

FOREWORD

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IN JUST A generation, diabetes has gone from rarity to epidemic, a catastrophic turn that presents urgent questions: Why are so many suffering, and so suddenly? And how have our health authorities failed to offer an explanation or treatment for so devastating a scourge, despite spending billions? They have, instead, essentially given up on finding a cure, pronouncing type 2 diabetes¹ a chronic, progressive disease that promises a life of slow, painful decline and early death.

Tragically, diabetes authorities worldwide have come to the consensus that the best hope for sufferers is merely to control or delay the disease through a lifelong dependence on medications combined with medical devices and surgery. There is no emphasis on better nutrition. Instead, some forty-five international medical and scientific societies and associations around the world declared in 2016 that bariatric surgery, which is both expensive and risky, should be the first option for diabetes treatment. Another recently approved idea is a new weight-loss procedure in which a thin tube, implanted in the stomach, ejects food from the body before all the calories can be absorbed, which some have termed “medically sanctioned bulimia.” And all this is in addition to the basic regimen for diabetes sufferers: multiple medications, which cost hundreds of dollars a month, and which include insulin, a drug that paradoxically often causes weight *gain*.

These techniques for managing diabetes are expensive, invasive, and do nothing to reverse diabetes—because, as Dr. Jason Fung explains in *The Diabetes Code*, “you can’t use drugs [or devices] to cure a dietary disease.”

The groundbreaking idea Dr. Fung presents in these pages is that diabetes is caused by our bodies’ insulin response to chronic overconsumption of carbohydrates and that the best and most natural way to reverse the disease is to reduce consumption of those carbohydrates. A low-carbohydrate diet for treating obesity is not only being practiced now by hundreds of doctors around the world but is supported by more than seventy-five clinical trials, conducted on altogether thousands of people, including several trials of two years’ duration, which establish the diet as safe and effective.

Remarkably, the practice of carbohydrate restriction for diabetes dates back more than a century, when the diet was considered standard treatment. According to a 1923 medical text by the “father of modern medicine,” Sir William Osler, the disease could be defined as one in which “the normal utilization of carbohydrate is impaired.” Yet soon thereafter, when pharmaceutical insulin became available, that advice changed, allowing a higher-carbohydrate intake to again become the norm.

Osler’s idea would not be revived until science journalist Gary Taubes unearthed and developed it into a comprehensive intellectual framework for the “carbohydrate-insulin” hypothesis, in his seminal 2007 book *Good Calories, Bad Calories*. And the modern-day clinical model for diabetics was set forth by scientists Stephen D. Phinney and Jeff S. Volek, as well as the physician Richard K. Bernstein.²

x In an exciting recent development, clinical trial evidence specifically on diabetics is now emerging. As of this writing, at least one trial, involving some 330 people, is underway for the treatment of the disease with a very low-carbohydrate diet. At the one-year mark, researchers found that some 97 percent of patients had reduced or halted their insulin use, and 58 percent no longer had a formal

diagnosis of diabetes.³ In other words, these patients successfully reversed their diabetes simply by restricting carbohydrates—findings that ought to be compared to the official standard of care for diabetics, which states with 100 percent certainty that the condition is “irreversible.”

Dr. Fung, a practicing nephrologist who gained renown by introducing intermittent fasting for the control of obesity, is a passionate and articulate proponent of the low-carbohydrate approach. In addition to his fascinating insights, he has a gift for explaining complex science clearly and delivering it with the perfect, telling anecdote. One never forgets, for instance, the image of Japanese rush-hour commuters being shoved into overstuffed subway cars as a metaphor for excessive circulating glucose packed into each and every corporeal cell. We get the point: the body cannot handle so much glucose! Dr. Fung explains the relationship between glucose and insulin and how these together drive not only obesity and diabetes but also, quite likely, a host of other related chronic diseases as well.

