David Sandstrom 0:08
Welcome to the holistic health matters podcast where it's all about maximizing your health potential in body, mind and spirit, so that you can pursue the abundant life more effective. I'm your host, David Sandstrom, and this is episode number six. This episode is part one of a two-part masterclass on sleep.

We're going to talk about what happens to us during sleep, and the benefits to a good night's sleep. We're going to talk about the hazards associated with a poor night's sleep. And in the next episode, we're going to talk about how to get a better night's sleep. We'll start off with some of the low hanging fruit and work our way up to some of the more aggressive and potentially more expensive measures. And finally, we'll wrap it up with some supplements. that we can use to get a better night's sleep. If you're a part of the double HCM community and you've been listening to these episodes, you know that I like to geek out now and then well, in this masterclass, we're going to do a little geeking out. In my book, I call these sections, the geeks corner, and I recommend that people use them as optional reading. But here on this in this format, I highly recommend that you listen to some of the more technical stuff because when it comes to learning as an adult, we're far more motivated to implement what we've learned if we understand why the recommendations are being made. So this first episode, we're going to outline how significant sleep is, and it's going to get a little technical, but I encourage you to hang in there. We'll get to the stuff that everybody wants to hear and that is how to get a better night's sleep, but I really encourage you to dig deep in this first episode. It's gonna be it's gonna be really fun.

I not only want to inform you but I want to motivate you as well and that's the reason for that recommendation. When I was in my MBA program, we took classes at various locations at Embry Riddle Aeronautical University. And one of my classes was at Homestead Air Force Base. And as you might expect, there are a lot of Air Force personnel in the class. And most of them were F-16 fighter pilots. And I was the only civilian in the class

with a class was called organizational change. And one of our assignments was to make a presentation to the class and teach a subject that we might be familiar with. Well, I started off my speech with this is why we're going to learn this topic today. And I wanted to give them a few reasons as to why they should do it. And I proceeded to make my presentation at the end of the class was given an opportunity to critique my my presentation. And the universal critique was, you know, why did you start off with such a diplomatic approach? So well, because I think adults learn better that way. If they understand why we're learning what we're learning. The Air Force has a strong culture towards respecting authority and understanding the chain of command. So following orders is deeply ingrained in a fighter pilot. So they thought it was ridiculous that I would encourage people or give people reasons why this lesson is going to take place. They said, Look, you just tell the student, either you do it or you're going to die. Okay, then you move on. I would disagree with that approach. I'm not your commanding officer. I'm not your drill sergeant. I'm your teacher and coach and hopefully mentor. So I'm going to give you some reasons why I make the recommendations I do. And hopefully that will motivate you and inspire you to implement some of these changes. So this is a masterclass. So it's going to get a bit technical. And I encourage you to listen to this episode a couple of times, and you may even want to take notes. Well, if you're anything like me, you listen to your podcasts on the go and you're unable to take notes. So got you covered. I've created an outline for this episode. It'll be available at David Sandstrom.com search for episode number six. And there in the show notes, you'll find the usual transcript that you can read online and or download. But for this episode, you're going to be able to download the Cliff's notes version and review that at your leisure. I encourage you to go there and do that.

The experts tell us that 85 to 90% of all doctor visits are stress related. That's a surprising number. But it's actually really good news for us natural and holistic health enthusiasts, because when it comes to stress reduction, we actually have a lot of control over that. And sleep is one of those lifestyle choices that we do have a great deal of control over exactly how much sleep someone needs is an individual thing. According to the National Sleep Foundation, they say that adults between the ages of 18 and 64 need between seven and nine hours of sleep per night. So if we're getting eight hours of sleep, that means We're spending a third of our lives in bed. So I would say that's something worth taking seriously, if we're going to spend that much time doing it. If we care about our health, I

