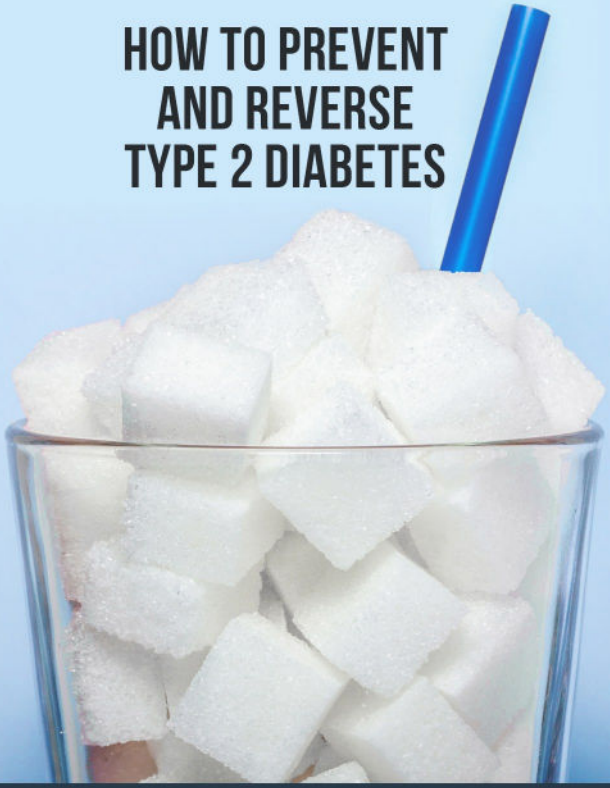
"Dr. Botelho's strategy to uncover root causes is changing the way clinicians look at Type 2 Diabetes. Not only has he blown the doors off of the old paradigm, but he's also customizing solutions to the individual - bravo!"

—**Dr. BT Watts, DC**, Nutrition Hero Podcast

THE DIABETES SOLUTION

HOW TO PREVENT AND REVERSE TYPE 2 DIABETES



DR. EMANUEL BOTELHO, DC

THE DIABETES SOLUTION
HOW TO PREVENT AND REVERSE TYPE 2 DIABETES
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To my Mother and best friend, Milena Botelho. I wish I'd had this knowledge before it was too late for you. You are forever loved and missed!

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CHAPTER 1

Introduction to the Doctor

I grew up in Massachusetts, in the city of New Bedford. My mother used to tell me that even when I first learned to write, I would write my name as "Dr." Emanuel Botelho. So, I guess I always knew I wanted to be a doctor. I never hesitated to answer the question about what I'd be when I grew up; my answer was always, "A doctor."

I graduated from the University of Massachusetts with a major in Biology. While there, I was seriously considering a career as a pharmacist. I even worked as a pharmacy tech prior to attending medical school. However, something didn't feel right to me as I helped dispense medication after medication to the same people. They didn't seem to be recovering their health and, what's worse, many patients needed additional medications to deal with the side effects

or complications of the initial meds they were prescribed. It occurred to me that, as a pharmacist, I'd be trapped in this cycle of providing medication but not providing a resolution. This concept made me question my choice.

So, I decided to do some of research. I interviewed a bunch of doctors and eventually I found an option. I found a medical field that would both fulfil my desire to help people and would also enable me to provide care that would truly increase the health of my patients. That search took me to the world of Chiropractic Care.

Pharmaceuticals serve a purpose when there is an acute need for it. However, when it comes to many chronic conditions, there are often better options that get to the root of the problem, correct it, and provide long-term or permanent relief. These solutions are far superior to being treated with potentially harmful drugs. I wanted to be part of that type of solution.

After graduating from New York Chiropractic College, I returned to Massachusetts and ran a successful practice for many years. Eventually I relocated to Southern California and have been practicing here ever since.

During my years providing chiropractic care, my mother became ill. Like the example I use in this book, it happened

without warning. A typical routine physical resulted with the unexpected diagnosis of Type 2 Diabetes.

My mother died of complications from Type 2 Diabetes. She was my confidant, my advisor, and my best friend. Her loss has been so painful to me that I still have a hard time discussing it. I am talking about it now because this book, and my practice were born out of a desire to prevent others from enduring the painful loss of their loved ones.

When Mom was diagnosed with Type 2 Diabetes, she was given the same cookie cutter treatment as most Type 2 Diabetes patients. Medications to attempt to maintain the disease and slow its progression. Had I known then what I know now, that this disease can be reversed, I would still have my best friend.

You do not have to go through this same scenario. Too many people face it these days. Treating Type 2 Diabetes with traditional medical protocol does not resolve the core problem. It can slow the progression, but usually as the result of an incremental, but steady, increase of medications.

Our protocol is quite different. The results are quite different as well. When patients follow the program we prescribe, their A1C numbers go down. Their blood sugar is regulated, they usually lose weight, and they gain energy.

We offer a solution with changes that enhance every part of your health while reversing the diagnosis of Type 2 Diabetes. The key to this success is putting together a customized individual care plan for each of our patients. The traditional approach of one-size-fit-all doesn't work now. It didn't work when my mother was first diagnosed either. The key to our success is looking at each patient as an individual and figuring out why each patient became a diabetic in the first place.

My mother's legacy will help others to enjoy a longer, healthier life with their loved ones.

Learn More—https://www.DrBotelho.com/

CHAPTER 2

The Patient's Story

Does this scenario sound familiar to you?

You pick up the phone and an unanticipated sense of dread runs through your body as you hear someone from your doctor's office say, "We have your lab results and the doctor needs to meet with you."

It was just a routine exam. What could possibly be wrong? Still confused, you apprehensively meet with your doctor who says, "I'm sorry to tell you this, but your test results reveal that you have Type 2 Diabetes."

Before the words of this alarming diagnosis have been fully communicated, he or she is already writing out your first prescription for an oral diabetic medication. They hand you

the paper and tell you that "you're going to need to change your diet, lose weight, and exercise." You don't even know where to start to change your diet or what exercises to perform. You feel condemned to taking medication and likely insulin injections for the rest of your life. You struggle with the fact that your life, as you have known it, will change drastically, and you wonder, "What will life be like now?"

You feel panicked, sad, confused, scared, or perhaps you're in denial. As a relatively uninformed patient, you fully accept the instructions your doctor has recommended. The problem, however, is that you have no roadmap or comprehensive plan to guide you through what you actually need to do.

Unfortunately, your traditionally-trained doctor, who utilizes the standard drug therapy model of care, may not really understand how to better help you either. In many cases, it's highly likely your doctor is very well meaning. It is also highly likely that your doctor feels ill-equipped and even jaded by the direction being taken. Many traditional healthcare providers feel handcuffed by the drug therapy model as they experience the obstacles it creates for optimal patient outcomes. They are commonly not well versed in emerging research, new clinical applications, dietary approaches, etc. Again, it is not that they are ill-intentioned; it's just that often they are not adequately trained to deal

with many of the chronic and degenerative diseases afflicting today's patient population.

Even if you've consulted a registered dietitian who provides you with a dietary plan, you most likely have been given a generic one-size-fits-all program. This program commonly revolves around restricting your calories, consuming smaller portions, avoiding fats, not eating late at night, eating more fruits and vegetables, eating less meat . . . well, you get the picture. Unfortunately, this approach is usually not sufficient to stop what has become, for many, the inevitable progression of your disease.

Throughout this book, you will uncover little-known facts, strategies, and clinical pearls, that explain why these often-antiquated instructions may be ineffective in significantly improving your health. Understand that the tools and methods you've been given up to this point in time are often part of the problem.

This is an important time to reinforce a few crucial aspects of this book. This book is for informational purposes only. It is certainly not intended to take the place of appropriate medical care. The information should not be used as an impetus to start, stop, or delay proper medical care. Please consult your

healthcare provider before making any changes to your currently prescribed recommendations.

For many, common health recommendations may be the reason their health has diminished over time. The treatment and advice given so far may not only be ineffective, it may actually be extremely dangerous. It's common knowledge that many drug therapy approaches can essentially make your condition worse over time. It's also well-known and documented that drug therapy comes with significant risks of further complications.

Ask yourself these questions:

How many times have you had to increase your medication?

How many "special" diets have you tried but haven't changed the course of your disease?

Did you begin and stick to an exercise program? Has it made any difference?

Often the answer to these questions is NO! For so many, Type 2 diabetic patients, the condition only seems to worsen with time, despite all the medications, insulin injections, radical and life-altering diets, and attempts at exercise.

At some point you have to ask yourself, am I on the right path?

Do I have the right information?

As a healthcare provider who practices in a functional health model and focuses on patients with Type 2 Diabetes, I know your story all too well. I empathize with your frustration because I am frustrated as well.

Why am I frustrated, you might ask?

I am frustrated because you are likely not being told the entire truth. The Type 2 diabetics I've seen all share similar stories, and I bet it's very similar to yours. Millions of Americans are suffering from Type 2 Diabetes. Based on my clinical experience, many of them are suffering needlessly and unnecessarily. I believe this epidemic is one of the most mismanaged conditions in recent history.

Since your diagnosis, have you worried about the complications this disease may cause?

Have you feared that you may one day lose your eyesight, lose a limb to amputation, or develop other diseases because of your diabetes?

Have you even felt the anguish that your life may be cut short?

Have you witnessed family members, friends, or co-workers suffer through the disease and the accumulating amount of drugs they've had to endure? Have you seen first-hand the many complications they've dealt with and watched their quality of life diminish?

Unfortunately, these are the sad realities many patients face when they are stricken with this very dangerous and life-altering disease.

Did you know that the United States makes up only 5% of the world population, yet we consume 50% of the medications produced in the world? Our society has become heavily dependent upon drugs because we are conditioned into believing that pharmaceuticals provide us with an easy and quick fix. If this were true, the United States should rank among the healthiest nations. The reality is that the World Health Organization ranks us at #46. It is apparent that access to (and taking) all kinds of medications is not the answer for experiencing good health. At times they are necessary, and when they are it is a blessing that we have such easy access. However, the rate at which they are used is staggering!

You may be one of the millions of patients who have taken medication after medication and insulin injection after insulin injection. If you are newly diagnosed or an individual whose Type 2 Diabetes seems to be "under control," you may think the medication is working and you'll be fine as long as you continue taking it. Please do not be shortsighted here. If all you ever do is take prescription medications, diet, exercise, and try to control your weight, you are quite possibly setting yourself up for disaster. There is certainly a time and place for prescription medication; however, they are massively overused, and that overuse can have very damaging consequences.

Obviously, drug therapy is not always a bad thing. For example, if you wind up in the emergency room because your blood sugar has spiked to unsafe levels, then a drug or insulin injection that can lower your blood sugar rapidly is certainly appropriate and should be used. Drugs are necessary for crisis and traumatic situations. They are needed and appropriate when stabilizing an emergency situation. But in our society, prescription medications have become grossly overused, misused, and abused. As for treating the daily symptoms of Type 2 Diabetes, this form of drug abuse, in my opinion, is far too prevalent.

When you were diagnosed with Type 2 Diabetes, it's likely you were prescribed Metformin. This pharmaceutical is

typically the first drug of choice for the majority of doctors who treat Type 2 Diabetes. You were likely prescribed 1,000 mg daily, though this varies by individuals. At first, it seemed to work, but when you followed-up with your doctor six-to-eight months later, you were surprised to find out that your A1C had gone up! The solution? Your doctor increased the dose to 2,000 mg per day—the accepted maximum dose. Again, you're okay for some time, but eventually this dose stopped working, too. As you know, when your A1C is not properly controlled, you're at risk for other complications—the very complications you've feared since you were first diagnosed, and the very complications you thought your medication would prevent. But no, that isn't the case. Instead, your doctor prescribes a new medication, and so the cycle begins.

The little-discussed truth is that when Type 2 Diabetes isn't approached comprehensively, it may very well get worse. Despite trying medication after medication with ever-increasing doses, the disease progresses, leaving you feeling as if you're rolling down a hill uncontrollably, grasping for something, anything, to stop this forward motion.

A significant part of this drug overuse and misuse dilemma is that when the body becomes accustomed to medication, it begins to require greater quantities of the same medication to provide the same benefits. You have to ask yourself:

if you continue to have to increase your medications, are they actually working to fix the problem? I'll discuss this more in-depth in a later chapter, but if this is indeed true, there must be a better, safer, and more effective solution to restoring normal function. The good news is that there is a better solution!

In my time treating Type 2 Diabetics, it is not unusual to see patients take multiple medications to control their blood sugar and additional symptoms. It's akin to putting a Band-Aid on the problem. It's also not uncommon to see patients taking their prescriptions at the maximum dosages. On top of oral medications, many patients are required to take insulin to regulate their blood sugar. In addition, patients often take two, three, or four high blood pressure medications. Frequently piled on top of that are prescriptions to lower cholesterol. And that's not all! Many patients also take a plethora of other medications to manage the side-effects and complications of their diabetes.

This process might be considered an acceptable approach when dealing with Type 2 Diabetes if it in fact worked for patients. However, for many patients, their symptoms and lab results remain abnormal and troublesome. In addition to the many serious side-effects that can be caused by the individual drugs, the body is also dealing with this potentially toxic soup of medications. You may not be aware that

these medications can have adverse reactions to each other. Based on this truth, it is clear to me that the majority of people suffering from Type 2 Diabetes are not experiencing a permanent solution with this approach. For those of you who still think you are on the right path, hold on to this book and keep reading!

Without a truly comprehensive and customized approach, Type 2 Diabetes is destined to worsen and likely never go away. The pharmaceutical-based treatment most patients receive, along with nutritional intervention, is obviously not, as they say, cutting the mustard. There should be no escalation of dosage and drugs. In other words, if the approach worked to fix the underlying problem, there would be no need to escalate treatment.

Some would argue that the increasing need for medication is just the normal course of the condition. While that may be true, in part, I believe that it speaks much more to the negligence of what is actually causing this disease.

If you've had this disease long enough, you've likely been graduated to new and different drugs numerous times. If you have recently been diagnosed with Type 2 Diabetes, I can almost promise you that this is the course you're bound to end up taking. That is, unless you take the information in this book and my message seriously.

If your quality of life is diminishing, you must consider a different direction. Think about yourself and your relationships. Your attitude about life and how you relate to others all begins with how you feel. You are meant to be happy, healthy, and independent. You should feel exhilarated and inspired to live each day feeling as good as possible. If you are suffering, fearful, and sad, your relationships, work and all aspects of your health are affected. If your diabetes is causing you this kind of pain, then diabetes is stealing your life! It doesn't have to, and it may not if you take proper action!

This book is meant to help you discover the one thing that will give you back your life.

Type 2 Diabetes is REVERSIBLE!

You may find that statement hard to believe, or you may wonder why your healthcare provider hasn't told you this. Your healthcare providers may have told you that it cannot be reversed. They may have told you that the best you can do is take one medication after another, and futilely try to diet and lose weight for the rest of your life in an attempt to slow down the inevitable progression of your disease.

This is not true. I see clinical results every day indicating that Type 2 Diabetes can be reversed. In all of the cases

I have accepted into care, I have rarely seen a patient fail. There are various reasons for success, many of which you will discover if you continue to read this book.

If you're skeptical, I get it. You've been told so many things already that have been, supposedly, in your best interest. Yet, you continue to struggle. All I can ask is that you put natural cynicism aside and maintain an open mind. There is absolutely no reason you have to suffer from this disease any longer, unless your health is not your number one priority.

So what does it mean when I say that Type 2 Diabetes is reversible? Here are the results I see with my patients:

- They are able to reduce their need and dependence on drugs and insulin.
- They are able to lower and stabilize their blood sugar while getting off of their medications—with doctor supervision.
- Patients lose weight, commonly without exercise.
- Patients increase their energy levels.
- Results show a reduction and elimination of risks for complications common to diabetes.
- Pre- and post-labs data is irrefutable; the patient is reversing their condition!
- Patients achieve the clinical status of non-diabetics.

We are fortunate to have medications available that can save lives in life-threatening and traumatic circumstances. However, Type 2 Diabetes is a chronic illness that can be managed, controlled, and reversed by a number of different interventions.

