep practices. Practice playing with various times in bed and then try to keep your sleep time very consistent. So, even if you, let's say you know you need eight hours in bed but that eight hours is shifting a lot from day to day. So one night you go to bed at 10 p.m. and the next night you go to bed at 2 a.m. That's not going to have the same recuperative

power as if you went to bed around 10 p.m. every night. So, keep those things in mind. Experiment a little bit and try to actually keep a record so you can go back... Because, again, one night of sleep is not going to be enough to explain how well you're sleeping.

Larry: What aggravates the problem?

Dan: Okay. So, one thing that makes this problem worse is the amount of technology that is a normal part of life. Companies like Apple and various computer manufacturers, they're making these beautiful and engaging products through which we view information that is interesting to us. And so, one big part of the problem is we can remain stimulated into the night. So our mind is engaged and we don't feel that sleepy and that's a two-pronged issue. On one hand, light is entering our eye, particularly a white blue light that is very stimulating to the brain. So, there's something now called iPod insomnia. The idea is people will lie in bed and say, "Well, I'm just going to look at my iPod until I feel sleepy." But the problem is that the light entering the eye and then, also, of course, the content of the reading, can keep you alert. And so, even though you might be asleep already, you're up lying in bed and reading a while into the night. And there are some nights where it can be really bad. You can stay up quite late. Then another night that's not so bad you reach into the night and you put it down. But on average, if you make that a part of your regular behavior, then when you find this is just another way you're tranquilizing, you've reduced total sleep time by half an hour or 45 minutes, maybe even an hour on average.



You're losing out on an hour of sleep because of these behaviors. And so, one thing you really want to do is control your light environment in the evening and at night and also during the day. There's more about that in the lifestyle section.

Larry: How would you treat the problem?

Dan: So, how do you get good sleep? You know, that somewhat depends on this specific sleep issue that you have. So, if you're somebody who doesn't have an organic sleep issue such as narcolepsy or mild sleep apnea or something like that, then there's going to be a very specific protocol you can use. You can work with your doctor. I think you get good advice about what you do best because there's a lot of different strategies and approaches. It's very dependent on the issue that you are dealing with. Then there's a content of sleep is hygiene and without it basically is... Sleep hygiene is the variety of things you can do behaviorally that are going to help you get a good night's sleep. This actually applies to everyone whether you have organic sleep issues or not. Everybody needs and can benefit from a good night's sleep. There are certain things you could do to encourage that. And so, good sleep hygiene generally means you can focus on what your bedroom looks like. Is it comfortable? Cool? Quiet? Dark? Does it enable you to get a good night's sleep without a lot of interruption? Do you have a lot of interruptions from your environment? If you do, there are ways you can negate that. Use ear plugs or an eye mask or blackout shades. So, that's one thing you can do to assess your environment. Can you improve it or can you optimize it so it's less distracting?



That's one. Then in the evening, you can think again about creating a smart approach for prior to bed. It will include dimming the lights because, remember, light is very stimulating to the brain. Then there's also quieting down. There's also setting a time. So, let's say 11 p.m. is your bed time. By 10 p.m. electronics are down, TV is off and you also are starting your "going to bed" routine, right? So, if you want to be in bed by 11, you don't want to start thinking about brushing your teeth and all the things before you get in bed at 10:55. All right, it's good to just disconnect from technology to start getting ready. I think the ideal scenario is, if you want to be in bed by 11 p.m., you try to be in bed actually even earlier than that. You don't want to be doing things and then try to sleep at 11 p.m. It's not just getting to the bed. So, it's my bed time, it is 11 p.m. I actually try to get in bed maybe by around 10:30 and just let my body kind of wind down. In that way, I'm already there and, if I feel the urge to sleep, I'll just let it happen. I think that's a really good thing you can do. And then you take one step backwards. So, we talked about what are the conditions in your bedroom. What do you do before sleep? And then during the day, what can you do as well? Well, getting outside during the day, and getting a lot of bright lights, that's when you want bright light. So, when you get outside during the bright of the day is going to increase melatonin production by about 50% at night. It also helps to anchor that circadian rhythm. So, you're not kind of inducing the state of an actual jetlag. It's very, very useful. Then, also, there's using your mind, using your body. An example of that is somebody that is on a bed rest either in clinical protocol or because of an injury. Then what happens is the less they move during the day, the more fragmented and poor quality their sleep at night. Think of sleep and physical activity as almost