The obvious question is why this low-carbohydrate approach is not more widely known. Indeed, in the six months prior to my writing this foreword, major review articles on obesity appeared in such respected publications as the *New York Times*, *Scientific American*, and *Time* magazine, yet among the thousands of words written, there was barely a mention of the word that can explain so much: insulin. This oversight is perplexing but is also, unfortunately, the reflection of genuine bias pervading an expert community that has for half a century endorsed a very different approach.

That approach, of course, has been to count calories and avoid fat. In recent years, authorities including the U.S. Department of Agriculture and Department of Health and Human Services, which jointly publish *Dietary Guidelines for Americans*, as well as the American Heart Association, have backed off the “low-fat” diet, yet they still believe weight control can be explained by little more than a model of Calories In, Calories Out. A good deal of rigorous science debunks this notion, and

the epidemics of chronic disease have not, to date, been curbed by it, but its captivating simplicity and widespread expert support allow it to endure.

There is also the stark reality that most medical associations today are significantly funded by pharmaceutical and device companies, which have no interest in a dietary solution to disease. Indeed, a nutritional fix that reverses disease and ends the need for medication puts them squarely out of business. This must explain why attendees at recent annual meetings of the American Diabetes Association (ADA) have reported that amidst a sea of presentations on medical devices and surgeries, there's a near-complete absence of any information on low-carbohydrate diets. And this fact must explain why, when the medical directors of two obesity clinics (including one at Harvard University) wrote an op-ed published in the *New York Times* about the lack of discussion on diet at the 2016 ADA conference, the ADA itself shot them down.⁴ One might assume also that, in addition to financial conflicts of interest, the cognitive dissonance must be overwhelming for experts confronting information implying that their knowledge and advice of the past fifty years is simply wrong. In fact, more than wrong: harmful.

For this is the unvarnished truth: the success of carbohydrate restriction directly implies that the last several decades of low-fat, high-carbohydrate nutrition advice has almost certainly fueled the very obesity and diabetes epidemics it was intended to prevent. This is a devastating conclusion to half a century of public health efforts, but if we are to have any hope of reversing these epidemics, we must accept this possibility, begin to explore the alternative science contained in this book, and start on a new path forward—for the sake of truth, science, and better health.

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HOW TO REVERSE AND PREVENT TYPE 2 DIABETES: THE QUICK START GUIDE

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THIRTY YEARS AGO, home electronics, such as a brand new VCR, came with a thick instruction manual. “Read thoroughly before proceeding,” it implored, and then launched into detailed setup procedures and troubleshooting guides that painstakingly described everything that could possibly go wrong. Most of us ignored this manual, plugged in our new purchase, and then tried to figure out the rest when the time clock began to blink 12:00.

Today, new electronics come with a quick start guide that outlines a few basic steps to get your machine working. Everything else is still referenced in a detailed instruction manual, now often found online, but there’s really no need to consult it until you want your machine to perform more complex functions. Instruction manuals are just so much more useful this way.

Consider this section of the book the quick start guide for reversing and preventing type 2 diabetes. It’s a brief introduction to the disease: what it is, why conventional treatment approaches don’t work, and what you can do today to start effectively managing your health.

**FACT: TYPE 2 DIABETES IS FULLY
REVERSIBLE AND PREVENTABLE**

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MOST HEALTH PROFESSIONALS consider type 2 diabetes to be a chronic and progressive disease. This promotes the idea that type 2 diabetes is a one-way street, a life sentence with no possibility of parole: the disease continually gets worse until you eventually require insulin injections.

But this is actually a great big lie, which is excellent news for anyone who has been diagnosed with prediabetes or type 2 diabetes. Recognizing the fallacy of this belief is the crucial first step in reversing the disease. Actually, most people already instinctively recognize this. It's ridiculously easy to prove that type 2 diabetes is almost always reversible.