There is a choice to be made, and it is imperative that you make it now. We all know the risks of diabetes: blindness, kidney failure, neuropathy, heart disease, and more. If you are reading this and are already experiencing these complications, you have most likely felt the frustration, fear, and panic of being told there is not much more you can do. If you are newly diagnosed, you may believe you have this disease under control. I urge you: do not ignore it. Once you develop one complication, others quickly develop soon after.

DO NOT TAKE THIS DISEASE LIGHTLY!

Not taking proper action to deal with Type 2 Diabetes can be a death sentence. If you are lucky, and this disease does not cut your life short, it will definitely rob you of your independence and overall quality of life. Reading this book is the first step in educating yourself and taking proper action.

Just imagine the possibilities:

- No more drugs
- No more insulin injections
- Restored energy
- Controlled blood sugar (without drugs or insulin)
- Reduced risk of diabetic complications and premature death

To find the solution, you have to know the cause. I can assure you it's not what you've been told and not what you think it is.

CHAPTER 3

The Doctor's Frustration

As a healthcare provider, I've seen my fair share of chronically ill patients, many of whom are trapped in the grips of the Type 2 Diabetes clinical scene. Why? Because the "epidemic" called Type 2 Diabetes is, in my opinion, one of the most mismanaged conditions in recent history. Most Type 2 diabetics are seldom provided with more than a one-size-fits-all plan of so-called action, given general orders to take medication, change their diet, lose weight, and exercise. For so many, this is not proving to be effective.

In fact, the treatment regimen many patients are prescribed may not only be unhelpful, but also make their condition and overall health worse over time.

I believe there is a lot more to the Type 2 Diabetes story than patients are being exposed to.

What most patients are told by their healthcare provider is that Type 2 Diabetes is a chronic, degenerative disease. This means it's going to get worse over time and never go away. They're often told to expect debilitating complications as the disease progresses—unavoidable complications they should just "accept."

This is all likely true—if all the patient does to manage their condition is take one drug after another, and diet and exercise themselves into oblivion.

If the only advice your healthcare provider has given you is to take a multitude of medications, inject yourself with insulin, diet, lose weight, and exercise, then I believe you are on the wrong path.

In a sea of nutritional programs and fad diets, which one is right for you? How exactly are you supposed to lose weight? What type of exercise regimen should you do? Is exercise even right for you at this point in time?

The nondescript guidance delivered by your healthcare provider is often an inadequate solution for your personal health challenges, setting you up for failure from day one.

Why? Because the information is vague and not customized to you as an individual with unique health needs.

My frustration with this cycle of poor information stems from knowing with certainty that Type 2 Diabetes is not only something that can be controlled, but is actually reversible!

Yes, Type 2 Diabetes IS REVERSIBLE!

My patients and I have experienced firsthand some of the following benefits from my clinical approach:

- Reducing and eliminating the need for prescription medications and insulin injections
- Weight loss (commonly without exercise)
- Reducing and eliminating risks for diabetic complications
- Increased energy levels and quality of life
- Even achieving a clinical status of non-diabetic

Perhaps what is even more eye-opening for me as a healthcare provider are the horror stories told to me by patients who have been run through the gauntlet of the Type 2 Diabetes circus. These first-hand accounts of misuse and abuse have really shaped the way I view the state of our health care system.

What is most frustrating to me is seeing one patient after another come to me telling of the same, cookie-cutter advice given to them by their healthcare provider that fails to address the underlying cause(s) of the problem. I've seen too many Type 2 diabetic patients go from one healthcare provider to the next, only to receive the same general and ineffective advice.

It's not unusual to see a Type 2 diabetic patient taking eight to ten different oral medications (or more!), injecting themselves with insulin multiple times per day, struggling to diet and lose weight, and attempting to exercise—all to no avail.

Despite all their efforts, many patients' lives are being ruined by Type 2 Diabetes. The worst part? Most patients are suffering needlessly.

But I know what is possible. Every day I see patients in my office who have reversed their condition. I see patients who have succeeded in getting their health and their life back. Most importantly, I rarely see patients fail.

A gentleman who had undergone a quintuple bypass open-heart surgery visited my office several years ago. His cardiologist told him that he shouldn't even be alive. He was told, "I can't help you anymore, I don't know what else to do." The overweight man, who could not even be weighed

on our standard medical scale, had significant cardiovascular disease and Type 2 Diabetes.

He had a problem, but not a unique one. The more insulin he took, the higher his blood sugar would rise. He was taking over 300 units of insulin per day, akin to throwing gasoline on a fire. When this patient communicated this scenario to me, I immediately knew what his problem was. After running some tests, including a very simple blood test that no one else had ordered, we confirmed that his immune system was attacking the insulin.

We welcomed the man into our program with open arms. Upon completion of the program, he was off all of his medications, including insulin, except for a small amount of Metformin. He lost over one hundred and fifty pounds and was achieved his ultimate goal: traveling to Disney World with his grandchildren to walk the parks and enjoy the attractions with them.

Like this patient, many diabetics have an excess of insulin in their bodies, which often desensitizes the insulin receptors. Taking high levels of insulin can perpetuate the problem and can cause you to become more resistant to insulin. The standard reaction is to take even more insulin; however, many patients are unaware that high levels of insulin increase the risk for cardiovascular disease, kidney damage,

cancer, and stroke. Insulin is also a fat-storing hormone, which means that it promotes weight gain—not helpful when you're being told to lose weight. It is important to be aware that weight gain is often a symptom of the problem, not necessarily the cause. You cannot diet and exercise your way out of this condition, yet this is the information most diabetics are given.

I've met with so many patients who all tell a similar story. They were diagnosed and given medication that appeared to work for a period of time, but eventually it became ineffective and they had to increase their dosage. When the higher dose failed, they were prescribed a different type of medication, followed by another, and another.

For instance, I once had a patient who was taking twenty-three different medications, but she was no better than when she took only one! These included medications to control her diabetes, blood pressure, cholesterol, and to protect her kidneys. To top it all off, she also took insulin. Can you see the problem with this paradigm?

This is an example of a very sick patient, but obviously the medications were not solving the problem. This is especially troubling for me, since the multitude of medications she was given were apparently not helping to correct the

cause of her condition. Despite her so-called treatment, the patient was deteriorating mentally and physically.

Some patients who realize this paradox—taking medication to help their condition, but not getting better through treatment—stop taking their medications completely. It's not uncommon for them to feel better once they do so! This feeling of improvement is likely due to the fact that they are no longer experiencing the side effects associated with their potentially toxic cocktail of medications.

However, while they may begin to feel better, it's still possible that blood sugar can spike to dangerous levels, which can be very dangerous. That is not the outcome anyone wants. So, they go back to their medications. The vicious cycle goes on and on until the patient realizes that they must try something different.

The most challenging part for me, as a functional health practitioner, is that I have no control over when patients will reach that crossroad. Unfortunately, many patients wait too long to seek a different direction of treatment. They stand by until they are suffering from debilitating complications like neuropathy, loss of eyesight, or even the amputation of a limb—a point at which their quality of life is so poor that they struggle to recall a time when they weren't sick.

In one particular case, I accepted a gentleman into care who was very ill with diabetes on a Thursday. We received a message from his family on the following Monday, prior to even starting care, that he was in intensive care at the local hospital. I didn't even have a chance to help him as he had waited too long to get the necessary information to change his life. Please do not let this happen to you.

You cannot take a backseat in the management of this condition, as time is truly of the essence. You may think everything is under control since you currently feel fine, but how you feel is a very poor indicator of your health! Feelings can change rapidly and with it your health status—all without any warning.

This is why I am writing this book. It is my obligation to you to spread the word and reach as many Type 2 diabetics as possible. There is hope. This condition can be reversed—and I've got the clinical results to back it up.

It is disheartening to see so many people with Type 2 Diabetes who have given up hope of finding a way to reclaim their health and their lives. It does not have to be this way; this can be the wake-up call that will change your life.

The traditional medical model follows a reactive approach instead of a proactive approach. I'm confident that if they

knew what we knew, they would certainly do what we do! If they did, I am confident that their patients would see the results my patients see.

There is a way out! There is a light at the end of the tunnel and it's not a freight train barreling down on your health and life. Don't wait until it's too late, but more importantly don't ever give up. You can reclaim your health and your life because you may be able to reverse your Type 2 Diabetes.

CHAPTER 4

The Patient's Frustration

Type 2 diabetic patients are often frustrated for a variety of reasons. One common reason for frustration arises out of fear and uncertainty. Upon receiving the initial diagnosis, patients are often taken back. They immediately wonder what their life will look like and what this disease will ultimately do to them. They often worry about how the diagnosis will impact their loved ones.

Patients go to doctors to find out what is wrong and to get a diagnosis. However, ultimately, they look to their healthcare providers to provide solutions. They not only want a solution, but they want the best solutions, effective solutions. They want and deserve solutions that are safe.

More than that, patients look to their healthcare providers for leadership, expertise, and knowledge. At the end of the day, patients are patients. They are not doctors. They are not equipped with the schooling and knowledge of doctors. They look to doctors for a transference of knowledge in how to properly handle what may be a life-threatening situation.

Our mainstream healthcare system, as it exists today, IS BROKEN! It is ripe with dysfunction created by many factors including bureaucracy, waste, incompetence, and providers who are over-worked. The dysfunction in our healthcare system often leads to a treatment approach that lacks comprehensiveness, customization, and empathy. It is all too common for a patient to receive rushed, cookie-cutter recommendations that are often dominated by a drug therapy approach.

I realize that nothing is perfect in our world, and maybe it will never be. However, if I am in an emergency situation, I want to be taken to the nearest emergency room in the United States.

However, 70% of people who die in the United States die due to a chronic and degenerative heath condition. Unfortunately, this is where the gaps are located. If you are suffering from a chronic and degenerative condition like Type

2 Diabetes most likely you will be recommended one drug after another and be given basic recommendations to change your diet, lose weight, and exercise. I have to tell you, from my direct experience that is not enough in many cases.

Many diabetics are frustrated and disenchanted with their treatment approaches. They are frustrated with the lack of options and alternatives, their doctor's bed side manner, and the overall lack of results. They are often diagnosed on a routine visit, given their first prescription, told to lose weight, change their diet, and exercise. Sadly, this is commonly the extent to which Type 2 diabetics are managed on Day One of their diagnosis. Even more heartbreaking, this is the extent to which diabetics are managed for the rest of their lives.

With prescriptions in hand and instructions from their doctor to diet and exercise, patients may think: "I can handle this." But does this approach really help?

Perhaps you take your medications, exercise, and controll your diet. Has the status of your diabetes actually improved? Unfortunately, this generalized treatment plan too often leaves patients just like you worse off than when they started, and headed down a path of worsening health with no relief in sight.

I know this book is starting out with a lot of doom and gloom that you are likely aware of already. I know you want me to get to the essentials of what you need to do to reverse this situation and condition. However, it is important to lay the groundwork so that you are able to make a good decision for yourself and for your family. It is also important to provide you with the proper context as I have seen many Type 2 diabetic patients in complete denial. I have also seen many who have no clue about the risks involved.

Many doctors treat patients with Type 2 Diabetes the same; they fail to look a little deeper, ask more questions, and uncover the real source of their health problems. The truth is, **Type 2 Diabetes isn't really a high blood sugar problem.** It's rooted in far more complex processes. At the end of the day, however, many healthcare providers are playing the "blood sugar game" as it relates to the diabetic condition. Meaning the goal is to, at all costs, lower a patient's blood sugar to levels that are determined to be safe.

There is no doubt that high blood sugar can be devastating to the body. But, ask yourself the following question: "Why do Type 2 diabetics, who have their blood sugar under control still suffer one or more diabetic complications?"

I would suggest that there are things going on underneath the surface of high blood sugar that are not addressed by

simply decreasing blood sugar levels. There is more to the story.

Many Type 2 diabetics also have high blood pressure and high cholesterol. These patients get drugs to lower those markers to safe levels too. There is often no inspection as to what might be causing those issues in the first place.

My point is this: At a very basic level, if you can no longer regulate your blood sugar on your own, then something is broken. It would stand to reason that in order to solve the problem, you must find out what is broken and devise a plan to fix the problem. It seems unlikely that the problem is that you are deficient in one or more pharmaceutical agents. If you think the problem is that you are ill-fated and just genetically determined to be ill, then you are certainly limiting yourself. If you think it's just because you are overweight, lazy, and have poor lifestyle habits, then you have been misled.

Again, Type 2 Diabetes, and even Type 1 (maybe even especially Type 1) is not a blood sugar disease. High blood sugar is just a symptom. Standard recommendations often fail to address the symptoms of deeper and more complicated problems. Who pays the price for that? You got it: You and your family.

But how are you supposed to know all of this? You are not the doctor. You are the patient. As mentioned, this condition is looked at and treated as a high blood sugar issue, and much of the information you are receiving revolves around your blood sugar levels.

Your healthcare provider likely wants to review your monthly glucose readings. You are trying to improve your diet. You are more aware of sugar in your diet. **Everything that seems to be "diabetes friendly" at the grocery store is covered in statements like "low in sugar!" and "sugar-free!"**

The truth is that a lot of the information you're bombarded with is misleading or just plain wrong. A lot of this information can actually be harmful to your health and worsen your condition.

How does it make you feel to know that your efforts to keep your condition under control may actually make it worse? I can tell you how it makes me feel as a healthcare practitioner who knows better: disappointed and mad. Want to set the record straight. I'm going to shine a light on the misinformation you have received so that you can truly understand what is harmful and what is helpful, and most importantly, how to get yourself on the path back to health.

THE TREATMENT MYTH

Type 2 Diabetes is a treatable condition, but the majority of the medications administered to diabetes patients only address symptoms of the condition, and don't actually resolve any of the underlying causes. I'm sure you've experienced this first-hand. You likely take at least one oral medication to help control your blood sugar levels, and if you have more advanced diabetes, you may also need to take multiple oral medications and daily insulin shots. In addition, many patients also take cholesterol and blood pressure lowering medications. Is your diabetes improving? Are your blood sugar levels responding in a positive way? Do you actually feel any better?

For so many people with Type 2 Diabetes, the answer to those questions is no. Based on a typical drug therapy treatment model, the only way to address those negative results is to prescribe more medication. The overuse of medications is one of the greatest frustrations for people living with Type 2 Diabetes. For people with insulin resistance, injecting large amounts of insulin into the body may only make the underlying problems worse, not help to correct it.

From a lifestyle perspective, the addition of medications to your daily routine also diminishes your quality of life. Have

you ever read the potential side effects of the drugs you are taking? This is a good exercise. On paper, make a list of all the negative and life-altering symptoms of diabetes. Then make a list of all the potential side effects of all of the drugs you take and observe the correlation. It's actually quite shocking. If patients had to deal with some negative side effects, but would be assured the results would be satisfactory, they might sign up for that. However, it's often a "no win" situation as the medications make them feel poorly and create risk, and often provide dissatisfactory results.

How does it make you feel when you have to excuse yourself before every meal to inject yourself with an insulin shot? Isn't it frustrating to think that all of the time you spend trying to closely follow your doctor's treatment plan may be for nothing? Yes, slowing down the progression of the disease is important, but at the end of the day you know you deserve more.

I hear and feel your frustration, and I want to help. There is absolutely a time and place for medication, but in so many cases it is grossly overused to the point that it may be more harmful than helpful.

The pharmaceutical industry isn't the only one keeping you down.

FOOD MARKETING AND DIABETES

The exponential growth of Type 2 Diabetes has directly attributed to an equally large explosion of food and health products marketed specifically to people with diabetes. There are entire aisles and even sections of grocery stores dedicated to food and supplement products designed specifically for a "diabetic friendly" diet—or so they say.

While an aisle full of food options, from packaged foods to sweet treats, may seem like a great thing—especially when you've received instructions from your doctor to change your diet—it can also be the most confusing and misleading aspect of being a Type 2 diabetic.

