



THE BLOOD SUGAR MANIFESTO

Dr. Brian Mowll
The Diabetes Coach™

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ABOUT THE AUTHOR



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Dr. Brian Mowll is the founder and medical director of SweetLife® Diabetes Health Centers and serves clients worldwide as The Diabetes Coach™. He is a master licensed diabetes educator (MLDE), CDE, and was one of the first doctors to be certified to practice functional medicine by the prestigious Institute for Functional Medicine.

Since 1998, Dr. Mowll has been helping people with all forms of diabetes properly manage their complex health conditions. Additionally, with type 2 diabetes, pre-diabetes, and metabolic syndrome, his goal is to not just manage, but to reverse these conditions using a natural, personalized lifestyle approach.

Dr. Mowll has spent over 20 years studying and applying clinical nutrition, physical activity, lifestyle management, functional medicine, and diabetes self-management education. He is the host of the popular "Diabetes World Summit", as well as a prolific writer, blogger, and speaker.

In addition, he has written hundreds of articles about diabetes and natural health, and has been a featured speaker and contributor on diabetes. Dr. Mowll treats clients locally in the greater Philadelphia area and nationally through his acclaimed Mastering Diabetes™ programs.

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I Wrote This Guide For You...

When I sat down to write this guide on reversing type 2 diabetes, pre-diabetes, and metabolic syndrome by addressing the real cause of these dysfunctional states, I had someone very specific in mind.

I did not write this for the people satisfied with their medical care. You know, the ones who cooperatively and mindlessly take their prescribed drugs, follow the high carb, low fat diet endorsed by their doctor or dietitian, and wait for the inevitable downward spiral of diabetes complications to destroy their lives.

Most likely, those people aren't reading this right now.

You're reading this guide because you think differently. You understand that the standard, conventional approach to managing diabetes and blood sugar is somehow flawed or lacking. It's not okay with you to just pop pills or inject insulin without understanding why your blood sugar is high in the first place. It doesn't make sense to you to eat 45-60 grams of carbs at each meal (plus snacks) when you know carbs raise your blood sugar. You want a fresh, sensible approach and you know there has to be a better way.

You feel frustrated that your doctor doesn't seem to listen to you, and won't order the tests that can help find the cause of your blood sugar problems. You feel like you're on your own at times, wading through pages of online material, podcasts, interviews, and articles trying to find the truth. You're confused about what supplements to take, how to take them safely, or if you should be taking them at all.

So, this guide is for you. I get it. After 20 years of working with thousands of patients and clients, I understand the struggles and the frustration that you experience. I feel it too.

My mission is to change how diabetes is managed and treated throughout the world. I've seen first hand how type 2 diabetes and metabolic dysfunction can be reversed using diet, lifestyle modification, and natural methods. I've helped hundreds of patients and clients eliminate their need for medication and normalize blood sugar levels. It can be done. We have to change the diabetes care paradigm, one person at a time.

Let's start with you and me.

How we got here

People often ask me, "how did we get here". In other words, why do doctors and dietitians recommend high carbohydrate, low fat diets? Why do doctors reach for their prescription pads so quickly when we know that type 2 diabetes can be managed and even reversed with proper lifestyle changes? Why do doctors consider type 2 diabetes to be a chronic, degenerative disease with no hope for remission?

I'll give you the short version.

Since the turn of the last century, our health challenges have changed. For most of our history, it was infectious disease that was our main enemy, because it contributed to most deaths. The health problems we face today are very different. Medicine has not caught up.

Our entire healthcare system is based on acute care. Think about it. Doctors see dozens of patients every day, suffering from various health concerns, with the task of solving the problem in a 10-12 minute visit. Once you leave the exam room, your doctor is on to the next patient and has already forgotten about you. It's the way the system is designed.

That may work for colds, broken bones, and allergic reactions, but it doesn't work for diabetes. You can't fix diabetes in 10 minutes. Even if you see your endocrinologist for 15-20 minutes 3-4 times per year. That's still about one hour per year. Really?

Not only that, the large majority of physicians, including endocrinologists, have little to no training in lifestyle modification strategies for diabetes, such as nutrition, exercise and physical activity, stress management, sleep improvement, gut restoration, complex immune balancing, and natural care. So, what do they have in their toolbox?

Our healthcare system today is largely driven by pharmaceutical drugs and propaganda. Pharmaceutical companies advertise directly to consumers who ask their doctors for drugs by name. They give doctors incentives to prescribe medication to their patients (one endocrinologist in my area receives over \$250,000 per year in consulting and speaking fees from one pharmaceutical company).

Doctors are encouraged (or forced) to prescribe drugs according to the "standard of care" guidelines, such as prescribing statin medications (Lipitor) and ACE Inhibitors (Lisinopril) to everyone diagnosed with diabetes. In fact, if they make an educated clinical decision to go against these recommendations, they are often punished with lower reimbursement rates and lower quality scores.

Dietary recommendations are set for large populations of people rather than individuals, and change very slowly. The guidelines we follow today still have their roots in the late 1950s. Despite mountains of compelling

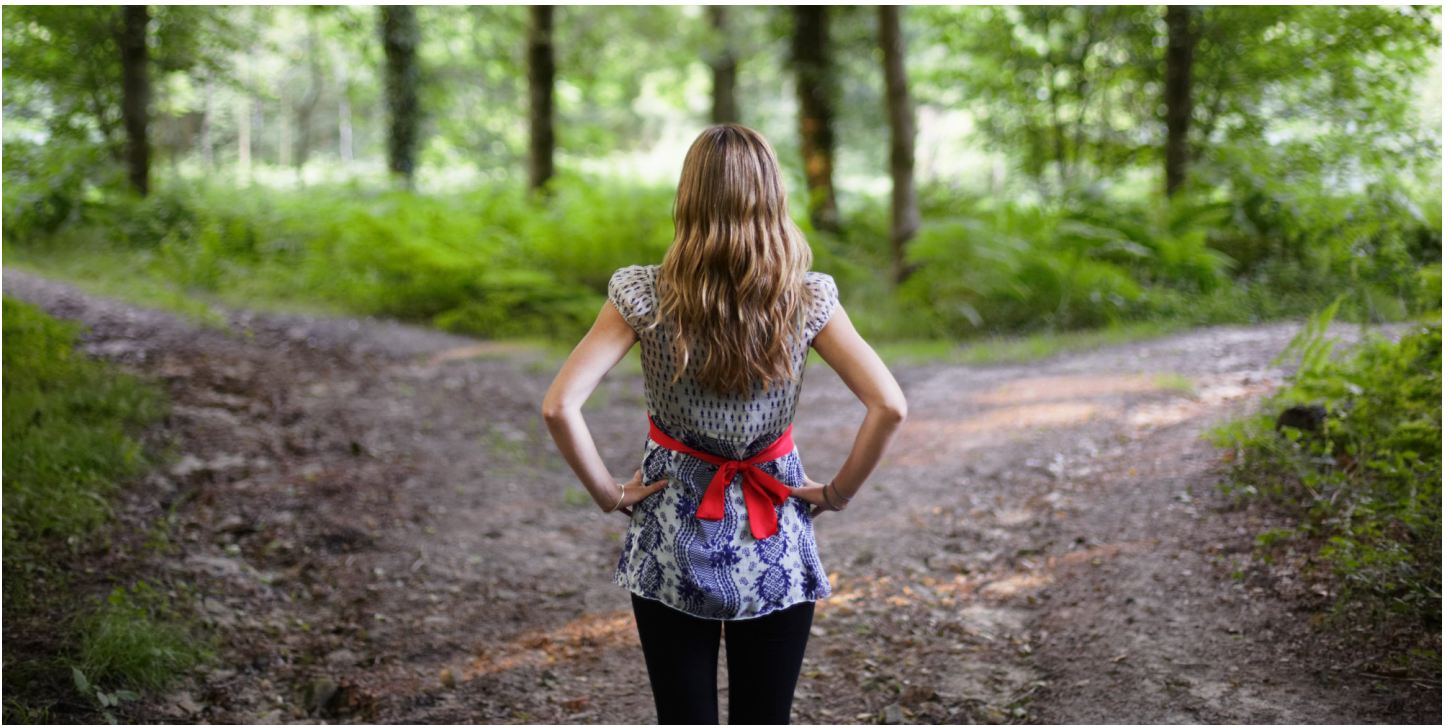
research and anecdotal evidence suggesting that low carb diets are better for people with diabetes and blood sugar problems, most doctors and dietitians still recommend the opposite.