believe we should be doing everything we can to maximize our restoration and the productivity of our sleep. So there are two categories to sleep. One is REM sleep, which is rapid eye movement, and then there's non-REM sleep. And we go through 90 minutes cycles throughout the night. We start off in non REM sleep and we progress from light sleep into deeper sleep. And this is where we do the deep sleeps where we do most of our physical restoration. Our cellular repair or detoxification, takes place during stages three and four, which is considered deep sleep. And those four stages are followed by REM sleep, which is lighter sleep, and that concludes the sleep cycle. during REM sleep, we dream and we process our emotions and we consolidate memories. We move items from short term memory or kind of like a computer's ram random access memory to long term memory, which is sort of like a computer's hard drive. During the light, rapid eye movement phase of sleep. The cycle takes about 90 minutes and then it starts all over again. Deep Sleep is the most restorative on the physical level, and occurs in the final stages of non REM sleep. The five stages of sleep represent a continuum of relative depth. Stage One is non REM and it starts out light. It lasts between one and seven minutes, and we move from being awake to being asleep. During stage one, our body functions like heartbeat, respiration and eye movements begin to slow our muscles relax, with occasional twitches. So if you most of us have experienced that, that sensation of twitching as you're falling asleep While you're actually in stage one sleep when that happens, our brainwaves slow and they produce alpha brainwaves which are indicative of a relaxed wakeful state. And then we move into stage two. Stage Two is also non-REM and it starts off at like 10 to 15 minutes cycles and gets longer as the night progresses. Stage two accounts for about 50% of our time in bed, and our body systems continue to slow and relax. This is where our core body temperature drops which is crucial to a good night's sleep. Our eye movements stop and the brainwaves continue to slow, but we have some short bursts of activity during stage two. Stage three and four are where we experience deep sleep, most of which occurs during the first third of the night. Stage Three is deeper sleep than stage two and it's considered deep sleep. We have even slower brainwave activities with a lower frequency But with a higher amplitude, which means the brain waves are going through a deeper cycle. Now this stage only lasts a few minutes, and it accounts for three to 8% of our total sleep. And then we move into stage four, where our heartbeat and breathing become their slowest there'll be throughout the night, our muscles relax, and it's difficult to awaken somebody in stage four sleep even with loud noises.

stage four sleep is also referred to as slow wave sleep or delta sleep where our brains are producing Delta brainwaves. This is the lowest frequency and the highest amplitude brainwaves we produce.

The first cycle of deep sleep stages three and four lasts anywhere between 45 to 90 minutes. It lasts for longer periods in the first half of the night, and they become shorter with each sleep cycle throughout the last half the night. This is why it's important to get to sleep at a reasonable hour because before midnight Night, we have better, more productive, deep sleep. And then there's stage five, which is rapid eye movement or REM sleep. It occurs about 90 minutes after stage one begins. during REM sleep, our eyes move rapidly from side to side, we experienced dreaming. As our brain activity increases to a more wakeful state, our heart rate increases to near its wakeful state, breathing becomes faster and even irregular at times. And this is where we do our emotional processing, and memory reconsolidation where we move our short term memory into long term memory sort of like the computer going from random access memory to the hard drive. So what are the benefits to a good night's sleep? Well, one of the major benefits is organ detoxification. All of our organs and systems go through a detox cycle based on ourselves. cycadian rhythm, the organs that do most of their detox. During the nighttime an early morning portion of our circadian rhythm are the gallbladder, liver, lungs, and the large intestine. The large intestine is stimulated to eliminate waste between five and 7am. Most of us will make a trip to the bathroom in the early morning hours.

The most important organ that does its detoxification at night is our brains. And there's been some great research came out recently from the University of Rochester Medical Center published in the journal Science that proves how important sleep is for brain detoxification. The lymphatic system plays an important role in detoxification in general, however, there's a major limitation because of the blood brain barrier. lymph fluid cannot access our brains. So how do our brains get to detox? Well, there's a system that God gave us called the Glymphatic system, and it's highly active during sleep. during sleep, our bodies pump cerebral spinal fluid to the brain in order to flush away toxins. During this process, toxins are moved out of the brain and into the lymphatic system where they make it to the liver and eventually removed from the body. This includes toxins such as amyloid beta that is known to contribute to neurodegenerative diseases such as Alzheimer's and Parkinson's. In addition, when we're in

an alert wakeful state, our brain cells enlarge. In a restful sleeping state, brain cells contract in size by upwards of 60%. This causes the spinal fluid to move more freely past the brain cells which greatly enhances the efficiency of the flush. Again, this system is highly active during sleep.