Suppose you have a friend who is diagnosed with type 2 diabetes, meaning the level of glucose in his blood is continuously above normal levels. He works hard to lose 50 pounds, which enables him to stop taking his glucose-lowering medications because the levels in his blood are now normal. What would you say to him? Probably something like "Great job. You're really taking care of yourself. Keep it up!"

What you *wouldn't* say is something like "You're such a filthy liar. My doctor says this is a chronic and progressive disease so you must be lying." It seems perfectly obvious that the diabetes reversed because your friend lost all that weight. And that's the point: *type 2 diabetes is a reversible disease.*

We've intuitively sensed this truth all along. But only diet and lifestyle changes—*not* medications—will reverse this disease, simply because type 2 diabetes is largely a dietary disease. The most important determinant, of course, is weight loss. Most of the medications used to

xiv treat type 2 diabetes do not cause weight loss. Quite the contrary. Insulin, for example, is notorious for causing weight *gain*. Once patients start on insulin injections for type 2 diabetes, they often sense they are heading down the wrong path.

My diabetic patients would often say, “Doctor, you’ve always said weight loss is the key to reversing diabetes. Yet you prescribed me a drug that made me gain 25 pounds. How is that good?” I never had a satisfactory answer to this important question because none existed. The plain truth was that it was *not* good. The key to treating diabetes properly was weight loss. Logically, because it caused weight gain, insulin was not making things better; it was actually making the disease worse.

Since weight loss is the key to reversing type 2 diabetes, medications don’t help. We only pretend they do, which is the reason most doctors think type 2 diabetes is chronic and progressive. We’ve avoided facing an inconvenient truth: *drugs won’t cure a dietary disease*. They are about as useful as bringing a snorkel to a bicycle race. The problem is not the disease; the problem is the way we treat the disease.

The same principles used for reversing type 2 diabetes also apply to preventing it. Obesity and type 2 diabetes are closely related, and generally, increased weight increases the risk of disease. The correlation is not perfect but, nevertheless, maintaining an ideal weight is a first step to prevention.

Many people paint type 2 diabetes as an inevitable part of modern life, but this is simply not true. The epidemic of type 2 diabetes really only started in the late 1980s. So we only need to go back a single generation to find a way of life that can prevent most incidents of this disease.

**FACT: TYPE 2 DIABETES IS CAUSED
BY TOO MUCH SUGAR**

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AT ITS VERY core, type 2 diabetes can be understood as a disease caused by too much insulin, which our bodies secrete when we eat too much sugar. Framing the problem this way is incredibly powerful because the solution becomes immediately obvious. We must lower our insulin levels by reducing our dietary intake of sugar and refined carbohydrates (a form of sugar).

Imagine your body as a big sugar bowl. At birth, the bowl is empty. Over several decades, you eat sugar and refined carbohydrates and the bowl gradually fills up. When you next eat, sugar comes in and spills over the sides of the bowl because the bowl is already full.

The same situation exists in your body. When you eat sugar, your body secretes the hormone insulin to help move the sugar into your cells, where it's used for energy. If you don't burn off that sugar sufficiently, then over decades your cells become completely filled and cannot handle any more. The next time you eat sugar, insulin cannot force any more of it into your overflowing cells, so it spills out into the blood. Sugar travels in your blood in a form called glucose, and having too much of it—known as high blood glucose—is a primary symptom of type 2 diabetes.

When there's too much glucose in the blood, insulin does not appear to be doing its usual job of moving the sugar into the cells. We then say that the body has become insulin resistant, but it's not truly insulin's fault. The primary problem is that the cells are overflowing with glucose. The high blood glucose is only part of the issue. Not only is there too much glucose in the blood, there's too much glucose in all of the cells. Type 2 diabetes is simply an overflow phenomenon that occurs when there is too much glucose in *the entire body*.