What should you do?

That's up to you. There are alternatives. There are thousands of doctors abandoning the conventional models that they were taught and getting retrained in functional and natural medicine. There are nutritionists and dietitians realizing the flaws of the standard guidelines and are taking the brave steps to personalize recommendations to the individual client. It's happening slowly but surely.

Are you willing to wait another 10-20 years for mainstream medicine and insurance coverage to catch up?

If not, then you have an opportunity to follow a different path. That starts with a decision. A decision to open your mind and eyes to new options, a new understanding of diabetes and blood sugar problems, and a new model for managing and reversing type 2 diabetes.



Understanding Diabetes

In *The Art of War*, Sun Tzu said, "If you know the enemy and know yourself, you need not fear the result of a hundred battles. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat. If you know neither the enemy nor yourself, you will succumb in every battle."

In order to be victorious, we need to know ourselves and know our enemy. In this case, the enemy is diabetes.

Do you really understand diabetes?

This is a valid question, because in my experience, most people do not understand the mechanism behind diabetes. In fact, many doctors fail to understand and recognize the root physiological cause and contributing factors to diabetes. Even less do anything to address it.

Let's first talk about what type 2 diabetes (or pre-diabetes) is not.

High Blood Sugar - What? Diabetes is *not* high blood sugar? That's right. High blood sugar has a different medical name. It's called hyperglycemia, and it's not the same as diabetes. High blood sugar is a sign of diabetes, but it's not the same thing.

This is an important fact because most physicians treat diabetes as if it's just high blood sugar. Most treatment methods, including all medications and insulin are designed to lower blood sugar. So, if diabetes is not just high blood sugar, how do these drugs really address the underlying, root dysfunction? Hmmm.

Insulin deficiency - Most physicians today still hold to the inaccurate assumption that type 2 diabetes is caused by an insulin deficiency. In conventional diabetes care, we are taught that by the time someone is diagnosed with type 2 diabetes, they've already lost 50% of their beta cell function (this misrepresentation is based on studies in people with T2D who show a loss of 50% of beta cell mass).

From my experience, working with thousands of people with type 2 diabetes over 20 years, this is simply not true. In fact, we test insulin levels on almost all of our clients, and the large majority (well over 90%) make plenty of insulin. In fact, most people with type 2 and pre diabetes over produce insulin.

Pancreas Disease - Many people, including almost all physicians, associate type 2 diabetes most closely with the pancreas. This is a mistake. Like I described above, the majority of people that we test with type 2 and pre-diabetes have a working, functional pancreas.

The pancreas can certainly be affected by high blood sugar and diabetes, like most organs, but it's not the root cause of the metabolic dysfunction.

Genetic Disease - Our genome, or genetic code, certainly plays a role in almost all disease and dysfunction in the body. Some people have a very strong familial tendency toward being over weight or developing metabolic dysfunction. That, however, does not mean diabetes is a genetic disease.

In fact, over the years, we've had just as many clients diagnosed with type 2 diabetes with no family history or known genetic predisposition to the problem. Your genes are part of the picture, but don't solely determine your health outcomes.

Sugar Disease - I've heard many patients and clients call diabetes the "sugar disease". I'm not sure if this describes sugar flowing into their urine, too much sugar in the blood, or as being caused by eating too much sugar. Maybe all three. Either way, this is not accurate.

Eating a diet high in processed foods, especially carbohydrates, including sugar and starch, is a contributing factor to diabetes, but not the cause. Many people eat too many carbs and never develop diabetes. It's more complicated than that. Despite what many people say and believe, you can't just eat your way into diabetes.

Lack of Diabetes Drugs - This one may sound funny, but there are many scientists and physicians who believe that people with diabetes and blood sugar problems lack important chemical to regulate blood sugar and need medications to function properly. This is utter nonsense.

The body is designed to work perfectly and we have a complex orchestra of hormones, neurotransmitters, and cellular chemicals created to perfectly balance our blood sugar in the face of myriad stresses. It's built in. You have what it takes to control your blood sugar.

If it's not a lack of insulin or a bad pancreas, or a lack of diabetes drugs, or eating too much sugar, what causes type 2 diabetes?

Let's take a better look.

Complex Metabolic Dysfunction - Type 2 diabetes is a complex metabolic dysfunction, involving multiple organs and systems. Diabetes is not found in one place. It affects the the liver, the brain, the vascular system, the eyes and ears, the sex organs, and the kidneys. It's driven by problems in those same organs, as well as the gut, the pancreas, the thyroid and adrenal glands, the muscles, and the fat cells.

Insulin Resistance - The root cause of type 2 diabetes, pre diabetes, and metabolic dysfunction is resistance to the hormone insulin.

In most cases that we've tested, our patients and clients make plenty of insulin, but their cells are not responding to insulin appropriately. This leads to an over-production of insulin which contributes to weight gain, inflammation, high blood sugar, and metabolic dysfunction.

It's the high insulin, rather than blood sugar, which leads to much of the damage and destruction associated with diabetes.

Lifestyle Disease - We said previously that type 2 diabetes is not a genetic disease. While there may be a predisposition in some people, development of diabetes requires a trigger (or many triggers), which lead to loss of proper insulin signaling, glucose tolerance, and blood sugar control.

We need to look at many factors, including diet, physical activity, sleep quality, stress (past and present), organ function, hormone balance, and others.

In addition, there are many environmental factors that may contribute to the development of diabetes. For example, certain toxins such as BPA are known to cause insulin resistance leading to diabetes.

By addressing these root factors and improving insulin sensitivity and glucose tolerance, type 2 diabetes can be reversed over time.



