Timing

Transcript

Hello and welcome to the *Timing* module for the Insulin Resistant Solution Practitioner training. I am Dr. Ritamarie Loscalzo and I am excited to share this cutting edge information with you. It is a topic that is not talked about enough. It is a topic that a lot of people don't want to hear about, but it is also a very freeing and awarding topic because there are no rules about what to do and what not to do. It is all about when to do everything. We are going to tie a lot of the other topics we've talked about already, the fitness, nutrition, supplements, the sleep, the stress management, and we are going to tie a nice little bow around it, and give you some tips that you can share with your clients about how to time all of these activities for the optimal results.

As usual the information that I am sharing is not intended to replace a one-on-one relationship with a qualified health practitioner. It is not medical advice and when you are sharing this with your clients you need to be aware that you are communicating that to them, that this is not medical advice, it is actually education and you are helping them to evaluate how to modify their diet and lifestyle so that they get the optimal results in terms of their blood chemistry, and in particular, their insulin sensitivity and blood sugar regulation. If they are under the care of a doctor or if they are on any medication, it is very important that they are in communication with that practitioner because the types of things that we are doing here are so powerful that it could profoundly change their biochemistry and thus their specific needs for the medication that they are on. It is important to have their practitioner involved so that they can make the necessary adjustments to those medication doses.

Let's begin.

Review of the Insulin Resistance Solution

Before we do jump into timing let's do a quick review of where we have come through. We have come through a lot of pieces of restoring insulin sensitivity. You have a lot of tools under your belt. We started with assessments and there are quite a number of ways to assess. We started with pencil and paper questionnaires, online questionnaires, then blood work testing, and of course our trusty little glucose meter which we want to get everybody using as much as possible because it gives so much information about how to customize the program to each person. We went into nutrition. I recommend it started with a specific set of supplements to help people to improve their sensitivity before going into dietary restrictions because you are going to get the most compliance that way.

We talked about stress and the importance of stress management and the effects of cortisol which we will talk a little bit more about in our timing presentation right here. It is really, for me the most valuable piece is doing the *HeartMath*, the quick coherence, and things like that. For you it might be something totally different. Maybe you are a whiz at *HeartMath*. Maybe you can teach them some relaxation techniques that you know. Whatever it is that you know that you can teach people that they are going to do. It is important to have a number of techniques under their belt. My personal favorite is the *HeartMath,* which is why I teach so much of it. We went into fitness and the importance of burst exercise and the timing of the exercise. We'll go into more detail today and talk about the growth hormone and the effects that the timing of exercise with food has. Then we talk about sleep and how important it is to get a good night's sleep and the chemistry that happens during the sleep.

Now we are ready for timing. After the timing we will pull it all together into an implementation plan and teach you how to guide people through a 30-day metabolic reset and then a reintroduction phase after that and a maintenance phase. Then I am going to teach you how to take this information out into your community and market it in a community education fashion. Before we get into timing I just want to reiterate there are going to be a lot of people who have insulin resistance and they don't even know that they have insulin resistance. You may have insulin resistance and you do not know. I would really encourage you to apply these principles first to you to bring yourself into balance, to be a model, to get to experience it firsthand and then you will be an amazing teacher and coach.

Let's get centered and calm and ready to receive by doing a little quick coherence and getting a little practice doing something that you need to become masterful at for yourself and for guiding your clients. Let’s all sit in our chairs. You can either fold your legs under you lotus style or put your feet flat on the floor.

Put one hand over your heart and the other hand over your belly. Go ahead and take a few long slow deep breaths. If you breathe, breathe as if you are breathing right into your heart. Breathe in your heart with clean air, oxygen, fresh re-oxygenated blood. Just allow yourself to feel that. If you breathe in the next time activate a feeling, a really deep heart feeling of love and appreciation. You might be able to do that by just thinking these thoughts, love and appreciation or you might need to reach for some sort of memory or visualization of a place that you love, a place that brings you joy and peace, or a person you love that brings you joy and peace to be around. Just get that feeling, go back into that scene, or go forward into that scene if it is something that you are imagining and visualizing and scheming towards. Just be there. Actually put yourself there.

The beauty of our brain, our nervous system, are magnificent nervous system, is that it cannot tell the difference between you faking it and really making it, between you remembering in vivid detail or visualizing in vivid detail, a scene and actually being there. It can evoke the same wonderful chemistry, the same balance in blood sugar and hormones that you could if you were indeed there. Trick your brain and learn this well so you can teach your clients because it is nothing short of miraculous. *HeartMath.org* has plenty more details, and the 30-day stress transformation tool that I gave you. Don't gloss over this. Take it seriously. Just pull up that beautiful scene, gazing into a lovers eyes, looking into a sunset, holding a newborn baby for the first time. Stroking a pet as it lays in your lap filled with unconditional love. I am going to the beach.

