



Smart Blood Sugar

# SMART BLOOD SUGAR

The Complete System to  
Naturally Balance Blood Sugar... and Prevent  
or Reverse Diabetes... Without Drugs!



BY DR. MARLENE MERRITT





# PART ONE | The Truth Behind the Diabetes Epidemic



## *Why Are My Doctor's Recommendations Not Working?*

You may be reading this because you've received a diagnosis of diabetes. Or maybe someone you know did. Or your doctor said you were pre-diabetic and that scared you. Or you have a family history of diabetes and don't want to follow in their footsteps.

Or maybe you're reading this because you or someone you know has gotten cancer and you've found out the impact that diet can have on that disease. Maybe you're dealing with depression, anxiety, fatigue, insomnia, gas and bloating, weight problems, or hormonal imbalances.

Whatever the reason, I'm glad you're here. This book will give you the tools to reverse what seems to be inevitable for many people, and to do it naturally, without drugs.

I've had lots of patients come into my office, follow my recommendations, get great results, and then ask me why their doctor didn't give them the same advice. Good question. Partly it's because the medical establishment has been married for decades to the idea that fat is bad and carbs are good, and it's hard to let go of something you've said for years and years even when the research doesn't support it.

But once you follow these recommendations and see the results, the whole thing will seem obvious to you: if you want to regulate your blood sugar, stop filling your body with sugar, or things that turn into it.

It'll seem obvious, too, that medications can't cure someone who's still eating poorly. It's tough to put out a fire when you keep throwing more logs on it. But if you fuel yourself with the right foods, those conditions can often reverse themselves – or you won't get them in the first place.

## *Dangers of Blood Sugar Imbalances*

**Blood sugar imbalances can cause dozens of different problems, from the serious and potentially fatal to the minor but constant annoyances. Starting with the worst:**

**Diabetes:** One out of eleven people in America have type 2 diabetes. But amazingly, a quarter of those don't even know they have it. Even worse, more than one in three adults are pre-diabetic, and nine-tenths of those don't know it.<sup>1</sup> And most people don't really get the impact. High blood glucose damages blood vessels and makes the blood too thick to pass through the little capillaries in the body – the ones that supply important organs like kidneys and eyes. That's why, every 24 hours, 230 diabetics lose a limb, 55 go blind, and 120 progress into kidney failure.<sup>2</sup> Diabetes is also the #1 cause of erectile dysfunction, and the risk of early death is 50% higher for people with diabetes than without.

**Hypertension:** We're quick to think that high blood pressure is mostly caused by salt, but "the wrong white crystals" are being blamed.<sup>3</sup> Interestingly, if you eat too little salt, that can speed up insulin resistance!<sup>4</sup> (We'll describe insulin resistance in more detail later.) If you want to manage high blood pressure, the first thing to do is stop eating processed foods and sugar.

**Hormonal Problems:** High blood sugar causes multiple hormone imbalances. One of the most obvious is high estrogen, which produces "man boobs" and beer bellies for men, and weight gain for both men and women. Estrogen is also tied to multiple cancers, including breast,<sup>5</sup> uterine,<sup>6</sup> and prostate,<sup>7</sup> as well as infertility. And estrogen prevents testosterone from functioning properly, leading to "low T" symptoms such as sexual dysfunction, low energy, depression, and reduced muscle mass. In some women, high blood sugar also causes high testosterone, causing male-pattern baldness, facial hair growth, and poly-cystic ovarian disease.

**Cardiovascular Disease and Strokes:** Most people have no idea that it's actually insulin and glucose that cause you to have the small, dense Type b LDL that causes plaques – because it's insulin that's vulnerable to oxidation (what causes plaques), not, as we've been told for so many years, saturated fat.<sup>8,9</sup> Since high blood sugar makes the blood thicker and stickier, incidence of blood clots and strokes go way up.<sup>10</sup> People with diabetes, are 180% more likely to have a heart attack, 170% more likely to die of cardiovascular disease,<sup>11</sup> and two and a half times as likely to have a stroke.

**Alzheimer's Disease:** Alzheimer's results from insulin resistance in the brain, which is why some people are starting to refer to it as type 3 diabetes.<sup>12</sup> If you're diagnosed with diabetes before the age of 65, it doubles your chances of developing Alzheimer's.<sup>13</sup>

**Cancer:** Did you know that cancer cells can only use glucose as a fuel? (This is actually not new information – oncologists have used PET scans as one of their main diagnostic tools since the 1980s, and the way PET scans work is by giving the patient radioactive glucose and then scanning their body to see where it went.) Lewis Cantley, director of the Cancer Center at Harvard Medical School, says that up to 80% of all human cancers have glucose and insulin as instigating factors. Dr. Craig Thompson, researcher and president of New York's Memorial Sloan-Kettering Cancer Research Center, believes that many pre-cancerous cells would never become malignant if it wasn't for the constant exposure to insulin and needing glucose for their metabolism.

**Chronic Pain and Autoimmune Disorders:** Both glucose and insulin are highly inflammatory, and inflammation leads to joint pain, arthritis, fibromyalgia and other chronic pain conditions and autoimmune disorders. We've had patients who've cured years of chronic pain in a couple of weeks just by cutting out sugar.

<sup>1</sup> <http://www.diabetes.org/diabetes-basics/statistics>

<sup>2</sup> Congressional Diabetes Caucus, <http://www.house.gov/degette/diabetes/facts.shtml>

<sup>3</sup> DiNicolantonio, James J., and Sean C. Lucan. "The wrong white crystals: not salt but sugar as aetiological in hypertension and cardiometabolic disease." *Open Heart* 1.1 a(2014): e000167.

<sup>4</sup> Garg, Rajesh, et al. "Low-salt diet increases insulin resistance in healthy subjects." *Metabolism* 60.7 (2011): 965-968.

<sup>5</sup> Yager, James D., and Nancy E. Davidson. "Estrogen carcinogenesis in breast cancer." *New England Journal of Medicine* 354.3 (2006): 270-282.

<sup>6</sup> Million Women Study Collaborators. "Endometrial cancer and hormone-replacement therapy in the Million Women Study." *Obstetrical & Gynecological Survey* 60.9 (2005): 595-597.

<sup>7</sup> Carruba, Giuseppe. "Estrogen and prostate cancer: An eclipsed truth in an androgen-dominated scenario." *Journal of cellular biochemistry* 102.4 (2007): 899-911.

<sup>8</sup> University of Rochester Medical Center. "How Diabetes Drives Atherosclerosis." *ScienceDaily*, 17 Mar. 2008. Web. 6 Jul. 2011.

**Depression and Anxiety:** Both depression and anxiety are poorly affected by sugar, as insulin prevents amino acids from crossing the blood-brain barrier, leaving you unable to make neurotransmitters effectively. In fact, having diabetes doubles your chances of being diagnosed with depression.<sup>14</sup> Once people get their blood sugar under control, incidences of anxiety and panic attacks drop dramatically.

**Fatigue or Insomnia:** Blood sugar roller coasters are just exhausting! Difficulty waking up, food comas, insomnia, and being tired all day (or at particular times of the day), are all symptoms of blood sugar imbalances. If you ever wake up in the middle of the night and have trouble getting back to sleep, this is caused from the years of sugar abuse tiring out your adrenal glands. Your adrenals help make sure your brain stays fed, but once your blood sugar system is “broken” and your adrenals are tired out, it’s hard to keep things stable at night. If you find yourself waking up at 2 every morning and unable to get back to sleep, that’s your body giving you a shot of adrenalin because it’s afraid you might slip into a coma otherwise. Improving your blood sugar solves all these problems, and you’ll have better energy in just a handful of days.

**Weight Gain:** Isn’t it frustrating? You’re eating the way they tell you to, but can never seem to lose weight and keep it off for more than a few months. The reason, for most people, is that insulin prevents fat from being burned. So every time you eat a carb and release insulin into your bloodstream, you put on more weight.

**Gas and Bloating:** This might seem like a no-brainer, but your digestive system doesn’t like sugar. This is because you’re not the only one who uses glucose for energy – bacteria do, too, and carbs feed the wrong bacteria in your gut, causing lots of gas. This is one of the first things to change when you cut down on carbs!

**Your Immune System:** A blood sugar count of over 120 causes your white blood cell function to drop 75% for over four hours!<sup>15</sup> So if you find yourself constantly getting sick, there’s a good chance sugar has something to do with it.

Clearly, the impact here is more than just the “sugar crash” our parents taught us when we were kids. So if you want to know the truth about the diabetes epidemic, and blood sugar, and what to do about it, read on.



<sup>9</sup> Quiñones-Galvan, A., “Evidence That Acute Insulin Administration Enhances LDL Cholesterol Susceptibility to Oxidation in Healthy Humans”, *Arteriosclerosis, Thrombosis, and Vascular Biology*. 1999;19:2928.

<sup>10</sup> Potter van Loon, et al. The cardiovascular risk factor plasminogen activator inhibitor Type I is related to insulin resistance. *Metabolism* 1993;42:945-949

<sup>11</sup> <http://www.diabetes.org/diabetes-basics/statistics/>

<sup>12</sup> Suzanne, M., and Jack R. Wands. “Alzheimer’s disease is type 3 diabetes—evidence reviewed.” *Journal of diabetes science and technology* 2.6 (2008): 1101-1113.

<sup>13</sup> <http://www.webmd.com/diabetes/news/20090130/diabetes-can-double-odds-of-alzheimers>

<sup>14</sup> Anderson, Ryan J., et al. “The prevalence of comorbid depression in adults with diabetes a meta-analysis.” *Diabetes care* 24.6 (2001): 1069-1078.

## Real Causes Behind The Diabetes Epidemic

### How Did This Happen?

It's actually a relatively new phenomenon, this diabetes epidemic. Up until the early 1980's, only one in seven people were obese and it had been the same for decades. Yes, that's correct – the obesity rate had not changed substantially for years and years. But then a couple of big changes occurred.