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The Standard of Care for Type 2 Diabetes

One of the most common questions I receive in the hundreds of emails I read each week as well as from my private coaching clients is, "Why doesn't my doctor tell me these things (run these tests, explain things the way you do, or use these natural methods)?"

It's a good question, and the answer is not very satisfying.

Simply put, it's not how they're trained to practice. As previously described, physicians typically follow practice guidelines, which are based on the standards of care for a particular disease or situation.

The standard guidelines for diabetes care are published each year by various groups like the American Diabetes Association and the American Academy of Clinical Endocrinologists. These recommendations are based on population studies and are designed for groups of people, but most physicians routinely apply them to every individual patient they encounter with diabetes.

What do these guidelines suggest? Here's a graphic of the ADA practice guidelines from 2015. Notice the amount of space and attention given to lifestyle modification. Compare that to the amount of space and attention focused on medication and insulin. This is not a mistake or insignificant. By far, the main modality that physicians use to treat diabetes today is prescription, pharmaceutical medication.

Perhaps you've had this experience. You sit down with your doctor to review your history and labs. He or she tells you that your blood sugar is high, your cholesterol is too high, and that you need to lose weight (this is not true for everyone with type 2 diabetes). Then, the doctor skips right over the first line of treatment, and immediately pulls out the prescription pad, recommending drugs like Metformin and a statin drug for your cholesterol.

Here's the problem... These medications do nothing to address the root cause of type 2 diabetes, and they all have side effects. Even Metformin, a safe and sometimes helpful medication, has numerous side effects, some of which can be dangerous.

These drugs may temporarily lower blood sugar, but because they ignore the root cause, the underlying diabetes continues to get worse, leading to life threatening complications. Even if your blood sugar is lower, if you don't address the cause, you'll likely get worse, and still develop problems from diabetes.

Many doctors tell their patients that diabetes is incurable, and that it will get worse over time, not better. This is only true when you ignore the root cause and follow the standard guidelines for diabetes treatment. Once you address the root cause and contributing factors to type 2 diabetes, you can stop the progression of the disease and allow your body to heal.

Diabetes Myths and Reality

There are five common myths or misconceptions that I hear almost everyday online, in newsletters, and even in professional journal articles. Understanding the truth about these ideas is imperative if you really want to get in control of your health and reverse type 2 diabetes.

1. Once you have diabetes, you'll always have diabetes

While it's true that this diagnosis may never come off your medical records, you can get to a place where you have no evidence of diabetes in your body.

Many people view diabetes as a life sentence. You may have been told that once you are diagnosed with diabetes, and start on diabetes medications or insulin, that there is no hope of reversing the condition. Some doctors tell their patients that they'll have diabetes forever and that the best they can hope to do is slow the progression of the disease or delay the onset of complications.

Based on my experience working with hundreds of patients and clients with diabetes over the past 20 years, this is absolutely FALSE. In fact, type II diabetes is completely reversible in many cases, if you find and treat the root cause by using the right approach.

If you have lost hope or feel depressed about swallowing pills and pricking your fingers for the rest of your life, then please change your perspective. In all likelihood, there is still a very good chance for you to turn your life and health around.

2. My family doctor or endocrinologist is doing everything possible

That would be great if it were true, but unfortunately, in most cases, it's simply not. I've had the privilege to coach and care for thousands of people, over the years, with diabetes and blood sugar problems. Most of them came to me *after* they had already been to their family doctor, endocrinologist, and typically several other specialists, with poor or unsatisfactory results. If what those doctors did worked, those people may never have made it to me.

Fortunately, for the large majority of them, was not too late. Using a functional medicine approach, evaluating the root cause of the problem, and designing a personalized program for each individual patient or client, we are able to help many people gain control of their blood sugar, reduce or eliminate certain medications, and reverse the progression of type 2 diabetes.

3. Drugs are the only treatment option for diabetes

Most people with diabetes are immediately prescribed medication by their primary doctor as soon as they get

diagnosed. Your doctor may have told you to watch what you eat and get some exercise, or to lose weight if you need to, but they rarely tell you *how* to do that. Instead, they pull out the prescription pad and start you on a lifetime of dependency on medication.

Rarely are other options discussed in a conventional doctor's office. That doesn't mean that they don't exist. Conventional doctors are typically overwhelmed caring for too many patients, and often do not have the time, knowledge, or experience to discuss nutritional, dietary, and lifestyle solutions to diabetes.

4. Type 2 diabetes is a genetic disease

The large majority of our clients with type II diabetes have no family history of the disease. The predisposition to develop type 2 diabetes can be passed down through families, but your genes are not your destiny. Expression of diabetes depends more on specific lifestyle factors than genetics. Just because your mother or father was diabetic and died from complications, it doesn't mean you cannot reverse your condition and avoid their fate.

Likewise, you may have no family history of diabetes and be wondering how you developed the condition. Type 2 diabetes does not depend on bad genes. Poor lifestyle choices, environmental pollution, cellular oxidation, stress, poor sleep patterns, gut dysfunction, and many other factors influence your genes to determine if you develop diabetes.

5. Keeping blood sugar down with medications will keep me healthy

This might be the most dangerous myth regarding diabetes. Unfortunately, despite billions of dollars worth of research and drug development, even the best diabetes drugs have little impact on prolonging life or preventing complications like heart disease, stroke, and kidney failure.

We've been able to reduce the number of amputations, and with frequent eye and foot exams, problems can be caught early, but there is little evidence that medications have any substantial long-term impact on quality of life.

Evidence states that complications from type 2 diabetes start long before the condition is even diagnosed. In fact, many of the health issues that people with diabetes face can occur even with relatively "normal" blood sugar.

Fortunately, if you are willing to put the time and effort into making the right changes and addressing the root cause of your diabetes naturally, you do have an excellent chance of avoiding problems and complications. By improving the function of the body and normalizing metabolic function, wounds heal better, circulation is improved, cardiovascular stress is reduced, and damage to the kidneys is minimized.

The Functional Medicine Approach

Over the past 25 years, a new, fresh approach to healthcare has emerged. It's based on the simple, but profound principle that the body can not be separated into parts and treated like a machine. On the contrary, the human body is dynamic and interdependent on many organs and systems working together to create balance and health.

There is a cause for every dysfunction and disease, and we are all different. Understanding the root cause is the first and most necessary step to create balance and health in the body.

Covering or suppressing signs and symptoms (like high blood sugar) with medication rarely creates health. In fact, many times the "cure" is worse than the disease, with long term side effects leading to more significant health problems.

Functional medicine practitioners, certified by the Institute for Functional Medicine (IFM), focus their attention on each individual client, not the disease they are manifesting. There's a realization that each person is different, and needs to be evaluated individually to customize an action plan with the best chance of helping each client to reach their goals, reversing disease, and improve their health.

In functional medicine, we treat the root cause, not just the symptoms. Drugs, medications, and insulin treat the high blood sugar, which is a sign of diabetes, not the cause. Finding and addressing the root cause for each client is an integral part of a functional medicine approach.

