

What Can Berberine Do For You?

Berberine is a yellow alkaloid found in goldenseal root, barberry bark, Oregon grape root, and coptis (goldthread) root. It is an antioxidant that is antibacterial, antiparasitic, antifungal, antiviral, anti-amoebic and has also been shown to:

- Decrease insulin resistance
- Stabilize blood sugar
- Activate AMPK
- Increase glycolysis inside the cells
- Slow the breakdown of carbohydrates in the gut
- Increase some beneficial bacteria in the gut
- Reduce triglycerides
- Balance cholesterol
- Lower blood pressure
- Increase mitochondria production
- Reduce the risk of heart disease
- Reduce fatty liver

Berberine For Weight Loss

Berberine studies produced weight loss and improvement of triglyceride, leptin, and cholesterol levels in obese patients (leptin is a hormone involved in hunger). Berberine has also been shown to inhibit the production of body fat cells.

Berberine is believed to activate the enzyme called AMP-activated protein kinase (AMPK). AMPK, sometimes referred to as a “metabolic master switch,” is an enzyme inside our cells that plays a major role in cellular energy homeostasis, activating glucose and fatty acid uptake when cellular energy is low. This enzyme plays a major role in regulating blood sugar and metabolism.

Berberine For Diabetes

Berberine has been shown in studies to work as well as the most commonly prescribed drugs taken for diabetes, metformin, rosiglitazone, and glipizide, to control blood sugar. Berberine reduces insulin resistance and lowers blood sugar levels. It also increases glycolysis inside cells, signals the liver to decrease glucose production, and slows the breakdown of carbohydrates in the gut. Berberine may also positively affect other enzymes and genes that affect blood sugar.

Berberine For Heart Health

Studies have shown that berberine can improve overall heart function in more than one way. Berberine may help repair and protect heart muscle cells. Berberine seems to improve the quality of life for patients with chronic congestive heart failure by helping to exercise lung capacity and reducing fatigue. Berberine also lowers lipid levels, prevents harmful fat deposition, increases fat burning in the mitochondria, relaxes the arteries, lowers blood pressure, and increases blood flow.

Berberine For Gut Health and the Immune System

Berberine exerts selective antimicrobial action, killing a wide range of harmful organisms without harming the microbiome. In fact, it promotes a healthy gut colony.

Many, if not all of berberine's health benefits may be more a result of berberine's effect on the gut microbiome than anything else. Researchers have shown that a very low percentage of berberine is actually absorbed from our gut into the rest of the body. But berberine increases the quantity of *Akkermansia muciniphila*, a beneficial gut bacteria that has

been inversely associated with obesity, diabetes, inflammation, and metabolic disorders. This bacteria is necessary for sufficient mucin thickness, which lines the gut, protects the intestines and the microbiome from damage, and keeps undigested food particles and pathogens from entering the rest of the body.

Without enough of the mucin layer, the gut becomes leaky and inflamed, which leads to chronic inflammation and insulin resistance, and then many more autoimmune symptoms result from this.

Low concentrations of berberine have also been shown to increase other beneficial bacteria including *Bacillus subtilis*, *Bifidobacterium adolescentis*, and *Lactobacillus acidophilus* but high concentrations can inhibit many of these microorganisms.

For more on gut health, see [How To Heal Your Gut](#).

What Supplements Go Well With Berberine?

If you suffer from autoimmune disease or are dealing with an infection it's probably wise to start off with a higher dosage of berberine and then after a week or two to scale back to a lower dosage to allow more of the beneficial bacteria to flourish.

In an unhealthy gut, fungal activity is virtually always present and proper enzymatic activity is certain to be lacking. In this supplement stack we include SF722 which is the best supplement we know of to kill fungi. There is also the AMD probiotic which is designed not just to supply the gut with beneficial bacteria but also to help the friendly microbes flourish with prebiotics and enzymes. The bacteria in this supplement work well with berberine. The MycoCeutics

complex is a mushroom complex. Just like bacteria, there are beneficial fungi and pathogenic fungi. I take the MycoCeutics and the SF722 separately, at least a few hours apart.

