INSULIN RESISTANCE SOLUTION
PRACTITIONER TRAINING

Sleep

Transcript

Hello and welcome to the *Sleep* module for the Insulin Resistant Solution Practitioner training. I am Dr. Ritamarie Loscalzo and I am excited to share with you today some of the really important aspects of controlling insulin resistance that are often overlooked and that is all about sleep. We are so sleep deprived as a society and as practitioners we probably suffer from it as well. I think that most people do not realize the amazing impact that sleep has on the way that our body handles blood sugar and in the production of insulin resistance.

Before we begin, I want to make sure, as usual, that the stuff that I am presenting is not intended as a replacement for medical advice and the work that you are doing with your clients is not intended as a replacement for medical advice but as education and evaluation, not diagnosis and treatment. It is really important that you make sure that you are aware of this.

If you have someone that you are working with who is on medication for diabetes or insulin resistance and is working with a doctor, or on any medication for that matter, it is really important that you make them aware that the kind of work that you are going to be doing in this insulin resistance reset could dramatically impact their physiology and biochemistry and thus make changes to the amount of medications they need.

They need to be working in conjunction with the medical practitioner if they are on any medication. That is to make sure they are safe and that the recommendations that you give them are done and taken and put into place in a way that is going to be extremely effective and safe.

Sleep and Insulin Resistance

When people don't get enough sleep they do not flourish. I will share with you some studies that talk about sleep deprivation and its effect on blood sugar balancing on insulin and hormones in general. We will talk about the effect of sleep deprivation on hormones, mental function, blood sugar metabolism, energy, and weight. When you don't sleep enough the hormones are out of balance. We'll talk about the specifics. You put on weight. You are hungrier the next day when you don't get a good night's sleep and insulin resistance increases.

We will talk about getting tools that you can use with your people on adopting a bedtime ritual that encourages sound sleep, herbs, activities, things like that, there is a whole regime and I am sharing all of that with you. I like you to understand the sleep cycles a little bit and you can share as much or as little with your clients as you need to, but actually choosing a bedtime that optimizes the sleep duration. Sometimes we think that just going to bed earlier is going to give us more sleep but it actually depends on what time you have to get up and the length of your sleep cycles. I will share with you a little bit about that, and I have a whole document for you to read the details on.

Understanding sleep cycles during sleep. This is critical. There are a lot of them. We think ‘oh, melatonin, that is the important hormone when you sleep, melatonin, good for a deep sleep’. No. I have a whole chart and list. I will go through those and how those work. I've got more information on this site so you can get more details. And it’s about optimizing your hormones during sleep. It helps you to maintain steady blood sugar throughout the night which will help you sleep and then throughout the next day, it also helps with mental clarity, fit body, and high-energy. I will talk about all those things and how they are put together.

Sleep Facts

Lets talk about a few sleep facts. You may have seen these before. A normal duration of sleep between 1910 and 1960 was nine hours. How many people do you know that get nine hours of sleep? If you ask your client on the first consultation, how much sleep you get? You are generally going to get below eight. This is the current averages 7.5, but a lot of people get much less than that; in fact it is estimated that one third of the population sleeps six hours or less. Shift workers, nurses, and other people who work shifts, less than five hours per workday. They make catch up a little bit on the weekends but less than five hours and this has devastating effects on their health and on insulin.

Sleep Tidbits

Some other studies. It is estimated that 70% of Americans are sleep deprived. Some have trouble falling asleep, some have trouble staying asleep. As you are working with somebody and asking them about their sleep, it is worthwhile to look at those factors to help them to not only get to sleep but to say asleep. One of the most common causes of being tired is lack of sleep. People come and see you and they say I am so tired, I need my energy back and what energy do you have for that? What food do you have for that? What magic bullet do you have for that?

In reality you ask them about their sleep, how much sleep you get, 'you know 3 1/2 or 4 hours a night. Sometimes 6, it is broken, I wake up every couple hours'. No wonder why they are tired. It is not rocket science why they would be tired if they are not getting enough sleep so it really needs to be addressed as an underlying cause of fatigue. According to Mark Hyman, he is an integrative medicine practitioner MD, he says "the most important thing that you can do for your health is to have enough sleep". Not just one of the most important things but he feels that it is *the* most important thing. You get an imbalance between a lack of hormones including melatonin and growth hormone and that can actually lead to growth and repair stunting and slower healing. Sleep is critical for so many things, and it is so overlooked.

Sleep Benefits

What are some of the benefits? Many of these are related to the whole insulin resistance problem that we are talking about. Fat burning. When your cortisol is lower and your leptin is higher, you burn fat more. That is what happens when you get sufficient sleep. When you sleep enough, you get enhanced production of growth hormone and DHEA. What are they responsible for? Growth and repair. Growth hormone helps with fat burning. We just learned a few minutes ago that DHEA helps improve insulin sensitivity. Overall they both help with fat burning, lean muscle mass, growth, and repair.