### Fat Becomes Public Enemy Number 1

Starting in the early eighties, we heard time and time again that saturated fat would clog our arteries, and that to be healthy and thin, we needed to cut down on our fat intake as much as possible.

### Remember the Food Pyramid?

Look at that. A tiny bit of fat at the top, and 6-11 servings of carbohydrates at the bottom.



There were a few problems with this. mostly that it wasn't based on good science. The body prefers fat as a fuel, since carbohydrates are a bit like throwing newspaper on flames – they burn very quickly, and then they're gone. But fat is the "big log," burning slowly for a long time, which keeps your blood sugar stable and your brain fed. Fat makes you feel full; remove that and people are hungry most of the time. (Sound familiar?) And contrary to what might seem now like common sense (because of what we've been told over and over again), saturated fat doesn't actually clog your arteries.

You heard that right. You may have heard it a million times that butter and red meat will block your arteries and kill you, but when you actually look at the research, there are a couple of situations that got muddled up.

I'll talk more about that later, but it's important to note that the woman who originally came up with the Food Pyramid – a highly lauded nutritionist – recommended almost the opposite of what you see above. In the original food pyramid, grains came in at no more than two to three servings per week, alongside four tablespoons of cold-pressed fats like olive oil in addition to those naturally occurring in foods. The rest of the pyramid included five to nine servings of vegetables a day, five to seven ounces of "protein foods" (which

included meat, eggs, nuts and beans), and two to three servings of dairy. Sugar should be kept to no more than ten percent of caloric intake, and white flour was lumped into the “junk food,” which was to be consumed rarely or never.<sup>16</sup>

Unfortunately, the organization that hired her was the U.S. Department of Agriculture, and their job is to support our farmers, not provide us with sound nutritional advice. So for reasons that had absolutely nothing to do with health, we were told to eat bread, pasta, and cereal to our hearts’ content, and get rid of eggs, butter, and whole milk.

All of which is to say, an entire nation changed its way of eating based on a combination of scant evidence and political economics.

If you were like me, you followed the recommendations, buying fat-free yogurt, drinking skim milk, eating cereals and bread (whole grain if you were healthy). And you consumed what we now know was about five to ten times the amount of carbs your body can really handle. At some point, your physiology just became overloaded, and suffered the consequences. As one researcher said, “Our diet is mismatched with our biochemistry.”<sup>17</sup>

### Cheap, Addictive Food

While all this was going on, the big food companies were very busy figuring out how to become more successful (read: more profitable). Saving a few pennies per product would increase their profits by hundreds of thousands of dollars, so they hired chemists and invested millions in research and development. And it worked like a charm. They substituted inexpensive chemicals that tasted like food for ones that had to be (expensively) grown and raised. They increased sugar and salt, because it would be completely unpalatable otherwise, and because both are those compounds are chemical wonders – acting as preservatives to lengthen shelf life, improving consistency, binding ingredients together, etc. They also stimulate the dopamine receptors in your brain, making them as addictive as heroin or cocaine.

Supermarkets, vending machines, and corner gas stations quickly filled their shelves with “hyper-palatable” items that never go bad and keep you coming back for more. Fast food exploded, because it was now easy to keep these food substitutes on hand almost indefinitely and heat them up quickly. Super-sizing and free refills were born. Then came the 99-cent menu to get people in the door. And before we knew it, we were surrounded by food that wasn’t actually food.

And then they marketed all this to a population that wanted to be modern, and hip, and all the things the commercials told us we would be. Now that women were in the workplace, we didn’t have time to cook anymore; and once home economics was taken out of the schools, we didn’t know how. What a joy those instant mixes became, cutting the prep time for brownies down from thirty minutes to five!

And because these foods were formulated to be addictive, we kept coming back for more. We bought the frozen pizza that (like three-quarters of the frozen pizzas



on the market today) didn't use real cheese. We ate low-fat frozen dinners that contained chemicals we didn't recognize, and drank our sodas, where the hidden sodium makes us thirsty to drink more. The serving sizes got larger and larger, and still we'd clean our plates.

*And then we'd order dessert.*

### Here We Sit...

**The current expression for pointing out the dangers of a sedentary lifestyle is "Sitting Is The New Smoking."**

To everything I've listed above, add in a lifestyle that has many of us driving everywhere and sitting in front of our computers for hours at a time. We all know that exercise burns calories (and that's still true – not everything you learned was wrong), but there's more to it than that. I'll talk more about the physiology of this later in the book, but for now let's just say this: exercise burns glucose. And when you fill your bloodstream with glucose and then don't burn it off, it leaves all that glucose (and insulin) sitting there, doing damage.

And now we have the perfect storm to create a diabetes epidemic.

### So It's NOT Genetic?

We inherited two things from our parents: their genes, and their way of life. It takes thousands of years to change genes. Thousands. But this diabetes epidemic has shown up in the last 30 years. We don't have a diabetic gene that's just appeared.

It's far from guaranteed that you'll get diabetes if your mother or father has it, and type 2 diabetes has proven to be reversible with the right diet changes.

*No, this is a man-made crisis. Which is good news, because it means you can unmake it.*

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<sup>16</sup> Luise Light, *What to Eat* (New York: McGraw Hill, 2006)

<sup>17</sup> Bremer, Andrew A., Michele Mietus-Snyder, and Robert H. Lustig. "Toward a unifying hypothesis of metabolic syndrome." *Pediatrics* 129.3 (2012): 557-570.





## Understanding Proper Nutrition

### *Macro Breakdowns*

Macronutrient is just a fancy term for the kind of nutrient that provides calories. There are three kinds: protein, fat, and carbohydrates.

#### Protein

Proteins are primarily broken down in the stomach and require proper levels of stomach acid to do so. You find it in animal products (meat, eggs, and dairy), soy, nuts, seeds, and beans.

I'm not going to spend a lot of time on this one, because it doesn't have much impact on blood sugar. The one thing I will say: soy is actually very difficult to digest and can cause all sorts of problems, ranging from digestive distress to hypothyroidism to preventing absorption of nutrients. This includes tofu, soy milk, soy cheeses, soy yogurts, and soy "meats." The exception is soy that's been fermented (the fermentation process neutralizes the harmful compounds), which means that miso, tempeh, and soy sauce are fair game.

#### Fat

Fats are found in animal products, plant oils and when they're added to processed foods. There are four main types:

- **Saturated:** solid at room temperature and very resistant to going rancid. These are the fats often associated with meat, dairy, and eggs, though coconut oil and nuts have quite a bit, too.
- **Monounsaturated:** liquid at room temperature and vulnerable to becoming rancid. Olive oil is a top provider of monounsaturated fat.
- **Polyunsaturated:** found in very small quantities and extremely vulnerable to becoming rancid. Commonly found in nut, flaxseed and fish oils.
- **Trans Fats/Hydrogenated fats:** these are extremely dangerous and absolutely contribute to heart disease, which is why they are being removed from the food industry. Found in anything with the word "hydrogenated" on the label, such as refrigerated doughs (think crescent rolls and frozen cookie dough), chips, supermarket cakes, and icing. Basically any place butter would have been used in the past. They are very difficult for the body to clear – it takes about 90 days to clear this kind of fat, so avoid it at all costs.

By the way, none of the the foods that exist in nature have purely one type of fat in them – they will always have a mix of both saturated and unsaturated. For example, beef fat actually has as much unsaturated fat in it as you'll find in olive oil.



A few decades back we got paranoid about saturated fats, because researchers thought that saturated fat raises LDL and they saw that people with heart disease had high LDL. From that, they concluded that saturated fat must cause heart disease.

The thing is, they never really tested their theory. They never looked for people with high LDL who don't have heart disease, which it turns out is quite common. If they had, they might have looked for the other things that people with heart disease were also consuming that might have been the real culprit.

It turns out, not all LDL is bad. There's a light, fluffy "good" kind (type A) that's the precursor to your hormones. (Drive your cholesterol down too far and you can't make testosterone, for example!) And there's a small, dense "bad" kind, which makes plaque. And what makes the small, dense bad kind? That's right, sugar and white flour. Eat more of those things, and you drive up your total cholesterol, regardless of your fat intake.

Fortunately, the medical community is starting to wisen up to this. For a while now, there's been general agreement that hydrogenated fats and trans-fatty acids are bad news, and in recent years they've started to consider the possibility that saturated fat might not be. And gradually, the focus on LDL is shifting towards triglycerides, which is a much better measure of an individual's risk of cardiovascular disease.

For more information on this, check out Gary Taubes' feature in The New York Times, "What If It's All Been A Big, Fat Lie?" or Time magazine's 2014 cover story, "Eat Butter: Scientists Labeled Fat the Enemy. Why They Were Wrong."

#### **With all that in mind, let's take a look at some of the healthy fats out there:**

- Fats in meat or dairy (including red meat and butter)
- Chicken skin
- Coconut oil
- Lard
- Nuts and seeds
- Eggs
- Avocado
- Seed oils (olive, peanut, sesame, etc.)

Lard? How is that a healthy fat? This one always shocks people a bit, as we've fallen hook, line and sinker, for the "lard clogs your pipes" way of thinking. But lard is actually in the same category as olive oil, a monounsaturated fat, and it's come back as a good cooking oil. ("Lard: The New Health Food" in *Food and Wine* magazine is a fantastic introduction to straightening out our misunderstandings about lard.)<sup>18</sup>

Coconut oil is particularly helpful when you're changing your diet in the way we recommend. It's what's known as a "medium-chain fatty acid" which means that the body won't store it as fat, but uses it just like a carbohydrate – meaning it's quick energy! We like to promote the use of this oil whenever you're cooking your food, but we've had people who stir it into their coffee and tea for a quick pick-me-up, or even lick it off a spoon! The refined kind doesn't taste like coconut like the unrefined does, but they both work the same, and there's no weird chemistry in the refining process – it only means they removed the coconut proteins. So pick whichever tastes better to you.