I am ready to be back with you and share with you some new insights, some more details, help you to take you to the next level, help you to get to the point where you own this material, where you feel so confident in teaching it that it just comes naturally and flows because you have seen the magic of the transformation that it can have. Take a couple of more deep breaths and then open your eyes. Come back into the room ready to learn, ready to grow, ready to have some new skills that you can take into your practices right away.

5 Key Steps to Restore Balance

Let review those five steps to restoring balance and insulin, increase your insulin sensitivity. Remember we said we like to increase insulin sensitivity by introducing some nutrients before we actually change those dietary things that are causing the person to need more insulin. The second step is to decrease the insulin need and that is through eating foods that keep the blood sugar in check by doing things like exercise and sleep breaks and stress breaks that help to decrease the need for insulin. Reducing inflammation is a big part of it.

We talked about allergies: the food allergies and inhalant allergies, but mainly we focused on food allergies and other autoimmune factors that cause an increase in inflammation and how that is devastating to insulin receptors. Optimizing fat burning and lean-muscle mass building: we will talk a little bit about that in terms of balancing growth hormone and timing of your exercise. Then finally minimizing what I like to call the candy bar eating effect of stress, how cortisol can actually raise your blood sugar as much as eating a blood candy bar without the fun. When you have somebody who is saying, 'well I did not eat anything bad but my blood sugar went up, what is going on?' You found out they were just screaming and raging. or they go through a lot of road rage, or they are going through some really difficult times and stress in their lives, and that is having the same effect; only they don't have to get to have the fun of eating a candy bar. We've gone through some tools and techniques so far that will help them with that.

What is Normal Blood Sugar?

Remember, what we are striving for is to have a normal blood sugar curve. You can see by the picture, I have shared this with you several times, on the picture you see there is a middle of the road one, and there is a low one, and there is a high one. You want your person ideally to be between the low one and the middle one. Once you get above the midline you are heading towards insulin resistance in terms of the numbers. But you will see that the curves look very similar in all cases. They start out at a baseline. After eating they peak at a certain point and then they come back down. One of the variations on this, which is a pathological variation, is that after it comes down it dips below the line and that is what we call reactive hypoglycemia. We are really striving for people to be in the low range. When they can keep it in that low range and if they don't allow their blood sugar to go above 110, max 120, they are decreasing the effect that the blood sugar and insulin have on those blood vessels.

Remember we talked on our very first module, we talked about how when the blood sugar goes above 120 they already are having the peripheral neuropathy changes. You think peripheral neuropathy is an end state of 30 years of diabetes when in fact it is happening 20 to 30 years before they are even diagnosed in some cases because their blood sugars are going above 120 and there is a little bit more damage, a little bit more damage, so by the time they get diagnosed they are having serious problems. The same came with the retinopathy. The numbers are between 120 and 140 but minimally, absolutely above 140 you are getting those retinal changes that are associated with end-stage diabetes. Our goal is to help our patients and clients to keep those numbers good and tightly controlled, and to learn to do the introspection of the lifestyle monitoring that allows them to see when it is going astray and remove those factors from their lives.

Whether it's doing more meditation and yoga, or *HeartMath* that keep these stresses down, or removing certain foods; even some foods that may be perfectly healthy for other people. We talked about incidences where people have problems with blueberries, and blueberries are considered foods that help restore insulin insensitivity, but with some people it causes their blood sugars to go up and they need to at least temporarily reduce those. As we go through the review I want to share with you, once you have taken your client through a process where they had maintained that really nice steady blood sugar and have not gone above 110 for 3 to 4 weeks and they are noticing a difference and their bellies are flatter, their brains are clearer, their energy is higher, then what you do? Do you have to keep them on that strict of a diet for the rest of their life? For some people, yes. Some people have strong genetic predispositions to diabetes and have been there for a long time, and you know what, it is worth it. If they can get their blood sugars down, and they can get their bodies working better, but they have to eat cardboard, many of them will say 'yes I will', but others won't.

I remember my son saying that to me once. "Mom", he said, "if I found out I had some disease and all I had to do is eat cardboard to keep me from having that disease, I would eat that cardboard and I would be happy with it." Other people would say don't take my food away I would rather be dead, like my brother-in-law did, and he is dead because he was not willing to change what he put in his mouth. Our job as coaches and practitioners is not just to give them the what-to-do's, but to help them and coach them to make them have better decisions, to help them get in touch with what is really most important to them and don't underestimate that. I have given you resources for that.

You can create your own based on my resources or based on your own work. Maybe you are working within a system of getting in touch with those goals and values. It is a super important step. I don't want you to take that lightly as you go through this. As you go through the program with me, you will see that I really emphasize that as a very important part of the process. One of my patients said to me after she had lost about 50 pounds, she had cancer and she was finding that she had a recurrence of the cancer and she decided she better do something about it. She said to me she started to run by the motto, 'don't exchange what you want the most for what you want in the moment.' Most people just go for what they want in the moment without regard for what it is causing them and how they are sacrificing what they want the most. Make sure you take that time with your people to really help them get in touch with what they want the most, so you can help them to bring them back on course when they start to go astray.