- [Berberine 500mg – Thorne Research](#)
- [Formula SF722 – Thorne Research](#)
- [Syntol AMD – Arthur Andrew Medical](#)
- [MycoCeutics MycoPhyto Complex – EcoNugenics](#)

Recommended Reading:

- [Best Supplements To Kill Candida and Everything Else You Ever Wanted To Know About Fungal Infections](#)
- [Holistic Guide to Healing the Endocrine System and Balancing Our Hormones](#)
- [Best Supplements To Kill Lyme and Everything Else You Ever Wanted To Know About Lyme Disease](#)

Sources:

- [Berberine: The Microbiome's Super Booster – Enzymedica](#)
 - [Berberine – A Powerful Supplement With Many Benefits – Healthline](#)
 - [Effect of berberine on Escherichia coli, Bacillus subtilis, and their mixtures as determined by isothermal microcalorimetry – NCBI](#)
 - [6 Proven benefits of Berberine – Selfhacked](#)
 - [Berberine to Boost Weight Loss & Lower Blood Sugar – Alive By Nature](#)
 - [Meta-analysis of the effect and safety of berberine in the treatment of type 2 diabetes mellitus, hyperlipemia and hypertension – NCBI](#)
 - [Berberine in the Treatment of Type 2 Diabetes Mellitus: A Systemic Review and Meta-Analysis – NCBI](#)
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Artificial Sweeteners Can Harm Gut Bacteria and May Lead To Diabetes, Obesity, and Cardiovascular Disease

U.S. consumption of artificial sweeteners has risen substantially in the last 20 years. Soda likely comes to mind, but aspartame and sucralose are being put into more and more products from bread to toothpaste. As more studies are being done, artificial sweeteners seem to be connected to more and more negative health consequences. That's probably because they're poison.

Artificial Sweeteners May Harm Gut Bacteria

Ariel Kushmaro is a professor of microbial biotechnology at Ben-Gurion University. He told Business Insider, "My recommendation is to not use artificial sweeteners." Kushmaro and his team performed a study with common artificial sweeteners and E. coli bacteria. Don't confuse this bacteria with the kind that makes us sick; E. coli is a beneficial bacteria in healthy human intestines.

Factory farming is how we get the "superbug" variety of E. coli. The "superbug" variety of E. Coli can happen when a cow is fed a very acidic, glyphosate-heavy grain diet while being pumped full of antibiotics. Whatever doesn't kill you...

Researchers exposed the E. coli to six artificial sweeteners including aspartame (Equal, NutraSweet), sucralose (Splenda), and saccharin (Sweet'N Low). They also subjected the bacteria to various protein powders and flavoring packets that use

artificial sweeteners.

After dosing the E. coli bacteria with artificial sweeteners 'hundreds of times,' Kushmaro concluded the sweeteners had a toxic, stressing effect, making it difficult for gut microbes to grow and reproduce. The researchers think that a couple of artificially sweetened sodas or coffees a day could be enough to have an influence on gut health –and could even make it tougher for the body to process regular sugar and other carbohydrates.” – [Business Insider](#)

Obviously, we need more testing. Fortunately, Kushmaro plans to run more of these kinds of experiments to see how artificial sweeteners alter the human gut microbiome.

Related: [How To Heal Your Gut](#)

Artificial Sweeteners Won't Reduce Appetite, or Satisfy Sugar Cravings

Sugar-sweetened foods trigger hormones throughout the body and chemicals in the brain that leaves us feeling satisfied after eating. The phenomenon, how it works, is similar to what happens with addiction to drugs. The satisfaction is short-lived, but it's there. But artificial sweeteners don't provide the sugar, or any calories for that matter, so scientists say the “food reward” system is never activated. This is probably why artificial sweeteners are shown to increase appetite, and sugar cravings as well.

Some researchers believe that artificial sweeteners do not satisfy our biological sugar cravings in the same manner as sugar, and could therefore lead to increased food intake. However, the evidence is mixed.” – [Healthline](#)

Related: [Healthy Sugar Alternative and More](#)

Artificial Sweeteners May Promote Obesity

In addition to promoting overeating, there are other mechanisms with which artificial sweeteners may promote weight gain. Sweet taste receptors are found not just in the mouth, but also in the [bladder](#), the [lungs](#), and our [bones](#). Recent research looked at how artificial sweeteners affect our cells that make up our fat stores.