**Fats to be avoided:**

- Partially hydrogenated vegetable fats (trans-fats)
- Unsaturated oils that are not cold pressed or expeller pressed

Commercially prepared seed oils (corn, canola, vegetable, etc.) found in grocery stores are not safe to eat. They use high temperatures and chemical solvents to economically extract the oils, and in the process they become damaged and rancid. The offensive smells are removed prior to bottling, but the free radicals are still present. These oils are one of the leading causes of heart disease.

**Carbohydrates**

And finally, we have reached the real culprit of diabetes: carbohydrates.

Carbohydrates are quick forms of energy for the body to use. They convert easily to glucose, the main fuel of the body, of which 30% is used for brain function. (This is why you have difficulty concentrating, or you get tired or irritable when your blood sugar is low – because your brain is literally starving.)

One thing to note is that your body doesn't actually need carbohydrates to get all its nutrients. Carbs are quick and easy to use as fuel, but your body can obtain all of its energy and nutrients from protein and fats. This is vital to remember, because the general recommendation about how you should always have a carb on your plate has contributed to the mess we're in.

There are two kinds of carbs: simple/refined (also known as simple sugars) and complex/unrefined. Simple carbs are anything ending in -ose (sucrose – which is white sugar – glucose, fructose, lactose, dextrose, etc.) as well as white, refined flour. Most of these simple sugars cause your blood sugar to rise rapidly and increase insulin levels as a reaction.

Complex carbs are basically chains of glucose bound together, and are found in whole grains and starches – e.g., potatoes, pasta, and rice. They're bound with fiber and other nutrients, which helps to slow down absorption and feed your body in other ways, but they still cause blood sugar and insulin levels to rise.

We've often been told that if it's a "good carb" that it's okay to eat it, or that if it's "whole grain" or "low glycemic" that it's fine. But one thing I tell my patients is that once your system is "broken," the general rules do not apply. For someone who is insulin-resistant or diabetic (which we'll talk about in the next section), these carbs still cause an overreaction of insulin, which is why using the glycemic index is not recommended by the American Diabetes Association. (Also because we have no idea about serving sizes.) Just because brown rice is a lower glycemic food doesn't mean that eating a cup of it is healthy!



<sup>18</sup> <http://www.foodandwine.com/articles/lard-the-new-health-food>

By the way, all vegetables have carbs, but the green ones and the non-starchy colorful ones (e.g., carrots or beets) don't have much. No one ever got diabetes from eating too many carrots!

## *Understanding Blood Sugar and Insulin*

### **The Path to Insulin Resistance**

One of the first things to understand about diabetes is that it doesn't happen overnight. It takes years of drinking soda, ordering dessert, buying candy bars and energy drinks, and eating mountains of mashed potatoes and spaghetti to cause your system to break down. So how does this happen?

A couple of points before we start: First, all carbohydrates break down into sugar, which is why the terms are often used interchangeably here. Even carbohydrates with fiber (so-called "good carbs") ultimately breakdown to glucose, so just keep that in mind as you read. And remember that this whole process happens at different speeds for people – some people exercise more, and stave off this process a bit longer, while others grew up drinking soda, so it went quicker for them. As you read, keep looking for yourself as to when these stages occurred.

So let's start with a hypothetical, normal, healthy person. If this person eats cereal, that cereal will go into his or her stomach and through the small intestines. There, the cereal breaks down into glucose, which travels through the walls of the small intestines and into the blood. Now, it is called blood glucose, and this is what is measured on blood tests.

When glucose enters this hypothetical person's bloodstream, the body wants to process it as quickly as possible. So the pancreas releases insulin, whose job is to carry the glucose from the bloodstream to all the cells in the body. Since our hypothetically normal person is healthy, his system is working perfectly. His pancreas releases the amount of insulin it needs based on the amount of glucose in the blood.

Unfortunately, I almost never see that person in my office.

Because for most people, after years of high-carb eating, their systems start trying to predict when that insulin is going to be needed. You've been eating high carb, so your body gives you a lot of insulin to deal with it. That insulin does the job it's supposed to, which is get the glucose into the cells, but the problem is that the extra insulin can also drop your blood sugar below the ideal levels.

The first organ that gets affected is your brain, because your body needs a minimum of 30% blood sugar in order for your brain to function properly. So that's when the fatigue, memory issues, concentration problems, and irritability kick in – because your brain is hungry!

Second, it causes you to crave more sugar. People keep thinking they have willpower problems, but that extra insulin is "looking" for sugar. It's not in your head, nor is it just "luck" that some people seem to have willpower – it's actually your physiology.

**And the other thing that insulin does is it prevents you from burning fat. Yes, you heard that right – insulin is a storage hormone, meaning it makes fat and prevents you from burning it. So every time you eat a carbohydrate and release insulin, that insulin prevents you from accessing your fat stores.**



Most people notice that when they're hungry and their brain isn't working well, that everything gets better when they eat something. And mostly we turn to simple high-carb foods like chips or crackers or energy bars, because they're cheap, easy to keep on hand, and they're addictive. Oh, and easy to metabolize. And while your brain will feel better temporarily, it's also released that insulin again to deal with those carbs. Which drops our blood sugar again, and so the cycle repeats.

After doing this again and again and again for a few years, this constant presence of insulin starts to "annoy" the insulin receptors on the cells, and some of them become resistant, meaning that the insulin stops working on them. Now the glucose can't get into that cell, and continues to float around the bloodstream. Your body recognizes this as a problem, so it moves the glucose out of the bloodstream by turning it into fat. It's the process of converting sugar into fat that produces triglycerides.

As time continues on, more and more tissues get resistant, and the blood sugar starts to rise, finally passing the number of 100 that you see on a blood test. At this point, your doctor might tell you that you have insulin resistance or pre-diabetes, but in reality, you've had it for years and your body has simply been trying to adapt.

Some people try to make some changes at this point, but usually the changes they make aren't effective or enough, as they're still consuming "good carbs" even if they cut out the simple ones. While the fiber in a whole grain slows down how quickly glucose enters the bloodstream, when your system is primed for insulin, a whole grain carb is still a carb. And that carb still causes an overreaction of insulin, so the process continues.<sup>19</sup>

So the blood sugar continues to rise, and the only way the body can deal with this rising blood sugar is to push the pancreas to make more and more insulin in an attempt to force the glucose into the cells, until finally the pancreas gets exhausted by the overwork and starts to fail. That's when you get a diagnosis of diabetes, because your body can't produce insulin anymore. But you can see that the blood sugar problems have been going on for decades at this point.

## *What Is Metabolic Syndrome?*

The technical definition of metabolic syndrome is insulin resistance plus three or more of the following:

- High triglycerides
- High fasting blood glucose
- Low HDL
- An expanding waistline
- High blood pressure

This is where the weight gain begins, and it's the stage where hormonal problems start. The health problems compound beyond just fatigue, and cardiovascular problems, digestive issues, and immune/autoimmune disorders may start to appear.

## **There's a Limit**

Think about how many times a day you actually consume sugar, or something that turns into sugar . . . really. Let's say you eat cereal with fruit in the morning (all sugar). Add milk to that . . . milk has sugar in it, too (lactose).

<sup>19</sup> Sacks, Frank M., et al. "Effects of high vs low glycemic index of dietary carbohydrate on cardiovascular disease risk factors and insulin sensitivity: the OmniCarb randomized clinical trial." JAMA 312.23 (2014): 2531-2541.

You go into the office and grab a donut in the break room on the way to your desk (all sugar). To wash it down, you have a cup of coffee with cream and sugar.

At lunch, you have a turkey sandwich and chips or a piece of fruit (it all becomes sugar except for the turkey). You have a mocha latte to “pick you up” in the afternoon (all sugar except for the espresso).

For dinner, you meet your buddies at your favorite Mexican restaurant, where you have a delightful margarita (sugar), chips (carbs becoming sugar) and salsa, and three fish tacos (the tortillas are carbs becoming sugar).

Wow! That’s a lot of sugar in one day when you really look at it. And that really is the typical American diet. We eat more sugar and refined carbs in a week than people who lived 200 years ago ate in one year. And every time sugar shows up in your system, your body produces insulin to try to process it.

I often explain it to people this way: It’s kind of like we were give a certain number of “points” for carbs in our lifetimes. And most of us have used up those points by the age of 30 or 35. The problem is, we often don’t know that we’re out of points until much later. At that point, we are well on our way to diabetes. And with kids nowadays, it’s actually much sooner – adolescents are the fastest growing population of diabetics. This current generation of kids are the first ones that will not live as long as their parents, primarily because of diabetes.

## Fructose

Before we go on, we need to talk about a special sugar: fructose.

There’s a lot of confusion regarding fructose, because it seems like it must be okay. It’s found naturally in fruit, right?

Well, yes and no. Fruit would have been fine if we’d left it the way we found it. But we didn’t. We took that orange and stuck it in a juicer along with several other oranges and made orange juice, thinking that it was just as healthy. But it’s not. Because when you do that, you’re getting all of the sugar and none of the fiber.

In the concentrations found in juice or high-fructose corn syrup, the fructose goes directly to your liver and metabolizes in the same pathways as alcohol. That’s right – drink too much alcohol and you get fatty liver disease; eat or drink too much fructose and you get non-alcoholic fatty liver disease.<sup>20</sup> This can ultimately lead to cirrhosis and liver cancer, and is far more prevalent than people realize – it is thought that up to 75% of obese people have NAFLD<sup>21</sup>, with 8 out of 10 of these people showing normal liver enzymes on a blood test, making this condition extremely difficult to detect.