Break the Vicious Cycle of High-Glycemic Carbohydrate Addiction

We talk about breaking that vicious cycle of high-glycemic carbohydrate addiction. This is really important. I can't emphasize this enough. It is what I started with, don't tell them what to eat, just give them the supplements that help to restore the insulin sensitivity. We don't want to just put people on supplements and let them think that is the way they fix their lives. The point is that if you help them to break the addiction they are going to make better choices. The cycle is that they eat these high-glycemic carbohydrates, which promote the excess insulin secretion.

Over time, with secreting all of that extra insulin, those cells adapt to the high level of insulin by turning it off, by not responding anymore, by putting their hands over their ears and saying 'no more, that's enough.' Then the high insulin is not allowing the sugar to go into the cells, so what happens is it causes it to get stored as fat and then have a rapid drop in the sugar. It says 'okay the sugar is too high, the sugar is too high, the insulin is too high.' Then it gets stored in the fat cells causing a rapid decline, and in some people, hypoglycemia, low sugar, which leads to cortisol or adrenaline to come out and try to bring that sugar back up. This is a survival thing, it is an emergency, we have to bring it up, and that creates the cravings. Then they go to the high-glycemic carbohydrates again and the whole thing starts all over. We need to break the cycle. All of the things that we have been learning so far are going to help you to break the cycle. We will go a little further and we will talk about the timing and how to put this all together.

Key Lifestyles Areas to Address

Remember our key lifestyle areas to address: nutrition, we talked about that already, stress, exercise, sleep, and we have given you a lot strategies in those areas. Finally we are going to talk about timing. I cannot over emphasize how important this is. I have had people who have simply done the timing pieces. I have one person who had heard me do an overview talk, shared with them the things about timing, said 'I don't have time, I am moving, I don't have time to do all this fancy food prep and change things much.' But she basically started to time her meals, not eat within three hours of going to bed, space meals 4 to 5 hours apart, and in two months she dropped 22 pounds without changing much else. So the timing is critical. Not that I am advocating that. She went on to join and started to follow all of this and now she is down to 75 or 80 pounds and is off all of her medication, hypertension medication, thyroid medication. She has never had to go on the blood glucose lowering medication, her blood sugar ranges from around 82 to 85, sometimes 78 to 82.

She had a high glycemic morning the day she had her cataract surgery and her blood sugar was up to 86 whereas if she had just been to the doctor before she started all of this and her blood sugar was 119 and I said you are almost diabetic lady, you are going to have to go on medication. So don't ever underestimate the value of timing.

You don't have to do these in the order that I presented them. When I do it as a group, I do it in a set order because that is how you have to do it when you have a group, but if you are working one-on-one with somebody you are going to do a really good consultation and really get to know them and figure out where the best place to start would be. The best place to start is not necessarily the one that is "most important to the outcome." It is the one that they will most likely follow through on and get some results and be really excited about continuing.

Meal Timing

Let's talk about meal timing. Why is meal timing important? Meal timing is important because it affects the ratios of hormones and the effects of one hormone on the other in terms of interfering with the mechanisms, and we will talk about those very specifically. Here are some meal timing rules I want to share with you. From here I am going to go through and share with you why it is important and what the mechanisms are so you understand it, and you can explain it in however much detail you need to explain it for your client or your patient.

Some of them want to know in gruesome detail and some of them just say, tell me what to do. If you understand it, you will be better able to explain it. Let's look at some of the meal timing guidelines. Number one, no snacking. When you eat more frequently your insulin is going to be up all day long. Remember what insulin is a fat-storage hormone. It is not a burning hormone. What does that mean? If a person is snacking all day long there insulin never goes down to normal. Their growth hormones never get to peak and they are basically in fat storage mode all day long. I don't know about you, but I have very few clients who want to be in fat-storage mode all day long. Then the only time they have to burn fat would be at night. Then we find that they are eating late at night. They eat right before they go to bed which causes an insulin spike which thwarts the growth hormones spike (and we will show you some charts on that shortly), and so they cannot have their growth hormones spike, which means they are not going to go into fat burning, and repair of lean muscle tissue.

One thing that is important, though, when we are looking at spacing the meals out, is that you don't want them to get famished, weak, or jittery between meals because that could put them into a stress state, cause the secretion of cortisol and adrenaline, which will cause them to actually cause their blood sugar to go up because it is an emergency.

Without getting famished, it is important to space the meals as far apart as possible. When you see how we present this in the program, you are going to see a model of how you can present it to your own clients. We also have it in your menu planner. That has a whole section on snacking. We have a *Snack Attack Strategy* that I gave you as a separate document in the *Nutrition* module.

Have them avoid eating a high-carbohydrate breakfast. If they can eat carbs without it raising their blood sugar, say they can eat brown rice and quinoa and lentils, and that does not raise their blood sugar, great. Don't have them do that in the morning because when they do it in the morning it throws off the levels of leptin, and I will show you a chart in a bit of how that happens. When leptin levels get thrown off and it peaks too soon in the day, then they get the cravings at night. If they are not so sensitive to carbs that they have to avoid them completely, have them do it later in the day. Have them do it for the evening meal and not too close to bedtime.