The new research, results of which were presented at ENDO 2018, the 100th annual meeting of the Endocrine Society in Chicago, looks at the effect that artificial sweeteners have on the cells that make up our fat stores. These cells have a glucose transporter (a protein that helps glucose get into a cell) [called GLUT4](#) on their surface and, when we eat more sugar, the cells take up more glucose, accumulate more fat and become larger. The researchers in this latest study found that the artificial sweetener, sucralose, commonly found in diet foods and drinks, increases GLUT4 in these cells and promotes the accumulation of fat. These changes are associated with an increased risk of becoming obese.” – [The Conversation](#)

Artificial Sweeteners May Lead To Diabetes

Dr. Brian Hoffman, George Ronan, and Dhanush Haspula are the authors of [a new study](#) that found a link between consuming artificial sweeteners and changes in the blood that increases the prevalence of type 2 diabetes. Researchers found that acesulfame potassium, a sugar substitute, accumulated in the blood of rats tested. This accumulation of potassium harmed

the cells that line blood vessels. The study indicates that artificial sweeteners can alter how the body processes fat and how we use energy at a cellular level. According to the authors, this vascular impairment may lead to diabetes (and obesity).

Gut ecology plays a huge role in disease, including diabetes, and medical science is at the forefront of realizing this. A potential new treatment hailed to be a likely medical breakthrough removed the mucous membrane of the small intestine to cure type 2 diabetes. The treatment inserts a balloon into the small intestine and inflates the balloon with hot water, hot enough to kill the gut's mucous membrane. Within two weeks, if the patients eat well enough, a healthier membrane develops.

By destroying the mucous membrane in the small intestine and causing a new one to develop, scientists stabilized the blood sugar levels of people with type 2 diabetes. The results have been described as 'spectacular' – albeit unexpected – by the chief researchers involved. In the hourlong procedure, trialled on 50 patients in Amsterdam, a tube with a small balloon in its end is inserted through the mouth of the patient down to the small intestine.

“Even a year after the treatment, the disease was found to be stable in 90% of those treated. It is believed there is a link between nutrient absorption by the mucous membrane in the small intestine and the development of insulin resistance among people with type 2 diabetes.” – [The Guardian](#)

It stands to reason that if foods and chemicals like artificial sweeteners negatively influence our gut ecosystem, this damage may promote diabetes, as well as a host of other chronic illness.

Related: [Holistic Guide to Healing the Endocrine System and Balancing Our Hormones](#)

Artificial Sweeteners May Contribute to Cardiovascular Disease and More

Researchers from the University of Manitoba's George & Fay Yee Centre for Healthcare Innovation reviewed 37 trials that followed a total of more than 400,000 people for an average of 10 years. The study showed a link between artificial sweetener consumption and increased risk of obesity, high blood pressure, diabetes, heart disease, and other health issues.

Artificial Sweeteners Are Likely To Promote Candida

Modern health loves to compartmentalize everything. Natural health practitioners generally have a more holistic outlook. Our belief is and has been, that toxic chemicals do damage to the body in a myriad of ways, including damage to the gut microbiome. Damaging the gut's ecosystem has long-lasting, far-reaching consequences to virtually every facet of health.

Damage feeds candida and other pathogens. Cells in the body are made up of sugars and starches. When these cells are damaged they can feed pathogens. A healthy gut feeds the body with healthy, beneficial bacteria (it's a misnomer that all bacteria is supposed to stay in the gut). An unhealthy gut with pathogens feeds the whole body pathogens.

Toxic chemicals damage the gut's ecosystem and they also do damage all over the body in various ways. This promotes pathogenic proliferation. Candida is a normal part of a healthy gut colony, but if beneficial bacteria is damaged enough candida is very likely to take over. If not candida,

other another fungus is likely there ready and waiting. It's nearly impossible to kill fungal spores. Once they proliferate it's a challenge to get them under control, especially with our modern sugar and toxin-laden diets.

Related: [*Best Supplements To Kill Candida and Everything Else You Ever Wanted To Know About Fungal Infections*](#)

How to Reverse Insulin Resistance: The Secret is Sensitive Cells

The relationship between your cells and your hormones determines, to a large extent, how healthy you are.

For example, when our cells are resistant to the effects of insulin (one of the main anabolic and energy-storage hormones in the body), we have a higher chance of developing metabolic diseases such as type 2 [diabetes](#), obesity, and heart disease.

In contrast, insulin sensitive cells are able to efficiently and effectively respond to insulin in a way that allows us to carry out many of the vital mechanisms needed to maintain health and prevent disease.