Altogether, the physiological impact is pretty astounding. Fructose increases your triglycerides<sup>22</sup> and increases visceral fat<sup>23</sup> (which has been linked to insulin resistance and heart disease). It makes you hungrier, which makes you eat more.<sup>24</sup> It causes your body to make the small, dense LDL particles that cause plaques.<sup>25</sup> And it drives non-alcoholic fatty liver disease, which can ultimately lead to cirrhosis and liver cancer.



So while glucose and insulin are hugely damaging in large amounts, fructose is just as bad, albeit in a different way.

### Different Types of Sweeteners

“But I don’t drink fruit juice or soda!” my patients will say. That’s great, except those aren’t the only places where fructose is found in those concentrations. People are always trying to find some substitute for sugar – some miracle sweetener that doesn’t have calories or give you health problems. Let’s just say that they’re still looking for this miracle.

One of the problems with sweeteners is that your body still recognizes the sweet taste. Usually, your body will release insulin because it thinks carbohydrates are on the way, even if they’re not.

Another problem is that, after years of eating sweet things, the receptors on your tongue are exhausted, and it takes more and more of the sweet flavor to actually taste the sweetness. It takes about two weeks for your tongue to recover. (When it does, your experience of all foods will improve!)

And then there’s the fact that pretty much every “sugar” on the market is some combination of glucose and fructose. Glucose causes that insulin reaction that leads to insulin resistance and prevents you from losing weight, while fructose damages the liver like alcohol.

### So let’s take a look at some of them:

**Regular table sugar**, whether it’s white or brown or raw or organic, is a 50-50 mix of fructose and glucose. (Sucrose is just a fructose and glucose molecule stuck together.) So if you eat a diet that has any sugar in it at all, you’re getting fructose in that. And while people often demonize high-fructose corn syrup and think “real organic cane sugar” is a better alternative, the two actually aren’t very different biochemically. Sugar is a 50-50 mix of fructose and glucose, HFCS is around 55-45.

**Honey** is basically the same, too. There you’re getting a few extra compounds that offer some nutrients, but most of it is still just a mixture of glucose and fructose. Like I tell my patients, we used to have to fight bees for honey, so that limited our intake of it. Now we just pull it out of our cupboards. So while it’s better than most of the stuff on this list, it’s still something to limit.

**Agave** nectar is marketed as being a healthy alternative, but it is anything but. The agave root has a starch called inulin which is only about 10% as sweet as sugar. Because it’s not sweet enough by itself, the naturally occurring sweetener in it (fructose) has to be concentrated into a syrup that has about 90% fructose, which we’re told is healthy because it’s “low glycemic.” Except the glycemic index only tells you how quickly something dumps glucose into your bloodstream. Since it’s only got 10% glucose it definitely qualifies, but that doesn’t mean it’s good for you. Just like juicing an orange, you’ve removed all the fiber and are pounding back the fructose.

Then there are all the non-sugar sweeteners, most of which should be avoided like the plague. Take **aspartame**, for instance. No other food additive took as long to get passed by the FDA. It’s been shown in studies to cause brain lesions, among other things. I’ve helped countless patients who have cleared up chronic and severe health problems just by cutting out aspartame, so avoid this one at all costs. **Sucralose** (Splenda™) is a sucrose molecule with chlorine added to it. Yum.



**Stevia is one sweetener that is okay** – it's from a plant and is about 300% the sweetness of sugar, so a little goes a long way. Although it's relatively new so there is less safety information on it, it's been used in Japan for over 30 years and so far it appears to be safe from any toxic side effects. It's one of two sweeteners that doesn't cause an increase in insulin, so if you have to use a sweetener, this might be the one. Truvia™ and Purevia™ are commercial forms that have been processed to remove the slight aftertaste.

**Xylitol** is another sweetener that can work. It's got about half the calories of sugar, has the same sweetness, and like stevia doesn't cause an insulin reaction. It can be used just like sugar, cooks the same, doesn't have any weird aftertastes, is actually good for your teeth, and is easily bought in the store. The one downside is that it can have a laxative effect if used in large quantities. Don't freak out about this too much – you've probably already had it in sugar-free mints or chewing gum. As long as you don't overdo it, this is a great sweetener to use, and it's my go-to for baking things like pumpkin pie or when I need a little something in my tea.

Always keep in mind, though: the less you trigger the sweet taste for yourself, the faster your body begins to reset itself, and the faster you get healthy.



<sup>20</sup> Lustig, Robert H. "Fructose: it's 'alcohol without the buzz'." *Advances in Nutrition: An International Review Journal* 4.2 (2013): 226-235.

<sup>21</sup> <http://www.westonaprice.org/health-topics/nonalcoholic-fatty-liver-disease/>

<sup>22</sup> Stanhope, Kimber L., et al. "Consumption of fructose and high fructose corn syrup increase postprandial triglycerides, LDL-cholesterol, and apolipoprotein-B in young men and women." *The Journal of Clinical Endocrinology & Metabolism* 96.10 (2011)

<sup>23</sup> Wei, Yuren, et al. "Fructose-induced stress signaling in the liver involves methylglyoxal." *Nutr Metab (Lond)* 10 (2013): 32.

<sup>24</sup> Elliott, Sharon S., et al. "Fructose, weight gain, and the insulin resistance syndrome." *The American journal of clinical nutrition* 76.5 (2002): 911-922.

<sup>25</sup> Lustig, Robert H. "Fructose: it's 'alcohol without the buzz'." *Advances in Nutrition: An International Review Journal* 4.2 (2013): 226-235.

## PART TWO | How to Prevent or Reverse Type 2 Diabetes



### Step 1: Get Your Pantry Ready

To prepare for eating healthier, we first want you to get familiar with what's already in your kitchen. Open your refrigerator and cabinets and take a look:

Are there lots of boxes and bags? What's in them? What kind of cooking oils and seasonings have you been using? What do they have in them? When you're hungry, what do you typically reach for? If you haven't cooked food at home in a while, how old would you say the stuff is in your pantry and cabinets? What's in your freezer and how old is it?

Now, look at the labels of all the things you eat regularly. How many have the words "diet" or "lite" on them? How many have the words "fat free" or "low calorie"? How many have the word "hydrogenated" in the ingredients? How many of them have ingredients with the words "sugar," "syrup" or anything ending "-ose"?

All these different labels are as confusing as they are plentiful. A lot of them imply "healthy" when, in fact, they are not. A lot of those ingredients are there to make that food more addictive, or to make it last forever on a shelf, with the hope that you won't notice that they're there.

To be clear, it's not necessary to "fuss" with food or make an entire meal every time you need to eat. You don't need to clean out your cabinets completely. The whole idea to becoming healthier is to begin incorporating quick, easy, and healthy options into your everyday life.

But you should be looking at the labels when you go to the grocery store, and be wary of the tricks of the trade so you can stay away from the hidden hazards.

With that in mind, here are some of the staples that are good to have on hand, and what to stay away from. It's vital, when you go shopping, that you don't automatically buy the high-carb foods and snacks that you have in the past. KEEP THOSE THINGS OUT OF YOUR HOUSE and you'll notice it's a lot easier to make good choices.

#### Things to get rid of (or never buy again)

- Vegetable oil
- Canola oil
- Anything with "hydrogenated" in the list of ingredients
- Soft drinks
- Fruit juices
- Candy
- Packaged snacks that use refined or bleached flour
- Instant mixes with more than one or two ingredients (things like Hamburger Helper and Rice-a-Roni are what we're after here, as opposed to powdered milk or oats)

**Things to get rid of (or never buy again)** *(continued)*

- Frozen/TV dinners: In general, you'll want to avoid items with long lists of ingredients you can't identify, and if it has any kind of added sugar or sweetener in it try to find a version without.

*Things to stock up on***Cold- or expeller-pressed olive oil**

Coconut oil (refined or unrefined), sesame oil, and peanut oil are all good cooking oils. Those are listed in descending order of benefit, but also descending order of cost.

**Carbonated water** is fine, and helps satisfy (or reduce) the soft-drink habit for a lot of people

**Shirataki noodles** (also known as "miracle noodles") are a great alternative to pasta. They are made from a Japanese yam that has no calories, no carbs, no gluten, and no fat. They are simply fiber. You can buy them in your local Asian grocery, or online ([www.miraclenoodle.com](http://www.miraclenoodle.com), [www.asianfoodgrocer.com](http://www.asianfoodgrocer.com)). You can find them in different shapes – from noodles to flat noodles to "rice."

**Nuts make a great snack.** Nut butters are also great. Justin's Nut Butters come in to-go packs, so you can keep them in a purse, backpack, or gym bag. But jars of almond or peanut butter are great for home. Again, look at the ingredients, though. Most of the famous brands (and even the "natural" varieties of them) have sugar and/or one of the oils that's in our no-no list.

**Water, green tea, white tea, black tea** are all really healthy to drink, and if you like red wine, have some (just in moderation!).

Again, the whole point of this is that it works within your current lifestyle, because if it doesn't you're not going to do it. So make the items that work for you part of your stash, and if you find yourself struggling, continue to look for something that works.







*There are three main parts to the 7-Day Challenge:*

- 1) **Eat 60 grams of carbs per day, excluding green and other non-starchy vegetables.**
- 2) **Eat every 3 hours.**
- 3) **Include fat with everything you eat, no exception.**

This is not meant to be a “no-carb” diet – this is meant to work in real life, like eating out or eating with friends. And I didn’t pick 60 grams arbitrarily – a researcher in Germany named Wolfgang Lutz saw that if you didn’t want to end up diabetic at the end of your life, you would want to average about 72 grams per day, with maybe a bit more if you were active all the time. Since most people at this point have run out of points, 72 grams is still too much, and we’ve found 60 grams seems to work better.