Eating protein within an hour of waking is important for so many people. It helps to promote growth hormone and it helps to regulate insulin, and also it helps with the cortisol levels throughout the day. Gradually increase the meals spacing. Remember we are not allowed to let them get famished, weak, or jittery. If they are used to eating every hour you don't tell them 'okay, now you have to eat every six hours.' The compliance is going to be low, or if they are one of these people who are very compliant and will listen to everything you say, they are going to really, really have a hard time between those meals. You need to work with that slowly, and work with increasing the capacity at each meal, like the client who had stomach bypass. She can't eat very much at a time, so you might not get that person to go to a six-hour spacing between meals because their stomach physically cannot hold enough, but there might be ways to get around that as well, and it is a matter of being creative as we work with people.

What's Timing All About Anyway?

Let's look at timing and summary of insulin resistant reset protocols. What is the timing about anyway? It is a matter of getting the hormones in balance and there are certain activities that you can share with your clients to help do that. What are the hormones that are particularly sensitive to timing of activities? I am not just talking food, I am talking food, exercise, and sleep. Hormones are leptin, ghrelin, growth hormone, insulin, melatonin, and cortisol. We will go through all of those in more detail so you understand the basic mechanism of how they work. The activities that you can control in terms of timing are sleep and awake. When do you sleep and when do you wake up? Being full and hungry.

We will talk about one of the advantages of being hungry for a little while in terms of inducing growth hormone. Then exercise and rest. The balance between all of these is going to be what is really important in helping them get their sugars under control.

When You Eat is as Important as What You Eat

Why? There is a control center in the brain called the hypothalamus that you have heard of before. It controls your response to life. It controls your temperature, your sleep patterns, your response to light and darkness, your hunger, your thirst, your exercise and stress. There are all kinds of things that are affected by the hypothalamus. When you eat affects the way that the hypothalamus controls that. Let's take a look at that.

Hormone Resistance, Timing and Blood Sugar

One of the things that happens when you aren't paying attention to the timing, and when you are getting these hormones out of balance and some of them are over secreting and others are under secreting, is that you develop hormone resistance. We all know about insulin resistance because that's what this whole course is all about is insulin resistance: when there is too much insulin and it causes the receptors to get burned out, and they no longer hear the signal of insulin, and we get blood sugar imbalance. But there is also leptin resistance, and leptin resistance is very common. As we will see, leptin is a hormone that is secreted by your fat cells and it says ‘enough, I've had enough food, let's go into fat burning, we don't need to take a more food, we can just use what we have for the next few hours’.

People who are overweight to say to me, ‘why am I overweight then because I must have plenty of leptin, it is just secreting all the time because I have a lot of fat cells.’ Well, leptin resistance. Because you have so much fat in the cells and you have overridden many times, how many of you have never overridden the signal that you are full and overeating? We've all done that. When you do that too much it causes the hypothalamus which hears the signal of leptin to say, ‘oh, you again? Forget it, you don't need it. I am going to ignore you. You are there all the time.’ So it's developed the resistance and it does not turn off the appetite. But you can even get adrenaline resistance. People who are hooked on their own adrenaline, adrenaline junkies, develop adrenaline resistance. What that causes is a decrease in fat burning because when adrenaline gets released it helps a process called lipolysis.

And then thyroid resistance. We develop thyroid resistance a lot of times as a result of over medicating with thyroid. Some people are on really high levels of thyroid for really long periods of time and the cells get resistant, but more important than thyroid itself is cortisol.

Cortisol and inflammation, cytokines, they will basically damage the thyroid receptors on your cells and cause your body to become resistant to the signal of thyroid. Chronic inflammation, which could be post trauma and to ignore it and you don't get it under control. Eating a diet that is inflammatory, lots of food that are inflammatory, eating food allergens. It could be a hidden infection somewhere in the body whether it is in the gut, or in a joint, or in the sinuses, and it could be also stress because cortisol affects the thyroid resistance and so many people are under stress and overproducing cortisol and that affects it. All of these resistances all come together to affect your blood sugar.

Leptin Cycle

Let's look at leptin. Leptin peaks in the late evening, and it is at its lowest point when you wake up. When leptin peaks, if you don't have leptin resistance, then the appetite is going to be turned off. Your appetite will be fine between dinner and bedtime because you are not supposed to eat then, but if you either have leptin resistance or you have done something to cause that peak earlier in the day, then what happens is you are craving food right after dinner. You have a full dinner, and even though your stomach is full you still are going, ‘I want food’, especially sweets. That happens when leptin gets out of rhythm and we are going to teach you how to understand leptin so that you can help your clients to do that.