In my coaching program, this process starts with a private client interview to determine the client's goals, needs, and desires as well their commitment level to improve health and reverse diabetes. To personalize the approach, we have each client complete a detailed "root cause assessment" and perform comprehensive laboratory evaluations.

This approach is unique, and goes well beyond the standard conventional doctor's visit to uncover the root cause of blood sugar imbalance specific to each client. In addition to your conventional doctor, it's important to find a Certified Diabetes Coach, highly trained in functional medicine and an integrative approach to addressing and reversing type 2 diabetes and metabolic syndrome.

A personalized action plan, using proven nutritional strategies, stress management, movement programs individualized to your fitness and health, community support groups, and evidence-based nutritional supplementation will create the ultimate program to reverse your condition and enhance your health.

Functional Lab Evaluation

In order to customize and guide an action plan to master diabetes and blood sugar problems, it's important to gather as much relevant information as possible. In addition to completing a comprehensive assessment, you'll likely need some functional labs to collect and analyze pertinent data.

There are hundreds of lab tests that can be used to gain a better understanding of physiology, function, and health status. Most physicians will perform "basic" tests such as a metabolic panel (which includes glucose and electrolytes), simple lipid (cholesterol and triglycerides), and hemoglobin A1c. They may also do a simple thyroid screen, called TSH, and Vitamin D in some cases. These tests are important, but totally inadequate to determine the root cause of blood sugar problems.

In addition to these basic tests, there are a few standard laboratory blood tests that everyone with blood sugar imbalance should consider.

Fasting Insulin

Completely different than glucose and HbA1c, insulin is a hormone that can be easily tested with a standard blood draw. The purpose of insulin is to increase uptake of glucose and amino acids into the cell. Glucose enters the cell and ultimately gets converted to cellular energy.

Normal fasting insulin, from a functional diagnostic perspective, is between 3-5 ug/dl. If insulin levels are too low, this may indicate a lack of insulin production and beta cell dysfunction. If insulin levels are too high (a condition called hyperinsulinemia), it's typically a sign of insulin resistance.

High insulin levels are characteristic of pre-diabetes and metabolic syndrome, and often seen in type 2 diabetes as well. In fact, according to published research, elevations in blood insulin may often be the cause of diabetes complications, such as heart disease and stroke, even when glucose levels are relatively normal.

Insulin Response Test

There are many cases where fasting insulin is normal or marginal (5-10 ug/dl), but the client still exhibits insulin resistance. In these cases, it may be necessary or helpful to complete an insulin response test.

The insulin response test is done in a similar way to an oral glucose tolerance test, which is much more common. Please note, though, that these are not the same test. The OGTT consists of 3-5 blood samples taken before and after consumption of a 75 gram glucose load. After having a fasting blood draw, the subject drinks a glucose syrup (equivalent to about two sodas). Blood glucose levels are then performed at 30 minutes, 60 minutes, and 120 minutes.

With an insulin response, not only glucose is tested, but also insulin. This distinction is very important. Many people with pre-diabetes or metabolic syndrome (or even with normal blood sugar), will have a normal OGTT, but a significantly abnormal insulin response. High insulin levels may be even more dangerous than high blood sugar, and have been associated with heart disease, stroke, inflammation, and kidney damage.

Inflammatory Biomarkers

There are several blood tests, which can be performed with a standard blood draw, that indicate an inflammatory process in the body. Inflammation is closely associated with insulin resistance and type 2 diabetes, and has been implicated in many chronic diseases, such as heart disease, stroke, kidney disease, vascular disease, and dementia.

Inflammatory markers include blood tests such as high sensitivity CRP, homocysteine, fibrinogen activity, ferritin, and specific cytokines, such as interleukins and TNF-alpha.

Advanced Lipid Testing

Basic lipids tests, such as total cholesterol, HDL, LDL, and triglycerides are only modestly helpful in assessing cardiovascular risk and metabolic health. There are newer, more comprehensive tests which have a much better association with cardiovascular health.

When evaluating a basic lipid panel, it's important to look at the most relevant data, and perform follow-up tests if necessary. The most predictive marker for vascular risk is the total cholesterol to HDL ratio, and the Triglyceride to HDL ratio. TC/HDL should be less than 4.0 and Trig/HDL should be less than 2.0 (closer to 1.0 is better). In addition, HDL levels should be greater than 40 (50 or above is better), and Triglycerides should be less than 100 (less than 70 is ideal).

If the total cholesterol, LDL, or these ratios are too high, we recommend following up with an advanced lipid panel. The most common method of advanced lipid testing is called the NMR Lipoprotein profile. It analyzes LDL particle size and count, and measures certain atherogenic lipid particles, which are associated with increased risk of cardiovascular plaques.

Small, dense LDL particle can become stuck in blood vessel walls leading to inflammation and plaque formation. On an NMR profile, we generally want the average LDL particle size to be less than xx, and the number of small, dense LDL particles to be less than xxxx.

Thyroid Testing

There is a significant correlation between low thyroid hormone levels and blood sugar problems, particularly related to insulin resistance. Thyroid hormone is the master metabolic regulation hormone, activating fat

burning and cellular metabolism. When thyroid levels are low, it slows down the metabolic machinery and can short-circuit glucose and insulin metabolism.

Current research and clinical findings suggest that the TSH test is woefully inadequate to evaluate optimal thyroid hormone levels. There is a significant population who has a normal TSH with abnormal thyroid hormone levels. Similarly, people can have normal levels of one thyroid hormone with abnormal levels of the other. For this reason, we recommend that all of our clients have thyroxine (T4) and triiodothyronine (T3) levels tested as well as TSH.

In some cases, we also recommend a more complete thyroid panel, consisting of thyroid antibodies (TPO Ab and Thyroglobulin Ab), free T3 levels, and reverse T3. These lab values can help provide a more comprehensive understanding of thyroid function and physiology.

Adrenal Testing

Many clients struggle with poor energy levels and stress-related blood sugar imbalance. In these cases, as well as in people with known thyroid problems or a history of significant stress, it may be helpful to consider salivary adrenal testing.

The salivary cortisol test has been used for decades and has been validated through clinical trials to be both accurate and clinically useful. This is not typically performed to evaluate for disease states, such as Addison's (hypoadrenal) or Cushing's syndrome (hypercortisolism). Rather, it is a functional test used to assess adrenal cortical function.

The adrenal glands make several hormones, such as cortisol, adrenaline, noradrenaline, DHEA, and aldosterone. Several of these hormones (particularly cortisol) exert control over blood sugar balance.

Cortisol and DHEA (as well as sex hormones, like testosterone and estrogen) can be tested using a simple saliva sample, taken at four distinct points over the course of one day. This information can be very helpful in assessing and supporting adrenal function and health.

Micronutrient Testing

Micronutrients, such as vitamins, minerals, and other compounds play an important role in blood sugar regulation. For example, the mineral chromium, has been shown to play a vital role in blood sugar metabolism, and zinc is important for insulin production, release, and utilization.