In response to excess glucose in the blood, the body secretes even more insulin to overcome this resistance. This forces more glucose into the overflowing cells to keep blood levels normal. This works, but the effect is only temporary because it has not addressed the problem of excess sugar; it has only moved the excess from the blood to the cells, making insulin resistance worse. At some point, even with more insulin, the body cannot force any more glucose into the cells.

xvi Think about packing a suitcase. At first, the clothes go into the empty suitcase without any trouble. Once the suitcase is full, however, it becomes difficult to jam in those last two T-shirts. You reach a point where you can't close the suitcase. You could say the luggage appears to be resisting the clothes. This is similar to the overflow phenomenon we see in our cells.

Once that suitcase is full, you might simply use more force to shove those last T-shirts in. This strategy will only work temporarily, because you have not addressed the underlying problem of the overfilled suitcase. As you force more shirts into the suitcase, the problem—let’s call it luggage resistance—only becomes worse. The better solution is to remove some of the clothes from the suitcase.



What happens in the body if we do not remove the excess glucose? First, the body keeps increasing the amount of insulin it produces to try to force more glucose into the cells. But this only creates more insulin resistance, in what then becomes a vicious cycle. When the insulin levels can no longer keep pace with rising resistance, blood glucose spikes. That’s when your doctor is likely to diagnose type 2 diabetes.

Your doctor may prescribe a medication such as insulin injections, or perhaps a drug called metformin, to lower blood glucose, but *these drugs do not rid the body of excess glucose*. Instead, they simply continue to take the glucose out of the blood and ram it back into the body. It then gets shipped out to other organs, such as the kidneys, the nerves, the eyes, and the heart, where it can eventually create other problems. The underlying problem, of course, is unchanged.

Remember the bowl that was overflowing with sugar? It still is. Insulin has simply moved the glucose from the blood, where you could see it, into the body, where you cannot. So the very next time you eat, sugar spills out into the blood again and you inject insulin to cram it into your body. Whether you think of it as an overstuffed suitcase or an overflowing bowl, it's the same phenomenon all over again.

The more glucose you force your body to accept, the more insulin your body needs to overcome the resistance to it. But this insulin only creates more resistance as the cells become more and more distended. Once you've exceeded what your body can produce naturally, medications can take over. At first, you need only a single medication, but eventually it becomes two and then three, and the doses become larger. And here's the thing: if you are taking more and more medications to keep your blood glucose at the same level, your diabetes is actually getting worse.

**Conventional diabetes treatments:
How to make the problems worse**

The blood glucose got better with insulin, but the diabetes got worse. The medications only hid the blood glucose by cramming it into the already engorged cells. The diabetes *looks* better but actually it is worse.

Doctors may congratulate themselves on the illusion of a job well done, even as patients get sicker. No amount of medication prevents the heart attacks, congestive heart failure, strokes, kidney failure, amputations, and blindness that result when diabetes is getting worse. "Oh well," the doctor says, "it's a chronic, progressive disease."

Here's an analogy. Consider that hiding garbage under your bed instead of discarding it allows you to pretend that your house is clean. When there's no more room under the bed, you can throw the garbage into the closet. In fact, you can hide it anywhere you can't see it: in the basement, in the attic, even in the bathroom. But if you keep hiding your garbage, eventually it's going to begin to smell really, really bad because it's starting to rot. Instead of hiding it, *you need to throw it out.*

If the solution to your overflowing suitcase and your overflowing house seems obvious, the solution to too much glucose, which leads to too much insulin, should also seem self-evident: *Get rid of it!* But the standard treatment for type 2 diabetes follows the same flawed logic of hiding the glucose instead of eliminating it. If we understand that too much glucose in the blood is toxic, why can't we understand that too much glucose in the body is also toxic?

FACT: TYPE 2 DIABETES AFFECTS EVERY ORGAN IN THE BODY
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WHAT HAPPENS WHEN excessive glucose piles up in the body over ten or twenty years? Every cell in the body starts to rot, which is precisely why type 2 diabetes, unlike virtually any other disease, affects every single organ. Your eyes rot, and you go blind. Your kidneys rot, and you need dialysis. Your heart rots, and you get heart attacks and heart failure. Your brain rots, and you get Alzheimer's disease. Your liver rots, and you get fatty liver disease and cirrhosis. Your legs rot, and you get diabetic foot ulcers. Your nerves rot, and you get diabetic neuropathy. No part of your body is spared.