Having high glycemic carbohydrates early in the day cause leptin to peak earlier, so it may peak before dinner, and then by the time after dinner comes the levels are going down, and the appetite kicks in, and the cravings for food kicks in. Then if you entertained that appetite and you actually eat right before bed, we will see on the next few slides that that affects growth hormone and then you don't have the nice growth hormone surge that happens right after you fall asleep and that affects fat burning as well. All of these things affect fat burning and they affect the levels of insulin and insulin resistance in the cells.

Leptin Optimization: 5 Rules

Five rules that you can teach our clients and I did not come up with these, they are well documented. There is a really good book called *Mastering Leptin*. It is over 400 pages long and it has hundreds of references that they talk about. Basic rules are, don't ever eat after dinner. Make your dinner the last food that you eat. Make sure there are at least three hours between dinner and bedtime, and at least 12 hours between dinner and breakfast. That will help your leptin levels. Three meals per day, not four, not five, not six; it is three meals per day. No snacking in between. Their recommendation is 4 to 6 hours between meals. More than six hours, maybe not as good because with more than six hours you might get into the starvation mode.

It may not happen right away but chronically having more than six hours between meals could cause a problem where you go into starvation mode. For example we will talk about something called intermittent fasting where one day per week you are going to go a really long time between your meals. That is really good as long as it is intermittent. That is why it is called intermittent fasting. But fasting on a regular basis down regulates your metabolism. Why? It decreases the level of leptin because your body is going, 'ooh, starving, starving, eat, eat', and then it creates a problem. With a lot of longer fasts, you have to be really careful coming off longer fasts. It can be challenging coming off a longer fast because your body wants food.

If you do intermittent fasting where one day per week or two days per week, not two consecutive days, you fast, you have your clients fast, it is going to affect their insulin levels, it is going to affect insulin sensitivity and their leptin resistance is going to go way down. I've had people do it and they've had phenomenal results. Some people one day per week and some people, two. It just depends on whether they are on a cycle. If they are in a cycle where they still have a tremendous amount of weight to lose, it is advantageous to do it two days per week, but if they are closer to their ideal weight and they are just trying to maintain it, then maybe just one day per week because it can promote some rapid weight loss.

We mentioned this earlier, this is one of the leptin, mastering leptin rules, is eat a high-protein breakfast. Ideally eat it one hour to one hour and a half after getting up in the morning because that sets everything for the day. If you start the day with carbs you are going to cause that's leptin peak that we talked about. If you started with protein it helps everything to stay stable. Then reduce overall the amount of carbs eaten. On the insulin resistance protocols that we have been talking about, that's what we are doing for at least those 30 days. Then you are monitoring to find out what that person tolerates. I am not an advocate of everybody needs to be on a low-carbohydrate diet. I personally am on a low-carbohydrate diet because that is what my body needs. I have a bunch of people who are and I have other people who can make a smoothie with eight bananas and lots of greens and their blood sugars goes up to 96. Do they have to be on a low-carb diet? Maybe not. Unless if that carb is causing them to have some kind of yeast overgrowth, but that is another story. So that is *Mastering Leptin,* a great book.

Normal Leptin Function

Let's look at the chart, normal leptin function. When leptin is perceived properly you are not going to be hungry after dinner because it is going to go up, it peaks around two hours after sleep, midnight, which is really a great time for its to peak.

Then it starts to come down. Then fat burning begins in the middle of the night. If it peaks earlier, and you are still eating when it is peaking, you are going to miss that fat burning because fat burning cannot happen in the presence of insulin. Keep this in your mind and really share this with your patients. You cannot burn fat when you have high levels above baseline of insulin. It is impossible. If you have somebody who needs to burn fat, they cannot do it while insulin is in their system. You need to have this nice rhythm of leptin and insulin happening. This is what normally happens and this is what happens when they are off. The level peaks sooner and then it is starting to go down after midnight. Then the level of the fat burning is going to be much lower because of that whole thing that happens around 4 AM, where it starts but it really does not happen that much because it peaked too soon and it is on the downhill spiral. It is really important to understand this.

Growth Hormone Normal Cycle

Intimately connected with the leptin cycle is the growth hormone cycle. The growth hormone peaks after intense exercise bursts and stays elevated for 90 minutes. If you do 30 *minutes* of cardio, moderate cardio, your growth hormone will stay elevated for 90 minutes; so it peaks right after and then it starts to go down but it takes 90 minutes. It stays elevated. If you do 30 *seconds* of intense 'burst' activity, all out up to the max, you get that same elevation and growth hormone and actually some of the studies show that it goes it a little higher. Then it comes down and still takes 90 minutes. If you get people doing 30-second bursts, multiple times throughout the day, it is going to put them in fat burning throughout the day *as long as they are not eating within an hour and a half* of either side.