When you don't get enough sleep, you don't do the spike of growth hormone. There is one big spike at the beginning of the night. Usually it does not happen if you get to bed after midnight and that is when a lot of the growth and repair happens. If you are exercising, let's say you have somebody who says 'I am exercising like crazy, I am lifting all these weights, I'm not getting any stronger, I am not building any muscle mass.' You might be thinking, maybe they have a growth hormone problem. We will talk about ways to optimize that.

Sleep enhances focus and attention. They have found that people who have enough sleep (they have studies with children and have given them tests, or with adults and given them tests, about not enough sleep and more sleep) can stay on task and stay focused better.

While you are asleep your body is engaged in detoxification and metabolic waste removal. What does that have to do with insulin resistance? A lot, because it is metabolic waste and toxins that damage your insulin receptors, in addition to the high levels of insulin.

Enhanced learning and creativity. There is a part of your brain called the hippocampus that gets damaged by stress. It gets repaired during sleep. Sleep improves insulin sensitivity. There have been many studies that show that when you skipped sleep or you have a low level of sleep even for one night, the next day you are more insulin resistant.
Think about that happening over and over again, it creates insulin resistance. It is where I have hurt myself with lack of sleep. Not that I could not sleep but I chose not to because I felt like I had too much energy.

It decreases cancer risk because melatonin protects against cancer and we need to have melatonin. We need to have melatonin for growth hormone balance. We are going to learn ways that eating before bedtime affects those hormones, and how it is dangerous not just for the insulin resistance and lack of growth hormone, but also for melatonin and increasing the risk of cancer.

Sleep enhances your serotonin production and reduces depression. It also reduces inflammation. They have found with C-reactive protein, a measure of inflammation in the blood, is a lot higher when people get less than six hours of sleep, and that can lead to inflammation of the arteries, heart disease, autoimmune disease, and joint issues. Finally sleep helps endurance and stamina. When they do studies with athletes and they check how well they performed on days after a good night’s sleep versus a shorter night's sleep, far outweighs on the days that they get better sleep, their endurance and stamina.

There are a lot of reasons, and you may share some of these with your clients, the ones that are going to be the most important to them. If they value brain function and memory and they are really concerned about the loss of memory, you hook it in there. If you have an athlete and they want to build a lean body and have good endurance, and they find that they don't have as much as they want, you can focus on that. Use these to help you to get people to make the changes that they need to make. It is not manipulation. It is education.

Sleep Deprivation Effects

Here's a few more things to convince you. Nurses and the worker studies all find that there are higher incidences of heart disease. Sleep deficits lead to performance loss, slowed reaction time, impaired memory, and decreased motivation. The uptake of glucose in the brain drops by as much as 7% with sleep deprivation. Your brain is a big part of the uptake of glucose and they are finding that insulin resistance and poor glucose uptake in the brain contributes to Alzheimer's and other degenerative brain diseases, neurodegenerative diseases.

Finally, one sleepless night can induce insulin resistance in healthy people. I went researching this when I first found out that I had insulin resistance and I discovered an enormous number of studies related to this. I have on the page, you are going to have a whole list of various studies if you want to go deeper and really study this further. I've done that work for you and I also note that you may want to dig especially if it is something that is close to home or you need more evidence to convince somebody.

The 5 Stages of Sleep

Let's take a brief look at the five stages of sleep. I go into this and a lot more detail on the site. There is a paper about this.

Stage 1 is the *lightest sleep*. It is when you first go to sleep but also transitioning between sleep cycles. If you sleep through the night, you go to bed at 10 and you wake up at seven, that chunk of time is not just one where you fell asleep and slept all the way through. There is an up-and-down. You probably went through several sleep cycles; every sleep cycle is somewhere between 1½ to 2 hours, and for other people it is as short as 1 hour, but generally 1½ to 2. Let's say you went through five sleep cycles. You came into that late stage of sleep multiple times. That is the time when you are most likely to be aroused. Some people think they wake up because they have to go to the bathroom, but really, a lot of times, it is because they are transitioning from the deep sleep into the light sleep, and they notice that they have to go to the bathroom. Or that's the time when there is the loud noise or a bright light is turned on that you are going to be roused from sleep, whereas if you are in the deepest sleep it may not rouse you at all. That is the in-and-out stage.

Stage 2 is *light sleep*. It is the beginning of your true sleep when your muscles become relaxed and you have that loss of awareness. It is actually 50% of your sleep. The other 25% is in your deep sleep. There is **Stage 3** *deep sleep*, and **Stage 4** *deepest sleep*. Stage 4 is actually the *restorative sleep*. Then **Stage 5** is the *REM sleep* where you would be dreaming.