Altogether, this biological phenomenon is known as insulin sensitivity, and it plays a significant role in fat loss, hormone balance, metabolic function, and disease prevention. When the majority of our cells aren't insulin sensitive, this can lead to a condition called insulin resistance, which significantly increases the risk of heart disease and type 2 diabetes.

Fortunately, you won't be stuck at a specific level of insulin resistance for the rest of your life. In fact, there are several strategies you can use to increase your receptivity to insulin and reverse insulin resistance – but before we implement them, let's take a closer look at insulin and insulin resistance.

Related: [*Holistic Guide to Healing the Endocrine System and Balancing Our Hormones*](#)

What is Insulin? The Lifesaving Effects of a Highly Misunderstood Hormone

Insulin is a protein-based hormone secreted by the [pancreas](#) in response to increases in [blood sugar](#) and certain amino acids. Insulin's primary role is to regulate the nutrients you absorb from food, primarily carbohydrates.

When you eat and digest carbs, it increases how much sugar is in your bloodstream. This is detected by the cells in your pancreas which will then secrete insulin into the blood. Once the insulin is traveling in your bloodstream, it will start binding to your cells and stimulate them to take in and utilize the sugar.

The purpose of this action is to reduce the amount of sugar in your blood and trigger the cells to use it and/or store it. This is essential for our health because abnormally high amounts of sugar in the blood can cause harm throughout the body. In some cases, having high blood sugar levels can even cause major health issues and become fatal if not managed properly.

With that being said, everything about insulin isn't "good." In fact, this (not so) superhero hormone hinders the one key metabolic process that allows us to lose fat: Fat burning.

Insulin, Carbs, Weight Gain, and Fat Loss: What is the Real Cause of the Obesity Epidemic?

With the increasing popularity of low-carb diets and the belief that carbs make you fat, insulin and carbs have been demonized as the reason why we gain fat. Although there is some truth to this (because insulin tends to stimulate sugar use and shut down fat burning), the hypotheses that arose from this understanding are not supported by the evidence.

For example, one of the most popular explanations for the growing obesity epidemic in westernized countries is that our carb-heavy diets keep our insulin levels so high that it prevents us from burning stored fat. This is known as the “Carbohydrate-Insulin Hypothesis,” and it’s touted as the main reason for why low carb diets, like the ketogenic diet or the Atkin’s diet, are so effective at boosting fat loss.

Makes sense, right? Just cut the carbs to decrease insulin levels, and you will trigger fat burning and lose fat. This hypothesis is accurate in some aspects, but it neglects the bigger picture.

Related: [How To Heal Your Gut](#)

If we consider the totality of the biochemistry and physiology of digestion and energy metabolism – without exaggerating insulin’s effects on fat cells – insulin is simply one piece of information that feeds into what the body decides to do.

Put in another way: insulin provides our cells with info regarding glucose availability and energy status, and our cells will integrate that information with all the other information they have about their own energy status, needs, and abilities to come up with the appropriate actions.

The ultimate result is that cells burn energy when they need

fuel and stop burning energy when they don't – insulin is just one of the hormones involved in the decision-making process of the cells. This means that your energy intake (i.e., calorie consumption) is the ultimate determining factor of whether you gain or lose weight. Insulin is but one of the multitude of factors that determines what you do with the calories you consume.

The Relationship between Insulin, Insulin Resistance, and Insulin Sensitivity

With this deeper understanding of the relationship between insulin and our cells, a much more accurate model of insulin resistance arises as well. Although carbs are the main reason why insulin is released, what is going in the cell is the ultimate determinant of how it will respond to that insulin.

Thus, the key to reversing insulin resistance as a whole is increasing the insulin sensitivity of each individual cell. Sounds simple enough, but how can accomplish such a solely cellular feat? To answer this question, we must develop a better sense of insulin sensitivity.

What is Insulin Sensitivity Exactly?

Insulin sensitivity is the term that we use to describe how the cells in our body respond to insulin. The more insulin sensitive your cells are, the more responsive they will be to insulin, and vice versa.

To measure this phenomenon objectively, we need to figure out how much insulin your body needs to produce to deposit a certain amount of glucose (sugar). You are considered insulin

sensitive if your body only needs to secrete a small amount of insulin to deposit glucose into the cells, and you are considered insulin resistant when you need a higher than normal dose of insulin for the cells to respond.

