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Understanding the Importance of Insulin

I'm going to talk to you about the hormone whose name you've heard many times: insulin. Some of the content of this chapter is fairly complex, but I think you ought to read it carefully. Because for many of you, the answers to your battle with the bulge and concerns about long-term health issues are here.

Almost everyone knows that insulin is given to people with a certain kind of diabetes, to help control their blood sugar levels when their own supplies become depleted or insufficient. Insulin is one of the most powerful and efficient substances that the body uses to control the use, distribution and storage of energy. At its most basic, insulin is the control hormone for glucose, a basic form of sugar. So listen up.

Your body is an energy machine, never resting, always metabolically active-and it powers its operations mainly through the use of glucose in the blood, which is why glucose is interchangeably called blood sugar. The body must maintain a certain level of glucose in the blood at all times. So when there is no carbohydrate food source to make glucose, the liver will actually convert protein to glucose. Remarkably, even on a prolonged, total fast, a healthy body can maintain its glucose level within a rather narrow normal range. As a general rule, of course, the body obtains its principal supply of fuel from food.

What Happens to a Meal

You sit down at the table and consume a three-course dinner. Somewhere between chewing and excreting, your body absorbs certain substances from your food, mostly across the surface of your small intestine. From the carbohydrate you eat, your body will absorb sugars, all of which are, or quickly and easily become, glucose. From fat, it absorbs glycerol and fatty acids, and from protein, it absorbs amino acids, the building blocks of all cells.

Obviously, if you eat a lot of carbohydrate, you'll end up with a lot of glucose in your blood. Sounds good, doesn't it? All that energy coursing through your system. Eat sugar, starches and fruits and you're going to get those blood-sugar levels up fast, aren't you? If you love candy bars, perhaps you're saying, "That's great-the more I eat, the more energy I'll have."

Alas, a bad mistake. You see, the human body evolved and primitive humans thrived as hunter-gatherers who subsisted primarily on meat, fish, vegetables, fruit, whole grains and seeds and nuts. Candy bars were few and far between. The human body is used to dealing with unrefined foods as they occur in Nature. Consequently, your body's capacity to deal with an excess of processed foods is pretty poor, which is why our twenty-first-century way of eating so often gets us into trouble.

If you don't understand this yet, let's look at what insulin and the other energy-controlling hormones do when you eat.

As Your Blood Sugar Rises

Consuming carbohydrates impacts your blood-sugar levels. The amount of carbs-and the type-will determine how your blood sugar responds. For example, a food full of refined sugar and white flour, such as a jelly doughnut, will raise blood sugar much more dramatically than does a salad.

To be useful to your body, blood sugar has to be transported to your cells. Think of insulin as the barge that transports glucose from your blood to your cells. Once it reaches the cells, three things can happen to that glucose: It can be mobilized for immediate energy; it can be converted into glycogen for later use as a source of energy; or it can be stored as fat.

Let's delve in a little deeper. Insulin is manufactured in a part of your pancreas called the Islets of Langerhans. As the sugar level in your blood goes up, the pancreas releases insulin to move the sugar out of the blood. It then transports the blood sugar to your body's cells for their energy needs. But as we previously mentioned, when these needs are met the liver converts excess glucose into glycogen, which is stored in the liver and muscles, where it is readily available for energy use. Once all the glycogen storage areas are filled, the body has to do something with excess glucose. And here is the big revelation: The liver converts the remaining glucose to fat, which becomes the "storage tanks" of fat on your belly, thighs, buttocks and elsewhere. That's why insulin is called "the fat-producing hormone."

Since fat is much more efficient-and has more capacity to store energy-than glucose, we can store a lot more fat in our bodies than glucose. That, my friends, results in obesity. And by the way, the main chemical constituent of all this fat (the fat you're reading this book to get rid of) is triglyceride, the very same triglyceride that, in your blood, can be a risk factor for heart disease and stroke.

Insulin is a pretty efficient worker. If it were not, your cells could not get enough glucose, their basic fuel, and blood-glucose levels would rise while the cells searched for other fuels-first for protein in your muscles and organs, and then for fat in your fat stores. That's why people with poorly controlled, insulin-deficient diabetes can lose weight when no insulin is present. And that's why a person on a low-calorie diet may lose lean body mass. (This shouldn't happen on Atkins, where sufficient calories and protein are consumed to meet the body's energy needs.)