When you really sit down with it, you can time your eating and your exercise bursts such that you maximize the amount of time and fat burning. If you've got someone you are working with who is skinny as a rail and does not want to lose weight, then you can also use this to help them to maintain their weight and gain actually. It peaks at midnight assuming you are going to bed at 11 o'clock. It actually peaks about an hour after you go to bed but studies that I have looked at show if you go to bed past midnight, you don't get as high of a peak in the growth hormone. The growth hormone peaks once every sleep cycle. We learned last week that we have probably 4 to 5 sleep cycles depending on the length of them throughout the night. Once in each of these sleep cycles it peaks, the biggest one by far is in that first one.

If you have somebody who eats a snack right before they go to bed and they have insulin in their system, growth hormone does not like insulin. They are like the cousins that are at war with each other. They will not play in the same pen. Once the insulin is up the growth hormones drop down.

It is the same thing after exercise. If you do this great exercise and thank you go get one of those lovely Gatorades and eat that, or gel packs or whatever else they are pushing for you to have energy, you completely stop fat burning and you go into fat storage mode. That is not good. You really want to be careful about the timing. It is super important.

Effect of Exercise on Growth Hormone

Here is a little picture of the effect of exercise on growth hormone. The upper curve is a 30-second 'all out' burst, like a sprint or if you are on an exercise bike, pushing it to the max, shooting it on up, or you get on one of those stair masters in the gym and you push it all out, and then you go back to a nice easy pace. There are a number of ways to do burst training and we talked about this in the module we did about fitness, but basically the more they do it the more they are going to shoot their growth hormone levels up. There is an interesting thing that it showed. When you did a second sprint 60 minutes after, you did not do a thing to the growth hormone. But if you wait until after it comes back down, or you wait a couple of hours or an hour and a half, then do another sprint, then it brings the growth hormone up to the same and sometimes even higher levels. We have a reference list in the program that you can look at if you really want to look at these in more detail.

Cortisol Rhythm and Timing

We talked about the effect of leptin and the growth hormone on our whole insulin resistance and belly fat burning, but cortisol is important as well. Cortisol generally peaks at eight in the morning. If you do one of those adrenal stress saliva tests, you will see that the highest level of cortisol is generally in the morning; it's ideally in the morning although some people have really low levels in the morning, and there are people in adrenal burnout. It's lowest at midnight. Again, you will see if you do these tests on people, that those people who have trouble falling asleep or staying asleep, that their cortisol starts to go up at bedtime, which stops them from sleeping. Then there is a sharp decline between 8 AM and noon; and then a gradual decline until evening. The reason for that is the cortisol is there to get us awake to get all the systems going, so it is sharp in the morning and then it settles down. It peaks during the day under stressful circumstances; so if you are sitting at your desks dealing with your boss and you have a deadline and you can't meet it. There are a lot of things that cause temporary spikes of cortisol, but then it comes back down again.

Circadian Rhythm

That is the ideal with cortisol. Cortisol is in a rhythm, and this is to show you graphically what that rhythm looks like. It is high in the morning and then it goes back down, and comes back up again. It usually starts to rise again at about 4 o'clock.

What happens and the reason that cortisol is so important with the blood sugar issues (we talked about this last week in our stress piece), is that your cortisol, when it elevates, it's job is to raise your blood sugar, because when you run away from a hungry tiger you are going to need sugar in your blood to fuel your muscles and get your heart pumping fast. It is natural for that cortisol to go up when you are under stress. If you are getting to be under stress a lot during the day, you will have spikes in your insulin. You're going to have blood sugar go up, and then you are going to have insulin spikes, and that is going to affect the whole fat burning fat storage.

The cool part is that when cortisol goes for fuel to burn and turn into sugar, it generally does not go for fat storage, unfortunately. It goes for muscle. It goes for glucose-neogenesis, breakdown protein stores because it is quick and easy for it to do. Basically if you are not running away from a tiger and were sitting at your desk stewing, you are sitting there and your blood sugar goes up because you broke down your thighs, and then insulin goes too high and it eventually gets stored back down around your waist. People love hearing this. If you want to turn your thighs into belly fat, get stressed out all day. One of the things that you can do to help dissipate that stress is to exercise. Teach them that if they are feeling really stressed out to run up and down the stairs or do something to actually burn that sugar because otherwise it is going to sit there and it is going to go on your belly. People can be just sitting there at their desk adding to their belly fat. It happens all the time.

Insulin and Protein Timing

Let's look at protein timing and insulin. Insulin increases protein synthesis. It also increases fat synthesis; that is what its job is. It is an anabolic hormone. Anabolic, meaning its stores, it makes things to store. If the protein is available in the bloodstream and the blood sugar is normal, insulin almost completely stops the process of breaking down muscle for your protein needs. You get up in the morning and you feed yourself with protein so that your body is not going to try to burn muscle to make sugar. It has the protein in the bloodstream and it can convert that into sugar. Especially if you are getting stressed probably if you have a specific time during the day that you get stressed, have a protein shake. Right before you know you are having a meeting with your boss have a protein shake, so that when that cortisol goes to find more fuel it won’t have to go very far, and won’t have to break your muscles down.