two sides of the same coin. When you're active, most physical during the day, and it doesn't mean you're training to run a marathon, it just means you are standing, you are walking, you are thinking about puzzles and challenges. All of that helps you have deeper sleep at night. It also means you're constant with a synchronization where it's not we're having desynchronized rhythms but we have a very flat rhythm. A good example of that is during the day, you're inside, in low light, sitting all day and maybe doing less mentally stimulating activity, sometimes stimulating, sometimes not. Then at night because you didn't have that much stimulation, you're actually experiencing shallow sleep. So, it's very normal to wake up during the night, you just fall right back to sleep. However, if you have a lifestyle like I just described, which is actually quite common in our modern world, then you end up more likely to wake up during the night and stay awake. Right? Instead of waking up rolling over and falling asleep, you wake up and you end up awake in the middle of the night. Insomnias call this Sleep Maintenance Insomnia. So, those are just a couple of things you want to think about. We have this concept, we want to help everybody become a restorative sleeper. And what does that mean? It means that during a 24 hour period, you're doing those things during the day, evening and night to help you get consistent, regular, deep restorative sleep. Those are some of the hallmark things that you can all do. So, I would try to view it that way.

Larry: Is there any differences between men or women?



Dan: Depending on what phase of life you're in, there can be some important difference between men and women. Women, during menopause particularly, often have trouble with sleep. The reason is a metabolized of progesterone that is active in the GABA system. So, as women are going through that period of their lives they can have more anxiety. They also can have more arousal at night. So, sleep is terrible and generally more anxious. That's often how women have to view it for a period of time. The body is used to always having had this stimulus. Once it's missing, it just increases the brain's excitement and that's something that takes time to deal with. There's a variety of strategies people can use and you certainly have to pay more attention to your sleep hygiene. During menopause you have less flexibility as a woman to neglect the things that are going to be helpful. But given everything we talked about, I would start doing that. If the problem is really persistent and remains, then you can explore some pharmacological methods or talk to a doctor. See if there's other... like eliminate sleep issues that are going on, get that diagnosed. Sleep apnea is very common in our population among both men and women. It can lead to a lot of daytime sleepiness. It's mostly a breathing issue. What happens is the airway becomes secluded and so you don't get air into your body very easily. So anybody who snores has a higher risk of sleep apnea. It can range from mild to severe. What happens is you'll end up waking up a lot during the night. Again, those arousals, you may not even remember them. You may go to bed and wake up in the morning and feel that way and just feel like, "Gosh. I got a really bad night's sleep." But if you were to study somebody in a sleep lab, you would see they were up hundreds of times at night. So, it was almost like they got no sleep at all. And so, if you

snore, go to your doctor. If you snore and have a lot of daytime sleepiness, then I think it's really good idea to go talk to doctor. See if you can get a sleep study done. Then you can explore the different options for how to address that.

Larry: What dietary recommendations would you make?