Labels with bold lettering that exclaim "low carb!" and "sugar-free!" seem promising, but have you ever asked yourself how these food manufacturers keep that package of cookies tasting sweet without sugar? If you take a few moments to read the ingredients label, you'll be alarmed to see the laundry list of unnatural additives, notably man-made sweeteners, which turn that package of cookies into a chemical-laden mess.

Ingesting foods that contain these man-made artificial sweeteners can promote weight gain instead of loss and

further complicate insulin resistance. Some studies also suggest that the use of artificial sweeteners like aspartame, saccharin, and sucralose could have serious consequences for your long-term health.

Much of the same pseudo-science that goes into these food products is also applied to the marketing of nutritional supplements. Many pills, powders, and meal replacement products marketed to diabetics can make your diabetes worse. What I am getting at is you have to be careful about what you eat. Make sure you are working with a healthcare provider who can give you the right information. It's not simple—it's actually quite complicated.

The good news is that there is another way and there are healthcare providers who can help you turn it all around. "Functional Medicine" has been shown to help Type 2 diabetics REVERSE their condition. Functional Medicine is a clinical model designed to treat you as an individual instead of a label. In other words, as a healthcare provider who works in a functional health model, I do not care that you have been labeled a Type 2 diabetic. What is more important to me is what has caused your Type 2 Diabetes. I am not referring to the outdated, overused, and often inaccurate perspective that it's your genetics, weight, or dietary habits.

As the patient, you have to make the decision to break out of the cycle. If you don't feel like you're receiving the best care and if your health is not improving, don't you think it's time to look for answers elsewhere?

Reversing Type 2 Diabetes requires extremely thorough testing that ultimately leads to a comprehensive diagnosis and a customized care plan. I cannot tell you how many patients have told me, "My doctor is very thorough . . . he or she has run all of the tests." Let me tell you how many times that this has been the case: NEVER! Not once in my experience! One person's idea of thorough is only predicated on their training, philosophy, tools, and the bureaucracy that often influences their decision-making process.

A comprehensive approach to the diagnosis and treatment of any condition, especially Type 2 Diabetes, involves detailed health information. You need an exhaustive panel of tests to examine the functionality of not just your endocrine system, but also many other bodily systems that contribute to endocrine health. You also need a personalized plan that addresses your specific deficiencies in a way that is suitable for your current health status. If all you get is the same basic recommendations as the next diabetic, do not be surprised when you get the same basic results. I think we can all agree that the typical results are appalling.

Type 2 Diabetes is not a one-size-fits-all condition. There are many different causes for Type 2 Diabetes. Patients often have their own unique situation. There is no specific blanket diet plan or formula that applies to every patient. Your body is unique, and therefore your treatment plan should be unique as well.

If you haven't received this kind of care, don't you think you deserve it? The decisions you make today can affect the rest of your life. Don't let yourself wither away while life passes you by. There are solutions and people out there ready and willing to help you regain your health. You deserve the best! You just have to seek it out and take action when the opportunity presents itself.

CHAPTER 5

What Is Type 2 Diabetes?

This is Not Your Grandfather's Diabetes

The information that we've learned about diabetes over the last several decades has vastly changed the landscape of this disease, from causes to management. Changes in the types and quality of food we eat and environmental factors that had little bearing on our lives years ago are now major contributors to the Type 2 Diabetes epidemic we are witnessing today.

Before we further discuss Type 2 Diabetes, let's review the foundation of diabetes as a general condition. It's important to know what you're up against, and it's quite possible you've been given incomplete and even misleading information about your condition.

THE BASICS

DISCLAIMER: **The information you are about to read has been purposefully simplified so that you, the patient, can read and fully understand it. There are many more intricate details and bodily processes that contribute to diabetes but understanding the basics of how your body metabolizes glucose and how things can go awry is the most vital information that you, as the patient, need to know.**

The food we eat serves as fuel for our body. Once digested, certain foods, such as carbohydrates, are converted into glucose and released into the bloodstream to be used as energy. The beta cells in the pancreas sense this change in glucose level and begin to produce and release insulin, which helps the cells in the body receive glucose and turn it into energy, or ATP. As glucose is accepted into the cells, blood sugar levels begin to drop. In response to this, beta cells and the pancreas produce and release less insulin, keeping blood sugar levels in check.

In a patient with diabetes, the body has lost the ability to naturally regulate blood sugar, resulting in high, uncontrolled levels of glucose in the blood. But diabetes is much more than just an irregularity in blood sugar—these high levels are associated with a long list of complications, the

most common being cardiovascular disease, kidney disease, loss of eyesight, poor circulation leading to amputations, and an increased risk of certain forms of cancer. It is also the leading cause of stroke and heart failure.

There are currently more than twenty-nine million Americans and over three hundred and eighty million people worldwide diagnosed with diabetes.[1] Are you one of them? If so, there's a good chance you're already experiencing some of the complications mentioned above—complications that are slowly stealing away your quality of life. If you have not begun to experience diabetic complications, I urge you not to sleep on this disease. It is a slow and silent killer, and if all you're doing is taking medication, changing your diet, and trying to lose weight, it is not enough.

The good news is there may be a way out. A way for you to:

- Reverse your condition
- Reduce and eliminate your need and dependence on drugs and insulin injections
- Lose weight without exercise and radical dieting
- Reduce and eliminate risk for diabetic complications
- Even possibly become "clinically non-diabetic"

Many Type 2 diabetics have been shown how to virtually beat this condition and essentially walk away from Type

2 Diabetes. But before you can beat it, you need to understand diabetes, its roots, and how it affects your entire body.

WHAT TYPE OF DIABETES DO YOU HAVE?

I know you may think you know the answer to this question, but you'd be surprised to learn how often I come across diabetic patients who have been misdiagnosed, or at the very least diagnosed incompletely. There is much more to this classification than you may realize.

In order to answer this question accurately, let's look at the difference between Type 1 and Type 2 Diabetes. This is significant. A problem with many diabetics is that they've been diagnosed incorrectly, or at the very least incomprehensively. Correctly and comprehensively diagnosing the type of diabetes certainly influences the type of treatment a patient receives and, in turn, affects the results of that treatment.

In my experience, one of the main reasons for a poor clinical outcome in a patient with diabetes is due to the lack of understanding of what type of diabetes the patient is affected by, leading to an incomplete or incorrect treatment plan.

TYPES OF DIABETES

Pre-Diabetes

Diabetes is the storm, but the rain shower that signals the approaching storm cloud—pre-diabetes—is equally important in your understanding of this complex condition.

When a patient visits their healthcare provider for a physical or is required to pass a health screening for a life or health insurance policy, a blood test that measures fasting blood glucose level is typically required. If the levels from the blood test are above average, generally between 100 and 125 mg/dl, the patient may be considered pre-diabetic.

Instead of ascertaining and addressing why a patient's blood sugar level is above normal, many healthcare providers will just warn the patient and advise them to lose weight through exercise and a change of diet. What is commonly an aimless directive from the healthcare provider often sends the patient down a long, confusing road of fad diets, fruitless attempts at exercise, and other actions. This road leads to discouraging results and may ultimately be harmful to the patient's health, all because the condition is being mismanaged.

Even pre-diabetics who don't progress to a full diabetes diagnosis still have underlying physiological problems. These problems may be not only causing their pre-diabetic conditions, but also contributing to an overall degeneration of their health.

Instead of being proactive, many healthcare providers are simply reactive. An elevated blood glucose reading often results in a knee-jerk reaction: instead of looking deeper for the root of the problem, many providers hand patients a cookie-cutter "solution" that is not personalized to your unique health situation and body chemistry.

Ultimately, this practice may be setting you up to fail.

Appropriate management of blood sugar is one of the most important processes that your body performs. Any disruption of the efficient movement of glucose out of the bloodstream and into the cell, where is it converted into ATP for energy, will often disrupt other physiological and biochemical processes, abnormally shift sex hormone status, and create cholesterol and triglyceride abnormalities, among many other negative reactions.

While it all seems like a slippery slope, you typically do not become a diabetic overnight. Diabetes, and especially Type 2 Diabetes, occurs over time and on a spectrum, with

normal blood sugar regulation on one end and Type 2 Diabetes on the other.

1. Your body struggles to regulate glucose levels, resulting in high blood sugar.
2. When high blood sugar is not corrected, you may begin to develop insulin resistance.
3. As a result of your acquired insulin resistance, you may develop metabolic syndrome.
4. At this point, you are often considered pre-diabetic.
5. After years of elevated blood glucose levels, you may be officially diagnosed with Type 2 Diabetes.

When your fasting blood glucose edges over the demarcation line, from 125 to 126 mg/dl, you officially have Type 2 Diabetes. Your healthcare provider will intervene, and likely tell you to diet, lose weight, exercise, and take prescription medication, such as Metformin. The thing is, this change in fasting glucose is often just a product of the many underlying mechanisms that have been at work for possibly the last fifteen to twenty years.

Diabetes

Traditionally speaking, there are two categories of diabetes: Type 1 and Type 2. Historically, the type of diabetes a patient is diagnosed with is based on the patient's age at onset.

Type 1 diabetes is often referred to as juvenile diabetes, and patients are often called "insulin-dependent diabetics."

Patients who are diagnosed in adulthood are typically diagnosed with Type 2 Diabetes, which is often referred to as "adult-onset diabetes." However, as time has passed and diabetes has become more prevalent, these categories are increasingly becoming obsolete or, at the very least, incomplete.

We now have a greater understanding of the underlying causes of this disease, and so the traditional categories and criteria often no longer accurately represent what is really happening to the patient.

TYPE 1 DIABETES

Type 1 diabetics typically require insulin because their bodies no longer produce adequate amounts to manage blood glucose. The underlying cause of this for nearly all Type 1 diabetics is an autoimmune disorder, in which their immune system attacks and destroys the insulin-producing beta cells in the pancreas, rendering them insulin dependent. This can ultimately happen at any age.

TYPE 2 DIABETES

Type 2 Diabetes is more closely associated with what is known as insulin resistance. While we mostly see this

condition develop in adults, more and more children of all ages are developing diabetes without an underlying autoimmune disorder (as seen in Type 1), thereby classifying them as insulin resistant.

As diabetes prevalence continues to increase, diagnosis should be increasingly based on the mechanism of action, rather than the age of onset. This, as you will see, is very important for every diabetic.

TYPE 1.5 DIABETES AND BEYOND

There is a lesser known type of diabetes often referred to as Type 1.5. This type refers to patients who have both an autoimmune and an insulin resistant mechanism as driving forces in their inability to regulate blood sugar.

For example, a patient may develop diabetes in their adult years, and are subsequently diagnosed with Type 2 Diabetes. Their healthcare provider often makes this diagnosis without performing the necessary testing to determine whether or not the patient may also have an autoimmune disorder that contributes to his or her diabetes. Unfortunately, we see many patients who have been diagnosed as insulin resistant, but also have an undiagnosed autoimmune mechanism in play. This is one of the major reasons why some patients are unable to successfully manage their condition.

In addition, there is increasing evidence for what some healthcare providers are calling Type 3 Diabetes, or Alzheimer's disease. You read that right: An accumulating amount of research indicates that the same insulin resistance behind Type 2 Diabetes may also be a significant mechanism in the development of the memory-disrupting plaques seen in the brains of people with Alzheimer's. Some studies have even found evidence of this plaque in the pancreases of patients with Type 2 Diabetes, inexplicably linking these two diseases.

We know that patients with diabetes are more than twice as likely to develop Alzheimer's, and that obesity and metabolic syndrome alone can cause cognitive dysfunction. The difference is that Alzheimer's is no longer considered a complication of diabetes; instead, the two conditions appear to share a mechanism of action that equally disrupt the actions of vital cells throughout the body.

To recap, the difference between Type 1, Type 2, and Type 1.5 are the underlying mechanisms that contribute to the disruption of normal blood sugar metabolism.

- Type 1 diabetics are insulin dependent; their pancreas does not work properly, most likely due to an autoimmune disorder that attacks the pancreas and negatively affects beta cell activity, inhibiting

insulin production. Patients with this underlying mechanism are almost always required to inject insulin in order to properly manage blood sugar levels.

- Type 2 diabetics are often insulin resistant; their pancreas produces insulin, but the cells are not able to utilize it effectively because the receptors are not functioning properly. Type 2 diabetics will often first rely on oral anti-diabetic medication. Many will eventually require insulin injections, which can cause further insulin resistance and numerous other negative effects on health. It's important to remember that many Type 2 diabetics indeed produce adequate levels of insulin on their own. Still, many are told by their healthcare providers that they do not produce enough insulin.
- Type 1.5 diabetics have autoimmune responses that can directly affect the pancreas, insulin, or insulin receptor sites, and also have insulin resistance.

SYMPTOMS

Now that you understand how diabetes develops inside your body, it's important to be able to recognize the symptoms of those changes, as they are often the catalyst behind many patients' decision to seek medical care.

While there are several types of diabetes, the symptoms of the disease are similar, and can include:

- Fatigue
- Sleep disturbance
- Hormonal imbalance
- Headaches
- Dizziness
- Blurred vision
- Nausea
- Rapid heart beat
- Aches and pains in joints and muscles
- Weight gain
- Frequent urination
- Insatiable thirst or hunger
- Cuts/bruises that heal abnormally slow
- Weight loss

In addition to general metabolic complications, a person who is insulin resistant and one who commonly has high levels of insulin in their blood can also develop problems associated with abnormal sex hormone levels. These hormonal balances and the symptoms associated with them differ between men and women.

Men

Insulin resistance is often accompanied with a condition called hyperinsulinemia—a medical term that means you have too much insulin in your blood. When this condition occurs in men, the enzyme (aromatase) that converts testosterone into estrogen can become hyperactive, resulting in a male losing his androgen (testosterone) dominance and contributing to estrogen dominance. In other words, a male patient may start to show the hormone profile of a female.

This often becomes what is called a feed-forward bi-directional vicious cycle.

Here's an example of how this plays out: A male patient who is insulin resistant also becomes hyperinsulinemic. As his blood sugar begins to rise, his pancreas produces more insulin in response. The more insulin he produces, the more insulin resistant he is likely to become. The more insulin resistant he becomes, the higher his blood sugar levels rise, along with the insulin he needs to produce. The more insulin that is flooded into the bloodstream, the more estrogen dominant the male patient is likely to become.

This type of clinical situation fuels itself, making it worse over time.

Additionally, increased levels of estrogen in a male may increase insulin resistance and can increase risk for cardiovascular disease, which is the number one killer of diabetics, along with many other harmful health effects.

POSSIBLE SYMPTOMS OF ESTROGEN DOMINANCE IN MALES

- Erectile dysfunction (Just because Viagra® seems to work does not mean you are fixing the underlying cause of the problem!)
- Decreased sex drive
- Female secondary sexual characteristics: pectoral region starting to resemble breasts; softening of facial features; etc.
- Enlarged prostate
- Increased risk of cardiovascular disease
- Increased risk of estrogen-dependent cancers

Females

Women have the opposite problem. In women, hyperinsulinemia can up-regulate the enzyme 17-20 lyase, causing an overproduction of testosterone. This condition is often referred to as polycystic ovarian syndrome (PCOS). PCOS is known to increase the risk for diabetes and is often called a pre-diabetic finding. In fact, many women will develop

PCOS long before developing diabetes. With proper care, many women might be able to avoid developing diabetes.

Similar to men, as women become more testosterone dominant, they have an increased risk for cardiovascular disease.

POSSIBLE SYMPTOMS OF TESTOSTERONE DOMINANCE IN FEMALES

- Male pattern hair growth on the face and body
- Face and body acne
- Inconsistent or absent menstrual cycles
- Infertility
- Increased risk of cardiovascular disease

TYPICAL TREATMENT OF DIFFERENT TYPES OF DIABETES

The traditional treatment model for diabetes relies on a bevy of oral and injected medications that aim to control glucose and insulin levels. This is often called drug therapy or pharmaceutical model. Many of these treatments often fail to address the underlying causes of the disease for the individual patient. Much like putting a bandage on an open wound instead of stitching it closed, drugs and injectables may only be treating the symptoms of diabetes while further masking the underlying cause(s).