Standard medications do not prevent the progression of organ failure because they do not help excrete the toxic sugar load. No less than seven multinational, multicenter, randomized, placebo-controlled trials have proved that standard medications that lower blood glucose do not reduce heart disease, the major killer of diabetic patients. We have pretended that these glucose-lowering medications make people healthier, but it's been a lie. We have overlooked a singular truth: *you can't use drugs to cure a dietary disease.*

FACT: TYPE 2 DIABETES IS REVERSIBLE AND PREVENTABLE WITHOUT MEDICATIONS

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ONCE WE UNDERSTAND that type 2 diabetes is simply too much sugar in the body, the solution becomes obvious. Get rid of the sugar. Don't hide it away. Get rid of it. There are really only two ways to accomplish this.

1. Put less sugar in.
2. Burn off remaining sugar.

That's it. That's all we need to do. The best part? It's all natural and completely free. No drugs. No surgery. No cost.

Step 1: Put less sugar in

The first step is to eliminate all sugar and refined carbohydrates from your diet. Added sugars have no nutritional value and you can safely withhold them. Complex carbohydrates, which are simply long chains of sugars, and highly refined carbohydrates, such as flour, are quickly digested into glucose. The optimum strategy is to limit or eliminate breads and pastas made from white flour, as well as white rice and potatoes.

You should maintain a moderate, not high, intake of protein. When it is digested, dietary protein, such as meat, breaks down into amino acids. Adequate protein is required for good health, but excess amino acids cannot be stored in the body and so the liver converts them into glucose. Therefore, eating too much protein adds sugar to the body. So you should avoid highly processed, concentrated protein sources such as protein shakes, protein bars, and protein powders.

What about dietary fat? Natural fats, such as those found in avocados, nuts, and olive oil—major components of the Mediterranean diet—have a minimal effect on blood glucose or insulin and are well known to have healthy effects on both heart disease and diabetes. Eggs and butter are also excellent sources of natural fats. Dietary cholesterol, which is often associated with these foods, has been shown to have no

harmful effect on the human body. Eating dietary fat does not lead to type 2 diabetes or heart disease. In fact, it is beneficial because it helps you feel full without adding sugar to the body.

To put less sugar into your body, stick to whole, natural, unprocessed foods. Eat a diet low in refined carbohydrates, moderate in protein, and high in natural fats.

Step 2: Burn off remaining sugar

Exercise—both resistance and aerobic training—can have a beneficial effect on type 2 diabetes, but it is far less powerful at reversing the disease than dietary interventions. And fasting is the simplest and surest method to force your body to burn sugar.

Fasting is merely the flip side of eating: if you are not eating, you are fasting. When you eat, your body stores food energy; when you fast, your body burns food energy. And glucose is the most easily accessible source of food energy. Therefore, if you lengthen your periods of fasting, you can burn off the stored sugar.

While it may sound severe, fasting is literally the oldest dietary therapy known and has been practiced throughout human history without problems. If you are taking prescription medications, you should seek the advice of a physician. But the bottom line is this:

If you don't eat, will your blood glucose come down? Of course.

If you don't eat, will you lose weight? Of course.

So, what's the problem? None that I can see.

To burn off sugar, a popular strategy is to fast for 24 hours, two to three times per week. Another popular approach is to fast for 16 hours, five to six times per week.

The secret to reversing type 2 diabetes now lies within our grasp. All it requires is having an open mind to accept a new paradigm and the courage to challenge conventional wisdom. You know the basics and are ready to get started. But to really understand why type 2 diabetes is an epidemic and what you can do to effectively manage your own health, read on. Good luck.