On the other hand, excessive carbohydrate intake results in high amounts of blood sugar and may, in turn, overstimulate insulin production. When this happens, it causes a drop in blood sugar, robbing the body of energy for the cells. The result of the process is destabilized blood-sugar levels, quite possibly causing fatigue, brain fog, shakiness and headaches.

The body attempts to adjust by liberating counter-regulatory hormones-such as adrenaline-to raise the glucose level, but another stiff dose of insulin can overpower the effect of those hormones. Fortunately for most of us, this glucose balancing act takes place automatically and our blood sugar stays in a fairly narrow, normal range.

But for some, the bodily insult of massive insulin release to deal with massive blood-glucose levels has been going on for years, causing the glucose-regulating mechanism in the body to break down, initiating unstable blood sugar and eventually diabetes. For more on diabetes, see Chapter 24.

What Is Hyperinsulinism?

Simply put, hyperinsulinism is the condition that results from too much insulin being produced by your body.

It's easy to see how this might happen when you realize that there's a relationship between the kinds of foods you eat and the amount of insulin in your bloodstream. Foods rich in carbohydrates-especially sugar, honey, milk and fruit, which contain simple sugars, and refined carbohydrates such as flour, white rice and potato starch-are readily absorbed through the stomach, so they speedily convert to glucose. When these foods are eaten in excess, they require a lot of insulin for transport. Foods made of protein and fat, on the other hand, require little or no insulin. (Protein in excess converts to glucose in the liver and requires some insulin to transport it to the cells; fat requires essentially none.)

And what happens when there is too much insulin? As an overweight person becomes heavier, insulin's effectiveness may decline. The cells become desensitized to the action of insulin so it can no longer effectively transport glucose to them. This is known in medical circles as insulin resistance, which quickly leads to hyperinsulinism. Numerous studies have shown that insulin resistance is more prevalent among the obese, although even some individuals who appear slim and healthy may actually be insulin resistant.

What appears to happen is that the insulin receptors on the surfaces of the body's cells are blocked, which in turn prevents glucose from reaching the cells for energy use. That's one reason overweight individuals may be tired much of the time. When insulin is ineffective in taking glucose into the cells, the liver converts more and more glucose to stored fat. Your body is, in fact, becoming a fat-producing machine instead of an efficient energy-producing machine.

Your body's hormonal system is now in desperate straits. At this point, insulin is being secreted more and more frequently to deal with high blood-sugar levels, and it is doing its job less and less effectively. Which makes you crave sweets and carbs, which compounds the problem in a vicious cycle. In time, even the insulin receptors that convert glucose to fat start getting worn out, forecasting diabetes.

A Host of Other Health Issues

Here are some further reasons why high insulin levels can lead to big problems:

- Insulin increases salt and water retention, a recipe for high blood pressure.
- Insulin is directly involved in creating atherosclerotic plaques, which, if not controlled, can lead to heart disease.
- High insulin levels have been shown to correlate with high levels of triglycerides and low levels of "good" HDL cholesterol.
- High insulin levels correlate with increased risk of breast cancer and polycystic ovarian syndrome. (Conversely, the lower the levels of insulin, the better the survival rates for breast cancer.)

Obesity increases insulin resistance. This means that you can sharply reduce your risk of blood-sugar disorders-and by extension, heart disease and other ailments-by simply keeping your

weight down and controlling carbohydrate intake. Even if you have a hereditary predisposition to diabetes, you may be able to stall or completely avoid its onset.

A Subject of Intensive Study

Don't think the mainstream medical profession hasn't noticed the correlation between insulin resistance and disease. In the past fifteen years-and this is a trend that only keeps building-medical journals have published studies of the powerful association between obesity-usually accompanied by hyperinsulinism-and the probability of heart disease or stroke. All around the world the studies pour in. For example, using data from several epidemiological studies, Dr. B. Balkau found links between high glucose levels and mortality in thousands of men whose medical histories had been followed for two decades. Uniformly, high blood-glucose levels and insulin resistance signified markedly higher risk of death from cardiovascular causes.