Type 1 Diabetes

Type 1 diabetics, those who are insulin dependent, require life-long insulin therapy, either via insulin injections or an insulin pump. With injections, a combination of fast-acting and long-acting insulin is typically used throughout the day to maintain a "safe" blood glucose level. Insulin administered via a pump utilizes a steady dose of rapid-acting insulin to maintain safe levels, known as a basal rate. Proper dosing to account for meals, or a "bolus" dose, requires close monitoring of carbohydrate intake and blood sugar levels. Interestingly, many Type 1 or insulin-dependent diabetics ultimately become insulin resistant over time, which is one reason why insulin dosing is increased over time in these patients.

Type 2 Diabetes

Type 2 diabetics typically begin treatment with oral medications meant to lower blood sugar levels by one mechanism or another. Most patients are prescribed metformin as a first line of defense. Patients are typically started at half of the maximum dosage and increased as needed based upon the patient's response. Once the first medication stops producing the desired effect, they are almost always prescribed another oral diabetic medication. It is not unusual

to see a Type 2 diabetic patient taking three or four oral diabetic medications at the maximum dosage. This does not include drugs that are prescribed to manage high blood pressure, high cholesterol, high triglycerides, and drugs to protect the kidneys and other organs. In total, it is not surprising to see a Type 2 diabetic patient taking eight to ten different oral medications (or more) at once.

When oral medications fail to keep blood sugar levels in an acceptable range, insulin injections are often required. For many patients, this is a dreaded stage of Type 2 Diabetes care. As a healthcare provider, I agree. Once insulin is initiated there is really no other place to turn. If blood sugars continue to rise above desired levels, all that is left to do is increase dosages of insulin to whatever level is necessary to normalize blood sugar levels.

A troubling observation I have made about this stage of diabetes care is that some healthcare providers appear to tell their insulin-dependent patients that it no longer matters what they eat, and that they can eat what they want as long as they adjust their insulin intake to a level that normalizes their blood sugar. If you have ever been told this by your healthcare provider, I advise you to find a new one, and soon.

What I can tell you is that the more insulin floating around in your body, the more likely your risk for poor health outcomes.

As I've previously stated, herein lies the problem: excessive amounts of insulin in a person who is insulin-resistant potentially leads to further insulin resistance and complications. Whether the high level of insulin comes from an overactive pancreas or frequent insulin injections, high levels of insulin in the body may exacerbate symptoms and cause other problems, including obesity, high cholesterol, and hypertension. High levels of insulin can also contribute to liver disease, arteriosclerosis, stroke, and coronary artery disease.

Do you see the disconnect? The very treatment you may be using may be making your condition worse and increasing your risk for other diseases and health problems. There is no doubt that there is a time and place for these medications, but I think it is clear they are vastly overused and over-prescribed. It would be one thing if patients were improving and enjoying a high quality of life. However, for many Type 2 Diabetes patients, this is not the case. Too many Type 2 diabetics are taking a multitude of drugs and insulin injections, and yet they continue to suffer due to the frustration of unpredictable and erratic blood sugar levels, poor quality of life, weight problems, fatigue, and more.

There has to be another way, right? Well, it certainly appears so. In the next chapters you'll come to understand how my approach to helping patients with Type 2 Diabetes might be able to help turn it all around for you.

REFERENCE

1. "Statistics About Diabetes." *American Diabetes Association*. N.p., 1 Apr. 2016. Web. http://www.cdc.gov/diabetes/data/.

CHAPTER 6

Some Common Myths About Type 2 Diabetes

When you're suffering from a condition that affects every aspect of your life, it's natural to wonder "Why?" or "Why me?"

You may feel angry that you've been born "predisposed" to this condition and are now "condemned" to live with it the rest of your life, or perhaps you feel guilty, thinking that somehow, you may have brought this on yourself. Now you face a future filled with medications that may or may not help you feel better and may even result in other health problems.

But the truth is that there is a lot of incomplete and inaccurate information surrounding Type 2 Diabetes. Despite what I've heard from many patients, I continue to be shocked

and disheartened by some of the information and so-called advice that is given to Type 2 Diabetes patients. This is dangerous. The more this type of information has been disseminated, the more it has come to be accepted as "truth."

Many myths are circulated through the diabetes community—myths that leave patients feeling both hopeless and helpless, and ones that have led to poor clinical outcomes and even premature death.

Many Type 2 diabetics are told by their healthcare providers that all that can be done is to take one prescription drug after another, diet, try to lose weight, and exercise with the hope of slowing down the inevitable. This false fate not only paralyzes patients with fear, but also perpetuates complacency. Many patients have resigned themselves to the "fact" that they are doing all they can do. In many cases, this is simply not true—not even close.

We know that Type 2 Diabetes is reversible in many cases, but let's first reverse those erroneous and possibly harmful beliefs you may have. I want to give you the most accurate and complete understanding of your condition so you can start to believe that you have the power to regain your health. You can take control of your life and your health if you have the right tools, and I hope that this information

will help to inspire the confidence you need to reclaim the best of you, and not just what is left of you.

MYTH #1:
Type 2 Diabetes is genetic.

There is no conclusive evidence that Type 2 Diabetes is linked to any particular gene. In fact, research has indicated that if there was a gene specifically associated with Type 2 Diabetes, it would only be responsible for a very small percentage of the Type 2 diabetic population.

MYTH #2:
Type 2 Diabetes is familial. It runs in your family.

A condition being "familial" is often misconstrued as meaning the same thing as having a genetic condition, but this is not the case.

Family members often share common habits, including the foods they eat, the activities they partake in, how they deal with stress, and more. In other words, the lifestyle and lifestyle choices you learned from your family have a really big impact on your risk for developing many diseases. If you learned and acquired habits that are not consistent with good health, then your risk for developing the same

or similar conditions as your family members can certainly increase. This is one reason why we see numerous family members suffering from Type 2 Diabetes. However, this phenomenon does not necessarily mean that your condition was predetermined from the start due to your genetics or any one particular gene.

In addition, through the emerging field of Epigenetics, we have come to learn that our environment plays an increasingly large role in how our bodies react to certain influencers. We may have genes that, when active, are responsible for the development of certain conditions, but just because we have these genes does not mean they will be activated. We now know that genes are not necessarily your fate.

Type 2 Diabetes is a metabolic condition that often develops over a long period of time and can be caused by many different factors. It can certainly be caused by an inadequate diet heavy on refined sugars like soda, alcohol, and desserts, but there are many other factors beyond diet that come into play. The causes can be, and are almost always, as individual and unique as each patient.

The concept or possibility that your condition is genetic can also contribute to a lazy approach by healthcare providers and patients alike. Often patients who have been told or believe that they have the condition due to genetics live

with an "I give-up attitude." Thinking that this is the hand they've been dealt, these patients resign to just learning to live with their disease, but this mindset often proves very destructive for Type 2 diabetics.

MYTH #3:
You have Type 2 Diabetes because you are overweight.

In my practice, it is often said that being overweight is not the cause of Type 2 Diabetes, and it is also not the solution.

There is absolutely a correlation between being overweight and having Type 2 Diabetes, however, correlation is not the same as causation.

Being overweight is often just a symptom of the deeper, underlying problems that are possibly causing your diabetes—problems that are often not contemplated, tested for, diagnosed, or treated. The same can be said for high blood sugar. Type 2 Diabetes is ultimately not a blood sugar disease. Instead, uncontrolled glucose is just another symptom of deeper, more complex problems.

Think of it this way: If being overweight was the cause of Type 2 Diabetes, then one would think that everyone with a weight problem would be afflicted with the condition.

This is certainly not the case. Also, how would one account for the many Type 2 diabetics who are not overweight?

Clearly, there is more to the equation.

I have seen many patients in my practice who have lost large amounts of weight, but to no avail. Even more troublesome is the push by healthcare providers for diabetic patients to undergo gastric bypass surgery, all under the guise that massive weight loss will rid the patient of their diabetes. This may be the case in the immediate months after weight loss surgery, but that "success" is often short-lived.

MYTH# 4:
You have Type 2 Diabetes because you do not exercise.

This is a very common misconception and can be a dangerous one at that. When patients are diagnosed with Type 2 Diabetes, they are often instructed to take medication, change their diet, lose weight, and exercise. But in many cases, exercise is not appropriate for the individual patient. Many of the patients I see in my practice are not healthy or fit enough to benefit from exercise. After all, exercise is a stress to the body, and when I evaluate a patient, I have to determine whether that stress is going to be beneficial or not. Much like what was said earlier about genetics and

family history, each patient is an individual, and should be evaluated as such.

Truthfully, most of my patients are asked not to exercise for a period of time until we are able to improve the status of their health. This is done to ensure that the stress of exercise does not worsen their current condition or create other health problems.

As I said above, stress from exercise can be helpful or harmful. It depends on the type of stress and your ability to adapt to it. Exercise, when performed by someone who is healthy, will often create eustress. Eustress is stress that benefits the body. It can motivate us to enhance our performance, help our body get stronger, and even increase our sense of well-being. When stress is detrimental to us, it causes distress. Distress places a burden on our bodies, and can perpetuate health problems, including Type 2 Diabetes.

Here's another example: When a healthy person lifts weights, it will cause their muscle fibers to tear. Over the next 24 to 48 hours, those muscle fibers will rebuild themselves stronger and larger than they were before, resulting in healthy muscle gain. However, in a person who is not healthy, weight lifting can cause injury, like damage to joint, or a play a role in the overall degradation of health. In many cases, especially in patients who have chronic and

degenerative diseases, this type of stress is not beneficial, and can unknowingly create more problems for the patient.

Cardiovascular, or aerobic, exercise is also a good example of good and bad stress. In a healthy body, this type of exercise strengthens the heart, lungs, and vascular system in response to the exertion put on those systems during exercise. However, in an unhealthy body, the stress on these organs can be very dangerous, leading to fatigue, muscle and joint damage, inflammation, and a great degree of discomfort for the patient.

MYTH #5:
You are Type 2 diabetic because your body or your pancreas does not produce enough insulin.

There is evidence to support that some patients with Type 2 Diabetes may have the condition due, in part, to an inability to produce adequate levels of insulin. However, in my experience, many Type 2 diabetics do not exhibit this problem.

Many Type 2 diabetic patients do produce adequate amounts of insulin, but the problem revolves around the mechanism of insulin resistance and the many factors that promote this phenomenon.

The lack of knowledge surrounding this clinical finding is a common reason why so many Type 2 diabetics are placed on treatment regimens that may not be in their best interest. Many healthcare providers only address the surface problem of high blood sugar and fail to explore the reasons why a patient is experiencing the symptoms of high blood sugar. Ultimately, the very treatment you are using to make you better may actually be making you worse. This is why it is of utmost importance that you understand what is driving your problems and not just simply take the drugs that are engineered to tackle the symptoms of your problems.

MYTH# 6:
Diabetes is a blood sugar problem.

The concept that Type 2 Diabetes is a blood sugar problem is only the tip of the iceberg and thus an incomplete understanding of the condition. High blood sugar is only a symptom of the disease, not the disease itself. It is a sign that other, more complex systems in your body are not working properly, which is why when we only address glucose levels, we are likely to get poor or mediocre results.

THE TAKE AWAY

Ultimately, Type 2 Diabetes has become more-or-less a waste basket diagnosis. The label of "Type 2 Diabetes"

does not properly characterize the problem. Type 2 Diabetes is a very complex condition with many contributing factors—many of which often go undiagnosed and ultimately untreated.

In the next chapter, I'll explore some of these contributing factors. I'm going to uncover the things that many healthcare providers fail to look for, and the reasons behind why you continue to struggle and suffer despite adhering to your prescribed treatment plan as best you can.

CHAPTER 7

Common Causes of Type 2 Diabetes

Throughout the previous chapters, I have emphasized that diabetes is not an all-encompassing, one-stop-shop diagnosis. There are many factors, both physiological and environmental, that go into creating a scenario that promotes the development of Type 2 Diabetes. We now know that it is narrow-minded to simply label someone as a Type 2 diabetic. This label does not properly characterize all of the health issues that the patient may be facing. More importantly, it does not set the stage for further inspection as to what might be causing or contributing to an individual's inability to regulate their blood sugar.

One reason why doctors label someone as a Type 2 diabetic is that it allows them the ability to assign a diagnostic code so they can submit a bill to an insurance company.

Medications designated to that specific diagnostic code do not cover all of the health problems that may be contributing to a particular patient's diabetes. This is a major flaw in the traditional health care model: drugs that don't fully address ongoing issues are doled out to patients, subsequently masking but almost never resolving that patient's health problems. The current health care model allows for minimal personalization of a treatment plan. Instead, it opts for a cookie-cutter approach to treating this chronic illness. Type 2 Diabetes can have many diverse origins in a large patient population.

As someone who practices in a model that many call "Functional Medicine," I look at specific symptoms as pieces of a much larger puzzle. You see, many of the symptoms of your Type 2 Diabetes are hallmarks of more complex issues that are going on deep inside your body. If these deeper problems aren't addressed, then the treatment you're receiving for your Type 2 Diabetes may only be masking those problems, not resolving them. In other words, you may be taking your medications, injecting yourself with insulin, dieting, and exercising and it still might not be enough. Yes, you could still be in a bad situation despite the above approach and despite blood sugars that are seemingly "in control."

My goal is to figure out *why* you're a diabetic. Let's discover what might be contributing to and/or causing your

situation. Let's dig deeper to know the WHY. Once we know the why, devising a care plan can be much more personalized and targeted to address the specific processes that are adversely affecting your overall health.

INSULIN RESISTANCE

Many Type 2 diabetics have been told, or are under the impression, that their pancreas no longer produces enough insulin. Now in some patients this can certainly be a part of the problem. However, in my experience, I will tell you that is quite rare. In fact, doctors tell many Type 2 diabetics that they are not producing enough insulin, even though the doctor most likely never performed the proper test to prove or disprove this possibility. When you have inaccurate information, you will often make inaccurate conclusions.

In most of the cases I have evaluated, patients' insulin production is completely normal. In many cases the insulin production is excessive and *this is the core problem*.

Let us *assume* for a moment that the patient is not producing enough insulin. The next question should be "Why?" However, often instead of searching for the answer, the reaction is to just supply the body with what it no longer produces, in this case, insulin. This is very short-sighted and does not provide a real solution that the patient deserves.

This brings up another point. A good doctor, in my opinion, always asks, "Why?" A good doctor never stops until he or she exhausts all options in an attempt to answer the question, "Why?" or "What is causing that?" Doctors or healthcare providers who hang their hats on genetics, diet, and lifestyle are not looking at the whole picture.

For many Type 2 diabetics, the issue is not a deficient amount of insulin. The issue many times is *insulin resistance*. This means that the body still produces adequate levels of insulin, however, the insulin receptors needed to properly process the insulin do not work well or do not work at all. Insulin resistance is one of the primary mechanisms for Type 2 Diabetes.

The question is: What sense does it make to give someone who is resistant to insulin more insulin? Well honestly, it does not make much sense at all. Again, the drug therapy approach is geared to get the blood sugar down by all means necessary. This is seen as paramount, and when it works, this approach is viewed as a successful therapy. The long-term effects of this approach, however, are often not considered. Often the thought is, when this approach creates problems, "We'll just handle that with yet another drug."

There are many reasons why insulin therapy, or even the use of drugs that stimulate more insulin production, can be counterproductive for someone who is insulin resistant.

Research and clinical experience illustrate that the more insulin you secrete and the more insulin you take, the more insulin resistant you are liable to become. This is maddening! This is why I believe that so often the *drug of choice* perpetuates the problem.

This phenomenon of increased insulin resistance in the face of excessive insulin exposure is often experienced by patients and doctors in the following way: Say, for example, a patient is required to take insulin injections by their prescribing physician. Further, let's say the patient starts with fifty units of insulin. For a while, this dosage may work to lower the blood sugar. Commonly, however, the patient's blood sugar starts to rise. The approach from the doctor is often to increase the insulin. What just happened? The patient became insulin resistant. One factor in this example is the exogenous (injections) insulin therapy.