The REM sleep should be 25%. The deep and the deepest should be 25%, the light, 50%, and *stage 1* is just your in and out. So that is your normal sleep cycle. Everybody has a little bit of variation, but it is important to know this. Why? Because if someone is having difficulty sleeping, one of the things you want to do is optimize their sleep cycles. I give you a whole process in the paper that you can read about and apply with people. I have a slide that summarizes it.

Analyzing Sleep Cycles

You can analyze the sleep cycle and help people to decide what time to go to bed. For example if you know that your sleep cycle, including the transition sleep, is about an hour and a half. You need to get up at 7 AM, you have to get up at that time to go to work. You are trying to decide what time to go to bed. If you were to go back six hours from that, that would be four sleep cycles, 7 minus 6 that is one. If you wanted to get five sleep cycles that is 7 1/2 hours, that would be say, 11:30. If you find that, since you have to get up at seven, you don't want to get up in the middle of a sleep cycle. You want to make sure you get up at the end of a sleep cycle because that is going to be really restful. If you do not wake up at the end, and you get woken up at the middle, you might as well have wasted that sleep cycle.

An easy thing to do is go backwards in time. Right now it is midnight. I should have gone to bed at 11: 30 to get 7 1/2 hours sleep. I am only going to get four sleep cycles now. Then you plan to go to bed right before so you fall to sleep right around 1 o'clock or 15 minutes before so you give yourself the transition time. That way you don't get into bed and end up feeling groggy. If you wake up from a full sleep cycle you feel good. If you wake up in the middle of a sleep cycle you feel groggy. This is something you can share with people. It is a little bit more sophisticated and advanced, but I just want to make sure that you are aware of it and that there is a lot more detail about this on the site.

Hormones and Sleep

Let's talk about the hormones that need to be balanced when you sleep. **Insulin and Glucagon**. We've talked at length about those. Insulin helps to reduce your blood sugar. Glucagon helps to raise it. If your blood sugar starts to fall in the middle of the night, glucagon should be released by the pancreas, goes out to the liver, finds some stored glycogen, releases just enough of it to keep your blood sugar right where it used to be, right up there at the 75 to 85 range. You shouldn't be secreting insulin at all while you sleep. If everything is regulated right you should not be secreting it.

However some people eat right before they go to bed so they are secreting insulin. The insulin interferes with growth hormone. When insulin goes high, growth hormone goes down. If you eat right before bed within a three-hour period before bed and there is insulin in your system, that surge of growth hormone that happens within the first hour of sleep does not happen. That interferes with your growth and repair.

Cortisol and DHEA. Again, cortisol should be at a minimum while you were sleeping. The lowest level of cortisol happens right around midnight. If you eat right before you go to bed you have a temporary rise in cortisol and that can affect the sleep and the amount of DHEA because again, they are antagonistic. Not that they can't coexist, like insulin and growth hormone are really at odds, but because cortisol steals away some of the precursors from DHEA, we tend to have lower DHEA when we have higher cortisol.

Growth Hormone is a really major hormone. You need to have these spikes. The first spike in the hour after you go to sleep is pretty high. The next one is a little bit lower, a little bit lower, a little bit lower. You generally have one growth hormone spike per sleep cycle and it happens right at the beginning in that second stage, that *Stage 2* sleep.

Leptin and Ghrelin. Leptin is secreted by the fat cells to say, ‘hey, I'm fat, I'm full. No need to eat any more food, shut off the appetite, we have plenty of fat here, come and burn it.’ Ghrelin is the opposite. It says ‘hey, feed me.’ It is secreted by the cells that line the stomach. When ghrelin gets secreted it says, ‘hey, we need food.’ Ghrelin actually, temporarily raises growth hormone. Growth hormone will burn fat.

When you have ghrelin in the system you raise your growth hormone. It is not a great idea to keep ghrelin at a peak level for too long because it has negative side effects and it can cause you to be ravenously hungry, but if you can have people tolerate a little bit of hunger and ‘learn to make friends with hunger’, if you can live with a half an hour of hunger, you can be really happy knowing that ghrelin is stimulating and releasing growth hormone and growth hormone is a stimulating growth and repair, lean muscle storage, and fat burning. It is a happy situation.

Melatonin as we know is very important during sleep. Insulin will affect the release of melatonin. If you eat something right before bed, the melatonin is not going to spike when it needs to, to get you into that deep state of sleep. A really critical piece is *no food before bed*. You don't want an insulin spike before bed because not only does it interfere with growth hormone and stimulate a little bit of cortisol, but it also affects melatonin.

Estrogen/Progesterone have effects; as well as testosterone, progesterone helps you to fall asleep better. Excess estrogen stimulates insulin insensitivity. We have a slide to go over each one of these in more detail.

