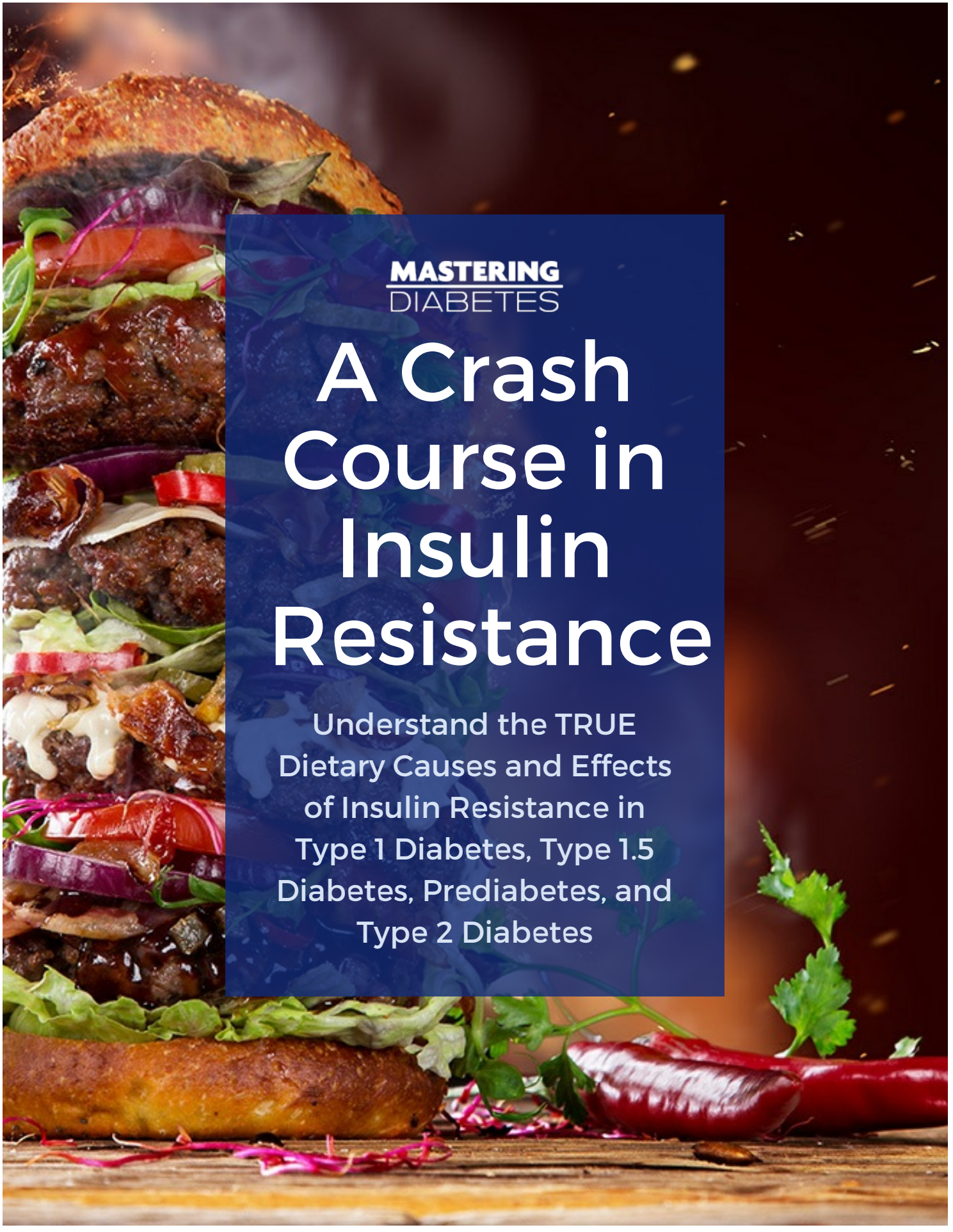


MASTERING
DIABETES

A Crash Course in Insulin Resistance

Understand the TRUE Dietary Causes and Effects of Insulin Resistance in Type 1 Diabetes, Type 1.5 Diabetes, Prediabetes, and Type 2 Diabetes

The Causes of Insulin Resistance in Type 1 Diabetes, Type 1.5 Diabetes, Prediabetes and Type 2 Diabetes

Insulin resistance is the common thread that underlies all forms of diabetes. In this ebook, you'll find out exactly why.

Most people believe that people with type 1 diabetes are not insulin resistant simply because they are not overweight. This could not be farther from the truth.

While insulin resistance affects many overweight individuals, many people with type 1 diabetes remain skinny their entire lives despite a large degree of insulin resistance (1–3).

Over the past decade, we have helped many people with type 1 diabetes, prediabetes and type 2 diabetes measure, track and reverse insulin resistance. In practice, 100% of all our clients with type 1 diabetes suffer from insulin resistance despite the *assumption* that they were insulin sensitive.

By measuring their baseline insulin resistance, we were able to identify an impaired ability to utilize glucose as a fuel, and through dedicated diet modification and frequent exercise, some of our clients have reduced their insulin usage by as much as 60%.