Insulin sensitivity has turned into a widespread phenomenon in the weight loss industry because of the strong correlation between insulin sensitivity and body fat percentage. The research literature suggests that increasing your insulin sensitivity (which also means decreasing your insulin resistance) will reduce your risk of heart disease, type 2 diabetes, obesity, and Alzheimer's disease. In other words, if you want to lose fat and improve your overall health, it is probably best to optimize your insulin sensitivity.

Related: [*Sugar Leads to Depression – World's First Trial Proves Gut and Brain are Linked \(Protocol Included\)*](#)

What Determines How Insulin Resistant You Are?

Both modifiable and non-modifiable factors determine the degree to which you are insulin sensitive or insulin resistant.

Non-modifiable factors are factors that cannot be changed. Some examples of **non-modifiable factors** that decrease insulin sensitivity are:

- **Increasing age.** Research has found increasing age to be associated with increased insulin resistance. However, it is possible to prevent this decline in insulin sensitivity with the lifestyle changes we will talk about later.
- **Genetics.** Your genes can determine how sensitive certain cells are to insulin. For one example of what I mean by this, check out our article on [polycystic ovary syndrome](#) – a condition that is intimately linked with cells that

were left vulnerable to insulin resistance by specific genes.

- **A family history of type 2 diabetes.** The combination of genetic and environmental factors that come with your family history can leave you with a higher risk of developing insulin resistance.
- **Ethnic background.** If you are of African-American, Asian-American, Latino/Hispanic-American, Native American, or Pacific Islander descent, you have a greater likelihood of developing insulin resistance.

In contrast, **the modifiable factors** (i.e., what you can actually do to increase your insulin sensitivity) are

- losing weight
- reducing stress levels
- maintaining a calorie deficit
- decreasing caffeine consumption
- eating less processed foods and sugar
- exercising
- getting adequate sleep
- taking specific supplements and/or drugs that decrease insulin resistance
- fasting/intermittent fasting
- and many more that we will take a closer look at later in this article

By neglecting to use these modifiable risk factors to your advantage, you will steadily reduce your insulin sensitivity and set the stage for insulin resistance and the conditions that come with it.

The Big Picture – Insulin Sensitivity and Insulin Resistance

The physiology of insulin resistance is so complex that we aren't even close to explaining it all. However, it is

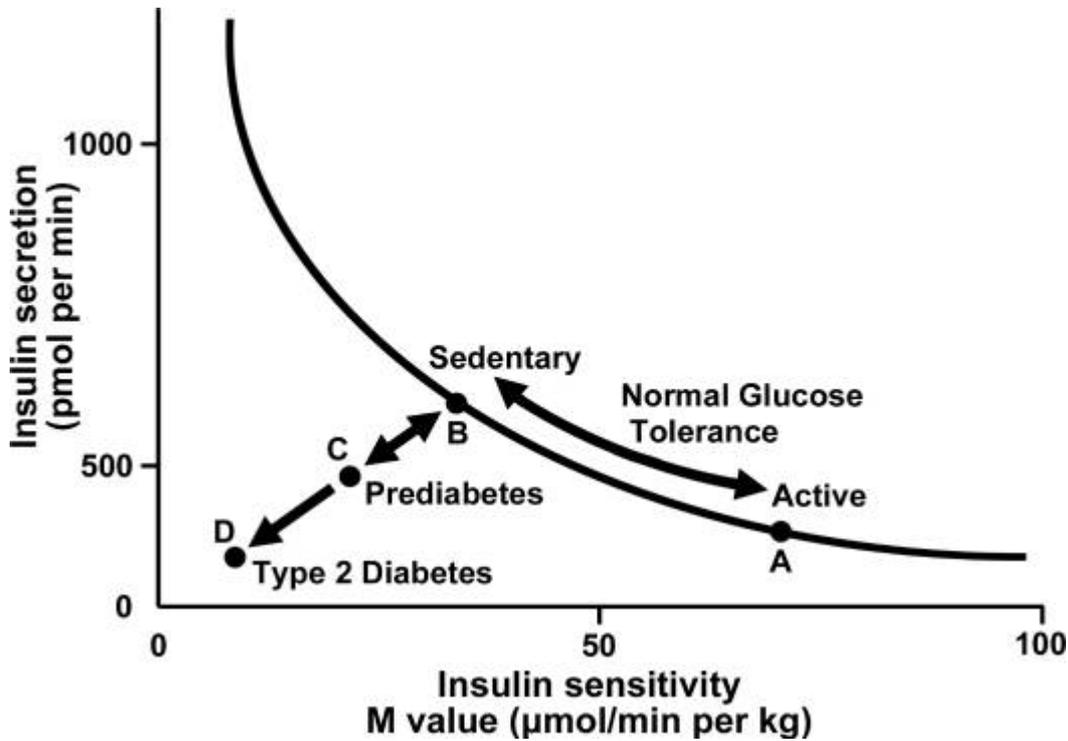
possible to distill our learnings into one simple concept that will help you understand what causes insulin resistance and increases insulin sensitivity for most people:

- Increased energy status will cause your cells to become more insulin resistant and less insulin sensitive over time.
- Decreased energy status will cause your cells to become less insulin resistant and more insulin sensitive over time.

By energy status, I mean the current state of your cells. Are they being bathed in energy molecules without any demand to use it up? This is “high energy status”, and it occurs when we are inactive and overeat.

In contrast, if your cells are in need of more energy to keep up with your body’s demands, then this indicates that you are in “low energy status.” As a result, your cells will increase their sensitivity to insulin so that they don’t miss out on the opportunity to get more fuel.

To further illustrate the big picture of insulin resistance, here is a graph from an article published in [Comprehensive Physiology](#):



This graph depicts the relationships between insulin secretion and insulin sensitivity. Insulin secretion rises as insulin sensitivity falls when an individual goes from a state of exercise training/being physically active (point A) to inactivity/sedentary (point B).

Conversely, insulin secretion decreases as insulin sensitivity increases when a person goes from inactivity/sedentary (point B) to physically active (point A). This is what commonly occurs in healthy individuals.

However, when insulin secretion fails to compensate for a fall in insulin sensitivity, the person will progress to prediabetes (Point C). If no changes are made at this point, the disease will progress from point C to Point D (type 2 diabetes). The only way to prevent this from happening is by improving your insulin sensitivity.

Ten Ways to Reduce Insulin

Resistance and Increase Insulin Sensitivity

Luckily, insulin resistance isn't a fixed mechanism in the body (even if you have all of the non-modifiable factors). It can be drastically improved (and potentially reversed) with simple lifestyle modifications.

Here are ten proven strategies you can use to help you optimize your insulin sensitivity:

1. Follow a Whole Food, Plant-Based Diet.

Simple sugar stimulates the most insulin release of all the macronutrients so, theoretically, removing carb-rich processed foods from your diet should decrease insulin levels and improve insulin sensitivity to some degree. This speculation is backed up by the research on how low carb diets affect patients with type 2 diabetes.

Also worth noting is the fact that whole foods are much more satiating and contain more fiber than processed foods. By increasing the satiety of our diet, we tend to eat fewer calories (decreasing the energy status of our cells), and the extra fiber helps slow carbohydrate and protein absorption, decreasing our insulin requirements and reducing insulin resistance.

2. Lose Fat.

Studies have shown that having high amounts of fat, especially around your midsection, can produce harmful chemicals and hormones responsible for increasing insulin resistance and inflammation.

Simply by losing excess fat, insulin sensitivity and metabolic function will improve significantly. More specifically, one study found that a weight loss of 5 percent in all obese

patients need to experience some of the positive effects of fat loss on insulin sensitivity.

One of the most effective ways to lose fat is by replacing all the processed foods with high-quality whole foods.

3. Add Fasting and/or Intermittent Fasting to Your Lifestyle.

We learned earlier that low energy status increases insulin sensitivity. Although following a healthy diet is one of the best ways to achieve a lower energy status, sprinkling in some fasting and/or intermittent fasting throughout your diet plan can help as well.

A pilot study found that intermittent fasting for 2 weeks (with a 18-20 hour fasting window) helped to improve blood sugar levels with a trend toward improved insulin sensitivity in type 2 diabetics.

The research on dietary interventions for type 2 diabetes also suggests that calorie restriction is one of the major factors that can help manage and potentially reverse the disease. One way to achieve this, which was confirmed by the pilot study on intermittent fasting, is by restricting your feeding window, so you eat fewer calories throughout the day.

By eating fewer calories, you decrease your energy status, which improves overall insulin sensitivity.