Studies: Sleep Deprivation, Insulin Resistance, and Growth Hormone

I wanted to include studies if you wanted to look to see where this information was coming from. Overall, sleep debt causes impairment in the endocrine system, cardiovascular system and your immune system. If you go four days with restricted sleep for four hours, the **glucose clearance rate is depressed** by 40%. It's as if you have that gestational diabetes. No wonder I ate pineapple and my blood sugar shot up to 167. My glucose clearance rate was depressed by 40%, probably more, because I had more than four days of sleep restriction of four hours per day. It is really important. I didn't realize I was doing myself so much harm with the lack of sleep. A lot of people aren't aware because they feel okay. They are going on adrenaline and they feel okay.

Glucose intolerance is decreased during sleep debt. This is another study. It is the same thing, it does not quantify it the same but it is the same. There are a couple of studies there. Three days of 10 to 12 hours of sleep, this is the good news, can normalize fasting glucose. Three days, that's not bad. That is why I tell people to do a three-day sleep vacation. Just take some time, go to bed, you can do this on a Friday, Saturday, and a Sunday. You can come home from work on a Friday night and go to bed. Don't eat, go to bed. Make sure you wait three hours. Go to bed and just stay in bed for 12 hours even if you don't sleep. Stay in bed for those 12 hours. Then do some light stuff for the rest of the day. Don't make a bunch of appointments and running around. Then the next night same thing, go to bed early and stay in bed for 12 hours. Do that three nights in a row and you can make, you can normalize fasting glucose. Try it.

If you have somebody who you are working with, with higher fasting glucose and you are working on the other things as well but it is not really putting a dent in it, try this. Try it yourself.

Sleep deprivation disrupts the normal pattern of growth hormone surge during the first three hours of sleep. That's the big one. Within an hour usually, and that is another study. There is a lot of evidence that supports this.

Growth Hormone

What is the big deal about growth hormone? We don't all necessarily aspire to a body like the one in the picture. But we want the other effects of growth hormone as well. We want a lean tissue. We want repair, the growth, and the rejuvenation of your organs. Growth hormone will cause an increase in protein synthesis in every cell. If you exercise or lifted weights during the day, but you don't allow the growth hormone surges at night, you are not going to be building new muscle. But if you do, the increased protein synthesis by growth hormone is going to help you build new muscle. It helps to promote the release of fat from the cells. You might be one of these people who are underweight. There are a few of you out there, but most people are, ‘yes, bring it on, I want to burn fat.’ Even some of you who are underweight may not be under-fat. You may be under-lean. Growth hormone is your friend there, too.

It helps to shift your cells from burning glycogen and glucose, to burning fat. That is a good thing. It promotes insulin sensitivity but it will not be in the system when insulin is there. It is like insulin, I don't like that cousin, I am running away. It goes away and levels go down. Once the insulin levels get back down to baseline, growth hormones can come back and do their own thing. That is really why I keep emphasizing no food late at night. Also another trick, and we talked about this in the exercise pieces, don't eat too close to working out because while you are working out, especially if you are doing burst training. You get this big spike of growth hormone but that if you eat right after that, something that secretes insulin, the growth hormone level goes down and it doesn't sustain itself for the hour and half that is normally would. Timing is really important and will talk about it more about those timing pieces in our next session.

Growth hormone is secreted in response to an emptying stomach. When ghrelin gets secreted, it is secreted in response to increased amino acids in the bloodstream. It secretes in response to exercise and the intensity of exercise. The more intense the exercise the higher the growth hormone peak. They have found that 30 seconds of high-intensity burst training increases growth hormone as much as 30 minutes of low-intensity aerobics. Finally deep sleep and we have the spikes three times per night.

Cortisol and Growth Hormone

Cortisol affects the rate of fat burning by reducing the rate of fat burning by inhibiting lipolysis and increasing glucose neogenesis. Cortisol will help the protein to break down and the fat to be stored. That is the opposite of what you want, isn't it? Growth hormone, when you add the growth hormone into that it increases the rate of fat burning. But the cortisol surge before bed inhibits the growth hormone surge.

If you happen to eat right before bed that is going to cause a little bit of growth hormone surge. Some people have high levels of cortisol at night. Some people have been abused in the night. Those are things you need to be asking, and they are on guard all night long so the cortisol levels go up. If you do in a adrenal stress index you can see what happens to that when somebody's cortisol levels go up high, you know that that person is going to have a hard time with lean muscle storage and fat burning because of that cortisol surge at bedtime. It inhibits the growth hormone surge.

Leptin

Let's change gears and talk about another hormone called leptin. Leptin is a new kid on the block. Leptin was first discovered in the 1990s it is one of the newest hormones. It was an amazing discovery. It is secreted by the white adipose tissue, that stuff around the waist that the insulin levels go up and they cause fat storage there, that is where the white adipose is; it is in other places as well but that is what produces leptin. It says ‘I am full, I've got enough.’ It signals both the hypothalamus and the pancreas that we are full. There are receptors in the hypothalamus and the pancreas. The response for the hypothalamus, which is the control system in your brain, is to turn off the appetite. The pancreas response is to stop producing insulin. There is a 24-hour circadian rhythm, which is also controlled by eating patterns.