This is one of the most important physiological processes that takes place during sleep, but it's not the only one. There are lots of other crucial processes that take place as well. For instance, hormone balancing goes on. In a 2015 study published in the International Journal of endocrinology, researchers showed that key hormones get regulated during sleep. Here's what they said. The regulation and metabolism of several hormones are influenced by interactions between the effects of sleep and the intrinsic circadian system. Growth hormone, melatonin, cortisol, leptin, and ghrelin levels are highly correlated with sleep and circadian rhythmicity unquote. So let's go over those one at a time. Growth Hormone crucial hormone, especially for muscle and bone tissue integrity. It's also used for sugar metabolism. Melatonin most people know produces relaxation and sleep. We'll be talking some more about melatonin in the next episode. cortisol. Cortisol is kind of gotten a bad rap these days. We need to understand that cortisol is not all bad. In fact, it's very good. We need it. It's essential for life. We have a cortisol rhythm and in the morning, our bodies release large amounts of cortisol around 8am. And this produces a more wakeful, energized daytime state. And it also cortisol enhances our ability to cope with stress. leptin is known as the satiety hormone it tells us when we're full ghrelin, on the other hand, is the hunger hormone, it tells us when we need to eat again. So if we have imbalances in our leptin, and ghrelin levels, we're going to struggle with hunger and unhealthy food cravings. In addition, hormone disruption is a source of stress. If we don't balance our hormones or have the right amounts of specific hormones, we can cause a cascade of all kinds of ill effects. Those effects would include weight control that can lead to obesity, blood sugar dysregulation that can lead to diabetes, and on and on it goes.

Another very important function that takes place during sleep is immune function. There's a study out of Germany published in the Journal of Experimental medicine in February 2019. that points to some important insights as to how sleep will enhance immune function. Our bodies destroy pathogens, such as viral infected cells, and cancer cells by using killer T cells manufactured in the bone marrow and the thymus. These specialized T cells make it into the general circulation or the blood flow by way of the

lymph system. But simple blood circulation is not enough. In order to do its job or fulfill its function. Each T cell must adhere to the unwanted viral infected cell Now, here's the really insightful part that these researchers shared. Our bodies use a special cell adhesion molecule called integrants. They make cell walls more sticky. This helps T cells do their jobs. The researchers in this study found that higher stress hormone levels such as cortisol and adrenaline, inhibit integren formation. stress hormone levels are lower during sleep. lower levels of cortisol and adrenaline during sleep help facilitate higher production of these sticky cell adhesion molecules called integrants. During the study, researchers compared integrant levels from people who stayed up all night to people who slept. Not surprisingly, people who slept had much higher levels of integrants. This helps the killer T cells adhere to the cell wall of the viral infected cell greatly enhanced Seeing the effectiveness of the T cells ability to kill the pathogen. Here's what they said in their conclusion, quote, because the levels of adrenaline and noradrenaline are lower during sleep time, the stickiness of the organs is stronger. This stickiness is important because in order for T cells to kill virally infected cells or cancer cells, they need to get in direct contact with them. And the intricate stickiness is known to promote this contact. Unquote. Or if if anyone ever needed a reason to work on getting a better night's sleep, then this is it. With a stronger immune system, we strengthen our internal terrain, making our bodies hostile environments for any undesirable microscopic organism. This is huge is really huge information. Remember we talked about in previous episodes, we want to treat our health like a seesaw and we can never completely lose innate health blocking factors but we want to stack our seesaw in a lopsided fashion where we have far more health enhancing factors on one side than we do the health blocking factors on the other. Well, this is one of those health enhancing factors that puts a lot of weight on the right side of our our seesaw.

Sleep not only enhances immune system function, but important cellular processes take place during sleep as well. When we're sleeping, our bodies replace old worn out cells with new ones. We live and die at the cellular level. Our bodies are made of groups of cells that make up tissues, and groups of tissues, makeup, organs, groups of organs, makeup systems, and groups of systems make up our bodies. So it all starts and we live and die at the cellular level. All cells have a lifespan. They range anywhere from a few days to several months between Because we are fasting or abstaining from food during sleep, certain crucial cellular