If you have type 1 diabetes, do not be fooled into thinking that you are insulin sensitive simply because you are skinny. Insulin resistance is a

hidden condition, and affects both normal weight and overweight individuals (1–3).

What Causes Insulin Resistance?

Insulin resistance underlies all forms of diabetes, and is a condition which primarily affects your muscles, liver and adipose tissue.

Many people think that diabetes is caused by an excess intake of sugar and candy starting from a young age. While eating artificial sweeteners and drinking soda can certainly increase your risk for the development of insulin resistance and diabetes, in most cases diabetes is caused by excessive FAT intake.

The most important thing you can do as a person with diabetes is understand the following:

Diabetes is caused by a fat metabolism disorder, which results in a glucose metabolism disorder. At the heart of all forms of diabetes is insulin resistance, a condition fueled primarily by the intake and accumulation of excess fat across many tissues.

This concept is one of the most fundamental realities that can significantly improve your ability to control blood glucose. While most diabetes education will instruct you to count and minimize your carbohydrate intake, this does nothing to treat the underlying condition of insulin resistance.

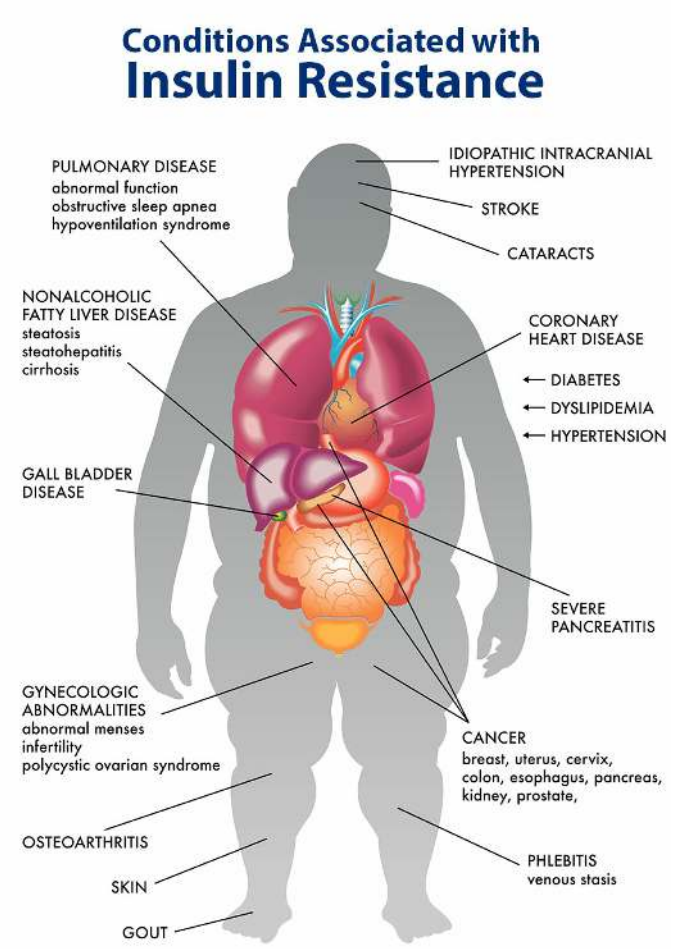
In fact, minimizing carbohydrate intake results in an increase in fat intake, which makes you more insulin resistant over time. Minimizing carbohydrate intake only treats the *symptoms* of diabetes (high blood glucose), and often results in increased insulin resistance over time.

Importantly, insulin resistance is a *risk factor* for many chronic health conditions, including heart disease, high blood pressure (hypertension), high cholesterol, cancer, diabetes, Alzheimer's disease, kidney failure, stroke and nerve damage.

Unfortunately, insulin resistance is grossly misunderstood, and as a result there are many fad diets that claim to improve overall health but actually *increase* insulin resistance. As a consumer, it is very challenging to

understand exactly what information to ingest and what information to disregard. Food manufacturers take advantage of this, and intentionally deceive people into buying their products.

But you are highly intelligent, highly motivated and are capable of applying these powerful methods to your daily life, and experience the difference that it makes first hand. By directly reducing your level of insulin resistance, you will improve the health of every organ in your body, to prevent against the conditions listed in the following diagram:



Low-Carbohydrate Diets are High-Fat Diets *by Definition*

A wealth of evidence supports the concept that insulin resistance results from the accumulation of excess fatty acids in tissues that are not designed to store fat, such as the liver and muscle. As these tissues accumulate fat over time, they experience cellular distress and mitochondrial dysfunction, which then results in a significantly impaired ability to respond to insulin (4–27).

There are a few fundamental problems with the no-carb or low-carb strategy that is specifically designed to reduce your intake of glucose (the primary breakdown product of carbohydrates):

- Glucose is a molecule which can be used by every tissue in the body for immediate energy
- Glucose is the very molecule that body tissues are designed to use as fuel
- Limiting carbohydrate intake results in the consumption of high amounts of protein and fat, which promote increased fat storage and exacerbate insulin resistance
- Eating large quantities fat directly blocks the action of insulin in the muscle and liver

Let's discuss the 3 causes of insulin resistance in detail.