What happens is if someone gets overweight they override this. People eat and become so stuffed, they just keep eating this food because it is so addictive and it overrides it. A lot of this leptin is being produced because they have a lot of fat cells. The hypothalamus and the pancreas both eventually get resistant. Just like you get insulin resistant, you get leptin resistant. You can also get thyroid resistant where your cells get resistant to its own thyroid. You can get progesterone resistant, and most recently I have found studies linking resistance to estrogen as well. So we can become resistant to all the hormones when there is a flood and an excess that burns out the receptors.

Normal Leptin Function

This is your normal leptin function. In the evening, that is when it starts to go up. It is pretty low level throughout the day. This is the circadian rhythm. It also goes down in response to food. If leptin is there and you are not leptin resistant, as it goes up after dinner you lose your appetite. You are not supposed to be hungry at bedtime. If you have somebody who says ‘I get so hungry at bed time’, it is probably because their leptin surged too early and it is now coming down. That can happen by eating carbohydrates too early in the day. It causes an early peak in the leptin levels. The leptin levels peak approximately 2 hours after you fall asleep. Then they start to go down. Fat burning is high when it peaks.

The fat burning time begins right when the leptin peaks. It increases up to a certain point, and when leptin gets to a certain level then the fat burning is going to go back down as well, which is normally in the morning. Right at 8 AM, leptin is back down to its lowest level. When you have a cycle that looks like this, you promote weight loss and normal metabolism. If the leptin peaks too early and it is down too soon you are going to be starving throughout the day because the leptin levels are not where they should be. If you are leptin resistant you are going to find that you are starving throughout the day.

Leptin Resistance

There is a really good book that I like called *Mastering Leptin* by BJ Richards. It goes through lots of detail. It is a big thick book, 400 pages; lots of references. I am trying to simplify this down from 400 pages worth of information. With leptin resistance, the peak is earlier. The peak is somewhere between 6 PM and dinner. You are still awake, the leptin levels are going down, and you are getting hungry. ‘I want food,’ food cravings, ‘I want carbs’. When this happens the fat burning does not start until later and you don't get as long a period of fat burning, therefore you don't get as much fat burning.

Rules for Managing Leptin and Insulin

We want to prevent leptin resistance and there are some rules for managing leptin and your insulin that will keep this in mind. Never eat after dinner. When you finish your dinner you are done. Leave three hours between dinner and bedtime. Byron Richards in *Mastering Leptin* says 12 hours is the ideal spacing between dinner and breakfast the next day. You need a 12-hour fast. Only eat three meals per day because when you're eating between meals it triggers an alteration of the leptin pattern. 5 to 6 hours between meals. You are going to be working with people who might be eating every two hours because that is what they have been told. ‘You have insulin problems, you have reactive hypoglycemia therefore you need to eat every two hours.’ Wrong! 5 to 6 hours between meals. There is a ton of research behind this. Get the *Mastering Leptin* book and you will see. I have also given you some on the site. Don't eat too much because eating too much turns the mechanism off.

Eating slowly so your body gets the signal that I have had enough. A breakfast containing protein. The worst thing in the world is the standard kind of breakfast that people do, which is toast and orange juice and coffee, or cereal and orange juice and coffee. Or a fruit smoothie and toast or a bagel. Bad news; too much carbohydrate. Some people go the opposite extreme, in their insulin resistance they’ll say ‘bacon and eggs for breakfast’. That is not exactly a balanced breakfast either. That is protein and fat and it is not the highest quality.

I like to see people eating what I recommend: something with omega-3 fats like a Chia or flax pudding or porridge or cracker or bread, and something green because green gives you lots of protein.

You can also add protein powders and other things like that to it, but green in the morning is great. If people are not into drinking green smoothies or green drinks in the morning, fine. Help them to learn how to make stirfries or steamed vegetables, or eat a salad for breakfast. I know that is a little weird for a lot of people, but it really helps. Green powders are a great practice for a lot of people. It is just easy. Reduce intake of starchy carbohydrates, not just in the morning but overall. If they are going to continue to eat, they want rice, they want bread, and they don't want to give it up, at least change when they eat it and it will make a huge difference. Have them do it later in the day, like dinner, instead of breakfast.

Meal Timing and Leptin

Here are some meal timing rules. **No snacking** because the more frequent insulin spikes, the more it decreases the leptin and promotes obesity. **Maintaining ideal body weight**. Obesity increases insulin resistance and insulin resistance increases obesity, so you've got to break the vicious cycle. I've said this ad infinitum, **no eating at night**, it causes insulin increases, and growth hormone and leptin decreases, causing you to not burn as much fat during the night, not go into the growth and repair state, and then have cravings the next day.