Some vitamins (like Vitamin D, Magnesium, and some B vitamins) are often tested in the blood serum. These tests can be misleading, as blood serum levels do not correlate well with intracellular levels. To gain a better

understand of micronutrient status, you may want to consider having a proprietary micronutrient assessment performed.

Revealing blood cell levels of important nutrients, such as magnesium, lipid acid, B vitamins, chromium, biotin, carnitine, co-enzyme Q10, zinc, and various antioxidants can be life changing. Once you know what your body needs, you can focus on repleting these important substances, which can be a crucial step in optimizing health and blood sugar metabolism.

GI Testing

There have been dozens of studies published in the past several years describing the importance of the digestive system, including the gut barrier and micro biome, in blood sugar and insulin metabolism.

Gut dysfunction drives inflammation, which is associated with insulin resistance and poor glucose control. Dysbiosis, or an imbalance with the gut flora, affects digestion, absorption, and utilization of nutrients, which plays an important role in blood sugar health.

There are several blood tests and stool tests which can reveal the ecology of the gut micro biota and integrity of the gut lining, as well as the function of the digestive system, which can help to guide specific recommendations for supporting and healing the gut to enable optimal insulin sensitivity and glucose control.

Organic Acid Testing

Another area of great interest and investigation is the mitochondria. When glucose and fatty acids enter the cell, they are eventually brought into the mitochondria to be processed into cellular energy. Mitochondria are the factories in our cells (some cells contain thousands), which produce the energy our body needs to function.

Mitochondrial dysfunction, which can be caused by oxidative stress, mitochondrial damage, and nutrient depletion, can lead to blood sugar and fatty acid imbalance and contribute to type 2 diabetes.

Another proprietary test, called Organic Acid Testing, is performed using a simple urine collection. Various metabolites are analyzed to determine the functional status of the mitochondria. In addition to evaluating mitochondria, the OAT can assess detoxification status, oxidative stress, DNA damage, methylation capacity, and other important cellular functions.

Food Sensitivity Testing

It's well known that stress drives blood sugar elevation. There are several types of stress, such as mental, emotional, and physiological stress. One of the most significant drivers of physiological stress in the modern day world is food sensitivity.

Food sensitivity is a delayed immune response, similar to an allergy, but more subtle. While food allergies typically cause immediate, severe reactions, food sensitivities may be less noticeable, but just as devastating to health. Many people today have unknown sensitivities to specific foods, which can drive blood sugar up through the stress response.

Testing for food sensitivities is typically done through a blood test where food substances are introduced to white blood cells to check for reaction. Most of these tests will evaluate for many common foods and some will even investigate additives, dyes, and commonly used chemicals.

Understanding which foods may be driving a stress response in your body, and avoiding these foods for a prescribed period of time, can help reduce physiological stress and improve insulin signaling and blood sugar balance.

Where to start

Is your head spinning? You may be wondering if you should run out and get all or some of these tests right away to find the missing link to your blood sugar health. It may feel a bit overwhelming.

A detailed assessment and system questionnaire will help guide the next recommendations for which tests may be most helpful. Most people start with the basic tests as well as insulin, inflammatory markers, and advanced lipid testing. From there, you may want to consider evaluating the areas that seem to need the most support and follow up with advanced testing to guide the discovery process.



What's your sub-type?

Over the past twenty years, I've worked with thousands of people with pre-diabetes, metabolic syndrome, and type 2 diabetes. After much frustration, experimentation, and research, I've found that there are several patterns that show up in people with blood sugar problems.

In conventional medical care, the purpose of the history, exam, and lab work is to reach a diagnosis. Once the diagnosis is made, most physicians will give standard recommendations, including diabetes medications, outdated nutritional advice (if any is given at all), and procedures to minimize the risk for complications.

This type of care is helpful, and in some cases, life-saving, but grossly inadequate for most people with diabetes and blood sugar problems.

The medications and recommendations given by most conventional physicians, dietitians, and educators is the same for every patient. It's a one-size-fits-all, population-based, practice guideline which drives these recommendations. The problem is that individual people with diabetes and blood sugar problems are very different from one another.

I've isolated four specific sub-types, which describe the differences in the clients that we've evaluated and helped over the years.

TYPE O - Over Insulinized

Type O is the most common presentation for type 2 diabetes, making up 65% of our incoming clients. It's characterized by over weight, particularly in the mid-section or around the viscera as well as high fasting and post-prandial insulin levels.

People with Type O are insulin resistant. This may be the primary or secondary presentation. They have reduced cellular sensitivity to insulin and therefore over-produce and/or over-release insulin, which leads to hyperinsulinemia. In turn, this drives adiposity, inflammation, oxidative stress, aging, and increases disease risk.

TYPE I - Insulin deficient

Type I is characterized by a lack of insulin production or release. This is different than type 1 diabetes, which is caused by autoimmune destruction of the pancreas, leading to little to no insulin production. Most people with Type I are normal or under-weight. They are typically not insulin resistance and show low insulin response on blood testing.

Type I is a sub-type of type 2 diabetes and can be caused by pancreatic burnout, or a dysfunction in the production or release of insulin. This dysfunction can, in many cases, be healed and reversed, given enough time and the right healing environment.

TYPE H - Hormone driven

Type H is primary or secondary hormone-driven blood sugar dysregulation. The most common hormone imbalance leading to problems with glucose tolerance is hypothyroidism and adrenal fatigue. In these cases, the lack of thyroid hormone or adrenal hormone regulation causes the blood sugar issues.

Once the hormone balance is discovered and treated, many people with Type H are able to achieve optimal metabolic health and blood sugar control.

TYPE S - Stress induced

Type S is stress-induced diabetes or metabolic dysfunction. High stress or an inappropriate stress response leads to high cortisol and adrenaline production, oxidative stress, inflammation, and insulin resistance, which causes diabetes. There are three categories of stress including major life events, daily stressors, and physiological stress such as chronic pain, gut dysfunction, and inflammation.

Understanding the sub-type is an important part of personalizing a treatment plan to help support your care and healing process. Once you have a better understanding of what's driving your blood sugar imbalances, you can design and follow a plan to address the root cause, gain optimal blood sugar control, and potentially reverse type 2 diabetes or metabolic dysfunction.

10 key factors to reverse type 2 diabetes

If you listen to conventional physicians and nutritionists, you might think that managing diabetes is all about diet, exercise, and medications. If that were true, diabetes would be easy to reverse and there would be far fewer people battling this complicated condition.

The truth is more complex. While diet and exercise are important, there are many factors that can influence blood glucose and stress the system leading to insulin resistance and diabetes. Here are the most significant ten factors that I've observed contributing to blood sugar imbalances and type 2 diabetes.

Diet

Diet is not everything, but it is certainly a key piece of the blood sugar puzzle. The secret is that there is no diet that is perfect for everyone. There may be, however, a perfect diet for you. Understanding the root cause of your elevated blood sugar, completing a thorough assessment, evaluating your current diet, analyzing your body composition, and doing proper lab testing will help you design the optimal dietary strategy for you.