As indicated earlier, insulin is a fat-storing hormone. So, as patients fight to lose weight, their prescribing physicians are often recommending medications that potentially lead to more weight gain.

It is important to understand that insulin is an inflammatory hormone. When secreted by your pancreas at normal and healthy levels, it is extremely important. However, when insulin is secreted in excess by your body or put into your body in excess, it can be devastating to your health.

Insulin can promote insulin resistance, weight gain, and inflammation. Unfortunately, insulin also can promote other negative conditions such as cardiovascular disease and coronary artery disease. Insulin strains the kidneys and other organs and can be a contributing factor to certain forms of cancer.

At the end of the day, many Type 2 diabetics are dealing with insulin resistance. There is research and there are tools that tell us how to properly combat insulin resistance. One of our focuses is to work to restore sensitivity to insulin receptor sites that have become desensitized. This approach is effective, but often only partially effective.

We must ask deeper questions. We must continue to ask "Why? What is causing the patient to be insulin resistant?"

What Can Cause Insulin Resistance?

As mentioned, many Type 2 diabetics are dealing with insulin resistance. This is when the pancreas produces

enough insulin, however, the receptor sites on the cells do not work properly.

This cellular failure to properly respond to insulin causes blood sugar to rise and ultimately more insulin to be produced by the pancreas. This vicious cycle often causes a build-up of insulin in the blood (hyperinsulinemia) and also in the tissues. This often leads to more insulin resistance. But, *what causes insulin resistance in the first place?* And more importantly what is causing it now?

There are many factors that can contribute to the development of insulin resistance. One of them is the over-production of insulin, which is often called hyperinsulinemia. This phenomenon can be caused by your body responding to elevated levels of blood glucose. Whether it is a poor diet or other factors, elevated levels of blood glucose will cause the pancreas to produce large amounts of insulin to try to bring glucose levels down. At the start, this flood of insulin is manageable, but over time, the cells become resistant to it. Tissues and cells become desensitized, with the body no longer able to fully utilize the insulin for proper function. Increased levels of insulin in the blood often cause the body to become more insulin resistant, in turn raising blood sugar levels to dangerous levels. Often a harmful cycle of increasing blood sugar levels and elevated insulin levels is set in motion.

This is an over-simplified explanation of the process, but this is a book written for you the patient. It is not my intention to "high-brow" you or bore you with overly technical explanations.

There are a number of other significant factors that can directly or indirectly promote insulin resistance in a patient, including:

- Inflammation
- Infection (acute and chronic)
- Food allergies and sensitivities
- Autoimmune conditions
- Poor diet and lifestyle
- Medications
- Chronic stress
- Obesity
- Vitamin D deficiency

Inflammation is one of the leading factors that can cause insulin resistance, but what is driving the inflammation?

A common answer may lie with acute and chronic infections. These are not the kind of infections that many healthcare providers and patients themselves are used to recognizing. In other words, these infections are what we

call "sub-clinical." When many healthcare providers talk about infections, they're thinking about the typical signs and symptoms of infection, such as fever. However, this is not what we see in our patient population. Instead, we see sub-clinical infections: infections that show up in lab results but do not present with typical symptoms that a patient or healthcare provider might identify as an infection.

Unfortunately, although lab results clearly indicate infection, many providers ignore the pattern because the traditional symptoms are not present. This is often a big clinical mistake and leads to poor patient outcomes.

Let me give you an example. Your blood work might show an elevated neutrophil and white blood cell count, but if you're not showing typical outward signs of infection, your doctor might dismiss those higher-than-normal levels. What your healthcare provider might discount as a non-concern is often properly supported in our practice and the results are often very positive.

Just because you aren't experiencing symptoms does not mean that these infections aren't producing a strain on your body. Chronic infections can contribute to inflammation and adrenal stress, as well as the over-production of cortisol, which may contribute to the development of insulin

resistance. This can include weight gain and a weakened immune system. This is just one of many examples of how inadequate testing and evaluation can promote poor results.

You deserve better!

Another major contributing factor is stress—the kind that comes with living in an ever-demanding and stressful environment. So many seemingly healthy people are facing a variety of health challenges because their body is not equipped to handle extended periods of stress—including physical and psychological stress. Whether it is poor lifestyle habits, diet and food sensitivities, long work hours, or unhealthy relationships, all of these lead to an accumulation of stress. At a very basic level, most people have an understanding that stress creates problems.

A common way the body responds to stress is the fight or flight response. During this period, the body produces all of the necessary hormones and physiological reactions so that the body can react appropriately to stress. When the stimulation ends, so does the physiological response. However, when the body is in a state of chronic stress, the constant stimulation can damage the body. Two of the key hormones at work in this situation are adrenalin (epinephrine) and cortisol. Both hormones are released by your adrenal glands (the stress glands) in response to stress. Both hormones

play a key role, in addition to a hormone called glucagon, in the increase of blood glucose. The increase in blood glucose in these situations is a key source of energy that your body requires to deal with the stress. In a constant state of stress, you can see how the body may be tricked into constantly producing glucose. This over-production of glucose can over-stimulate the cells, ultimately promoting insulin resistance.

A final thought on stress. For many patients the stress is imperceptible. This is due to our remarkable ability to adapt and reset our norms. If I only had a dollar for every time a patient told me, *"I'm not stressed."*

Autoimmune conditions are also quite common in patients with Type 2 Diabetes. While there are many people with diagnosable, well-defined autoimmune conditions like multiple sclerosis, rheumatoid arthritis, lupus, and Hashimoto's disease, there is also a number of patients who, upon laboratory testing, show signs of an autoimmune response—despite not being formerly diagnosed with an autoimmune disease. This internal threat to the tissues of the body often causes chronic inflammation and thus contributes to insulin resistance.

Many Type 2 diabetics are diagnosed with Type 2 solely as a result of their age when they develop the condition.

In other words, if you are diagnosed during in your adult years you will most likely have a working diagnosis of Type 2 Diabetes.

What we are seeing more and more is that many "Type 2 diabetics" are not comprehensively diagnosed. They may have an underlying mechanism of insulin resistance, but many have an underlying mechanism of autoimmunity. Autoimmunity is the predominant mechanism in Type 1 diabetics and thus patients who have both an autoimmune mechanism and an insulin resistance mechanism are commonly described as Type 1.5 diabetics.

In my clinical model it is crucial to isolate all of the mechanisms in a diabetic patient, particularly the mechanism of autoimmunity. A Type 2 diabetic and a Type 1.5 diabetic will almost always require very different treatment approaches.

Are you really a Type 2 diabetic? If you ask your doctor this question and he or she does not take your question seriously, I can almost assure you that you need better guidance. If they say it really does not matter because you have to take the same medication anyway, that's a problem.

Vitamin D deficiency in the U.S., in my opinion, has reached epidemic proportions. I almost never test a patient

that has adequate levels of Vitamin D. Not only can a lack of vitamin D negatively impact bone health, your immune system, and various other bodily systems, but it also can be a direct contributor to insulin resistance. The other factor with low Vitamin D is you often have to mega-dose this nutrient in order to normalize the levels. This must be done with proper supervision as excessive Vitamin D can create problems. Another observation with Vitamin D supplementation is you often have to continue to supplement even once levels have been normalized. It is a common clinical observation that when Vitamin D supplementation ceases the levels fall again to unhealthy and unsatisfactory levels.

Another major factor that may contribute to insulin resistance and the development of Type 2 Diabetes is medication. You may be surprised to learn that some medications can actually contribute to or cause diabetes. These include common medications such as glucocorticoids, from over-the-counter steroid creams to prescription medications like Prednisone. Medications for the thyroid, statins for the heart, and estrogen replacement therapies are also known to contribute to the development of diabetes. I encourage you to talk to your prescribing physician about these risks.

You might ask, "Aren't these drugs supposed to be helping me to feel better, not make me feel worse?"

The simple answer is yes. However, many of the medications given to patients with varying ailments are simply used to mask the symptoms of that ailment, and do not address the cause. All drugs, in one way or another, inhibit normal physiology. Medications are not meant to facilitate normal function; they are used to force the body to do something it can no longer do on its own. While there is absolutely a time and place for pharmaceutical intervention, in my opinion, drugs are grossly overused and are a major contributing factor to many health problems.

Many doctors have become accustomed to measuring success by lab values alone, without a common sense evaluation of potential downstream negative effects. By basing treatments only on lab markers, doctors are commonly only treating the symptoms, not the cause, and certainly not the whole person. This approach to treatment is often ill-fated, as we now know that many factors can contribute to insulin resistance and ultimately Type 2 Diabetes.

I hope you are beginning to see how all of these factors contribute to a very complex problem. It's not just a high blood sugar disease or condition, but rather a complex metabolic condition that has many potential causes. Some causes are very obvious and easy to spot, while others are more obscure and require great "doctoring"—if that is a word!

But which of these factors comes first? Figuring out which occurs first—inflammation, Vitamin D deficiency, obesity, or insulin resistance—is challenging. However, at the end of the day it does not really matter, as it all needs to be fixed.

CONNECTING THE DOTS

Can you see how all of these factors are interconnected? A patient who is deficient in Vitamin D and who has a sub-clinical infection has a weakened immune system and chronic inflammation. Their body is on constant high-alert; the physiological stress that the body is under causes the over-production of glucose. Elevated levels of glucose cause the body to produce elevated levels of insulin. When the deep-seated problems, like Vitamin D deficiency and infection are not addressed, the body will continue this vicious cycle until the cells become desensitized. At this point the patient officially develops insulin resistance. Once insulin resistance sets in, the risk of advancing to full-blown Type 2 Diabetes is high.

I hope you now have a better understanding of how a patient might develop Type 2 Diabetes. It's not necessarily because you have bad genes, are overweight, or have poor health habits. These may certainly be aggravating

and contributing factors, but I think you can see there is so much more to the story. You do not just wake up one morning and suddenly need an insulin injection to control your blood glucose. Diabetes is an umbrella term that represents many contributing physiological processes that ultimately result in this diagnosis.

Just as each patient is unique, so is each case of Type 2 Diabetes. Therefore, no patient should be treated exactly the same. In our practice, patients are extensively evaluated so that we may uncover those factors that are contributing to their condition. Once those factors have been identified, we develop a comprehensive, personalized treatment plan that helps to address every aspect of a patient's life so that we effectively address all the contributing factors to their diabetes.

Don't you think you deserve to find out exactly what is contributing to your diabetes? Don't you want to know if all the medications you are currently taking are working to help fix the problem, not just mask it?

You deserve to know the answers to those important questions, but if you don't seek out the right kind of care, you may never get them. Don't send yourself down a path of medication overuse and chronic decline. Our office and

clinical model may be able to help you uncover exactly what is causing your illness, and may be able to point you in the direction that will help you to begin reversing this condition instead of being relegated to getting worse with time.

CHAPTER 8

Epigenetics

Diabetes Runs In My Family

By now you have a pretty good idea of how my patients are able to REVERSE their Type 2 Diabetes. You have heard me say more than once that it is important to identify the underlying causes. Many people turn to what they have been told in the past: "It's my genes, my weight, it runs in my family, I need to exercise." This is what most Type 2 diabetics have been told and what many now believe. Frustratingly, every one of those elements leaves you in a place where there is not much a person can do to change the situation.

Many Type 2 diabetics can't lose weight despite dieting and exercising. This is because the disease itself is a "fat-storing" condition and many of the medications promote weight gain. Right from the start you are swimming upstream

with respect to your doctor's recommendations. In addition, Type 2 Diabetes often promotes a lot of joint pain and also robs you of the necessary energy to do any exercise at all. Finally, many Type 2 diabetics grow frustrated with calorie counting, carb-counting, and attempting radical and life altering diets. In other words, the standard advice of lose weight, change your diet, and start exercising is futile from the start. In addition those recommendations fail to take into account what is really going on with the Type 2 diabetic population.

So many Type 2 diabetics "toe the line" and attempt to follow their healthcare providers recommendations. When they do not work, as is often the case, the healthcare provider often begins to blame the situation on genetics. This is a very dangerous and limiting proposition as it often promotes a "give up attitude" for patients. Many patients that I meet have basically given up and think they are where they are because they inherited "bad genes." Until now, you may have thought there is little you can do to change the course of your condition. After all, it runs in your family, right?

You are not alone if you believe that you are a by-product of your genes and family heredity. This thought has been propagated for quite some time now. It has become so engrained in our society that many of us deem it as a fact, having no idea there is more to the story.

Luckily, what was once thought to be written in stone is now being seriously challenged by an emerging field. History is littered with examples of things that were once thought to be solid in fact, only to be questioned and disproven down the line. Old beliefs oftentimes die-hard.

I'm sure you are all too familiar with the many pages of medical intake forms you are asked to fill out as a new patient in a doctor's office. In addition to basic contact information, the intake forms ask you to list your symptoms and reason for your visit. However, no doctor's new patient questionnaire would be complete without an in-depth inquiry about your family history. They ask which family members have, or had, specific diseases or conditions. We start going through our internal database of diseases that run in the family, checking off who had what.

While reviewing this family history, we can't help but get an uneasy feeling when starting to think about our lineage of diseases, wondering if there is any correlation to our current state of health and our symptoms.

If several family members have had a particularly serious disease or condition, just the thought of possibly developing that condition can "worry you sick!" "Worrying yourself sick" plays a larger role in your health than you may realize.

Succumbing to the belief that you are a victim of your genes and that there is nothing you can do about it leaves people feeling helpless and hopeless. They conclude that their health, good or bad, is largely dependent on their genes, and heredity. Many believe that some people are just lucky and got dealt a good hand, while others are not so lucky. This view of health leaves many people feeling like victims, and often with a resigned feeling that if I can't do anything to change it, why try?

Thankfully, the emerging field of *epigenetics* is gradually changing all of this, and not a moment too soon! I say that because this information I share with you here could forever change the way you view your health, and puts the power of greater health, happiness, and well-being in your hands, and not the fate of your family history.

Enter the emerging field of epigenetics. The term epigenetics literally means "above" or "on top of" genetics. But what does this mean for you? How will understanding epigenetics change your health and life?

Of all the information written on the topic of epigenetics, one of today's leading pioneers to bring the findings of epigenetics into the mainstream is cell biologist, Dr. Bruce Lipton, Ph.D. The power of the work Dr. Lipton and other researchers have done is revolutionizing the way we look

at health, our bodies, and life in general. It is also revolutionizing the healthcare provider's ability to help patients overcome diseases and conditions once thought to be intractable.

A tenured professor at the University of Wisconsin, Dr. Lipton taught cell biology to medical students. However, when he discovered that his findings were so contrary to what he was teaching from the medical texts, he felt he could no longer teach dogma and blatant untruths. He chose to leave formal education and tenure behind. He wanted to continue his research and went on to perform pioneering studies at Stanford University's School of Medicine. After many years of research and study in the field of epigenetics, Lipton shared his findings in a groundbreaking book entitled, *The Biology of Belief—Unleashing the Power of Consciousness, Matter, & Miracles.*

In his book, Dr. Lipton drives home the point that the majority of the time, our genes DO NOT play the significant role in our overall health as we've been taught. So, if our genes aren't responsible for our health, what is?

The fundamental teaching of his research shows that we are NOT victims of our genes or our DNA. We have been taught to believe by many healthcare providers and even the

media that our heredity has the biggest influence on our health.

Epigenetics teaches that it is our individual, and even our collective, thoughts and beliefs that affect our health, the world we experience, and how this translates to gene expression. Further, and maybe more fundamentally, epigenetics teaches us that our genes, and how they express themselves, are much more influenced by our environment than what was previously thought.

Could it be true? Could our health and wellbeing be almost entirely dependent on our environment, thoughts, beliefs and how we process the world around us? By examining our environment, beliefs, and thoughts can we really change our health?

The answer, through research and clinical experience, is a resounding YES!