Avoid high-carbohydrate breakfasts. We saw what happened to the insulin curve, it spikes sooner and then we get cravings for food between dinner and bedtime. If you are going to do the carbs, it has got to be later in the day. Of course we have our whole list of foods that we are trying to get them to avoid. **Eat protein within an hour of waking,** it promotes growth hormone and regulates insulin. It even can be just a green drink or protein powder. It does not have to be bacon and eggs.

Ghrelin

I have included ghrelin for completeness. It is not really affected by sleep but it is that ghrelin-leptin balance and its affect on growth hormones. I just wanted to give you a little bit of information about it. It is secreted by cells in the stomach wall. Eating suppresses ghrelin. You get the ghrelin, you are hungry, you eat, and the ghrelin goes away. An empty stomach will secrete lots of ghrelin. Ghrelin stimulates appetite and it stimulates growth hormone. It is not a bad idea to wait until you are really hungry. If you eat every time you get that little bit of hunger then you lose the opportunity to have a growth hormone surge that will help you with fat burning and muscle sparing if you do. I like to call it ‘making friends with hunger.’

Hunger is just another sensation. If you have an itch in a place that is not socially acceptable to scratch in public, you generally forgo the scratching until you are in private. Same thing with eating. You do not have to eat every single time there is hunger. Learning to live with hunger, it is just another sensation. If you have ever had teeth drilled on or had a toothache, that is worse than hunger. You can deal with hunger. If you have ever given birth to a baby, that is a lot worse than hunger pains. We do not have to satisfy hunger every time we have hunger, in the same way we don't have to satisfy an itch every time we have one, or have a bowel movement every time we get the urge.

Melatonin

Critical for sleep. It is produced by your pineal gland. Not your pituitary, your pineal gland. It is affected by light, so light going through your eyes affects the release of melatonin. When we talk about ways to manage and get better sleep, you are going to see some more interesting ways to manage melatonin related to exposure to light. It is turned on by low light and turned off by bright light. In the evening we have this artificial bright light because we live in homes rather than in caves and in the woods like animals do. There are some really good things that I have on my list of things you can share with people to help, which has to do with turning the lights down.

Melatonin is very highly protective of tumor growth especially estrogen related tumors, breast cancer in particular. When you sit at the computer and TV at night we are reducing our melatonin. If you really want to optimize somebody's melatonin, help them to stop watching TV or computer at least one hour or two after bedtime. Eating too close to bedtime inhibits just like it inhibits the growth hormone. It is produced from tryptophan and requires vitamin B6, so deficiency of B6. Inability to digest protein well because of low stomach acid. It is important to be looking at the person's digestion as well, in order to have the balance of these hormones.

Progesterone

What does progesterone have to do with sleep, and what does it have to do with insulin resistance? More than you think. It promotes deep sleep. Some people will get a really good effect if they are having trouble sleeping because of a progesterone deficiency, and they take progesterone at bedtime and fall asleep really well. It helps prevent lipid peroxidation. That is the breakdown of oxidation of cells. And cell membranes. That can affect insulin receptors. It is anti-inflammatory and antioxidant; it reduces NK cells, natural killer cells, TNF-alpha and Th1, which are cytokines that have to do with inflammation. It helps to stimulate the production of interleukin 4 and 10, and increase glutathione and superoxide dismutase.

It is really important to have good levels of progesterone. Where I'm going to tie this in is when you are under a lot of stress, you are using the precursors to progesterone to make cortisol resulting in your protection against these being reduced. Your inflammation goes up, the insulin receptors get damaged. It also suppresses excess estrogen, and estrogen dominance can lead to all sorts of imbalance, which we will talk about in a moment.

It activates GABA receptor sites and GABA is a neurotransmitter that calms you down. If people do not have enough progesterone they may not be making enough GABA, or they may not be activating the receptor sites for GABA, and that interferes with sleep. Finally it is involved with the regulation of hypoglycemia. It gets to play along with glucagon and adrenaline depending on the seriousness of the hypoglycemia. Usually when you go into a hypoglycemic state that is an emergency situation and the body produces adrenaline and cortisol to bring that back up and we know that is not good. There are a lot of ways that all of our hormones are coming into play during sleep and then affecting the receptors for insulin.

Estrogen

Estrogen can have an effect on promoting deeper sleep beyond hot flash control. There are a number of studies that say, we thought the estrogen helped with sleep because it helped control hot flashes, but there is more than that. Excess estrogen in males can induce insulin resistance, there are a number of studies about that. Oral contraceptives that include estrogen, which they all do, increase insulin resistance. We know that higher levels of estrogen increase insulin resistance. When we have deficiency in the progesterone it allows the estrogen to get out of balance and a combination of the two contributes to more profound insulin resistance.