There are lots of books and dietary theories regarding diabetes. Each of these works, at least for some people, but none of them will work for everyone. The major drawback of every book written for blood sugar control is that they are not customized for the person. The author has no idea what is causing your blood sugar to be out of balance, leading to diabetes and your specific situation.

In fact, it's the same problem that is plaguing the conventional approach to diabetes. Every patient gets the same diagnosis and virtually the same treatment. Doctor's follow an algorithm, or flow chart, that tells them what drugs to prescribe in each situation. That approach is good for insurance companies and good for pharmaceutical sales, but may not be the best thing for the patient.

It's important to approach diet individually and to customize a strategy that works for you. By doing that, you can control hormones such as insulin, leptin, and adiponectin, limit the toxic burden on your body, and start to heal your blood sugar system to ultimately reverse diabetes.

Physical Activity

While exercise is not essential for blood sugar control, it can be an important tool to help correct sugar problems, and to reverse type 2 diabetes. There are several types of exercise which can be important for the body to achieve optimal health and well-being and to control blood sugar levels.

Most people are aware that exercise is important and can help lower blood sugar and improve blood sugar levels, but understanding what type of exercise to do can make a huge difference. Some people excel with slow cardio, like walking or swimming. Others will benefit more from resistance training (weights), while some

actually do better with gentle exercise like hatha yoga or tai chi.

Creating the most optimal movement strategy by evaluating hormone status, adrenal and thyroid health, body composition, and general fitness level is an integral part of turning your condition around and mastering diabetes.

Body Composition

Type 2 diabetes is characterized by high free fatty acids in the blood and an accumulation of fat around the liver and pancreas. Losing weight for many people with pre-diabetes and type 2 diabetes (not all, but many) can be important, but burning the fat packed around the organs is even more important.

Research has shown that just a few grams of fat in the liver and pancreas can lead to insulin resistance and cause type 2 diabetes. Influencing physiology to burn this fat, rather than store it, is essential to achieve optimal blood sugar control.

Optimal Sleep

There are a number of studies linking poor sleep to insulin resistance, weight gain, and blood sugar problems. Sleep and rest are important for healing and proper endocrine function.

Without proper rest and sleep, it is nearly impossible to control blood sugar and reverse diabetes. Many people stay up too late, suffer with sleep problems, wake up frequently during the night, or suffer from insomnia, and these issues can short-circuit the best diet and lifestyle changes.

Sleep can be evaluated (without having to do a sleep study), and improvements can allow proper rest and recovery, which may be the key piece to help correct blood sugar imbalance.

Metabolic Function

Are you primarily a "sugar burner" or a "fat burner"? Most people with diabetes burn sugar preferentially over fat due to high blood insulin levels, which leads to more fat storage, elevated lipids, and metabolic dysfunction.

If you crave sugar or carbohydrates after a meal, have trouble going more than 4-5 hours without eating, have high triglycerides, or are over-weight (particularly in the midsection), you are likely a "sugar-burner". This means that your metabolism is looking for more sugar to fuel your energy and cellular function rather than tapping into the vast resource of stored energy in your fat cells.

Up-regulating your fat-burning metabolism by increasing insulin sensitivity, reducing blood insulin levels, optimizing thyroid hormone levels, and improving mitochondrial function may be the missing link to allow you to lose abdominal fat and achieve blood sugar balance.

Organ Health

The liver is the primary organ involved with type 2 diabetes. With over 2,000 mitochondria per cell, it's the center of metabolic function. The genesis of type 2 diabetes is hepatic (liver) insulin resistance, which leads to fat accumulation and high blood sugar.

There are other organs which are essential for proper blood sugar metabolism as well, including the thyroid gland, adrenal glands, muscles, kidneys, and pancreas. Supporting these organs with the right nutrients, and helping them to function optimally, will allow your body to regulate blood sugar levels internally and reverse the progression of type 2 diabetes.

Healthy Gut

Health starts in the gut. As mentioned previously the human micro biome is an area of intense study and new information is emerging each year regarding the role that the gut and micro biome play in blood sugar regulation, immune health, inflammation, and healing.

Evaluating gut function and supporting the digestive system with nutrients to heal and function properly, as well as bolstering the gut micro biome can help improve nutrient assimilation, reduce inflammation, and improve insulin sensitivity and glucose metabolism.

Taming Inflammation

Next to stress and poor dietary choices, the factor that seems to influence blood sugar levels the most is immune health. You may have noticed that when you get sick, your blood sugar tends to go up. Immune stress will absolutely trigger elevations in blood sugar, and keeping the immune system strong to avoid illness is essential to optimize glucose levels.

Inflammation drives many diseases of our time including cardiovascular disease, dementia, autoimmune, many forms of cancer, and certainly diabetes and metabolic dysfunction. Calming the inflammatory response can allow the body to heal and repair itself.

Chronic infections or repeatedly getting sick makes it difficult to properly control blood sugar, and virtually impossible to reverse type 2 diabetes. There are key strategies and nutritional support supplements which can keep the immune system well-balanced and healthy to ensure optimal blood sugar control.

Hormone Balance

There are a variety of hormones which affect blood sugar and can drive imbalances. Low thyroid function and adrenal fatigue are the two most significant factors. We also see estrogen/progesterone imbalance, testosterone deficiency, and gut hormone problems leading to blood sugar imbalance.

You may already be aware of hormone imbalances. If not, there are simple tests which can reveal thyroid levels, adrenal function, and sex hormone balance. Supporting these with the right nutritional approach, using food, lifestyle, supplementation, and replacement when necessary, is vital to achieve optimal blood sugar control

Nutrient Status

Nutrition is more than just the food we eat. In addition to the macronutrients (carbs, protein, and fat), there are hundreds of micronutrients that are essential for optimal body function and healing.

I previously discussed micronutrient testing, which can be important an way to evaluate your nutritional status. Once you understand what's lacking, you can support the body with key nutrients to bolster health, cellular function, physiology, and blood sugar regulation.

Reversing type 2 diabetes, pre-diabetes, and metabolic syndrome is much more complex than just making a few dietary changes or exercising. There are many factors which can contribute to type 2 diabetes and blood sugar problems. Each person is different. Sometimes, there may be a strong connection to sleep issues and other times it may be more related to hormone or gut imbalance.

Personalized care is about finding and addressing the root cause of high blood sugar in each individual. There's no one cause of type 2 diabetes, and therefore, there is no one cure.



The optimal diet for blood sugar control

What is the perfect diet to prevent and reverse type 2 diabetes? I'm sorry to disappoint you, but unfortunately, there is no such thing. At its best, nutritional therapy is customized to the individual and is dynamic and evolving, rather than a static set of rules.

There are, however, some guidelines which are important for anyone with blood sugar problems to follow, especially those with diabetes, pre-diabetes, metabolic syndrome, and insulin resistance. From here, the optimal diet can be adjusted to the individual based on blood sugar response, inflammation, energy, immune health, sleep quality, physical activity level, organ function or dysfunction, and overall health.