Dan: The information about food and sleep is really not that compelling to me. I think it's been studied in a variety of ways. You want to have low protein or low carbohydrates or higher fats. The information on the subject is, I think, still new and it's conflicting. So, I do think having any sort of food close to bedtime has the potential to make you sleep less and have lower quality sleep. If you think about it, eating a meal is going to be something your body has to process. So, your body has to digest that meal. Right? So, if you're going to bed at the time when your body is really working hard, then its ability to get into the deeper sleep stages might be compromised. So, additionally, there are certain hormones like Ghrelin, which is a fascinating hormone, to be released from the gut and it's terminally thought of as a "feeding" hormone. So, if you inject into humans and animals, this hormone causes a lot of hunger for them. They eat and, over the course of the day, you have Ghrelin levels that naturally are what they call episodic. So, they will rise in their lower and when they rise, it basically stimulates meal time and then after you eat, it's suppressed, and then they slowly start to rise closer to the next meal. Also, this hormone is very potent at stimulating growth hormone. In fact, the function of these hormones was discovered before the hormones. It was thought of as a major secreted growth hormone and that is one thing it does. And so, a lot of our growth hormone, which is restorative and helps repair body tissue, is released in the beginning half of night. So, if you have a standard bed time somewhere between 10 and 11:30 p.m.



and you had your last meal after 6:30 or 7:30 p.m., you're going to need a few hours to digest that. Your Ghrelin levels are going to start increasing slightly by the time you're ready for bed. That kind of stimulates growth hormones, which also is closely integrated with a very deep type of sleep that is important for a variety of things called slower sleep. If you have a meal very late at night, then you're suppressing Ghrelin which can has one signal that's going to not again stimulate a lot of growth hormone and kind of reducing the amount of growth hormone that's released for that night. Then you're also making your body work, which is going to interfere with getting into those really deeper sleep stages. So, the point here is that timing is important. If you eat late, try keeping it light. It's better to have your bigger meal earlier in the evening and give yourself two hours before you sleep. I know some people also can have hunger issues in the middle of the night. That is an entirely different type of parasomnia depending on the severity. Some people will wake up in the middle of the night and go eat food and not even knowing it. It's a form of sleep walking. We're very much creatures of habit. So, if you are used to waking up and going the refrigerator, you really create that habit by doing it more and more. So, you want to try to extinguish it. One way to do that is just not to attend to that hunger if you wake up and experience it. Then over the course of the next couple of days, you actually might be able to get through the night. Now supplements people should take in are 5-HTP, Magnesium, Melatonin. These things are not really well studied. Magnesium is involved with more than 300 different enzymes in the body. Some of those are related to neurotransmitter like GABA formation and the formation of melatonin. So, they're involved but it's not really been well studied to know if they help you with sleep initiation. I will say the placebo affect of these towards sleep is very powerful. Now, people think of the placebo affect as a dismissal of the real affect. The placebo affect, in fact, is a very legitimate effect. It means you're taking something you believe is going



to work and it actually does. Actually, different physiological things take place because you believe this is going to have efficacy. So, and, in fact, I won't go into a tangent here. You can tell someone it's a placebo and they take it. It still works. That's some work from Harvard. So, that's why, for any insomnia studies where the drugs will get FDA approval, after they exceed a very high control group effect because they're being affected by the placebo ideas as well. So, you have to have very high efficacy levels to counteract various types of stimulant control that are taking control of your efficacy. So, anyway, whether these things are actually causing a psychological effect that is important in either sleep initiation, with depression, with gratefulness is yet to be told. But people do report that they have, they find benefit from them. So, I think taking magnesium at night is not a bad thing. 5-HTP is a 5-hydroxytryptamine that crosses the blood-brain barrier. It is a precursor in the balance and consistency of serotonin, which is a several bio-chemical fluctuated from the production of melatonin, which, of course, is involved in sleep regulation. So, that one could definitely have a probable effect and I know a lot of people will probably get its help. So, you may want to do a little bit of experimentation. It just acts mostly as a precursor to the neurotransmitters. I don't foresee any issues at normal dosage. And then, melatonin is hormone and when you think about it, because of artificial light stimulation, we're getting a lot less dark. The melatonin is the darkest hormone or getting a lot of less dark as it used to. And you know, this hormone is going to affect how the brain's master clock is working and the signal that it's giving you in the body. But melatonin also acts as an anti-oxidant. It has a pervasive effect, which it shoots off the body. And so, pretty interesting research has looked at melatonin for anti-suppression and things such as rheumatic arthritis and other conditions. The conclusion is outstanding. But it sounds...it's interesting. They're also being looked for certain neurological conditions and very high doses. So, it's an interesting drug. I think it takes very little, half a milligram, to affect circadian rhythm but it's actually not