Insulin Resistance Cause #1: Lipid Overload

There is only one tissue in your body that is designed to store fat, and that tissue is called adipose tissue (fat tissue). Fat tissue is perfectly designed to uptake, store and export fatty acids, and possesses all of the enzymatic machinery to do so.

Most importantly, fat tissue is an elastic tissue which expands and contracts in response to periods of high and low fatty acid availability.

When fatty acids are available, adipose tissue expands.

When fatty acids are limiting, adipose tissue contracts.

This very elastic behavior of adipose tissue is exactly what results in

weight gain and weight loss, and can be manipulated to your advantage if weight loss is your long-term goal.

Insulin Resistance Cause #2: Refined Carbohydrates

We've all heard that you should eat less sugar, and eliminate food additives like high fructose corn syrup, because they increase your risk for cancer, heart disease and diabetes. But why is that the case?

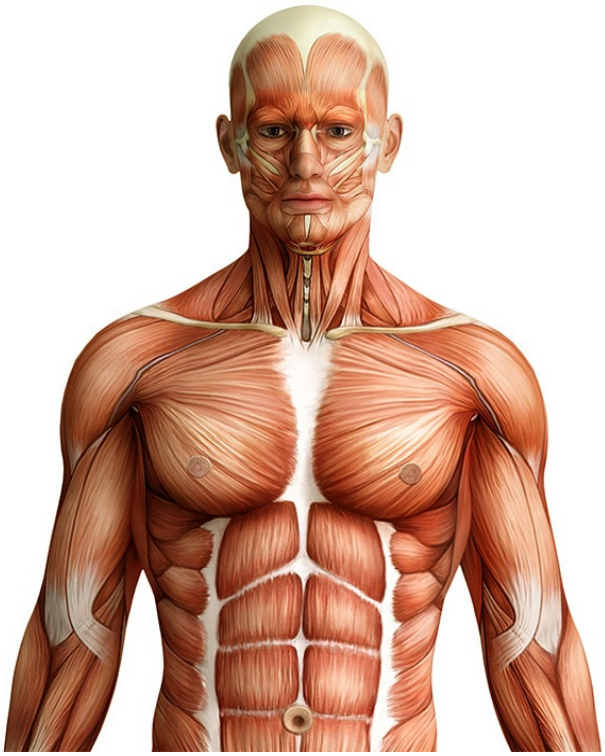
One simple way that refined carbohydrates promote diabetes is specifically by causing insulin resistance in the liver. Think of your liver as a glucose sponge, whose responsibility is to uptake glucose when it first appears in your bloodstream. In this way, your liver is actually *protecting* other tissues against large glucose surges following a carbohydrate-rich meal.

If you haven't done so already, thank your liver for acting as a glucose sponge every time you eat carbohydrates – it is literally sparing other tissues from metabolic damage caused by the rapid appearance of glucose.

When you eat refined carbohydrates - most often disguised as sugarnyms in packaged and processed food products – the breakdown products of these artificial sweeteners (mainly glucose and fructose) flood your liver immediately.

Insulin Resistance Cause #3: Insufficient Movement

Mitochondria are cellular organelles that function as cellular power plants. In the same way that a power plant produces electricity for a city, mitochondria are responsible for the production of energy derived from the breakdown of carbohydrates and fatty acids.



Mitochondria oxidize or “burn” carbohydrates, amino acids and fatty acids for energy, yielding ATP. ATP is the cellular form of energy utilized by cellular processes all throughout the body, providing the energy to pump your heart, power neurons in your brain, contract muscles in your limbs, exchange gases in your lungs, extract nutrients from food and regulate body temperature, to name just a few.Insufficient movement results in low mitochondrial number and a reduced ability to “burn” fuels. As a result, the muscle tissue is prone to accumulating fatty acids as triglycerides, resulting in insulin resistance.

Since muscle tissue occupies more than 40% of the human body by mass, a reduced ability of muscle mitochondria to burn fatty acids and glucose for energy is partly responsible for feelings of low energy and sluggishness that many people with diabetes experience.

Insulin resistance is a metabolic disaster for muscle tissue, and reversing insulin resistance involves the direct “reprogramming” of muscle mitochondria.

More importantly, defective muscle mitochondrial function often induces a mild inflammatory state within the muscle tissue that results in the production of blood borne myokines that signal a state of stress to circulating immune cells.

Take Home Messages

The take home message of this article is simple: insulin resistance has 3 very clear causes, and taking a series of specific actions can result in significantly increased insulin sensitivity in a short period of time.

- If you have type 1 diabetes, do not be mistaken into thinking that you are insulin sensitive simply because you are normal weight or skinny.
- If you have type 2 diabetes, insulin resistance is the underlying cause of high blood glucose.

Looking for a Diabetes Coach to Help You Transition?

If you're looking for education, guidance, and accountability to help you transition to a plant-based diet for the BEST diabetes health you've ever had, sign up for a free strategy session to see if you're a good fit for an online group coaching program (type 1, type 1.5, prediabetes and type 2 diabetes).

LEARN ABOUT OUR COACHING PROGRAMS

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