An optimal diet begins with whole foods. As my friend Sean Croxton says, "JERF: Just Eat Real Food". That's a good start. But for blood sugar control, unfortunately, it's not quite that simple. Whole, real foods are things like plants and animals. It's the only food that we would have access to if it were not for technology and agriculture.

There are some foods that should not be eaten by anyone. Let's start with the easy ones.

- ✦ Candy like starburst, skittles, snickers, m&ms, chocolates, and licorice.
- ✦ Anything that comes in a snack package, like potato chips, pretzels, crackers, cheese curls, cookies, pastries, and granola bars.
- ✦ Dessert-like foods such as donuts, pancakes, waffles, pastries, cakes, cookies, pie, ice cream, sorbet, and mousse.
- ✦ Refined flour-based foods like bagels, bread, pasta, and muffins.
- ✦ Sweetened (or naturally sweet) beverages like sweet tea, sweetened coffee, soda, sugary drinks (vitamin water, gatorade), and fruit and vegetable juice.
- ✦ Processed meat and meat products such as hot dogs, bologna, salami, and deli meats
- ✦ Fried foods and foods containing partially-hydrogenated vegetable oils

For optimal blood sugar regulation, there are a few additional types of food that should be avoided. These foods typically raise blood because they rapidly break down to sugar in the body. The blood sugar rush, and resulting insulin surge will interfere with proper blood sugar control.

- ✦ Grains, such as oatmeal, wheat, rice, quinoa, and barley as well as any products made from these foods.

- ✦ Starchy vegetables, such as potatoes, corn, and parsnips.
- ✦ Moderate-High glycemic fruits such as bananas, grapes, mango, papaya, melons, and pineapple, as well as dried fruits including raisins.
- ✦ Lactose-containing or sweetened dairy products such as milk, yogurt, and ice cream.

Now, let's focus on what to eat. The optimal diet for blood sugar control includes a wide variety of whole, real foods. The two main rules are simplicity and diversity. Keep things simple. Elaborated meal plan can be fun and interesting down the line, but in the beginning, can invite temptation and lead you astray. Apply diversity within the scope of foods you'll be eating. There are dozens of acceptable vegetables, fruits, nuts, seeds, beans, legumes, animal proteins, and beverages. Mix it up, focusing on a variety of colors so that you are getting a wide range of vitamins, mineral, antioxidants, and phytonutrients.

- ✦ Fibrous Vegetables such as broccoli, cauliflower, asparagus, spinach, greens, bell pepper, tomato, cucumber, and celery.
- ✦ Low glycemic fruits such as avocado, coconut, olives, berries, cherries, and apples.
- ✦ Animal protein such as grass-fed beef, free-range poultry, wild-caught fish, and organic eggs, as well as shellfish and organic pork in moderation.
- ✦ Nuts and seeds, such as macadamia nuts, almonds, walnuts, pistachio, sunflower seed, flax, chia, and hemp.
- ✦ Bean and legumes such as black bean, pinto beans, white and red kidney beans, as well as green peas and chickpeas in moderation.
- ✦ Healthy fat sources such as olive, coconut, avocado, nuts, organic meat and eggs, and butter from pastured cows.

In addition, there are certain foods that may be acceptable in limited quantities for some people, but may create problems in others. This largely depends on blood sugar response, food sensitivities, and inflammatory factors.

- ✦ Organic (preferably raw) dairy products with little to no lactose, such as cheese, whey protein, milk protein, cream, and butter from pastured cows.
- ✦ Alcohol is typically acceptable in limited quantities, particularly one serving of dry red or white wine or hard alcohol such as gin, vodka, or whiskey.

- ✦ Artificial sweeteners are generally not recommended, however, consuming them in chewing gum, mouthwash, and sugar-free breath mints in low moderation is probably safe.

There are a few other guidelines that are helpful to follow as well to ensure optimal success in controlling blood sugar and preventing and reversing type 2 diabetes.

It's best to eat two to three moderately sized meals per day rather than eating five to six meals, which is sometimes recommended. Continually eating throughout the day by "grazing" or eating frequent meals keeps the blood sugar, insulin, and leptin levels elevated and interferes with the healing and correction process. Instead, spread the time between feedings out at least 4-5 hours to allow insulin and leptin levels to reset.

While it may be difficult at first, it's best to avoid snacking between meals and before bed. For the same reason just discussed, snacking keeps the blood sugar and insulin elevated and interferes with the correction process. Snacking also reinforces food craving and emotional eating, which can be an issue for many people with blood sugar regulation problems.

Experiment with intermittent fasting (I.F.). I.F. involves going an extended period of time without food to allow blood sugar, insulin, and leptin levels to reset. During this fasting period, the primary nutrient the body uses for fuel is fat which improves metabolic efficiency and causes an up-regulation of insulin receptors on the cell membranes. One simple way of accomplishing this is to skip breakfast 1-2 days per week.

For most people with blood sugar problems, it's extremely important to limit carbohydrate consumption. A good starting point for most people who want to prevent or reverse type 2 diabetes is less than 50-75 grams of net carbohydrates per day. While this is a broad range, there are many differences based on size, condition, and physical activity level. Eventually, you may want to consider reducing your non-fiber carbohydrate consumption to 50 grams per day or less for optimal blood sugar control.

Low carb does not mean high protein, and it's also important to limit protein to a moderate level. Again, this is largely based on size, lean mass, and physical activity level. Generally, it's recommended to limit protein to around 75 grams per day and no more than 25 grams per meal. As stated, this can be adjusted based on lean body mass, size, sex, and physical activity.

Drink lots of water and eat high-water content foods. Water is essential for life and many people are chronically dehydrated. If you feel hungry, try drinking 12-16 ounces of water and waiting 20 minutes. Don't wait until you are thirsty. Start the day with a glass of water and sip water, herbal tea, and green tea throughout the day. Squeezing a lemon or lime wedge in the water is acceptable, and using carbonated water in moderation is fine as well.

Helpful supplements and essential oils

Addressing blood sugar and reversing type 2 diabetes is a process that requires patience and persistence. The primary factor is a healthy diet designed to improve blood sugar and insulin metabolism with reduced carbohydrates, moderate protein, and high in healthy fats. Other factors include physical activity, stress management, sleep quality, reducing toxicity, inflammation, and oxidative stress, and improving hormone balance.

Another key factor to preventing and reversing type 2 diabetes and blood sugar imbalance is supporting nutrient insufficiencies and supplementing the diet with key botanical agents to improve insulin and blood sugar metabolism.

Plant-based medicinal supplements can be very effective at helping to regulate, control, and improve blood sugar levels long term, but addressing the root cause, insulin resistance. There are dozens of vitamins, minerals, and plant extracts which have been studied using controlled clinical trials, and have shown positive benefits.

Here are some of the most effective and promising nutrients:

Chromium Polynicotinate - Chromium improves insulin sensitivity, reduces insulin resistance, and improves glucose uptake. Dozens of studies have shown the benefits of chromium on blood sugar and diabetes.