If the protein is not available and the glucose is normal, muscle breakdown is partially stopped. But if the blood sugar is high, insulin then stimulates muscle breakdown throughout your body. Let me say that again. If your blood sugar is high, the high level of insulin will stimulate the muscle breakdown throughout your body. That is to take away.

Every time you stimulate insulin production by eating carbohydrates, you need to eat some complete protein with it, or instead of rebuilding your muscles and tissues your body will continue to dissemble itself to get that protein. This is all science. This is not anything I made up. This is not anything from theory or conjecture. This is all in the science.

Leptin and Insulin

Leptin, when you have a high-glycemic diet and the insulin surges, too much fat from overeating causes excess leptin. The pancreas and the hypothalamus both develop leptin resistance by shutting down the receptors when it is too high. Basically it is always reading the gas tank is empty even when it is full. If your gas tank is always reading empty when you are on the road, you are going to spend a lot of time looking for a gas station to refuel. It's the same in your body. Increases appetite and decreases metabolism because you are saying conserve. The pancreas reduces its insulin in response to rising leptin. Basically you eat a meal and the insulin goes up. You've got sugar in your system. The leptin levels are stimulated because you are storing it, and then you basically turn off that. If the pancreas has become leptin resistant then it just continues to secrete insulin when normally it would stop doing that. When you go back to those charts we looked at, that is why it is really important to maintain those rules about leptin so you don't get into trouble that way.

Protein Timing

The timing for protein for optimal protein within an hour of getting up. There are some gurus who say 30 grams of protein within 30 minutes of rising. Actually that was not necessarily a health guru. That was in the *4-Hour Body* by Timothy Ferris, who wrote the *4-Hour Work Week*. He did this experiment and he discovered that people who had 30 grams of protein within 30 minutes of rising tended to burn fat better. It is an experiment from one guy with a group of people but it is something to keep in mind if you are working with somebody who is having some difficulties. Say 'give this a try for a week: take 30 grams of protein within 30 minutes of rising. That means that they are going to do some pretty intense stuff like protein powders. I figured out a green smoothie that had one pound of kale and a couple of scoops of protein powder, and that had 30 grams of protein. This is going to keep your leptin, insulin and cortisol all balanced and in control.

Here is a study: *A Protein Rich Breakfast Reduced Food Cravings*. It was from the University of Missouri. A researcher found that eating a healthy breakfast especially one high in protein increases satiety and reduces hunger throughout the day. In addition using functional magnetic resonance imaging, the researchers found that eating a protein-rich breakfast reduces the brain signals controlling food motivation and reward-driven eating behavior.

So there is evidence here, this is one of many studies that I found and I have a really long list of references in a document on your page.

Protein at Breakfast

Since your cortisol peaks at 8 AM, and its role is to create glucose from storage to get you going for the day, if you eat protein it is going to be used as fuel rather than breaking down your muscle because that's what cortisol's job is. When cortisol is high like that it is looking for protein to break down into glucose. If you eat the protein it does not use the muscles, it uses the protein instead, and that is why eating in the morning within an hour of getting up when the cortisol level is at its highest, tends to be really effective.

Meal spacing

There are some people, and it shows this in a lot of intermittent fasting research, that do really well with skipping breakfast and just having one meal, and doing that one day per week. But when you do it on a regular basis it can be problematic. Again you've got to work with your person and where they are.

Here are a couple more studies that you can look up. Salk Institute found that the daily waxing and waning of thousands of genes in the liver is mostly controlled by food intake and not the circadian clock. It is not set in time when this happens; it's more related to when you are eating and when you are fasting. You are either in a fasted state or a fed state. There is a researcher called Panda. He did a lot of insulin resistant type studies. He found out that the activity of your fat burning genes is highest when you have not eaten for a while. That is why we like to have that 4 to 6 hours between meals and that is going to stimulate the fat burning genes as well as the other hormonal things that we talked about.

Again, another study. If feeding time determines the activity of a large level of genes completely independent of the circadian clock, when you eat and fast every day that will have a huge impact on your metabolism. We want to be in a fasted state, fed state, fasted state, fed state. People who are eating because they were told that it is important to eat every two hours, really need to do the research and make their own decision about what they feel is right, but the research is really strongly saying that it’s a really poor idea. I have given you a research paper I wrote. It is about 18 pages including references, to help you make that decision. Again you have to go by each individual person, like the person who had the stomach bypass is going to be different. You may have to work with people slowly and gradually to get into the meal spacing but over all meal spacing is the best thing.

Meal Frequency and Weight Loss

I like to give you studies so that you can have a chance to look them up. Increased meal frequency does not promote greater weight loss in subjects who were prescribed and eight week, equal caloric energy restricted diet. You will hear this all the time. Eat six small meals per day. A lot of really popular people who are writing about blood sugar, are not looking at the research, I don't think, and they are not looking at the science. They are looking at popular stuff. They want you to not get too hungry between meals so you don't trigger cortisol but there are ways to plan your meals so that you are feeling satiated so you don't trigger that.