processes are enhanced. Specifically, a pop ptosis and toffee G. I've never heard of those. A pop ptosis is programmed cell death. So you might say, well Dave, why would I want my cells to die? Well, cell death is a very good thing because there's a name for uncontrolled cell growth. It's called cancer. So we want our cells to die off, we want them to be replaced, and they're replaced through a mechanism called autophagy. Auto stands for self and phagy means eating. So autophagy means the cell eats itself or commit suicide. Now autophagy takes place during a fast when we're abstaining from food, obviously, if we're sleeping or not eating right, so if you want to maximize the physical benefit during sleep, do not eat after dinner and don't eat in the middle of the night. Yes, you know what I'm getting at. Next time you're on a Netflix binge at one o'clock in the morning, you don't order the Pizza Hut delivery. Okay, we just do without the food. Of course, I would recommend getting getting to bed before one o'clock, but we'll talk about that in the next episode. But during a fast, the body breaks down cells it doesn't need sort of like when a corporation is experiencing a downturn and they need to reduce staff. They'll try to figure out where the dead weight is, and lay off those people first. Our bodies do the same thing. They get rid of old worn out cells that aren't doing us as much good. They're not as efficient as they should be. And they replace them with new healthier ones. During autophagy. Our bodies take debris that's leftover when a cell dies, and either make a new cell out of it, recycle it or remove it or take out the trash. So autophagy Is recycling and taking out the trash at the same time. At the cellular level, the level of autophagy is not a switch, it's more like a dial. There's been a lot of discussion these days about intermittent fasting and how we can trigger autophagy through through a fast. And you'll hear a lot of people say things like, well, you need at least 14 hours, some say 16, some say 18. Well, maximum autophagy efficiency is reached after a five day water fast. We're always experiencing autophagy, but it depends on what level we're experiencing it it's kind of it's more like a dial than it is a switch. Okay? This is important to understand, because if we want to really maximize autophagy, we've got to do a five day water fast. Well, we can't do four or five day fast per month. It's just impossible. But we can experience an enhanced level of autophagy every night by not eating in the middle of night. And being disciplined about our sleeping habits. Apoptosis program cell death and autophagy recycling or taking out the trash are super important cellular activities that need to take place in order for us to maintain our health. And they also have huge anti-aging applications. If we want to age gracefully which you should do if you're embracing a natural

and holistic lifestyle, experiencing regular and efficient apoptosis and autophagy is crucial to that end.

Another thing sleep does is it helps us process our experiences at an emotional level. Remember, this podcast is Holistic Health Matters. We are spirit, we have a mind and we live in a body. We're not going to stop it just talking about the physical implications of a good night's sleep. I want to talk about the mental and emotional aspect as well in a study public In the Journal of American Psychological Association, researchers found a strong interaction between sleep and emotional regulation. This is especially true with depression and PTSD or post traumatic stress disorder, which are both highly associated with poor sleep. Up to 90% of people struggling with depression or PTSD, also struggle with their sleep. The research is used both clinical observations and brain imaging to confirm the connection between sleep and effective emotional processing. I feel like I'm in a very good position to testify to the benefits of a good night's sleep and emotional regulation. We have four daughters, the oldest of which is 19 years old, she's sophomore in college, and the youngest are 11 year old twins. And we have a 16 year old in the middle. So between our four daughters, my wife and our female dog there There's a lot of estrogen running around in my home, I'm the only male. So I get to watch what happens to our kids, especially the younger ones, when they're wrestling with their emotions after a poor night's sleep. Our younger ones may have sleep over and they think it's fun to stay up late when someone's over. So even though we know it's an unhealthy practice, if it's a weekend, we'll let them do that just to have some fun once in a while, but I know that they will pay a price in terms of their ability to handle their emotions the next day. What would ordinarily be a nickel and dime event can turn can escalate into a real drama real fast when the girls have not been well rested. So a good night's sleep is super important when it comes to emotional regulation and the processing of our emotions. Sleep also plays an important role in the consolidation of memory. Remember I said earlier that we take short term memory and move it into long term memory. during sleep, according to a peer reviewed study in the journal Public Library of Science, declarative memory, or the recall effects is enhanced after a sleep event. This was a really cool study. They took they studied teenagers, and they took half of them and train them on memory exercises at 9am and then tested them again at 9pm. With no sleep in between, and the other half the subjects were trained at 9pm slept and then tested 12 hours later at 9am. The subjects with the sleep score 21%

higher in declarative memory tests. That's pretty significant. I mean, when it comes to performance in school or performance on the job, in terms of finding the abundant life and living life to its fullest, I think a 21% increase in memory Is is a pretty huge factor. So sleep is super important when it comes to recall effects. Now enhancing memory is still only part of the story. Sleep also increases daytime cognition, concentration, productivity and performance. And an article published in the journal memory and cognition in February 2013. Researchers showed that complex problem solving skills improved after a good night's sleep. So, what other hazards of getting a poor night's sleep?