How do we get estrogen dominant? Plastics in the environment, a lot of zenoestrogens, dental materials, birth control pills. There are all sorts of ways to get estrogen dominant and a lot of people are estrogen dominant. Estrogen increases the amount of time people have REM sleep and reduce time awake. It is not just that estrogen is bad and progesterone is good. You need the right amount; too little estrogen can reduce the amount of REM sleep that you have, and you end up being awake more. You need the Goldilocks principle, just the right amount. We know how important the managing of stress is to managing all the rest of the stored hormones, the DHEA, the estrogen, the progesterone, and the testosterone; so go back to all of the techniques that you've got in your modules that help with stress.

On the one hand there’s the insulin resistance; it is simple, you just put them on a low-glycemic diet. You see that it’s a lot more than that. For some just doing the diet is great.

Even doing the diet is not easy. It is hard for some people. But these other factors play huge roles. I have a lot of people who will go into the program and they are doing the diet and they are saying, 'I don't understand, I have been doing this diet for six weeks and my glucose levels are still high. I still have a high fasting glucose. Why do you think that is?' I am like 'whoa, can you hear the tone in your voice?' They are really stressed about it. They don't realize how much that affects them. It is really important to control these things.

Stress is not just the emotional and mental. If they've got hidden infections somewhere in their gut, or in the joints, they're going to have a stress in their system. Arthritic joints, an autoimmune process, all of those things are going to contribute to the stress, the physiological stress. It is really about balance in the whole body. We are focusing on insulin resistance because it's super important and there are lots of ways to get it under control, but you cannot overlook the stresses happening in the rest of the body. It is really you being the detective that determines what is really going on for this person.

Testosterone

Finally we've got testosterone. It is associated with snoring and sleep apnea if somebody does not have enough. Excess testosterone in women is associated with insulin resistance. We're back to excess estrogen in men, and excess testosterone in women. It is a matter of having the right amounts of our particular sex hormones and the right amounts of the opposite sex hormones. Sleep can increase testosterone so if somebody's testosterone deficient, getting a good night's sleep is important.

Sleep deprivation decreases testosterone. That makes sense. When we look at diabetics across the board they have a lower level of testosterone. Lack of testosterone contributes to insulin resistance. We know that men who have low levels of testosterone have more belly fat. That happens a lot to men as they get older. Women go through menopause and men go through andropause. In andropause you end up with men who get low energy and belly fat. They have something to do with the insulin resistance being induced by low levels of testosterone.

Sleep Resources

You've got the background as to why sleep is so important. You are going to have to watch this a few times and read through all the resources. It will take time before you own this, but the more people you work on with this, the more you are going to own this. I have given you resources, a document about *Herbs And Supplements To Assist With Sleep*. There is a document about *Understanding Sleep Cycles*.

There is a document about *Hormones That Dance In Your Sleep*. There is a resource list of the hormones involved with sleep and how they affect blood sugar and there is a document with a list of studies. It is really important that you have some good sleep resources under your belt. Not just for your insulin resistant patients, but in general, you are going to see insomnia coming through a lot. There is a lot you can do with lifestyle and nutrition. It is all about fixing things as much as you can with lifestyle and nutrition.

I have given you a lot of resources. Not everything is going to work with every person but you will have a lot of tools in your toolkit. It is nice when you don't have just one tool in your tool kit. It is often said about modern medicine is if the only tool you have is a hammer, everything looks like a nail. If the only tool that you have is pharmaceutical medication to deal with insulin resistance then that is what everybody is going to get, and they are overlooking really making a profound difference. That is what is going to set you apart.

Optimizing Sleep

We talked about many of these things. I just pulled them all together and talk about them in greater detail on the site and in the documents that you have. Stop eating within three hours of bedtime. I think I've made a case for that now. Dim the lights in the evening, you will stimulate the natural environment and that will simulate melatonin. It does not mean you have to turn off the lights but turned down to low and incandescent lights. Read by candlelight. Do things that are softer rather than sitting in the bright lights, and sitting in front of the TV or a computer, within two hours would be nice. The TV, if you are going to watch the TV in bed, make sure that they've got the lights turned off and they are reclining to watch it, but it is not a good idea. It is hard to break people of that habit.

Avoid intense exercise close to bedtime. I know people who go out for a run, take a shower, and then go to bed. Not great for sleep and it is going to keep the body temperature higher and it is not going to allow you to get into the optimal hormone balance during sleep. For some people hot baths interfere with sleep, but if they take a nice lukewarm or neutral bath can be really helpful for helping the body go down. You will have to just see what works for different people. Of course meditation, visualization, mini vacations, little *HeartMath* excursions, right before bed, is going to turn down the cortisol. I recommend people get into bed. If they've got anything on their mind, take out a piece of paper in a notebook and jot it all down. Get it out of your mind so it does not keep you awake during sleep. Once you have done that then go ahead and lie down and switch off the lights and do some appreciations.