### **Carb List**

Here’s the list of items whose carbs you need to count:

Bready products, like:

- Bread
- Crackers/Chips
- Cereal/Granola
- Bran
- Breakfast bars/granola bars/energy bars
- Oatmeal
- Pasta
- Rice

### **Desserts, including:**

- Candy
- Baked goods
- Pastries
- Cookies/cakes

### **Drinks like:**

- Fruit juices
- Energy drinks
- Milk
- Soda
- Certain alcoholic beverages

### **The Following Grocery Items:**

- Fruit
- Beans
- Potatoes/sweet potatoes
- Corn (including popcorn)

And of course, anything whose label includes sugar or any of its many euphemisms, including (but not limited to) honey, corn syrup, high fructose corn syrup, agave nectar, evaporated cane syrup, etc.

Notice that this is a list of carb-dense foods, not “bad” foods. That’s why it includes things like beans, which have some protein but also have carbs, and healthier foods like oatmeal and sweet potatoes, which have tons of nutrients and fiber but are still carb-dense.

Also, you may have heard that tomatoes, cucumbers, and avocados are technically fruits. While that’s true – the official definition of a fruit is the flesh that surrounds a seed – those aren’t the fruits we’re talking about here. Yes, they have carbs in them, but nobody got diabetes from eating too many avocados. What we’re talking about are the things you traditionally think of when you think of a fruit: i.e., the sweet ones. If people sometimes cover it in chocolate or whipped cream and serve it for dessert, that’s a fruit. Eat as many tomatoes and cucumbers as you want.

### 60 Grams a Day

You’re going to look at two things – is this food on the list above, and how much are you having? If it’s not on the list, then it doesn’t need to be counted. Count only what’s on the list.

So how fast does 60 g go? Well, a piece of bread is about 20 g of carbs. A banana is 29. A serving of rice is typically about 1 cup and it’s 45 g. A glass of orange juice (8 oz.) is 26. Do you see how quickly this adds up if you’re not paying attention!

If it came in a package, then it should be easy for you to determine how many grams of carbohydrates you’re having. For the produce, you may have to look it up. Here are a couple of good online calculators that will include name brands if that’s helpful:

[www.myfitnesspal.com](http://www.myfitnesspal.com)

[www.loseit.com](http://www.loseit.com)

Let’s look at this in action. Say you have some oatmeal for breakfast – the serving size of old-fashioned, cook-it-yourself oatmeal is ½ cup dry, and it has 27 grams of carbs. So did you eat just a half cup? Or did you have more? Did you put raisins in it? Or sprinkle some sugar on it? How about some milk? All these have carbs in them. Add all of this together and the number might be a bit shocking.

But what if you had scrambled eggs? That’s pure protein, and also not on the list. You sprinkled a little cheddar cheese on it, but cheese is not milk, has very little lactose (depending on the type), and minimal carbs, if any, which is why cheese is not on the list. You added half an avocado (also not on the list), a little tomato, and put it on a bed of spinach (none of which is on the list). Nothing in this breakfast impacted your 60 gram allotment of the day. Great!

**Let me repeat: the only thing you’re counting here is your grams of carbs. Not fat intake, calories, or protein intake. Just your grams of carbs.**

**Literally, if it’s not on that list, don’t count it.**

**And remember – this doesn’t include green vegetables, so eat as much of them as you want.**

### What About The American Diabetes Association's Recommendations?

It seems quite clear, right? Carbohydrates turn into sugar in your blood, and if you want to drop the sugar in your blood, you should eat less carbohydrates. This is so logical that back before insulin was invented, this was how doctors treated high sugar (they didn't see it in the blood yet, but they could test for it in urine) – with a diet that was 70% fat, 10% carbohydrate. That's right – a mostly fat diet brought these Type 1 diabetics back into normal ranges.<sup>26</sup>

Which makes it hard to understand, then, why the American Diabetes Association's recommendations are 45-60 grams of carbs per meal. No wonder the average person can't get their blood sugar handled or their diabetes reversed!

### Every 3 Hours

When your system is primed for sugar and carbs, the moment your blood sugar drops and you get hungry, your brain starts looking for carbs to feed it. Those are the times you crave sugar. People always think that they just don't have willpower, but that's not it – it's just that they're hungry! And so, until your blood sugar learns to stabilize itself, you need to help your body along and avoid getting to that low-blood sugar state. That means eating every 2-3 hours, or before you get hungry. This is vital.

If you find that every three hours isn't enough, and you're still getting those cravings or you're still getting irritable or tired before you eat, then increase the frequency. We had a patient once who monitored herself closely and discovered that the 2½ hour mark is when she started getting tired and cranky. When she ate every 2 hours, she felt great. So that's what she did. Three or four weeks later, she tested herself again, and noticed she could now go 3½ hours before those symptoms kicked in. That's how quickly this can turn around.

As you get healthier, you may see that you can go longer without eating, which is fine as long as you don't get hungry and then make bad choices!

### Eat Fat with Everything

After decades, or a lifetime, of eating low-fat, you might struggle with this initially. I know I did. One problem is, we don't even realize we're doing it anymore. The most popular cut of meat is a boneless, skinless chicken breast. The default milk for your favorite latté is 2%. It's quite difficult to find full-fat yogurt, as all that's on the shelves is typically fat-free or low-fat.

But remember that this all started because we took fat out of our diet. So let's put it back in. Eating carrot sticks is okay, but eating carrot sticks with hummus (which has olive oil), or eating a half an apple with almond butter works a whole lot better.

### Why?

Because fat fills us up. It stabilizes our blood sugar. It gives us consistent energy over time, keeping our brain fed and our willpower strong. It also provides vital nutrients we need to restore our blood vessels and our cell membranes, so it allows us to access the nutrients in the food we're eating.





And it adds back in the flavor we've been craving after all this low-fat stuff.

Now, you get to have real food back again. No more skim milk in your coffee – use half-and-half. Skip the turkey bacon and get the real stuff. Throw away that almost-like-real-butter spread. Eat the eggs. Put butter on those steamed vegetables and add some cheese to your salad. Welcome back to the world of real food.

Sometimes people think I'm recommending that they eat more meat, which is not what I'm saying. I said before, there are only three nutrients that provide calories – carbohydrates, proteins, and fats – and we've spent decades taking fat out. Now I'm telling you to instead take a lot of the carbohydrates out, and add the fat back in. Yes, you can also add in protein as well, but we're focusing on the fats – nuts, olive oil, beans, avocado, dairy, coconut, all of those have fat in them, and they're all incredibly nutritious.

I always hope that people will increase their vegetable intake, because no one in our society eats enough vegetables. So add those in too. As long as you're using fat instead of carbohydrates to fill yourself up, you'll start feeling much better soon.

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*So again, the three parts of this are:*

**Eat 60 grams of carbs per day.**

**Eat every 3 hours.**

**Eat fat with everything.**

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### **Beyond the 7-Day Reboot**

Most diets end up being temporary, and with good reason. Who can put up with eating only cabbages or grapefruit every day? Who wants to count points or drink weight loss shakes forever?

This is different. I'm really trying to teach people how to eat for the rest of their lives, because it's not just a matter of getting your blood sugar down to normal, but it's also to give you some tools to prevent the diseases that are so rampant today. So, here are a couple of things to keep in mind.

First you won't have to count carbs forever. I certainly don't anymore. But I've been doing this awhile, so I've got a pretty good internal calculator at this point. I know how many of those potatoes I can eat before hitting my limit. So yes, I still check the labels at the grocery store, particularly if it's something I haven't eaten before, but I'm not using a notepad to write it all down.

If I'm going to a birthday party with a homemade cake and real buttercream frosting, then I know I'll probably have some. (If it's a supermarket cake I have no problem resisting – they don't even taste good anymore.) But I come to the party not having had many carbs that day, or yesterday, or the whole week, and I'll go right back to eating correctly tomorrow. Once in a while, an indulgence is okay. It's when we find ourselves having sugar every day, or multiple times a week, or every "special occasion" (how many birthdays happen in your office every month?) that we find ourselves in trouble.

The second thing is, you're not going to be perfect at this after a week. In fact, you're not going to be perfect at this after a month. I say this for two reasons. First, you've been eating a certain way your entire life. If you're forty, that means you've spent 39½ years probably developing this particular habit. You can't expect that to change in a week. Second, we don't live in a culture of health. It's a lot harder to resist temptation when someone's bringing donuts into the break room every day than if they're not.

On a practical level, we find a ton of people who are able to make this change for a week or two, but then they go to a party, or they decide to have dessert, and then before they know it they're eating exactly the way they did before. This is normal.

Now, some people just stay there, and keep eating that way, using reasons like "I just can't control myself," or "It just tastes so good!" But the only difference between people who succeed at this and people who don't is that the people who succeed get right back on the wagon. So what if you went to happy hour and had a whole bunch of chips and foods that don't work? In your next meal, just go back to eating the way we recommend here.

What this looks like in real life is this: you'll do great the first week or two. Then something will happen like a dinner party where you had dessert, and then next morning you will then have a choice – have scrambled eggs with cheese on a bed of spinach? Or waffles? By now, you might be making good choices about food half the time. Just keep practicing. Soon it will be 60% of the time. Then 70%. And before you know it, you'll be making good choices more than 90% of the time, and you'll have achieved the results you've been looking for!

*It's just a matter of practice.*

## Proper Exercise

Exercise is far and away, without question, the fastest way to reverse diabetes. It lowers blood sugar far more effectively than any medication, and it helps people stave off insulin resistance for years, even decades longer than if they didn't exercise at all.