a very potent sleep drug. So, when you take it, it does induce sleep, but it does so somewhat weakly. And so, if you're taking that at night, I don't see that it is a problem. You can get into fairly complex protocols depending on jetlag but honestly they're confusing. So, it's probably hard to discuss them, but you can look up some of them up online. So those are probably the three main ones. Otherwise, there's some herbal teas and valerian root. What I would say is, do some experimentation and find something that works for you. Like anything, try to address the behavioral side first before you think about any sort of pharmacological intervention. Then you might have some things I think can be used occasionally. Generally speaking, you probably are going to be okay. And that even includes things like Ambien..etc. I think periodic use on occasion can be okay. More of the chronic use is when you get into a situation where you can have issues. So, my default is always trying to address it as naturally as possible, beginning with behavior intervention. Then do not forsake some of the good kind of pharmacological treatments, whether that would be "natural" or the drug related for certain kinds of situations. So, that's my general recommendations about medications, food, food timing and sleep and what I do to induce good sleep on a regular basis. So, alcohol is a bit paradoxical because it is a depressant. We don't drink alcohol so we get depressed, even though that's one of the effects of a depressant. But one of the first effects is a central nervous system depressant, which lessens inhibition. So, that's why we drink alcohol, because feel loose and disinhibited and it has a generally positive effect on our mental being, when taken in the right amount. And so, the problem is eventually it can make you feel very sleepy but when alcohol has metabolized out of the body, you can be very alert. But people often drink in the evening, when it might make them sleepy and fall asleep more quickly but then it can disrupt sleep at night. So, this is occurring during the time when you're usually getting your deepest stages of sleep, which are then reducing all of that sleep pressure that built up

across the day, has dissipated and most aggressively in that first third of the night. When you drink alcohol, that first third of the night is affected negatively. So that's why when people who drink sometimes, they wake in the morning and just feel slow and groggy. In fact, a lot of people think it is alcohol's effects, alcohol's toxicity, that makes them feel bad. A significant contribution to that poor feeling is actually the effects of alcohol, causing you to not get very good sleep. So, what I would say is drink lightly in the evening and try to stop drinking within an hour of bed, usually. Obviously, there is always times here and there that may not be the case. Just try making that your general habit. So, that's probably the biggest one. As far as diet goes eating fat at night, or carbohydrates, all of that is speculative and there is nothing that shows definitively like this is exactly what's going on. It's very contextual. So, I think we can play around a bit but there is nothing really conclusive. So, I would say, watch your alcohol level, watch your light level, watch your other stimulation. Those are some things you can do.

Larry: What lifestyle recommendations would you make?

Dan: Okay. So, when you're thinking about constructing a healthy behavior set around sleep, we call it when you go back to what my company does. We try to help everybody establish an effective daily health practice. So, that means that around things such as physical activity and sleep and eating, you're practicing behaviors that are going to heal both your immediate and long term health. So, as a restorative sleep contact, we talked already about things you can do during the day, evening and night to affect your environment and also become more physically active. It doesn't take a lot of physical activity, but we have an objective of walking 10,000 steps a day. That means you are sitting less. If you look at the chart, it's remarkably effective. Walking is remarkably effective