Find three things that you appreciate more than anything during the day. Then do a little mini vacation, go to the beach, make it longer. In your stress transformation bonus, I teach all about the other techniques within *HeartMath,* and there is one that they call *Heart Lock-In*. Nice time to do it would be before the going to bed. Have your people learn how to do that. You will teach them want to learn yourself.

Next part, avoid intense mental activity within two hours of bedtime. If you are taking a physics course and you are having a test next day, studying right up to bedtime is going to keep those cortisol levels peaked and affect the hormone balance. If you have outdoor activity early in the day before 1 PM, that gets the bright light into your eyes and decreases the melatonin during the day, so it is allowed to increase later. If you stay indoors all day in the dark and then you go out later, that is really going to throw off your melatonin levels.

The best thing to do if you can is first thing in the morning when you get up in the first 15 minutes, go out and let the sunlight bathe into your eyes. Even if it is not bright and sunny yet it is going to help turn the melatonin off so that it is down during the day and comes up later in the night as soon as you turn the lights down. Bright lights off as soon as possible after sunset. Go camping sometimes. Go camping and maybe you will have that little incandescent flashlight that you will read by, that is not going to really affect you too much. It is the bright lights. The neutral bath, we talked about that before bed, 15 to 60 minutes, somewhere in this time range especially if you throw in lavender oil. This is for somebody who is having trouble falling asleep.

I will give you a list of herbs. These are best taken 30 and 60 minutes before bed and then again at bedtime for somebody who has a lot of really serious problems falling asleep. The choice of herbs is going to depend; you will have to play it by ear. Learn about the herbs and choose the right ones. It is really a good idea to be horizontal from 30 minutes to an hour before you fall asleep. If you lay down and let your body rest into it, maybe read a little bit, or meditate, or do a *HeartMath* excursion, that would be really great. These are all things that help optimize sleep.

Herbs And Supplements To Help With Sleep

Here are some herbs and supplements. I have just given you a little one-liner about these. I would recommend that you go explore them and read about them, and see which ones that you are going to use if you have a problem yourself or if your clients have problems. There are also Chinese herbs. My Chinese herb materia medica is not my strong suite.

Passionflower is really great for people who've got the mind chatter; they are thinking about this and that and cannot turn off the brain. Passionflower can do a great job with that. **Lemon Balm** relaxes the mind but also the whole body. **Chamomile** is really soothing and relaxes muscles. It relaxes the digestion.

Hops is a little bit stronger than the ones above but really good for relaxing. Right before I did my elbow surgery I wasn't doing anesthesia but I wanted to be relaxed. I took a whole bunch of hops in the morning and **Valerian** before I went there and then I took another heavy dose of Valerian. I think the combination had hops, lemon balm, and other herbs in there. I took that right before I went so it would calm me down and it made a huge difference. I could feel my body, I was kind of dozy. It only lasted for 45 minutes because it was a bit of different situation than sleep.

Phosphatidylserine is an amino acid that helps to decrease cortisol levels in the production of cortisol. If you have somebody who is just really that high at night, or they have a history of abuse, or being broken into that house and being robbed during the night, or they don't feel safe at night, Phosphatidylserine would be good; and also if you've done an adrenal stress index and they have high cortisol. **Magnolia** is another one and it's really good at helping calm down the cortisol stress-induced sleeplessness. And then **Adrenal Adaptogens** and learning about those, that would be really helpful as well.

Additional Sleep Activities

Getting out in the morning sun is critical. Using relaxing herbs before bed, schedule a three-day sleep vacation. Remember we talked about 10 to 12 hours of sleep three days in a row can help reset the insulin receptors. Sleep in as dark an environment as possible. This is critical because some people sleep where their bedrooms are in the front of the house. They don't even realize that that is affecting the sleep, the bright light coming in. The room darkening shades, some eye covers, there are a number of ways they can do that so it is really dark. Turning off or turning away the alarm clocks, or having the dimmer turned way down, those bright red lights, the LEDs, are not good for promoting deep sleep.

That's what we have for your stress and your emotional and your sleep issues related to insulin resistance. I know there is a lot here. I wanted to get as much as possible. There is more, there is background, you can read the extras on the site, really learn this, and really be able to work with people. The more you work with people the more natural it is going to become. The more you listen to me talk about it the more natural it is going to become. The more you read about it the more easily you will be able to access the information.

It is not rocket science but it is nice to understand the mechanisms so that you can then put it into place. You may not remember exactly all of the mechanisms and be able to recite everything that I have taught you, but you are going to have a sense of, well, it is really important to manage the stress. What are some of the tools that work best? It is really important to deal with the sleep and the hormone balance, the timing, and all of the things that you can control.