There aren't many factors of our being that can skate by unscathed with a poor night's sleep. A poor night's sleep increases our chances of getting into a car accident. According to an article published in the National Highway Transportation Safety Administration, they had this to say: "Drowsy driving is not just falling asleep at the wheel. It is a profound impairment mimics alcohol impaired driving in many ways, drowsiness leads to slower reaction times and impaired attention, mental processing, judgment and decision making." You know, as an airline pilot, this is kind of a big deal for us. We have regulations that strictly govern the amount of rest we get before we show up to work because of this very this very factor, that if we're fatigued, our performance can degrade down to the level of being intoxicated. In fact, after 16 hours awake, some some test show some studies show that a pilots performance in the simulator is degraded about the same level as having two or three beers. That's pretty significant. So we have regulations that govern us getting a minimum amount of sleep before we go to work. A lot of times when that happens, it might be because of a delayed flight the night before. Maybe there was weather or some type of a mechanical issue and we got in really late and was asleep early the next morning so we have to delay the flight the next morning. Well, usually when we get to the airplane in the morning the flight will be boarded flight attendants are on board already with the passengers. And we'll get some comments like, "Ohhhh, did you get your beauty sleep last night?" Well, let me tell you something. You do not want to be in the back of an airplane with a fatigued, tired pilot. Trust me, it's not a good idea.

The number one cause of death in the United States is heart disease. A lack of consistent quality sleep increases your risk of high blood pressure, heart attacks, and cardiovascular disease. Our hearts are susceptible to

problems with even a few nights of sleep disturbances. According to Matthew Walker, Professor of neuroscience and psychology at University of California, Berkeley. He is also the founder and director of the Center for Human sleep science. Here's what he had to say about heart disease and sleep. "In the spring, when we lose one hour of sleep, we see a subsequent 24% increase in heart attacks. In the fall, when we gain one hour of sleep, we see a 21% decrease in heart attacks. That is how fragile your body is, with even the smallest perturbations of sleep."

The number two cause of death in the United States each year is cancer. Again, cancer is uncontrolled or unchecked cell growth. Because of cellular apoptosis and autophagy, a regular fasting regimen and consistent quality sleep will help reduce your chances of cancer. Because you listen to this podcast and you're part of the double hm community. You understand how crucial cellular cleanup is, you know why a good night's sleep will help prevent cancer.

Two more very common health challenges are obesity and type two diabetes because of hormone dysregulation, again, Lack of consistent quality sleep increases your risk for both of these as well. Poor sleep will increase our risk for osteoporosis, we see an increased risk for pain and pain related conditions, increased susceptibility to stomach ulcers, impaired sexual function, increased risk of depression and anxiety, impaired regulation of emotions and emotional perception. We just talked about that. premature aging and all cause mortality. I could give you references in the public literature for all of this, but we'd be here all day. I think you get the point. So are you ready for some tips on getting a better night's sleep? I hope so. I hope you've warmed up to that idea. But you got to have to wait till next week because this episode is full. We don't have a whole lot of time left.

As a quick recap, with a good night's sleep. we enhance our brain detoxification through the glymphatic system. we enhance our hormone balancing with especially certain key hormones that help to regulate our appetite which will will help control our weight and reduce our chances of obesity or type two diabetes. we enhance immune function in super important way by helping our killer T cells do their jobs better. Our cells experience apoptosis which is programmed cell death, and autophagy, which is cellular recycling and taking out the trash simultaneously. We have better or improved emotional processing and emotional regulation.

we enhance our memory. we improve our complex problem solving skills with a better night's sleep. We reduce our risk of cardiovascular disease, cancer, obesity, diabetes. We also reduce our risk of getting in a car accident. We reduce our risk of osteoporosis We reduce pain and pain related conditions reduce our susceptibility to stomach ulcers. good sleep will reduce our risk for depression and anxiety. good sleep will slow the aging process and will reduce our chances of all cause mortality. So you might be saying to yourself right now… Dave that was a mouthful. You just shared a ton of information…the glymphatic system, apoptosis, autophagy…I'm not even sure I understand at all… that's OK neither do I, but raw cool part is our bodies do. Remember our bodies have a God-given innate intelligence to them and they know how to perform all of those functions and more… All we have to do is get the obstacles out-of-the-way and let our bodies do what they already know how to do… and that is to thrive. So, there are a lot of good reasons. I told you at the beginning of this episode, I was going to give some reasons to pursue a better night's sleep. And there's a long list as some pretty pretty good stuff, some pretty exciting stuff with a better night's sleep. And next week we're going to be talking about the specifics on how to go about doing that. For more you can always go to my website, David Sandstrom.com forward slash podcast, search for episode number six. in the show notes section you can find a full transcript can read it online or download it if you want. And for this masterclass episode, I've created some notes for cliff notes that you can download and print out and read for your review. In those notes. I will have references to all of the published literature articles that I mentioned in this episode if you care to dive a little deeper and do some reading up on your own. Well, as always, thank you for tuning in. I appreciate you and I'll talk with you next week. Be blessed.