A poignant fact that Dr. Lipton shares in regard to genes and heredity that, "the central dogma was a hypothesis that was never scientifically studied or observed to find out if it was true or not. Everybody just believed it because they were looking for the answer, so when the theory came out in 1958, it was only an idea that everyone bought into. By 1968, it was in all the medical textbooks and to this present

day, this challenged hypothesis is STILL being taught in medical schools. Everyone forgot that it wasn't a scientific fact but an idea that was written into textbooks and was adopted as fact."[1]

If you search the internet today, what you will find is a multitude of articles STILL referencing genes, family history, and their relationship to disease. Is there any wonder why the vast majority of the population still believes that genes control our health and our lives?

For many years now there has been dogma in science called, The Primacy of DNA. This means that DNA is "first cause," and that all things flow from or interact with DNA after DNA has been determined. Our mainstream healthcare model tends to push a theory that we are a biochemical machine controlled by our genes. This does not appear to be the case after all. The THEORY was: You are a victim of your genes, and your heredity.

Epigenetics indicates that genes cannot determine how we function because they are responding to something else, the environment around us, through the receptor sites on the genes. What makes this of critical importance to us, is that our cells are responding to an invisible field of energy that is molded by our beliefs, so our beliefs control our biology, as do our habits and how well we handle life and its stressors.

Your genes are simply a blueprint of you. Can blueprints build a house? Of course not. Blueprints are merely a guide and aren't capable of building a house or anything else. It takes a contractor to take the set of blueprints the architect prepared to construct the house, step by step. You are the contractor for your body. Genes are a basic guideline that make up an individual, but like a house, the contractor has "artistic expression" in the final product. The contractor chooses which materials to use when building the house. These choices can make two houses with the exact same blueprints look very different.

How your genes function is dependent on you, its sole contractor. Blueprints, like genes, aren't off or on. Someone or something must turn the switch. This on/off switch is called gene expression.

Your genes **do not** turn on and off randomly, or by heredity. Though it has been impressed upon us all that genes CAUSE disease, science has now seemingly proven this idea as invalid. Unfortunately, the mainstream healthcare paradigm has bought into this theory since 1958, and to present day this challenged finding is still being taught in many schools. As a result, the majority of allopathic healthcare providers have no idea that what they've been taught is quite challenged and limiting.

Consider cancer for instance. Dr. William Li, MD, Cancer Researcher, President and Medical Director of the Angiogenesis Foundation states that, "Every single person absolutely has microscopic cancers growing inside them. **We don't *get* cancer. We *provoke* cancer. Now that is a powerful statement!** He explains that the human body is made up of more than fifty trillion cells that are continuously dividing to keep us healthy. But if just one of those cells makes a mistake or "mutates," then presto, we have formed a potentially microscopic cancer. The good news is that most of these abnormal cells will never become dangerous because our bodies have excellent defenses against cancer."[2]

So if our bodies are programmed for health, what makes these rogue cancer cells go from relatively harmless to life threatening?

Much of it depends on how you interpret the environment and the world around you. Our view of the world causes genes to be expressed or built in a manner that either supports health and life or compromises it.

The vast majority of people believe that if you have a family history of diabetes, or even cancer, it automatically makes them prone to developing it too. What I wish to share here is that the link to family history is engrained in all of us, yet

epigenetics has now shown that it does NOT place one at a significantly higher risk for developing a particular disease or condition.

An interesting study was done with identical twins, sharing the exact same DNA since conception but who were raised separately due to adoption. However, the study showed the twins, in different families, had the same potential of getting cancer or not getting cancer as their non-biological family members. If cancer ran in the family the child was adopted into, they shared that same increased risk of developing cancer as non-blood related family members.

Life, it seems, changes everyone in unique ways. One twin might get cancer while the other does not. Many identical twins clearly behave differently as they grow older, and some even grow to look less alike. Research found that even though the twins had identical DNA, which is the software for life, what makes the most difference is how the genes express themselves, and how these distinctions chemically modified the genes over the years.

So what chemical modifications are responsible for turning genes off and on?

We live in a physical world, so when it comes to health, it's no surprise that the emphasis is still placed on the

importance of diet and exercise when it comes to physical health. Referencing the twin study above, we can say it was the diet and exercise habits of the family that led to the same risk of developing cancer in the adopted child, or perhaps chemicals and toxins this family was exposed to was higher than normal. However, it may surprise you that the latest findings show that our mental and emotional state overrides the physical signal. So regardless how great your diet or exercise program is, if you are feeling "stressed" or upset, the cells in our bodies react to this state first. There are many other examples of how the expression of your genes is altered by your environment.

YOUR CELLS EXIST IN EITHER GROWTH OR PROTECTION MODE

The fifty to seventy trillion cells in your body at this very moment are highly intelligent. In the average human adult, between fifty and seventy billion cells die each day (due to a process called apoptosis). For an average child between the ages of eight and fourteen, approximately twenty billion to thirty billion cells die daily.

Cells exist in one of two modes: growth mode or protection mode. Think of growth mode as thrive mode. When in growth mode, cells take in nutrition, damaged parts of cells are rebuilt, and waste is eliminated. You are feeling

energetic and great! Your body is in a state of homeostasis. In growth mode, our cells are so intelligent they know when it is time to die off, allowing for healthy, new cells to replace them.

In protection mode, we experience an entirely different scenario. Think of protection mode as lockdown mode for your cells. Nothing good gets into the cell, and nothing bad can leave the cell. Damaged, sick cells don't die off as they should and allow mutant cells to begin replicating. This sets the stage for diseases of many types to take root.

So what determines whether our cells are in growth or protection mode? One determining factor is the way in which we handle everyday stress. Studies show that 85% of all trips to the doctor are due to stress. But what is stress really? Stress is fear, worry, and engaging in any thoughts, feelings, and emotions that don't feel good in your body. Pain and upset is your body's way of communicating with you. It's important to pay attention to what it's telling you and to listen.

Many of us know the importance of reducing stress in our lives, but that is often easier said than done. Stress, or distress, plays a large role in the health of our cells. Our bodies are designed to handle a certain amount of stress as all

stress isn't bad. But many of us spend way too much time living in a chronically stressed state.

All animals, including human beings, were designed to handle some stress, but only in limited quantities. When a gazelle is chased by a lion, the gazelle's sympathetic nervous systems kicks into gear, releasing hormones that activate the physiological changes needed for the fight or flight response to take over. This surge of hormones gives the gazelle the short-term power it needs to safely get away. But the difference between the gazelle and you and me, is that once the threat is over, the gazelle goes back to grazing and forgets all about the incident. We, on the other hand, remain in a stressed state for hours, days, weeks, or longer. For a great many of our population, rather than experiencing short-term stress, we live in chronic stress. Your cells receive this stress as if we were actually being physically attacked or exposed to toxins. This throws your cells into protection mode. Because living with stress has become so common in our world, many of us now see it as normal. It may be common, but it is *not* normal. Further, it is often quite damaging to our health and our lives.

Your body can only endure this perpetual state of stress for so long. At some point, the body becomes physically, mentally, and emotionally exhausted. So many of us are

running on fumes. How you feel on the outside is transmitted directly to your cells on the inside. When we shut down due to too much stress, so do our cells.

NEUROPLASTICITY

Neuroplasticity is the study of how we can alter our brain, and thus our health, by thought alone. This incredibly fascinating and emerging field has eluded to how incurable diseases and conditions have spontaneously healed, without medical intervention. If it was an isolated incident, it would be considered an anomaly, however, that is not the case. You've probably heard of the placebo effect; how people given sugar pills healed at the same rate or faster than those given the actual drug. If we can make ourselves well through thought alone, wouldn't it also prove to be the case that we can make ourselves sick by thought alone? Understanding this placebo/nocebo effect (belief you will get well or sick) is a fundamental aspect of epigenetics.

HOW BELIEFS CONTROL OUR BIOLOGY

Mind over matter is in essence what epigenetics is all about. Your mind is an incredibly powerful tool when it comes to your health and how you experience the world around you. Depending on your overall view of the world, your thoughts will tend to lean toward being generally positive or negative.

Most of us are not all-or-nothing in this area, but if you're honest with yourself, you know if you tend to look on the positive side, or what's good about a given situation, versus the negative side and what's wrong. Whether you are a "glass half full," versus "glass half empty" type of person, your thoughts contribute a lot more to your overall health and wellbeing than you may realize.

We have approximately fifty trillion cells in our body. What most people are unaware of is that every one of those cells is listening to everything you think, say, or do.

When we recall a happy memory for instance, we feel lighter because we are tuned into elevated frequencies. These thoughts and memories, good or bad, impact our physiology the same way. Happy thoughts make us feel good. Sad or angry thoughts make us feel bad. This is due to the way our brain is wired. When thinking of a past event, your body doesn't know if it's happening right now or twenty years ago. Whatever feelings are associated with that past event, we re-experience the same energy in our cells as we did during the actual experience.

This is why it is important to apply forgiveness as often as is necessary and learn to let upsetting thoughts and feelings go, sooner as rather than later.

When it comes to health, believing that you are (or can become) strong, healthy, and thriving, impacts your health at the cellular level. Unfortunately, for many people who are dealing with a chronic condition, the belief is that they'll never be completely healthy again. This belief is not just in their head, but gets firmly rooted in their cells, making it a self-fulfilling prophecy. Change your thoughts and your physiology must follow!

Thoughts are very real. They don't just stay within the confines of your mind. They are being perceived by every one of your fifty trillion cells, 24/7.

It is said that all emotions stem from only two true emotions—love or fear. Wayne Dyer reminds us, "Loving people live in a loving world. Hostile people live in a hostile world. Same world."

If you view the world around you as loving and supportive, your health and happiness will reflect it. If you view the world and life as threatening, and something to fear and stress over or that you are doomed to live with disease and other problems, then you will create that, too.

Mindfulness is a powerful tool that once learned and applied allows you to direct your thoughts toward those that support health and life. Practicing mindfulness helps

bring awareness into your daily life, giving you the opportunity to cancel out the negative, fearful thoughts, and replace them with healthier, happier ones. Becoming the observer of your thoughts, feelings, and beliefs, puts you in a much better position to modify them in a way that supports the life you desire. Your mind energy is far more powerful than you know. See it as your number one ally in overcoming anything you wish to change. This is epigenetics in action!

"Your thoughts create an inaudible sound that creates a frequency that creates matter that creates your physical world."

—PAMELA GREGORY

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CHAPTER 9

The Foundations of Good Health

As I have stated, many Type 2 diabetics are often just told to take their medications, lose weight, change their diet, and exercise. If any more information is provided it is often in the form of a pamphlet or a general class on nutrition provided by a nutritionist or registered dietician. So often that information is general in nature and very flawed.

Despite this type of information, Type 2 diabetics often find themselves having to "go-it-alone" and begin to look for more specific and detailed information through books and the internet. The problem with all of this is that none of that data is designed for you as an individual. How do you know if it's right for you? Many patients think that if the information is for Type 2 diabetics, then it applies to them. I cannot tell you how misguided this belief is.

Although I cannot tell you in a book what you should do to begin reversing your condition, I can share with you some basic health practices that may help support your body.

Overall health and wellness are maintained by a handful of factors that I like to call The Foundations of Good Health. These individual foundations are often combined to support what is called homeostasis—a baseline in which your mind and body are in balance, working together efficiently to make sure that all of your body's systems are operating as they should. So often healthcare providers and patients forget the essentials for setting the body up for success. Further, often I have seen patients who just do not have a clear idea about how to manage their bodies.

These parameters include diet, exercise, general nutrition, sleep, hydration, stress reduction, bodywork, and having a good support system. All of these factors make significant contributions to your overall health. Making sure that you fulfill these categories properly can help maintain good health in a person with no health problems and can also help a person with chronic health problems like Type 2 Diabetes.

If these basic foundations are ignored through poor diet, inactivity, lack of sleep, and more, your body's systems

will become strained begin to malfunction. If you do not fuel your body with the correct foods, it will not have the strength or ability to generate the compounds it needs to give you energy. If you fail to get at a minimum mild to moderate physical exercise, your cardiovascular system may begin to fail you, becoming sluggish and weak. If you stay up into the wee hours of the morning watching television, and fail to sleep and wake during normal hours, you may find yourself with brain fog: your body is unable to reset itself to take on the challenges of the next day. Our bodies are pretty resilient, but at the end of the day they require basic care and maintenance in order to function properly.

Are you currently experiencing any of these deficits? Are you struggling to break old habits and adopt new ones? I can help you with this process, but the best way for me to help you is to show you how to help yourself. If you don't understand the serious affect that these foundations have on your health, what will keep you committed to fulfilling them when you have a tough day? Understanding how each of these foundations plays a significant role in your everyday and long-term health will not only make you a better patient but a better person. Fulfilling these needs correctly will not only help you to maintain physical health but also mental health, which plays a significant role in helping to maintain proper health of your body's internal systems.

I'm going to share with you, in as much detail as possible, The Foundations of Good Health so that you can start making positive changes to your lifestyle today that will help you get on the road to recovery and sustain good health.

DIET

As a person with Type 2 Diabetes or a loved one of someone affected by the disease, you need to be fully aware that what you put into your body has a direct effect on how your body feels, how it functions, and the state of your overall health.

You may have been told in the past that what you eat doesn't really matter, but that is just not true. If you constantly exercised but ate poorly at every meal, exercise would not be enough to overcome the damage of poor nutrition. It would also not be enough to help your body generate the compounds it needs for proper function.

Ultimately, the saying "You are what you eat," could not be more true. How our body behaves is often a direct reaction to what we put in it. Food has a cause-and-effect relationship with your body, and if you don't fuel your body with the proper nutrients, the result will be less than optimal.

In a world filled with sweet treats, I recognize that it can be especially challenging to resist such temptations. But it comes down to this: What do you want more? The instant gratification of eating a brownie or enjoying a long, healthful life for not only yourself, but also your family?

In my office, I will help you to re-learn habits, replacing the bad ones with good ones. After all, you can't have health habits that are inconsistent with health and expect to be "healthy."

The amazing thing is this: once you reprogram your habits to be healthy, you will realize that it is easier and much more gratifying to be healthy than to deal with the consequences of poor health choices.

As a Type 2 diabetic, you must be aware of foods that are high on the glycemic index and ultimately cause abrupt glucose spikes. There are obvious foods that fit into this category such as soda, cookies, candy, cakes, and alcohol. But there are also many other types of food that people don't realize turn into sugar quite rapidly. These include foods that are high on the glycemic index, including breads of all kinds, pasta, rice, potatoes, beans, and corn.

Corn is a grain, not a vegetable, and is a major contributor to spikes in glucose. Starchy vegetables like peas, potatoes, squash, and yams are also high in carbohydrates and in turn can contribute to unhealthy alterations in your glucose level. A diet high in these sugary, starchy foods, even those considered vegetables, can contribute to the development of Type 2 Diabetes or can make the condition worse.

Ultimately, a "hunter-gatherer" diet plan much like the one our predecessors thrived on will suit a Type 2 diabetic best. This means eating protein—specifically animal protein like chicken, beef, turkey, lamb, eggs, and fish—for all three meals each day, along with vegetables. Visualize this: if you divided your plate into four sections, one section would be filled with a lean protein, and the remaining three would be filled with a variety of vegetables. That might seem like a lot of vegetables, but they are packed full of the nutrients that your body needs to function well and are an essential part of any healthy diet. I also advise my patients to eat fruit as a snack between meals. Yes, fruits have sugar in them; however, the cells in your body process fructose differently. And for most patients, fruit can be a healthful snack.

It is important for me to reinforce that the information being provided here is of a general nature. I have found this approach to be the right one for most situations, but not

all. This is just a guide for you to consider as you look to improve your health habits and get on the road to recovery.

It's important to note that I do not advise my diabetic patients to become vegetarians. Clinical experience has shown that eating animal protein is a key component to supporting a normal blood sugar metabolism. Additionally, vegetarian-based diets struggle to fulfill the full spectrum of nutrients that a patient eating a hunter-gatherer diet will ingest. These nutrients are essential to helping your body return to homeostasis.

I also advise my patients to avoid dairy products as well as gluten, soy, and wheat. Why? Many of these foods and compounds are common food allergies and sensitivities that contribute to inflammation. While some patients are aware of these sensitivities, many are not, and in turn are doing unknown damage to their body by continuing to ingest these foods.