However, there is one caveat to fasting and intermittent fasting for people who have diabetes. Since both forms of fasting can cause significant changes in blood sugar levels, it is best to consult your doctor before adding them to your treatment plan.

4. Add Aerobic and Anaerobic Exercise to Your Weekly Schedule.

Want to improve your insulin sensitivity as rapidly as possible? Start working out, right now.

Exercise draws upon our energy stores so much that many of the cells throughout our body have to make themselves sensitive to insulin to ensure that they will get the energy they need.

Fortunately, both aerobic and anaerobic exercise will reduce your insulin resistance in a variety of ways, so the type of exercise you do is entirely up to you.

Aerobic exercise involves any form of physical activity that requires you to exercise for a prolonged period of time without rest breaks. This includes jogging, swimming, or anything where you're moving your body at a steady state for 30 minutes or longer.

Anaerobic exercise, such as lifting weights, sprinting, and intense rowing/cycling, can also drastically improve your insulin sensitivity.

In general, it is best to aim for five hours of exercise per week. Research suggests that this is the sweet spot for significantly improving your insulin sensitivity.

To get the best results, I recommend doing a combination of aerobic and anaerobic exercise throughout the week. Anaerobic exercise will help you build more muscle and burn through glycogen stores, which keeps your insulin sensitivity high, while aerobic exercise will ensure that your cells never have a chance to increase their insulin resistance to unhealthy levels.

5. Reduce Your Stress Levels.

Stress, physical or emotional, causes us to secrete cortisol.

When cortisol is circulating through the blood, it stimulates various mechanisms in your body that increase your blood sugar levels, providing you with the energy you need to handle the stressful situation. One way that cortisol does this is by increasing insulin resistance.

Once the body has taken care of the stress-inducing situation, cortisol will be broken down as insulin sensitivity is restored. This response to stress is healthy and normal – in the short term.

However, most people in modern society are typically stressed for the majority of the day. With every stressor comes more cortisol, decreased insulin sensitivity, and more stress. The only way to stop this cycle is by giving your body a chance to relax and recover from your daily stressors.

Here are some helpful strategies you can use reduce your stress levels and decrease insulin resistance:

- Meditate
- Take a short nap
- Do yoga, tai chi, and/or qi gong
- Quit smoking
- Exercise regularly
- Maintain a good sleep schedule
- Use adaptogenic herbs like Rhodiola and Ashwagandha
- Supplement with vitamins and minerals that you may be deficient in (magnesium and vitamins C, E, B, and D, in particular, can help with stress)

6. Get Adequate Sleep Every Night.

When you don't get enough sleep, your body's hunger hormone, ghrelin, begins to fluctuate, and your cortisol levels elevate. Simply put, losing sleep will cause you to feel hungrier than usual while simultaneously increasing your stress levels and insulin resistance (thanks to cortisol).

Altogether, these hormonal changes will typically cause you to eat more and struggle to regulate glucose effectively when you do have those extra calories. The best way to counteract this is by going to sleep at the same time every night and waking up at around the same time every day after getting at least 7 hours of sleep.

7. Consume More Soluble Fiber.

Of the two types of fiber, insoluble and soluble, soluble fiber is most notable when it comes to reducing insulin resistance. This is because soluble fibers slow down the movement of food through the small intestines, which helps reduce the amount of sugar that enters your blood, decrease appetite, and lower cholesterol levels.

Not sure how to get more soluble fiber? Here are some of the healthiest sources (as long as your digestive system can tolerate them):

- Cruciferous vegetables
- Leafy greens
- Pumpkin seeds
- Sunflower seeds
- Legumes
- Oats

8. Add More Fruits, Vegetables, Herbs, and Spices to Your Diet.

Many studies have found that a diet rich in plant compounds from fruits and vegetables is linked to reduced insulin resistance. The healthiest plants tend to be low-carb fruits and vegetables like wild berries, leafy greens, and cruciferous vegetables.

Herbs and spices have also shown promising results for boosting insulin sensitivity. Some of the most effective are:

- **[Turmeric](#)**: This powerful herb contains a compound called curcumin, which has potent antioxidant and anti-inflammatory properties. It can indirectly increase insulin sensitivity by reducing free fatty acids and sugar in the blood.
- **[Ginger](#)**: This popular spice is linked to increased insulin sensitivity as well. Studies have found that its active component, gingerol, makes muscle cells more receptive to sugar.
- **[Garlic](#)**: Garlic has antioxidant properties that may directly increase insulin sensitivity, according to animal studies.
- **[Cinnamon](#)**: This popular spice is well-known for its ability to reduce blood sugar and increase insulin sensitivity. One meta-analysis found that consuming 1/2–3 teaspoons (1–6 grams) of cinnamon daily can significantly reduce short- and long-term blood sugar levels.