✦ Recommended dose: up to 1,000 mcg per day

Biotin - Combined with chromium, biotin has been shown to improve carbohydrate metabolism, reduce blood sugar levels and create more insulin sensitivity. In addition, it has been shown to lower cholesterol and reduce the risk of heart disease.

✦ Recommended dose: 2-9 mg per day

Vanadyl Sulfate - Improves glucose metabolism, insulin sensitivity, and mimics the activity of insulin directly stimulating insulin receptors.

✦ Recommended dose: 50-100 mg per day

Omega 3 fatty acids (DHA, EPA) - Reduces inflammation, protects the lining of the blood vessels, prevents blood clots, enhances circulation, improves hormone sensitivity, lifts mood, improves attention, and nourishes the brain.

✦ Recommended dose: 2-4 grams per day of combined EPA and DHA

Gymnema Sylvestre - Ayurvedic herb used for blood sugar regulation since 600 BCE. Decreases absorption of glucose in the blood, blocks the taste of sugar and may help with appetite control and sugar cravings. Studies have shown a possible effect of regenerating beta cells in the pancreas.

✦ Recommended dose: 400 mg per day

Alpha Lipoic Acid - Powerful antioxidant for both fat and water soluble toxins. Enhanced energy production and carbohydrate metabolism. Improves insulin sensitivity, prevents against glycation from elevated sugar. Effectively improves the symptoms of peripheral neuropathy.

✦ Recommended dose: 1200 - 1800 mg per day

Bitter Melon (gourd) - Contains compounds that improve blood sugar metabolism, and transport glucose into the cells. Inhibits enzyme that breakdown carbohydrates into smaller pieces for absorption. Improves insulin resistance and prevents diabetic complications.

✦ Recommended dose: 2-5 g per day

Cinnamon extract - Slows the gastric emptying time, delaying the glycemic response. Improves insulin sensitivity, reduces insulin resistance, and acts as an antioxidant protecting the cell membranes. Contains a bioactive component with "insulin-like" properties.

✦ Recommended dose: 2-4 g per day

Berberine - Plant alkaloid that is used in Chinese and Ayurvedic medicine to reduce blood sugar levels. Helps prevent and treat type 2 diabetes, by activating AMPK, which stimulates uptake of sugar and improves insulin sensitivity. Also reduces glucose production in the liver.

✦ Recommended dose: 500-2,000 mg per day

Banaba Leaf - Medicinal plant that lowers blood sugar by producing an insulin-like effect.

✦ Recommended dose: 32-48 mg per day

Green Tea extract - Rich in polyphenols, antioxidants that reduce inflammation, increase insulin activity, and prevent type 2 diabetes. Also helps to reduce blood pressure, improve metabolism, reduces glucose absorption in the gut, and limits the liver's production of glucose.

✦ Recommended dose: 250-500 mg per day

Essential Oils

In addition to specific vitamins, minerals, and powdered botanical supplements, there are several essential oils which can be very effective at improving insulin sensitivity and reducing blood sugar levels. Essential oils have been used for thousands of years to support health and healing and numerous research studies have shown their efficacy for supporting blood sugar health.

Cinnamon

Probably the most well-researched botanical product for blood sugar health is cinnamon. Much of the research performed for cinnamon and diabetes uses the powdered spice, with a great deal of data showing benefits for pancreatic support, glucose lowering, weight loss, and general diabetes prevention and management.

Recent studies have demonstrated cinnamon's ability to reduce glucose levels, as well as triglyceride, LDL cholesterol, and total cholesterol levels in patients with Type 2 diabetes. While the specific mechanics are still unclear, cinnamon extract has also been found to increase insulin sensitivity.

One advantage of the essential oil is that just a few drops may be equivalent to 5-10 grams of the powdered spice. When using cinnamon essential oil, internal use appears to be most effective.

Coriander

Traditionally people have used Coriander to heal anorexia, gas and bloat, abdominal pains and diarrhea. Research has shown that coriander oil offers dual blood glucose-lowering effects in people with diabetes. First, it works by increasing the secretion of insulin from the pancreas, and second, by exhibiting insulin-like activity at the cellular level.

Coriander has also been shown to reduce triglycerides levels, total cholesterol and LDL cholesterol while significantly increasing HDL cholesterol.

Clove

Clove is another fantastic spice that not only adds tremendous flavor to both sweet and savory dishes, but also has numerous health benefits, particularly for people with diabetes. Clove has been found to lower glucose levels and total cholesterol in people with type 2 diabetes. In animal studies, clove oil has also been found to reduce chronic inflammation.

Grapefruit

Grapefruit contains a flavonoid called naringenin which has been shown to have some important effects for blood sugar regulation and overall health. It's an antioxidant, promotes carbohydrate metabolism, has anti-inflammatory effects, and helps to modulate immune function.

One study showed that grapefruit extract was able to reduce LDL cholesterol by 42% and improve insulin sensitivity by 64%.

Black Pepper

Black pepper oil has been used for thousands of years. The ancient Egyptians actually used it in their mummification process. It has also traditionally been used as an anti-oxidant, anti-inflammatory and anti-spasmodic element.

Research has determined that black pepper oil has the ability to modify aldose reductase activity, one of the mechanisms behind the development of various secondary complications of diabetes.

Using these agents individually or in combination has been shown through various trials to have documented benefits. It's important to work with a doctor trained in functional medicine or a diabetes educator with a working knowledge of diet and effective supplement support and how these may interact with medications. It's important to discuss any changes to your health regime, including dietary changes or supplements with your personal physician so he's aware of the changes and can treat you accordingly.



Resources

The Diabetes Summit

A free annual online conference for anyone interested in blood sugar health, diabetes, weight loss, and metabolic health.

<http://www.thediabetessummit.com>

Mastering Diabetes Premier Program

The world's premier program for people who want to find and address the root cause of blood sugar imbalances to normalize blood sugar, reduce need for medications, and help reverse type 2 diabetes, metabolic syndrome, and pre-diabetes naturally

<http://www.drmowll.com>

The 8 Week Blood Sugar Bootcamp

The 8 week interactive program designed to help people gain control of their blood sugar and start the process of reversing type 2 and pre-diabetes using a natural, functional medicine approach.

<http://www.drmowll.com>

Professional Supplements

Dr. Mowll's preferred dispensary for obtaining high quality, professional-grade supplements to support the health and healing process.

<http://bit.ly/drmowll>

Therapeutic Grade Essential Oils

The essential oils that Dr. Mowll recommends are the highest quality available, naturally and indigenously sourced for the best potency and effectiveness.

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Dr. Brian Mowll is the founder and medical director of SweetLife® Diabetes Health Centers and serves clients worldwide as The Diabetes Coach™. He is a master licensed diabetes educator (MLDE), CDE, and was one of the first doctors to be certified to practice functional medicine by the prestigious Institute for Functional Medicine.

Since 1998, Dr. Mowll has been helping people with all forms of diabetes properly manage their complex health conditions. Additionally, with type 2 diabetes, pre-diabetes, and metabolic syndrome, his goal is to not just manage, but to reverse these conditions using a natural, personalized lifestyle approach.

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The Blood Sugar Manifesto
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