American research points in the same direction. The Bogalusa Heart Study followed four thousand children and young adults." Even in childhood, a high insulin level corresponded to higher triglyceride levels and higher VLDL cholesterol-a particularly damaging form of "bad" LDL cholesterol. Not surprisingly, these associations were even more marked in the overweight. We'll go over this ground in greater detail in Chapter 27 when I discuss heart health. For now, just remember a bad diet produces results that are not merely cosmetically unattractive; it flies the black flag of some of the very worst health catastrophes.

Ah, but you came to this book for weight loss. All right, let's make crystal clear the connection between high insulin levels and excess weight.

This Is Why You Can't Lose Weight

I am about to recount a horror story that might be headlined: **Innocent Human Is Turned Upon By Own Hormones!** But we did it to ourselves, you know. Remember, no culture in world history has ever consumed even a fraction of the sugar we twenty-first-century Westerners do.

Perhaps you've been overweight for a long time. Once there was a stage in the progress of your metabolic disease when you could lose weight pretty easily, if you sharply cut your caloric intake. You'd gain the pounds back, but at least at the price of hunger, you could shed them again. Then, although your weight continued to yo-yo up and down, you began to notice that the yo-yo went up easily, but getting it to fall down again was harder and harder.

Now maybe you're past even that stage, and you simply cannot drop pounds. If you are, insulin has really closed the trap. The pancreas, faced with your abuse of simple and refined carbohydrates, has become so efficient at secreting insulin that just a touch of blood sugar will release a flood. In response to high insulin levels, your body has become intent on storing fat by the process I've explained. Group A responders (see pages 34-35) will recognize the role that excess insulin plays in preventing weight loss by giving you an ongoing sensation of hunger that can be satisfied only by constant overeating.

Now that you've reached this understanding of the metabolic basis of being overweight, imagine going into your doctor's office after diligently eating a low-fat diet that was quite possibly high in sugar and carbs. And imagine being told, "Well, if you just had a little more

willpower..." Sad, isn't it? Willpower is not the issue. To lose weight, you're going to need the controlled carbohydrate nutritional approach offered by this book. You will also need the two other legs of the Atkins triad: regular exercise and nutritional supplementation.

I know I've produced a really heart-sinking analysis of how and why fat accumulates on your body. So, what do you do now? You adjust the insulin spigot. And so far as weight loss goes, the answer lies in two entwined concepts: burning fat and controlling carbohydrates, which we will explore in the upcoming chapters.

KEY POINTS!

- Insulin is the hormone that transports glucose from your blood to your cells, where it can be converted to energy. The liver will convert excess glucose to glycogen, which is stored in the liver and muscles for additional, accessible energy.
- Remaining glucose will be converted to fat and stored throughout the body.
- Excessive carbohydrate intake results in an oversupply of glucose, and thus insulin, in the body.
- An ongoing cycle of excess blood glucose overproduction and insulin overproduction eventually results in hyperinsulinism and ultimately diabetes.
- Hyperinsulinism is what makes it hard for many people to lose weight.
- Atkins can stabilize insulin production to make it easier to lose weight.
- High levels of triglycerides in the blood are a proven risk factor for heart disease and stroke.
- Atkins can sharply reduce your risk of blood-sugar disorders-and by extension, heart disease and other serious ailments.

A FREQUENTLY ASKED QUESTION:

Can I manage my insulin and blood sugar without eating much fat?
No, because when you cut out fat, what is left is protein and carbohydrate, both of which can produce a blood-sugar response. Fat is the only substance that won't have an impact on your blood sugar. It also provides essential fatty acids you can't get from protein or carbohydrates. Contrary to much of what you may have heard, fat can be good for you!

TIPS:

- If you don't stabilize your blood sugar you will have difficulty losing weight.
- If you lower your carbohydrate intake you will lower your insulin levels as well as your triglycerides.
- If you are taking oral diabetes medicine or insulin, consult your physician before starting Atkins. You will need to reduce and then monitor your dosage as you lower your blood-sugar level.