at satisfying various aspects of physiology that yield to help them. Right? So, for example, if you walk 10,000 steps a day, you tend to handle blood glucose from your meals a lot better, whereas if you don't, and your sedentary you have these blood sugar spikes. But additionally, that same amount of movement can facilitate deeper sleep. So, you know, all of the stuff. We talked about it sometimes in a somewhat linear and isolated fashion. I've been talking about exercise and now I'm talking about sleep and diet. They all are interrelated. So, overall we want you to create a healthy lifestyle that has certain objectives everyday. Then one really exciting thing now is the technology has been developed with tracking devices that let you know if you're doing something. So that can be enormously helpful because access of health, particularly around sleep, can be mundane. It's not that exciting to go to bed at the right time every night. It doesn't feel like, you know, hey, I went out there and I trained 10 miles for my marathon or whatever. That feels a little bit more substantial, whereas, "I went to bed at 11," doesn't feel as impressive. Yet, the health benefits are really comparable, right? And so, that's part of the problem. We're dealing with the situation where the right things you do is easy to dismiss and it's easy to overlook. So, technology can help. For example, in my company we created dash-board, and that dash-board, the whole idea is trying to help somebody stay in their zone of health. Then we can validate a couple of different measures in our physical activity, both high intensity and low intensity, and then sleep. So, there's sleep timing and sleep duration and then we integrate data from devices such as the Fitbit and the activity tracker and body weight scale. So, all you have to do is use these tools. Wrap them on your body, step on the scale in the morning and the data is transmitted wirelessly. It can create some really informative feedback for you. And so, I feel really good about recommending the people, if they listen. You know, make Dan's Plan or make one of these tools a part of your daily health practice. It's giving you feedback that helps you make small adjustments. The



other way to do it is getting information from a doctor or somebody else and then you go months, right? Then you want to get blood work done so you get to know of a physical... Then you find out, "Hey. How am I doing?" There's a lot of fine tuning that can happen on a day-by-day basis that just keeps you in that healthy form. When you engage with these tools, they become remarkably powerful and effective at modifying your behavior. If you've never used a Fitbit or a step tracker, wear one. Set a goal. The average goal usually is about 10,000 steps a day. The World Health Organization and most major medical organizations inside and outside of the United States recommend that because the data is compelling enough and suggests that's a good level to try and reach. And the nice thing is, how do you know how many steps you've taken if you don't have a little device to tell you? You might have a one-mile walk built into your day but the majority of your steps are going to take place when you are at work. So, the step tracker reminds you to get up and pace around, walk around and the Fitbit also tracks sleep. So, you can wear it on your wrist. There's an event tracker that, if you push the button right when you go to sleep and then you push it again in the morning, that's all you have to do. You're going to see what time you went to bed and your approximate sleep duration. It's going to give you some measure of efficacy about your sleep deficiency. There are a lot of these kinds of devices. The competition between them is pretty fierce. So, each device wants to offer more features. What I say is be very cautious. The type of information the device provides might be interesting for maybe two weeks but it can distract you from the things that actually matter, such as getting into bed on time. Right? Remember, your sleep quality tonight is influenced not just by what you did today but what you did yesterday and the day before that, last week and even last month. So, your sleep last night, that quality of sleep is very long range cycles that are restored within you. But the things you can control include bed time, bed duration and how you sleep, right? I like to keep things as



simple as possible and focus on the things you can do that are actions. So, as you're evaluating different devices, I really recommend using them, making them a part of your health routine. Watch out for the ones that promise too much and give you 20 additional features. It's not about that. I think, often times, a lot of them don't necessarily state their value clearly. They just say they do "X,Y and Z" and, unfortunately, just part of marketing. You can use Dan's Plan or you can use others. I think in the next couple of years, new self-tracking and searching devices are going to move from a population that is afraid of doctors and become a little bit more tech oriented to mainstream. Our parents are going to be using them and kids are going to as well. They really will reach across the age spectrum. So, I think you can get in early but they are already popular enough and they really do provide good value. So, because with sleep, we're dealing with an act where it's really easy to neglect the important things. This is a way to fight back. I encourage you to use these devices. I encourage you to use Dan's Plan. It's free and useful. And I think that is a good comment on lifestyle. Otherwise, we've covered other aspects of diet and things you can do during the day. So, I would say use technology as well, that can really benefit you.