This has nothing to do with burning calories. It's that exercise makes your system work, even when it's "broken." Even if your cells are normally resistant to insulin, exercise forces them to accept glucose – taking it out of the blood stream, where it causes damage, and putting it safely into the cells, where it's used for energy. And this doesn't just happen while you exercise, it occurs for several hours after exercise as well.<sup>27</sup>

**And the best news: it works for people with diabetes exactly the same as for people who don't. That's great news for diabetics!**

And the even better news: it doesn't have to take nearly as much time as you think. Contrary to popular belief, spending an hour on the treadmill or elliptical machine is not very effective. Your body gets used to that level of exercise and gets more efficient, translating to fewer calories and less glucose burned.

***Far more effective is to make your body work for less time with more intensity. That's right – I said less time.***

There was a 2014 study in which one group did traditional exercise like walking on a treadmill at a moderate speed for 30 minutes once a day, and the other group, 30 minutes before a meal, did 6 x 1 minute of intense exercise (walking and/or weights) with a recovery between each minute (they called them exercise "snacks"). The results were striking. Blood sugar levels were lower all day for the "exercise snack" group, as well as 24 hours later – far more so than the traditional exercisers.<sup>28</sup>

Riffing off of that, the 7-Minute Scientific Workout, featured in *The New York Times*, has been a runaway hit. In this series of exercises (with a downloadable app you can use on your phone or tablet to track it), you do the exercise as intensely as you can for 30 seconds, and rest for 10 seconds. It covers everything from arms to legs to abs, all in 7 minutes.<sup>29</sup>

Another study even showed a benefit from ONE minute of exercise! The overweight and out-of-shape participants did 20 seconds of intense riding on an indoor bicycle, followed by 2 minutes of easy pedaling to recover, and repeated this 3 times. Adding in a 2 minute warm-up, and a 3 minute cool-down gives you 10 minutes and those 10 minutes made a difference – the participants saw a change in endurance, blood sugar control, and muscle structure.<sup>30</sup> Just with 1 minute total of intensity!

**And weight-training, FYI, works just the same way.**

There's the trick, though – the benefit comes with having those intervals be as hard as you can stand it, with much less benefit coming from a halfway effort. But if you're willing to increase the intensity to shorten your workout, then no longer can we say we don't have time to exercise!

Here's another version here, that also takes only 7-8 minutes per day. This one also uses intensity, and incorporates some weight-training, using your own body. There are four basic exercises:

**Get-Ups:** Lay flat on your back and then getting up to a standing position. Trust me – these are simple but effective.

**Wall-Push-ups:** This is like a push-up, just vertical. Walk up to a wall, stand about 2' away with your hands outstretched, bend your elbows, and then straighten.

**Air Squats:** mimics the movement you would do if you sat in a chair, but in this case there is no chair. You simply squat down as you would to sit in a chair, and then stand back up. Keep your feet pointing forward, and your back straight.

<sup>26</sup> Kennedy, John W., et al. "Acute exercise induces GLUT4 translocation in skeletal muscle of normal human subjects and subjects with type 2 diabetes." *Diabetes* 48.5 (1999): 1192-1197.

<sup>27</sup> Francois, Monique E., et al. "'Exercise snacks' before meals: a novel strategy to improve glycaemic control in individuals with insulin resistance." *Diabetologia* (2014): 1-9.

<sup>28</sup> <http://well.blogs.nytimes.com/2013/05/09/the-scientific-7-minute-workout/>

**Air Punches:** Air Punches is simply standing with one foot in front of the other and then punching the air in front of you as if you were a boxer punching a bag. Alternate between right and left arms.

*The work-out looks like this:*

**Day 1:** Warm-up by marching in place for 4 minutes. Then complete:

10 Get-ups

10 Air Punches

**Day 2:** Take a 20-minute walk at a moderate pace.

**Day 3:** Warm-up by marching in place for 4 minutes. Then complete:

10 Wall Push-ups

10 Air Squats

Do this three times, alternating back-and-forth, for a total of 30 of each.

**Day 4:** Take a 20-minute walk at a moderate pace.

**Day 5:** Warm up by marching in place for 4 minutes. Do as many rounds as possible in 8 minutes:

10 Wall Push-ups

10 Air Squats

10 Air Punches

**Day 6:** Take a 20-minute walk at a moderate pace.

**Day 7:** Rest day – this allows your muscles to rest and recover.

***How do you ramp up the intensity of the workouts?*** The trick is to complete the work as fast as possible and make the exercise as intense as you can while still staying within the range of safety. The very best way to do this is to keep track of the time it takes you to complete the exercises below. Each time you perform them, try to beat your old time by a few seconds.

As you improve, you can add more more reps or more rounds, or move to the floor for the push-ups, or start to use light hand weights.

### Intermittent Fasting

Intermittent fasting is designed to mimic the feasting-famine times of our forefathers, and can jumpstart your metabolism if you're healthy. Typically, lowering your calories or going too long without eating or on a low-calorie diet slows your metabolism down, but intermittent fasting is just that – occasional – and it never lets



your system slow down because it's not long enough for that to happen.

There's a long history of intermittent fasting, ranging from different religions that took a day off per week (or several days once or twice a year) to occasionally going without food as a type of "time-off" to give your body a break from food. The benefits of IF are:

- > A decreased caloric intake
- > Teaching your body to burn fat, not muscle
- > An increase in growth hormone
- > Easier to burn fat
- > Easier to do than "dieting"
- > It improves insulin sensitivity
- > It lowers fasting insulin levels

***There is no shortage of varieties of IF with which to experiment! Here are some examples:***

**Five Days Off, Two Days On** – You eat normally for five days and "fast" (fewer than 500 calories for women, 600 for men) for two days per week. (The days don't have to be consecutive.) It's very popular in the UK and easier to do for many people.

**Eating Two Meals Per Day** – This looks like skipping breakfast, and eating lunch and dinner, or any version of two meals per day.

**One Day A Week** (or every two weeks, or once a month) – Start at lunch, and don't eat until the next day at lunchtime.

*In all of them, make sure you continue to stay hydrated by drinking no-calorie drinks like tea and sparkling water.*

***There are a couple of caveats to watch out for, though:***

If you are sick, pregnant, underweight, or struggling with fatigue or stress, then IF is not right for you right now. Fatigue often means that your adrenals are stressed, and going without food will stress them more. It's better to wait until your fatigue is lessened and your energy is better (read: your blood sugar is better-regulated) before you start doing intermittent fasting.

It's also been shown that intermittent fasting may not work the same for women as men, so if you notice that you feel worse doing this, then don't continue. Not everything is for everybody.

## Smart Supplementation

I could write a whole other book about nutritional supplements (in fact, I teach doctors about this very topic), but since we're focused on blood sugar here, I'm going to resist the temptation to go down that rabbit hole.



Instead, I'll talk about just the ones that impact blood sugar directly.

Be aware, the following section is pretty dense, and you should probably talk to a health professional before digging too deep into any of these. But if you're dealing with Western doctors prescribing medications that aren't doing much good, these can be healthier, safer, and more effective alternatives, with fewer side effects.

### Banaba Leaf

Leaves of the banaba tree, native to Southern Asia, have been used in traditional herbalism for centuries as a remedy for diabetes. Though the first scientific studies documenting banaba's blood sugar-regulating benefits date back to the 1940s, banaba has only recently become a medicinal plant of interest among naturapaths and the health-conscious public, due to the rising diabetes epidemic.

Banaba offers a combination of benefits that are not available in any diabetes drug currently on the market.<sup>1</sup> In your digestive tract, banaba inhibits the breakdown of sugars and starches.<sup>2</sup> It also encourages your cells to absorb available glucose from your bloodstream in an action similar to the way insulin works.<sup>3</sup> Additionally, banaba lowers blood sugar levels by preventing your body from burning fats and proteins for energy, instead favoring the use of glucose.<sup>4</sup> And while insulin promotes fat production, banaba is fat inhibiting,<sup>5</sup> making this powerful plant a useful tool for managing your blood sugar and preventing weight gain.

One of banaba's main active compounds, corosolic acid, takes effect rapidly, lowering blood sugar levels within an hour after you consume it. This is particularly helpful for preventing dangerous post-meal blood sugar surges.<sup>6</sup> In one study, when diabetic and pre-diabetic patients took 10 mg of corosolic acid their 2-hour post-meal blood sugar levels decreased by 10%.<sup>7</sup> Participants also reported increased energy levels and decreased thirst and hunger. Banaba extract has also been shown to lower fasting blood sugar levels by as much as 30% in type 2 diabetics within two weeks of daily supplementation.<sup>8</sup>



Long-term use of banaba has been shown to improve glucose tolerance and reduce glycation.<sup>9</sup> In one preliminary study banaba proved as effective as the widely used diabetes drug Metformin at reducing elevated blood sugar levels. Banaba has been found to be safe for both short-term and long-term use, with few to no reported adverse effects.<sup>10</sup>

### Chromium and Vanadium

Chromium and vanadium are both essential mineral required in trace amounts.

Chromium helps regulate your blood sugar by assisting the function of insulin. It decreases insulin resistance by increasing the number of glucose transport molecules on the surfaces of cells, making them capable of

absorbing more glucose.<sup>11</sup> It also decreases low-grade inflammation (which contributes to insulin resistance and damages the insulin-producing cells of the pancreas).<sup>12</sup> It does this directly by inhibiting pro-inflammatory molecules and indirectly by acting as an antioxidant, reducing cell-damaging free radicals and the associated inflammation.<sup>13</sup> This vital mineral also helps repair damage to the cellular machinery that prepares glucose to be used for energy.<sup>14</sup>

An analysis of seven separate clinical trials totaling nearly 400 type 2 diabetics found that chromium supplementation in doses ranging from 400 to 1,000 mcg per day was effective at lowering fasting blood sugar levels.<sup>15</sup>

Vanadium, meanwhile, is found in a wide variety of fruits and vegetables, and is thought to reduce blood sugar levels via an insulin-like effect. Low blood levels of vanadium correlate with increased risk for type 2 diabetes,<sup>16</sup> and in a study of type 1 diabetics, supplementation with vanadium for 2½ years resulted in a 30% drop in insulin use and a 36% drop in fasting blood sugar levels, as well as a reduction in total cholesterol.<sup>17</sup> The only adverse side effect reported in this study was mild diarrhea at the beginning that resolved on its own.