The kind of food you eat isn't the only thing that matters when it comes to your meals. Where your meal came from can also play a role in how your body processes and uses up the fuel you are feeding it. You should be, within your budget, sourcing quality foods that are organic and grown without pesticides, herbicides, hormones, antibiotics, nitrates,

and genetically modified organisms (GMOs). All of these things potentially pollute your body, depositing toxins into your cells, and altering the way your body processes fuel and functions.

In the end, a healthy diet isn't about cutting out whole food groups or calories; it's about eating foods that will fuel critical systems and thus your overall body. You should be eating often. A general guideline is to eat something every 2 hours. Some patients need to eat even more frequently. Fueling your body with healthy foods takes pressure off of vital systems that are commonly not working properly, thus allowing them the opportunity to return to normal function. Your day should consist of three main meals and snacking throughout the day on healthy foods. This strategy not only takes pressure off of organs and systems that are already struggling, but can also be a good strategy to control binge eating and making poor choices.

It is important to understand this concept when you are structuring your food intake and particularly when eating frequently. When we are trying to heal, we are not necessarily eating because we are hungry, but rather eating to fuel our body. We are eating to deliver vital nutrients and fuel to an ailing body. This means sometimes you will eat according to plan, despite not being hungry. Please do not take this advice the wrong way. I am not giving you a license

to gorge yourself during meals and snacks. You should still eat modestly and reasonably.

SLEEP

After diet, sleep is one of the most important functions essential to the maintenance of good health. Sleep is absolutely crucial. I cannot stress this enough. Sleep is when your body and mind repair and reset themselves, working towards homeostasis. A proper amount of sleep allows you to wake up feeling renewed and refreshed. When you don't get enough sleep, your body does not have ample opportunity to perform these renewal processes that are crucial to your overall health.

Due to our culture and the vast expectations that our lifestyles and work schedules demand of us, it is often challenging to get enough sleep. Getting home after a long workday and then staying up to watch television into the late hours of the night is not healthy. Our bodies are meant to be awake when it is light and asleep when it is dark. Ultimately, going to sleep at 8 or 9 P.M. and waking when the sun rises is a good strategy.

Sleep needs vary from person to person; however, everyone needs proper sleep in order to give their body a chance to complete the full, restorative sleep cycle. This includes both

rapid eye movement (REM) sleep and non-rapid eye movement sleep. These cycles are part of the circadian rhythm, which regulates the body's sleep and wake cycle throughout a 24-hour day. This rhythm also influences the secretion of cortisol by the adrenal glands. If it is interrupted, it can adversely affect cortisol levels, which you have learned play a significant role in glucose control.

Allowing your body enough time to move through these cycles is crucial for long-term wellness—and simply for the fact that you'll feel more alert and energetic the next day. Many people will complain that they just simply cannot get to sleep at night at a reasonable time and that they have difficulty staying asleep. I certainly understand this dilemma and have experienced it with my patients. My advice is to work towards the goal of going to sleep around 8 P.M. (no later than 9 P.M.) and looking to rise when the sun comes up. Begin to set up your life to allow for sleep at an appropriate time and push yourself to get up each morning when the sun rises. Getting up when the sun rises despite feeling tired will often create a scenario in which you are able to go to sleep earlier and earlier each night. Remove distractions like the internet, TV, work, or housework, that may be standing in the way of getting to bed at the suggested time. Your health is more important; move it to the top of your "to do" list in order to make progress.

While the length of time you sleep is very important, it is of equal importance that you sleep in an environment that is conducive to great sleep. Ideally, you should try to sleep in a room with complete darkness—no light from night-lights, cell phones, alarm clocks, etc. You should also adjust the temperature in the room to approximately 66–69 degrees Fahrenheit. That may sound quite chilly, but the cool environment will allow your body to properly regulate its temperature and produce the ideal physiological conditions for sleep. Another major component of good sleep is avoiding the use of electronic devices at night, including televisions, cell phones, e-readers, tablets, and laptop computers. In fact, I recommend not having these near you while you are preparing for sleep or sleeping. Exposing your brain to bright sources of light at night can disrupt your body's natural sleep-wake cycle, making it more difficult for you to fall asleep, stay asleep, and get quality rest.

GENERAL NUTRITION

Maintaining a healthy, balanced diet filled with lean protein and vegetables is an excellent start to life-long health; however, many individuals discover that their bodies are still deficient in essential vitamins and nutrients. Regardless of your health status, supplementation of vitamins and nutrients is a smart choice for most people.

Some of the key supplements that I recommend to my patients are Vitamin D-3, Omega-3 fatty acids, and probiotics. Other supplements to consider are adaptogenic herbs (for example, ginseng, holy basil, and licorice root), that have specific properties to help return physiological balance to your body. Most people, regardless of where they fall on the "healthy" spectrum, are deficient in these categories and can benefit from the added boost of nutrition.

When selecting supplements, check for quality ingredients and make sure the brand has a good manufacturing reputation. It is important to consult your doctor prior to starting any kind of supplement, but generally, adding these vitamins and nutrients into your routine will help you on your path to better health.

EXERCISE

Once you work on improving your diet and nutrition and getting enough sleep to refresh and renew your body, you should consider starting an exercise program. After all, movement is life and living a sedentary life alone can increase your risk of disease and premature death. Movement is key to blood flow, lymphatic drainage, and other essential processes that keep your body working at its best.

Depending on your state of health and fitness, exercise may or may not be appropriate for you. It's important to ease yourself into any kind of exercise program and do so with the supervision of a qualified healthcare provider.

Generally, most people can benefit from a very basic activity level, such as a mild to moderate walking program. The most important thing I stress to my patients is that exercise does not need to be complicated! Keep it simple and you will see results as long as you stay committed to your program.

A great tool to help monitor your progress is a heart monitor. There are many fitness and heart rate trackers out there that are readily available for purchase, but I personally prefer the monitors that you strap around your lower chest. These monitors are especially accurate and can help increase your awareness of your ideal heart rate range that keeps your body in a fat-burning exercise zone. Consult your healthcare provider about your ideal heart rate zone to make sure that you are not over-exercising. Exercising at too intense of a level could be harmful to your health, so it is always best to take it easy when you start and build up as you go forward. The key is to stay active and keep moving, even if it is at a very low intensity.

So many of my patients come to me feeling completely confused about exercise. What is the best exercise for me? How

should I exercise? How long should I exercise? It doesn't need to be complicated or too involved. Exercise is movement and movement can be whatever you make it.

A lot of people struggle to fit exercise into their daily routines due to the demands of life. However, there are opportunities throughout the day when you can incorporate simple exercises. For people who work at a desk all day, getting up and walking around for ten to fifteen minutes every hour, standing, and stretching, or working standing up can make a small but positive impact on your health.

Exercise doesn't just benefit your physical health, either. Exercising releases endorphins, which can help to boost your mental state. It also reduces stress; helps you sleep better at night and feel more energized during the day.

When it comes to exercise, generally something is better than nothing, and performing even moderate physical activity several times per week can help improve your overall health significantly.

STRESS REDUCTION

In a world where we are constantly on the go and always asked to produce, it is incredibly important to learn

strategies to help deal with stress. Whether we realize it or not, stress impacts us physiologically. When you are able to deal with stress in a healthy manner, you are giving your body the opportunity it needs to heal itself from the demands of everyday life.

You learned previously that chronic stress can wreak havoc on your body as a diabetic. Having strategies to properly manage your stress in a positive way is a key component to taking control of your life and health.

Some strategies and activities to help you deal with stress include meditation, prayer, exercise, spiritual development, social activity, and self-development. These activities can help you deal with outside stressors, whether it is what's happening on the news, at work, or at home. Learning how to utilize tools like meditation and spiritual development can condition your mind and body to deal with stressors in a controlled manner. Self-development, including self-help books and other resources, can teach you how to take the proper, positive perspective in trying times. All of this will help you reach homeostasis, keeping your body's systems in balance and working together properly. At the end of the day, I have learned that many people lack the tools to properly deal with our increasingly stressful lives. It's all about finding and implementing a few tools to help yourself on a daily basis.

HYDRATION

Hydration is crucial to every process that our body performs; including blood sugar regulation, yet many people are chronically dehydrated. Why? Most fluids do not necessarily contribute to hydration. When I talk about hydration, I am talking about water—pure, clean water. Coffee, tea, soda, juices, and other beverages do not count towards your daily hydration since all of the additives change how your body processes the liquid, and some of them have the potential to actually dehydrate you.

The quality of your water is nearly as important as the quantity. The reality is that our tap water is compromised by chlorine, fluoride, bacteria, other chemicals and biological matter. You should use a filtration system in order to help rid your drinking water of these substances so that you are hydrating your body with the purest water available. The vessel from which you drink is also an important component to consider. Drinking from BPA-free bottles and avoiding plastics can help you avoid contact with unwanted toxic materials.

Regarding quantity, the much-publicized eight glasses per day are far less than what I recommend to patients in my practice. Typically, I recommend that my patients set a target to drink half their body weight in ounces of water

per day. After all, our bodies are mostly water, and it is a crucial element that helps keep all of the body's processes functional.

BODYWORK

When I talk about bodywork, I'm referring to taking care of joints and muscles. While our organs and cells work to keep our body functioning from the inside out, our musculature and frame is what allows us to keep active and engaged in healthy activities. Further, there is a strong correlation between the physical structure of your body and how systems and organs function.

Our daily schedules are extremely tough on our physical bodies—repetitive motions, sitting all day long, poor posture. All of these things take a toll on our muscles and bones, wearing them down and tiring them out. In order to help avoid fatigue and wear and tear, consider experimenting with alternative types of care, which have become quite mainstream, including massage therapy, acupuncture, chiropractic care, and physical therapy. All of these can help rehabilitate and keep your physical body feeling its best.

If you have diabetes and are dealing with weight control issues, it is even more imperative to try and maintain the health of your muscles, joints, and connective tissues.

Excess weight puts added stress on your joints and inactivity can cause your muscles to deteriorate over time. All of these things can make adopting a new, healthier lifestyle more challenging, especially in the beginning. The good news is that healthy habits including a better diet and more physical activity can help restore the strength you may have lost. Investing in different types of bodywork during this period may help make the transition easier, helping your body to recover physically from potential new challenges.

SUPPORT SYSTEM

The last but certainly not least important Foundation of Health is having an excellent support system by your side to help guide you through the ups and downs of health. Regardless of your health status, you should work to surround yourself with healthcare providers, friends, and family that advocate for you and support you. This is especially important when you are trying to overcome something as serious and difficult as Type 2 Diabetes.

Knowing that you have an advocate by your side who has your best interests in mind should make you feel more confident in your journey toward better health. Good communication skills are a huge asset and as a patient you should

seek out a provider who makes you feel comfortable, who challenges you, and whom you feel listens to your concerns and communicates a treatment plan efficiently.

Creating and nurturing a positive relationship with your physician, other healthcare providers, friends, and family will help to ensure that you have people who are watching out for you—people who will help keep you accountable to reach your goals of better health.

Ultimately, you can see that there is a lot more to being "healthy" than simply taking medications that artificially try to return your body to its normal state. A state of good health involves many components of mental and physical well-being, from a healthy, nutritious diet to adequate sleep and hydration. Deficiency in any one of these categories can cause your body to function at a sub-optimal level, and ultimately contribute to the development of chronic disease, including Type 2 Diabetes.

In my practice, I take the whole-body approach to improving your health in order to conquer your Type 2 Diabetes from every angle. As I've discussed earlier in this book, Type 2 Diabetes is the result of a much deeper, complex problem that is taking place inside your body. By working to improve these individual foundations of health, we can

help restore balance to your body, correcting the problems from the inside out, and addressing your disease with an all-encompassing plan that will help to create new, healthy, and sustainable habits.

GLOSSARY

Albumin—Albumin is one of the major blood proteins. Produced primarily in the liver, Albumin plays a major role in water distribution and serves as a transport protein for hormones and various drugs. Albumin levels are affected by digestive dysfunction and a decreased albumin can be an indication of malnutrition, digestive dysfunction due to HCl needs (hypochlorhydria), or liver dysfunction. Malnutrition leads to a decreased albumin level in the serum primarily from lack of available essential amino acids. Decreased albumin can also be a strong indicator of oxidative stress and excess free-radical activity.

Albumin/Globulin Ratio—The albumin/globulin ratio is the ratio between the albumin and total globulin levels. A decreased ratio is associated with liver dysfunction

and immune activation from infectious or inflammatory processes.

Alkaline Phoshatase—Alkaline phosphatase (ALP) is a group of isoenzymes that originate in the bone, liver, intestines, skin, and placenta. It has a maximal activity at a pH of 9.0–10.0, hence the term alkaline phosphatase. Decreased levels of ALP have been associated with zinc deficiency.

ALT (SGPT)—SGPT/ALT is an enzyme present in high concentrations in the liver and, to a lesser extent, skeletal muscle, the heart, and kidneys. SGPT/ALT will be liberated into the bloodstream following cell damage or destruction. Any condition or situation that causes damage to the hepatocytes will cause a leakage of SGPT/ALT into the bloodstream. These would be exposure to chemicals, viruses (viral hepatitis, mononucleosis, cytomegalovirus, Epstein-Barr, etc.), alcoholic hepatitis. The most common non-infectious cause of an increased ALT is a condition called steatosis (fatty liver).

Anion Gap—The anion gap is the measurement of the difference between the sum of the sodium and potassium levels and the sum of the serum CO2/bicarbonate and chloride levels. Increased levels are associated with thiamine deficiency and metabolic acidosis.

AST (SGOT)—SGOT/AST is an enzyme present in highly metabolic tissues such as skeletal muscle, the liver, the heart, kidney, and lungs. This enzyme is at times released into the bloodstream following cell damage or destruction. AST levels will be increased when liver cells and/or heart muscle cells and/or skeletal muscle cells are damaged. The cause of the damage must be investigated. Low levels are associated with a B6 deficiency.

BUN—BUN, or Blood Urea Nitrogen, reflects the ratio between the production and clearance of urea in the body. Urea is formed almost entirely by the liver from both protein metabolism and protein digestion. The amount of urea excreted as BUN varies with the amount of dietary protein intake. Increased BUN may be due to an increased production of urea by the liver or decreased excretion by the kidney. BUN is a test used predominantly to measure kidney function, where it will be increased. An increased BUN is also associated with dehydration and hypochlorhydria. A low BUN is associated with malabsorption and a diet low in protein.

BUN/Creatinine Ratio—The BUN/Creatinine is a ratio between the BUN and Creatinine levels. An increased level is associated with renal dysfunction. A decreased level is associated with a diet low in protein.

C-Peptide—C-Peptide is used as an indicator for insulin production from the pancreas. It can help assess whether a high blood glucose is due to reduced insulin output from the pancreas or due to reduced glucose uptake by the cells, a condition called insulin resistance.

Calcium—Serum calcium levels, which are tightly regulated within a narrow range, are principally regulated by parathyroid hormone (PTH) and Vitamin D. A low calcium level indicates that calcium regulation is out of balance and not necessarily that the body is deficient of calcium and needs supplementation. Check Vitamin D levels, rule out hypochlorhydria, the need for magnesium, phosphorous, Vitamins A, B, and C, unsaturated fatty acids, and iodine as some of the reasons for a calcium "need" before supplementing with calcium. Elevated calcium is associated with parathyroid hyperfunction. If significantly elevated (>10.6 mg/dl or 2.65 mmol/L) check serum PTH levels and refer to an endocrinologist.

Calcium: Phosphorous Ratio—The calcium: phosphorous ratio is determined from the serum calcium and serum phosphorous levels. This ratio is maintained by the parathyroid glands and is also affected by various foods. Foods high in phosphorus and low in calcium tend to disrupt the balance and shift the body toward metabolic acidity, depleting calcium and other minerals and increasing inflammation.