Ghrelin and Growth Hormone Timing Rules

Let's look at a couple more hormones and then we will move on to the summaries. We won't go through these in excruciating detail because we've got them in documents. Ghrelin, what is ghrelin? Ghrelin is a hormone secreted by your stomach. Those cells in your stomach secrete ghrelin to say ‘I am empty, I am hungry’. It sends the signal to the brain and says ‘I am hungry’. When you eat you suppress ghrelin. When you are hungry you secrete ghrelin. Very simple. It stimulates your appetite. But here is the good part. Most people do not like to be hungry. They think that as soon as they are hungry they have to eat something. Do you ever have an itch in public, and it is a place where you just cannot scratch in public? You live with it, you just live with it. You can't satisfy all of your desires or urges at the time you have them.

It’s the same with hunger. When you are hungry, and explain this to your patients, especially those who need to lose weight, here is a good thing that happens. When you get hungry, you increase the secretion of growth hormone. Growth hormone increases your muscles and decreases your fat. Wouldn't you like that? It doesn't mean you stay in that state for hours because then you can end up with way too low blood sugar and it is not going to work real well. But if you just do it for a short period of time, say a half an hour, you say ‘okay, I am going to get hungry and I am going to stay hungry for a half an hour before I eat again’. Your body gets trained. You can teach this to your clients and patients.

It is really important because it is a potent stimulator of growth hormone and you know we want more growth hormone. People are paying a lot of money to get shot up with growth hormone because it is effective. It is an effective stimulator. Why get shot up with that? Why pay a fortune and have the risks? I did a radio show on that. Why go through that? Do it naturally. This is one of the ways: love your hunger. Appreciate your hunger. Make friends with hunger.

Timing Rules for Leptin and Insulin

Let's review the rules. The rules for managing leptin and insulin. **Never eat after dinner**. Why? Because you have that insulin surge. It affects your growth hormone, it affects your leptin. Don't eat after. **Eat only three meals a day**. When you eat in between you are in a constant state of fat storage. **Allow 5 to 6 hours between meals**. I have been saying four to six because four is more reasonable for people but really 5 to 6 is the optimal. **Don't eat large meals and eat slowly**. People say to me, 'you want me to go 4 to 6 hours but I'm not supposed to eat large meals?' You eat to capacity. You don't want to overdo it because overdoing it is problematic. Eating slowly helps you to get the signal that you are full before you are overfull. The overfull feeling just affects the whole system so you really want to do it slowly and allow the time in between. **Eat breakfast containing protein**, I cannot emphasize that enough. **Reduce the amount of starchy carbohydrates**. That is not a timing rule per se but I threw it in there because it is so important. All of these others are timing rules. It is all about timing. This is not just what to do but went to do it.

Timing Guidelines

Let's review. I am going to say this enough times that you are going to have them down. Please get them to **quit eating three hours before bedtime**. If you are still eating right up to bedtime start with doing it yourself. The more you do it yourself the better you feel. The concept of **"burst and burn" before bed**. About two hours before your last meal and at least an hour before bed do a 2-minute high-intensity burst. It tends to lower the fasting glucose in the morning. I have seen it over and over. People in the program they would be like I am doing all of these things and my fasting sugar is still low. I say try this one, are you doing this one? No. They do it and then boom; the blood sugar in the morning is 86. It happens a lot.

If it is somebody who is waking up at three in the morning because they were molested as a child at three in the morning, that is not necessarily going to help. You are going to have to be working more on the emotional stuff, but it can help dramatically for people where that is an issue. Plan fitness bursts two hours after each meal. That will give you time to have the insulin levels dropping back down. It will burn whatever sugar is left in a system. It will cause a growth hormone spike, stimulate fat burning between meals, and it is going to regulate everything really, really well. **Extending the time between meals to five hours** is ideal, 5 to 6. **Consume protein within an hour of waking**. We have said it before. **Avoid high carbohydrate breakfasts**. You are probably going to hear me in your sleep saying that.

Practice breathing and appreciation before each meal. Why? Because that gets you out of your sympathetic mode and into your parasympathetic.

That gets you out of the cortisol mode, which shuts down digestion and into more of the acetylcholine and other of those nice parasympathetic hormones, which help with memory, and satiation, and calmness. **Going to bed no later than 11 PM** is the ideal; midnight at the outset, but the earlier the better.

If you've got somebody who is used to going to bed at two you are not going to say okay, starting tomorrow your bedtime is 11. They are not going to buy it. You are going to have to move it back gradually. I find 15-minute increments, while it is slow it still works well for people. The other thing I just wanted to mention just related to leptin and it is not really related to timing but it is in a way, you want to get a full eight hours of sleep if you can.

What I discover is that if I do not get enough sleep then, especially if I go to bed really late, I am missing that growth hormone surge but it also affects that surge of leptin and it does not turn off my appetite for the next day, and after I don't get enough sleep, I am starving. On days when I get plenty of sleep I can go hours without eating.