A word of caution: Taking high doses of chromium and vanadium for long periods of time can cause them to accumulate to toxic levels.<sup>18, 19, 20</sup> It's better to either get these from eating a healthy diet, or else you should consult your healthcare provider for guidance in proper dosage for your individual health needs.

## Gymnema

*Gymnema sylvestre* is an herb long used in traditional Ayurvedic medicine. Its common Indian name, gurmar, means “sugar destroyer,” because gymnema contains several compounds that block sweet receptors. When consumed in liquid form gymnema suppresses the taste of sugary foods, so it can help you manage both your sugar cravings and your blood sugar levels. This herb is also used to decrease cholesterol and inflammation, ease digestive ailments, prevent tooth decay, fight free radicals and even fend off cancer.<sup>21</sup>

In the intestinal tract gymnema slows the absorption of glucose and fats. Upon entering your bloodstream it circulates to your pancreas where it promotes the secretion of insulin and helps convert it into its active form.<sup>22</sup> Gymnema also activates enzymes involved in breaking down glucose to produce energy,<sup>23</sup> inhibits release of glucose from the liver into the bloodstream,<sup>24</sup> and promotes repair and regeneration of insulin-producing cells. At the same time as it stimulates glucose burning, gymnema inhibits your body from burning fats for energy. In this way available glucose stores are used preferentially, helping to keep your blood sugar levels within a healthy range. In preliminary studies gymnema has demonstrated the ability to reduce HgbA1c levels,<sup>25</sup> proof positive of this herb's blood sugar-lowering effects.

As an antioxidant gymnema protects against the damaging effects that result from chronic high blood sugar levels, such as oxidation of cholesterol. In one preliminary study, gymnema decreased oxidized cholesterol by 31%.<sup>26</sup> Supplementation with gymnema has also been shown to increase levels of antioxidant enzymes.<sup>27</sup>



One safety concern regarding gymnema is whether it might lower blood sugar too much. Some studies indicate that moderate doses of gymnema may lower blood sugar levels in diabetics but not in non-diabetics, indicating a high safety profile for this herb.<sup>28</sup> However, high doses of gymnema have been shown to cause hypoglycemia.<sup>29</sup>

### Alpha-Lipoic Acid

A fatty acid your body manufactures in small quantities, alpha-lipoic acid is present in every cell, where it assists in the breakdown of glucose and amino acids to produce energy.<sup>30</sup> Alpha-lipoic acid helps manage blood sugar by making cells more sensitive to insulin, prompting them to absorb glucose and thereby lowering blood sugar levels<sup>31</sup>. In one study, type 2 diabetics who took 300 mg of alpha-lipoic acid per day for two months showed significant decreases in fasting blood sugar, post-meal blood sugar, and insulin levels.<sup>32</sup> Alpha-lipoic acid also calms the body's inflammatory response, which is a major contributing factor to diabetic complications.<sup>33</sup>

Perhaps the most important function of this compound and the one that has garnered the most attention is its significant antioxidant benefits. Alpha-lipoic acid regenerates other antioxidants back to their active forms once they've done their work. And in true hero fashion, alpha-lipoic acid may also be capable of stepping in and performing the functions of other antioxidants if their levels become depleted.<sup>34</sup>

Alpha-lipoic acid is further distinguished in that it possesses a structure that is both water soluble and fat soluble. This singular characteristic makes it highly versatile and able to function in many parts of your body. Its ability to interact with fats makes it particularly helpful for healing and preventing diabetic peripheral neuropathy. A study of type 2 diabetics with longstanding symptoms of peripheral neuropathy of the hands and feet showed that alpha-lipoic acid supplementation reduced symptoms by up to 40% within four months of treatment.<sup>35</sup> Some evidence suggests that alpha-lipoic acid supplementation may be even more effective for healing autonomic peripheral neuropathy – nerves to the heart and other internal organs – than it is for healing and protecting nerves to the hands and feet.<sup>36</sup>

*Tip:* This supplement absorbs up to 30% more effectively when taken on an empty stomach.<sup>37</sup>

### Biotin

Biotin is a water-soluble B-complex vitamin that assists the enzymes that break down carbohydrates, fats and proteins into usable energy. It affects blood sugar regulation at the genetic level, improving function of the genes that control insulin production.<sup>38</sup>

Biotin is found in small quantities in a variety of animal and plant foods, including egg yolk, sardines, legumes, nuts and whole grains. Your beneficial intestinal bacteria produce biotin as well. Deficiency of this essential nutrient is rare, but has been associated with low blood sugar and insulin levels and impaired structure of insulin-producing cells.<sup>39</sup> Biotin deficiency also results in increased secretion of glucagon, a hormone that raises blood sugar by depleting the liver's glycogen stores.<sup>40</sup>



Conversely, preliminary studies have demonstrated that supplementing with high levels of biotin increases insulin secretion and may improve the structure and function of pancreas cells.<sup>41</sup> One study demonstrated that insulin-producing cells of biotin-supplemented mice were larger and structurally superior to those of unsupplemented mice.<sup>42</sup> Biotin supplementation may also improve glucose tolerance and lead to more robust insulin production in response to glucose. In diabetic animals, biotin has been shown to decrease post-meal blood sugar spikes.<sup>43</sup> Drug companies have begun experimenting with incorporating biotin into oral insulin medications to improve their effectiveness. Results of one such study showed that biotin-enhanced insulin was absorbed up to five times more efficiently compared to conventional oral insulin drugs.<sup>44</sup>

Biotin has also been found to work synergistically with chromium. Several human clinical trials report reductions in fasting blood sugar and increased insulin sensitivity, as well as decreased cholesterol levels with chromium-biotin supplementation.<sup>45, 46, 47, 48</sup> In one study, the combination reduced HbA1c levels in type 2 diabetics with poorly controlled blood sugar levels by up to 1.9%,<sup>49</sup> putting the nutritional supplement on an equal footing with some of the most commonly prescribed oral diabetes medications. With no reported side effects at the dosages and treatment durations used, chromium-biotin supplementation may present a superior option in terms of effectiveness.

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<sup>3</sup> Ibid.

<sup>4</sup> Stohs, Sidney J., Howard Miller, and Gilbert R. Kaats. "A review of the efficacy and safety of banaba (Lagerstroemia speciosa L.) and corosolic acid." Phytotherapy Research 26.3 (2012): 317-324.

<sup>5</sup> Klein, Guy, et al. "Antidiabetes and anti-obesity activity of Lagerstroemia speciosa." Evidence-Based Complementary and Alternative Medicine 4.4 (2007): 401-407.

<sup>6</sup> Stohs, Sidney J., Howard Miller, and Gilbert R. Kaats. "A review of the efficacy and safety of banaba (Lagerstroemia speciosa L.) and corosolic acid." Phytotherapy Research 26.3 (2012): 317-324.

<sup>7</sup> Miura, Toshihiro, Satoshi Takagi, and Torao Ishida. "Management of diabetes and its complications with banaba (Lagerstroemia speciosa L.) and corosolic acid." Evidence-Based Complementary and Alternative Medicine 2012 (2012).

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<sup>9</sup> Miura, Toshihiro, Satoshi Takagi, and Torao Ishida. "Management of diabetes and its complications with banaba (Lagerstroemia speciosa L.) and corosolic acid." Evidence-Based Complementary and Alternative Medicine 2012 (2012).

<sup>10</sup> Ibid.

<sup>11</sup> Hua, Yinan, et al. "Molecular mechanisms of chromium in alleviating insulin resistance." The Journal of nutritional biochemistry 23.4 (2012): 313-319.

<sup>12</sup> Chen, Yen-Lin, et al. "The effect of chromium on inflammatory markers, 1st and 2nd phase insulin secretion in type 2 diabetes." European journal of nutrition 53.1 (2014): 127-133.

<sup>13</sup> Hua, Yinan, et al. "Molecular mechanisms of chromium in alleviating insulin resistance." The Journal of nutritional biochemistry 23.4 (2012): 313-319.

<sup>14</sup> Ibid.

<sup>15</sup> Abdollahi M, Farshchi A, Nikfar S, Seyedifar M. Effect of chromium on glucose and lipid profiles in patients with type 2 diabetes; a meta-analysis review of randomized trials. Journal of Pharmacy and Pharmaceutical Sciences 2013; 16(1): 99-114.

<sup>16</sup> Wang, Xia, et al. "Inverse Association of Plasma Vanadium Levels with Newly Diagnosed Type 2 Diabetes in a Chinese Population." American journal of epidemiology 180.4 (2014): 378-384.

<sup>17</sup> Mahmood Soveid, M. D., and Gholamhossein Ranjbar Omrani. "Long-term efficacy and safety of vanadium in the treatment of type 1 diabetes." Archives of Iranian medicine 16.7 (2013): 408.

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<sup>19</sup> Vanadium. NYU Langone Medical Center. Available at <http://www.med.nyu.edu/content?ChunkID=21881>. Last accessed January 27, 2015.

<sup>20</sup> Preet, Anju, et al. "Efficacy of lower doses of vanadium in restoring altered glucose metabolism and antioxidant status in diabetic rat lenses." Journal of biosciences 30.2 (2005): 221-230.

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## Conclusion



I spent years making a lot of the same mistakes you and many other people have made, and years more to put together all this information in a way that made sense both to me and to my patients. I had to redo all my thinking about fats, and about “good carbs” and figure out how exercise fitted into this. I had to figure out where patients succeeded and where others didn’t, and how to adjust my recommendations. And after years of doing this, the medical establishment is finally starting to catch up, with many of the same recommendations being seen to be effective there as well.