Chloride—Chloride plays an important role in human physiology. The amount of serum chloride is carefully regulated by the kidneys. Chloride is involved in regulating acid-based balance in the body. Increased levels are associated with metabolic acidosis and decreased levels are associated with metabolic alkalosis. Chloride is an important molecule in the production of hydrochloric acid in the stomach, so decreased levels are associated with hypochlorhydria.

Cholesterol/HDL Ratio—The ratio of total cholesterol to HDL is a far better predictor of cardiovascular disease than cholesterol by itself. A lower ratio is ideal because you want to lower cholesterol (but not too low) and raise HDL. A level below 3.0 would be ideal. Every increase of 1.0, i.e. 3.0 to 4.0, increases the risk of heart attack by 60%.

Cholesterol Total—Cholesterol is a steroid found in every cell of the body and in the plasma. It is an essential component in the structure of the cell membrane where it controls membrane fluidity. It provides the structural backbone for every steroid hormone in the body, which includes adrenal and sex hormones and Vitamin D. The myelin sheaths of nerve fibers are derived from cholesterol and the bile salts that emulsify fats are composed of cholesterol.

Cholesterol is made in the body by the liver and other organs and from dietary sources. The liver, the intestines,

and the skin produce 60–80% of the body's cholesterol. The remainder comes from the diet. Increased cholesterol is just one of many independent risk factors for cardiovascular disease. It is also associated with metabolic syndrome, hypothyroidism, biliary stasis, and fatty liver. Decreased cholesterol levels are a strong indicator of gallbladder dysfunction, oxidative stress, inflammatory process, low-fat diets, and an increased heavy metal burden.

CO^2—Carbon Dioxide is a measure of bicarbonate in the blood. CO^2, as bicarbonate, is available for acid-base balancing. Bicarbonate neutralizes metabolic acids in the body. Elevated levels of CO^2 are associated with metabolic alkalosis and hypochlorhydria. Decreased levels are associated with metabolic acidosis.

Creatinine—Creatinine is produced primarily by the contraction of muscle and is removed by the kidneys. A disorder of the kidney and/or urinary tract will reduce the excretion of creatinine and thus raise blood serum levels. Creatinine is traditionally used with BUN to assess for impaired kidney function. Elevated levels can also indicate dysfunction in the prostate.

eGFR African American—The eGFR is a calculated estimate of the kidney's Glomerular Filtration Rate. It uses four variables: age, race, creatinine levels, and gender to

estimate kidney function. Levels below sixty are an indication of a loss of kidney function and may require a visit to a renal specialist for further evaluation.

eGFR Non-African American—The eGFR is a calculated estimate of the kidney's Glomerular Filtration Rate. It uses four variables: age, race, creatinine levels and gender to estimate kidney function. Levels below sixty are an indication of a loss of kidney function and may require a visit to a renal specialist for further evaluation.

Eosinophils—Eosinophils are a type of White Blood Cell, which are often increased in patients who are suffering from intestinal parasites or food or environmental sensitivities/ allergies.

Ferritin—Ferritin is the main storage form of iron in the body. Decreased levels are strongly associated with iron deficiency where it is the most sensitive test to detect iron deficiency. Increased levels are associated with iron overload, an increasing risk of cardiovascular disease, inflammation, and oxidative stress.

Fibrinogen 321.00 mg/dl (+ 71 %)—Fibrinogen is one of the principle blood clotting proteins. It is produced in the liver and liver disease, and dysfunction can cause a decrease in the level of circulating fibrinogen. Levels increase with

tissue inflammation or tissue destruction. Elevated fibrinogen levels are associated with an increased risk of cardiovascular disease, heart attack, and stroke. Fibrinogen levels are often elevated in patients who have cancer, especially colon cancer.

Globulin Total—Total serum globulin is a measurement of all the individual globulin fractions in the blood. Globulins constitute the body's antibody system. A raised globulin level is associated with hypochlorhydria, liver dysfunction, immune activation, oxidative stress, and inflammation. Decreased levels are associated with inflammation in the digestive system and immune insufficiency.

Glucose—Blood glucose levels are regulated by a number of important hormones including insulin and glucagon. Glucose is also directly formed in the body from carbohydrate digestion and from the conversion in the liver of other sugars, such as fructose, into glucose. Increased blood glucose is associated with Types 1 and 2 Diabetes, metabolic syndrome, and insulin resistance. Decreased levels of blood glucose are associated with hypoglycemia.

HA1C—The Hemoglobin A1C test measure the amount of glucose that combines with hemoglobin to form glycohemoglobin during the normal lifespan of a red blood cell, which is about one hundred and twenty days. The amount

of glycohemoglobin formed is in direct proportion to the amount of glucose present in the blood stream during the red blood cell lifespan. In the presence of high blood glucose levels (hyperglycemia) the amount of hemoglobin that is glycosylated to form glycohemoglobin increases and the hemoglobin A1C level will be high. It is used primarily to monitor long-term blood glucose control and to help determine therapeutic options for treatment and management. Studies have shown that the closer to normal the hemoglobin A1C levels are kept, the less likely those patients are to develop the long-term complications of diabetes.

HDL Cholesterol—HDL functions to transport cholesterol from the peripheral tissues and vessel walls to the liver for processing and metabolism into bile salts. It is known as "good cholesterol" because it is thought that this process of bringing cholesterol from the peripheral tissue to the liver is protective against atherosclerosis. Decreased HDL is considered atherogenic, increased HDL is considered protective.

Hematocrit—The hematocrit (HCT) measures the percentage of the volume of red blood cells in a known volume of centrifuged blood. It is an integral part of the Complete Blood Count (CBC) or Hematology panel. Low levels of hematocrit are associated with anemia. The hematocrit should be evaluated with the other elements on a CBC/

Hematology panel to determine the cause and type of anemia.

Hemoglobin—Hemoglobin is the oxygen-carrying molecule in red blood cells. Measuring hemoglobin is useful to determine the cause and type of anemia and for evaluating the efficacy of anemia treatment. Hemoglobin levels may be increased in cases of dehydration.

Homocysteine—Homocysteine is a molecule formed from the incomplete metabolism of the amino acid methionine. Deficiencies in Vitamins B6, B12, and folate cause methionine to be converted into homocysteine. Homocysteine increases the risk of cardiovascular disease by causing damage to the endothelial lining of the arteries, especially in the heart. Increased levels of homocysteine are associated with an increased risk of cardiovascular disease and stroke, as well as cancer, depression, and inflammatory bowel disease.

Hs CRP—High Sensitivity C-Reactive Protein (Hs-CRP) is a blood marker that can help indicate the level of chronic inflammation in the body. Increased levels are associated with an increased risk of inflammation, cardiovascular disease, stroke, and diabetes.

Insulin—Fasting insulin is the hormone released in response to rising blood glucose levels and decreases blood

glucose by transporting glucose into the cells. Often people lose their ability to utilize insulin to drive blood glucose into energy-producing cells effectively. This is commonly known as "insulin resistance" and is associated with increasing levels of insulin in the blood. Excess insulin is associated with greater risks of heart attack, stroke, metabolic syndrome, and diabetes.

Iron Serum—Serum iron reflects iron that is bound to serum proteins such as transferrin. Serum iron levels will begin to fall somewhere between the depletion of the iron stores and the development of anemia. Increased iron levels are associated with liver dysfunction, conditions of iron overload (hemochromatosis and hemosiderosis) and infections. Decreased iron levels are associated with iron deficiency anemia, hypochlorhydria, and internal bleeding. The degree of iron deficiency is best appreciated with ferritin, TIBC, and % Transferrin Saturation levels.

LDH—LDH represents a group of enzymes that are involved in carbohydrate metabolism. Decreased levels of LDH often correspond to hypoglycemia (especially reactive hypoglycemia), pancreatic function, and glucose metabolism. Increased levels are used to evaluate the presence of tissue damage to the cell causing a rupture in the cellular cytoplasm. LDH is found in many of the tissues of the body, especially the heart, liver, kidney, skeletal muscle,

brain, red blood cells, and lungs. Damage to any of these tissues will cause an elevated serum LDH level.

LDL Cholesterol—LDL functions to transport cholesterol and other fatty acids from the liver to the peripheral tissues for uptake and metabolism by the cells. It is known as "bad cholesterol" because it is thought that this process of bringing cholesterol from the liver to the peripheral tissue increases the risk for atherosclerosis. An increased LDL cholesterol is just one of many independent risk factors for cardiovascular disease. It is also associated with metabolic syndrome, oxidative stress, and fatty liver.

Lymphocytes—Lymphocytes are a type of white blood cell. An increase in lymphocyte concentration is usually a sign of a viral infection but can also be a sign of increased toxicity in the body or inflammation. Decreased levels are often seen in a chronic viral infection when the body can use up a large number of lymphocytes and oxidative stress.

Magnesium—The majority of magnesium is found inside the cell so measuring magnesium levels in the serum may not be the best way to assess magnesium deficiency. That being said, an increased serum magnesium is associated with kidney dysfunction and thyroid hypofunction. A decreased magnesium is a common finding with muscle cramps.

MCH—The Mean Corpuscular Hemoglobin (MCH) is a calculated value and is an expression of the average weight of hemoglobin per red blood cell. MCH, along with MCV can be helpful in determining the type of anemia present.

MCHC—Mean Corpuscular Hemoglobin Concentration (MCHC) measures the average concentration of hemoglobin in the red blood cells. It is a calculated value. It is elevated with B12/folate deficiency and hypochlorhydria. Decreased levels are associated with a vitamin C need, vitamin B6 and iron deficiencies, and a heavy metal body burden.

MCV—The MCV is a measurement of the volume in cubic microns of an average single red blood cell. MCV indicates whether the red blood cell size appears normal (normocytic), small (microcytic), or large (macrocytic). An increase or decrease in MCV can help determine the type of anemia present. An increased MCV is associated with B12, folate, or Vitamin C deficiency. A decreased MCV is associated with iron and B6 deficiency.

Monocytes—Monocytes are white blood cells that are the body's second line of defense against infection. They are phagocytic cells that are capable of movement and remove dead cells, microorganisms, and particulate matter from

circulating blood. Levels tend to rise at the recovery phase of an infection or with chronic infection.

Neutrophils—Neutrophils are the white blood cells used by the body to combat bacterial infections. They are the most numerous and important white cell in the body's reaction to inflammation. Levels will be raised in bacterial infections. Decreased levels are often seen in chronic viral infections.

% Transferrin Saturation—The % Transferrin Saturation index is a calculated value that tells how much serum iron is bound to the iron-carrying protein transferrin. A % Transferrin Saturation value of 15% means that 15% of iron-binding sites of Transferrin is being occupied by iron. It is a sensitive screening test for iron deficiency anemia if it is below the optimal range.

Phosphorus—Phosphorous levels, like calcium, are regulated by parathyroid hormone (PTH). Phosphate levels are closely tied with calcium, but they are not as strictly controlled as calcium. Plasma levels may be decreased after a high carbohydrate meal or in people with a diet high in refined carbohydrates. Serum phosphorous is a general marker for digestion. Decreased phosphorous levels are associated with hypochlorhydria. Serum levels of

phosphorous may be increased with a high phosphate consumption in the diet, with parathyroid hypofunction and renal insufficiency.

Potassium—Potassium is one of the main electrolytes in the body. Due to the critical functions of potassium for human metabolism and physiology, it is essential for the body to maintain optimum serum levels, even though a small concentration is found outside of the cell. Potassium levels should always be viewed in relation to the other electrolytes. Adrenal hormones greatly influence potassium concentration. As such, high potassium levels can be a marker for adrenal dysfunction

Protein Total—Total serum protein is composed of albumin and total globulin. Conditions that affect albumin and total globulin readings will impact the total protein value. A decreased total protein can be an indication of malnutrition, digestive dysfunction due to HCl need, or liver dysfunction. Malnutrition leads to a decreased total protein level in the serum primarily from lack of available essential amino acids. An increased total protein is most often due to dehydration.

RBC—The red blood cell (RBC) functions to carry oxygen from the lungs to the body tissues and to transfer

carbon dioxide from the tissues to the lungs where it is expelled. The RBC count determines the total number of cells or erythrocytes found in a cubic millimeter of blood. Increased levels are associated with dehydration, stress, a need for Vitamin C and respiratory distress such as asthma. Decreased levels are primarily associated with anemia.

RDW—The Red Cell Distribution Width (RDW) is essentially an indication of the degree of abnormal variation in the size of red blood cells (called anisocytosis). Although the RDW will increase with vitamin BI2 deficiency, folic acid, and iron anemia, it is increased most frequently with vitamin B12 deficiency anemia.

Sodium: Potassium Ratio—The sodium: potassium ratio is determined from the serum sodium and serum potassium levels. Both of these elements are under the influence of the adrenal glands. An increased sodium: potassium ratio is associated with acute stress and a decreased sodium: potassium ratio is associated with chronic stress and adrenal insufficiency.

T3 Uptake—The T-3 Uptake test has nothing to do with actual T-3 levels, as the name might suggest. Increased levels are associated with hyperthyroidism and people on thyroid hormone. Decreased levels are associated with hypothyroidism and deficiencies of iodine and selenium.

TIBC—Total Iron Binding Capacity is an approximate estimation of the serum transferrin level.

Total T4—T-4 is the major hormone secreted by the thyroid gland. T-4 production and secretion from the thyroid gland are stimulated by the pituitary hormone TSH. Deficiencies of zinc, copper, and Vitamins A, B2, B3, B6 and C will cause a decrease in production of T4 by the follicles of the thyroid gland. The majority of T4 in the blood is in the bound form, i.e. bound to proteins in the blood such as thyroid binding globulin. A very small amount is available in the free unbound form. Total T4 reflects the total amount of T4 present in the blood (i.e. amount bound to thyroid binding globulin and free levels).

Total WBCs—The total White Blood Cell (WBC) count measures the sum of all the WBCs in the peripheral blood. White Blood Cells fight infection, defend the body through a process called phagocytosis, and produce, transport, and distribute antibodies as part of the immune process. It is important to look at the WBC differential count (neutrophils, lymphocytes, etc.) to locate the source of an increased or decreased WBC count.

Transferrin—Transferrin is the protein that carries the majority of the iron in the blood. Elevated levels are associated with iron deficiency anemia.

Triglycerides—Serum triglycerides are composed of fatty acid molecules that enter the bloodstream either from the liver or from the diet. Patients that are optimally metabolizing their fats and carbohydrates tend to have a triglyceride level about one-half of the total cholesterol level. Levels will be elevated in metabolic syndrome, fatty liver, in patients with an increased risk of cardiovascular disease, hypothyroidism, and adrenal dysfunction. Levels will be decreased in liver dysfunction, a diet deficient in fat, and inflammatory processes.

TSH—TSH is a hormone produced by the anterior pituitary to control thyroid function. TSH stimulates the thyroid cells to increase the production of thyroid hormone (T-4), to store thyroid hormone and to release thyroid hormone into the blood stream. TSH synthesis and secretion is regulated by the release of TRH (Thyroid Releasing Hormone) from the hypothalamus. TSH levels describe the body's desire for more thyroid hormone (T4 or T3), which is done in relation to the body's ability to use energy. A high TSH is the body's way of saying "we need more thyroid hormone." A low TSH is a reflection of the body's low need for thyroid hormone. Optimal TSH levels tell us that the thyroid hormone levels match the body's current need and/or ability to utilize the energy.

Uric Acid—Uric acid is produced as an end product of purine, nucleic acid, and nucleoprotein metabolism. Levels can increase due to over-production by the body or decreased excretion by the kidneys. Increased uric acid levels are associated with gout, atherosclerosis, oxidative stress, arthritis, kidney dysfunction, circulatory disorders, and intestinal permeability. Decreased levels are associated with detoxification issues, molybdenum deficiency, B12/folate anemia, and copper deficiency.

Vitamin D (25-OH)—The Vitamin D test measures for levels of 25-OH Vitamin D and is a very good way to assess Vitamin D status. Vitamin D deficiency has been associated with many disorders including many forms of cancer, hypertension, cardiovascular disease, chronic inflammation, chronic pain, mental illness including depression, diabetes, and multiple sclerosis, to name just a few.

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