But instead of waiting for them (research is often 10 years ahead of standard medical advice), I’m just going to give this information to you directly, so that you can take control of your own health and get yourself back on the path to feeling good and being well! Thank you for wanting to take back your health and for allowing me to be a part of that journey.

*Dr. Marlene*

## Appendix A: Quick Tricks

### Quick Tricks and Hacks

Nuts and nut-butters make great snacks. Keep them in your purse, gym bag, etc. – they'll feed your brain and then you won't be tempted to go for the chips. Just don't go crazy with them – too much of them isn't healthy either. Everything in moderation! (except sugar, of course!)

Keep some guacamole or hummus in the fridge (make sure it's not heavily processed!) to eat with carrots, celery sticks, or cucumbers.

Hard-boil some eggs to keep as a quick snack, or use the whole dozen to make egg salad for a few days

Use real butter instead of a spread, real bacon instead of turkey bacon, and half-and-half or whole milk instead of low-fat or skim.

### Easy Substitutions

***The following can make great substitutes for your usual carb-dense foods:***

- Flavored sparkling water (or sparkling water with a splash of juice or a few drops of flavored stevia) instead of soda
- Spaghetti squash instead of pasta (if you're not ready to jump into shirataki noodles!)
- Xylitol instead of sugar
- Mashed cauliflower instead mashed potatoes
- Grated cauliflower instead of rice

### The rule of "Halves"

Remember that this is not meant to be a "no-carb" diet. This is designed so that if you'd like to have something that is carb-dense, you just balance it out. The trick to not having a carb wreck your 60 gram allotment is to avoid having a ton of it. So split it with someone – when you start doing this, you'll quickly notice how disproportionately huge desserts are in restaurants, and you'll wish they would bring you one a quarter the size. Or get a to-go container when you order it and put half in the container before you even start eating. Get the sandwich, but leave half the bread off. Or cut the sandwich in half and eat only half.



## Appendix B: FAQ / Troubleshooting Guide

Many people notice huge improvements in how they feel and in their overall health by controlling their blood sugar, but as with any change in diet or lifestyle, there may be a few issues that come up. This Troubleshooting Guide should answer most of your questions. If your issue persists, or you don't get relief after following our suggestions, please see your physician.

### **"I am experiencing tiredness and fatigue."**

Your body is beginning to generate the enzymes necessary to efficiently burn protein and fat for energy and it may take one person a little longer than another. Generally, it's about two weeks, depending on how much you restricted carbs in your diet.

### *Ask yourself these questions and try these recommendations:*

- Are you eating frequently enough? Going too long between meals or skipping meals will make you tired. Eat every 2-3 hours.
- Are you eating enough calories? We don't encourage calorie-counting, but sometimes people cut their carbs and don't replace the calories with protein or fat. Don't be afraid of healthy fats – remember, fats by themselves won't make you fat.
- Are you drinking enough water? The estimate is half your body weight, in ounces. So if you're 150 pounds, that's 75 ounces of water per day.
- Are you getting enough sleep? A minimum of 7-8 hours a night is recommended.

Don't over-exercise in this period of time if you're tired as your body is already trying to make changes and if you tend to exercise a lot, it might all be a bit too much. Just keep it in moderation until your system has adjusted.

### **"I have constipation."**

Carbohydrates feed the bacteria in your gut that give your stools bulk. But carbs can also irritate your colon and force it to move, masking a weak digestion.

### **Try these suggestions:**

- Drink plenty of water.
- Eat more fibrous vegetables or add a fruit like an apple every day or two.
- Try an herbal laxative like Smooth Move Tea (available in health food stores)
- Weak stomach acid can also cause digestive problems like constipation. Try 1-2 tablespoons of apple cider vinegar in water at mealtimes.

**"I have gas and bloating."**

Most people notice a big reduction in gas and bloating by reducing carbs, but sometimes they can be caused by other reasons, like weak digestion.

**Try these suggestions:**

- Make sure you're not eating more carbs than you realize. Sugars and carbs cause lots of gas, more than people think. Measure the grams of carbs you're eating each day using one of the websites listed on page 19
- Add 1-2 tablespoons of apple cider vinegar in water and drink at mealtimes to help digestion.

**"I'm burping a lot and having loose stools/light-colored stools."**

If you have a weak gallbladder, it may initially not be able to handle a diet that is higher in fat. Try easing into this a bit more slowly, to get your body used to eating more fat and protein.

- Many natural practitioners can help with gall bladder issues. Try finding one in your area to help restore better function to yours.
- We strongly recommend contacting your physician if your symptoms are severe or if you have diarrhea lasting longer than 24 hours.
- Make sure you are drinking plenty of water!

**"I fell off the wagon and am eating too many carbs again and my cravings came back. What should I do?"**

First, it's totally normal to fall off that wagon – you're learning a new way of eating, but you have decades of different habits, so it'll take some practice. All you have to do is get back on the wagon. It's kind of like this: you have this dragon that's been fed sugar and carbs for a long time. When you were eating low-carb, you put him to sleep. But when you ate that birthday cake (or lasagna, or dessert), you woke him back up. It'll take a little bit to get him to go back to sleep.

When you've been eating low-carb long enough, the dragon eventually goes away. You'll know this because you might have that birthday cake, but it won't give you cravings again, or wipe you out. All it is is practice. Just keep getting back on the wagon.

**"I exercise a lot – how will this affect me?"**

Many athletes are taught to eat carbs – the term "carb-loading" came from them! But many of them have blood sugar problems, evidenced by scores of overweight exercisers, and the coaching that they get about how they have to eat something sugar/carb-like every 45 minutes while training. This is probably the biggest falsehood perpetrated on athletes. It is absolutely possible, and actually preferable, to eat low carb, as your energy levels will stay more stable, you'll have more endurance, you'll have much better energy, and it's overall better for your health.

It takes about 2 weeks to get your body used to eating a higher protein/higher fat diet when you're exercising, so just know that you might notice that you're a little more tired initially, or that you can't exercise as long. That's all normal – think of it like you're converting your car from gas-powered to a more efficient electric-powered. It'll take a little bit to get the conversion to occur, but once you do, it'll be great!

**"I've just started eating healthier, and I'm having terrible headaches."**

Sugar and carbs are addictive, and your body is letting you know that. You're going through a detox, so make sure you're drinking enough water. Ease into this way of eating a little slower if that's what feels right. And if you need to, take a pain killer like ibuprofen. It should clear up in a day or so.

**"My weight loss is stuck."**

Our experience has shown that even with the guidelines of 60 grams of carbs per day, some people get "stuck". Common places where individuals may have problems can be:

**Fruit.** Some people can handle more than others, so make sure you're not eating too much. Our general guidelines are at least twice as many vegetables as fruit.

**Nuts.** It's easy to overeat nuts, and at some point, calories DO count, so watch how much you eat, and check the carb count on your nuts.

**Alcohol.** You might have the numbers right regarding the carb counts, but alcohol metabolizes differently, and in some people, will prevent weight loss or even cause weight gain. Try reducing your alcohol intake and see what happens.

**Not eating enough, or frequently enough.** Some people might be eating low-carb, but simply not eating enough. Make sure your breakfast is substantial enough, and that you actually eat enough calories during the day. Not eating enough calories will slow your metabolism, preventing weight loss.

**Are you exercising?** While it's possible to lose weight simply with food changes, it goes much faster if you're also exercising.

**Are you getting enough sleep?** Studies have shown that less than 7 hours of sleep can absolutely inhibit weight loss, so make sure you're going to bed early enough!

**Stress** also inhibits weight loss, so use the techniques we mentioned to help you lower your stress levels.

Of course, other things may be affecting weight loss as well. Thyroid function, adrenal function, and your body's ability to clear estrogen will all affect weight loss. You may need to find someone to work with you to help you with these issues, and natural practitioners like certified nutritionists, naturopathic doctors, acupuncturists and doctors trained in functional medicine call all help.

**“How long does it take to reverse my diabetes?”**

It depends on how long you’ve had the disease, and how much damage has occurred. Some people will notice that their blood numbers start dropping within a short time, and others have it a bit harder. Sometimes, blood sugar numbers won’t drop for a while because the body has too much insulin resistance, which makes it vital to stick to this program to keep insulin out of the system and re-sensitize the insulin receptor sites on the cells. Doing the short intense style exercise will speed this up.

REDUCING THE GLUCOSE AND THEREFORE THE INSULIN IN YOUR BODY IS THE MOST PIVOTAL PART OF TURNING THIS DISEASE AROUND.

You may need to stay on your medication for a while – just keep monitoring your blood glucose, and keep your doctor updated.

Typically, the average is 12 to 18 months if someone has diabetes, and usually less if they have insulin resistance. It just depends on how much you adhere to this. I’ve had patients who couldn’t get blood test numbers to change until they did the exercise “snacks” (on page XX) even though they were already exercising. I’ve had other patients who had to eat less than 60 grams of carbs to cause a change. Others who couldn’t do carbs at night at all. Still others who took longer (but never gave up!) or who needed, at some point, to deal with calories, or even others who had bariatric surgery but then STILL kept going on making good choices! Everyone’s physiology is different to some degree, so some personal modifications may need to happen. But it still comes down to this:

There are NO OTHER OPTIONS to reversing diabetes and insulin resistance. Not by eating “healthy, whole-grain carbs”, not by eating low-fat, not by taking insulin (insulin just by itself causes a whole range of serious problems).

In your hands are the tools to preventing and reversing many of the major diseases that afflict people these days, and cause our degenerative decline in health as we age. We are thrilled you have taken on your health, and honored that you have allowed us to contribute.