9. Drink Green Tea

Green tea an excellent choice for people who are struggling to manage their blood sugar levels. Several studies have found that drinking green tea can increase insulin sensitivity and reduce blood sugar levels.

The beneficial effects of green tea could be due to its powerful antioxidant epigallocatechin gallate (EGCG), which many studies have found to increase insulin sensitivity on its own.

Supplementing with decaffeinated green tea extract may be the best option since caffeine has been found to increase insulin resistance.

10. Experiment with Supplements that Help

Reduce Insulin Resistance.

There are many supplements that can help with insulin resistance, but let's stick with the ones that are backed by research:

- **[Resveratrol](#)**: This is a polyphenolic compound that can be found in red wine and is known for its antioxidant benefits. High-quality evidence indicates that resveratrol can boost glucose uptake significantly without increasing insulin needs.
- **[Alpha Lipoic Acid](#)**: Alpha Lipoic Acid (ALA) is an organosulfur compound that is essential for aerobic energy metabolism. Many studies have reported that supplementation with this compound can help reduce insulin resistance in subjects with type 2 diabetes.
- **[Berberine](#)**. This is a plant alkaloid that has been shown to lower blood glucose in many cases. Some researchers have even found berberine to be as effective as the popular diabetes drug, metformin.
- **[Chromium](#)**: Some evidence indicates that this essential trace element has the ability to indirectly increase insulin sensitivity.
- **[Magnesium](#)**: This essential mineral is so crucial for proper insulin signaling that magnesium deficiency can worsen insulin sensitivity.
- **[Gymnema Sylvestre](#)**: It lowers blood sugar and is also called gurmar, which means "destroyer of sugar" in Hindi.

How to Know If These Changes are Reversing Your Insulin Resistance

The quickest and safest way to find out if you are insulin resistant is to get a test done by your doctor. The most reliable test is called HOMA-IR, which makes an accurate guess

regarding your body's insulin resistance by tracking your blood sugar and insulin levels over time.

You can also measure your blood sugar fluctuations directly with an oral glucose tolerance test. This test consists of multiple blood tests and the ingestion of a glucose solution as a way to see how your body handles an increase in blood sugar levels.

Despite how helpful both of these tests are, they are inconvenient and unnecessary for most people. A more accessible way to track your level of insulin resistance is by seeing how your blood work and other key health indicators change as you make the appropriate dietary and lifestyle adjustments.

For example, if your blood sugar levels, blood lipids, and blood pressure reach healthier levels, then you are most likely improving your insulin sensitivity, reducing your insulin resistance, and optimizing your health. Furthermore, if you are losing inches off your waist, then you are almost certainly making your cells more sensitive and less resistant to insulin.

Sources:

- [*The role of adipose tissue dysfunction in the pathogenesis of obesity-related insulin resistance.* – NCBI](#)
- [*Metabolic Syndrome and Insulin Resistance: Underlying Causes and Modification by Exercise Training* – NCBI](#)
- [*Insulin sensitivity in the intact organism.* – NCBI](#)
- [*14 Natural Ways to Improve Your Insulin Sensitivity* – Healthline](#)
- [*How do I increase insulin sensitivity?* – Examine](#)
- [*Changes in beta cell function occur in prediabetes and early disease in the Leprdb mouse model of diabetes* – NCBI](#)

[Understand Your Risk for Diabetes – American Heart Association](#)

- [The top 10 causes of death – World Health Organization](#)
- [Understanding Insulin Sensitivity and Diabetes – National Institutes of Health](#)
- [Insulin Resistance and Hyperinsulinemia – American Diabetes Association](#)
- [Insulin resistance and associated compensatory responses in african-american and Hispanic children. – NCBI](#)
- [Racial/Ethnic Differences in Insulin Resistance and Beta Cell Function: Relationship to Racial Disparities in Type 2 Diabetes among African Americans versus Caucasians. – NCBI](#)
- [Effects of long-term calorie restriction and endurance exercise on glucose tolerance, insulin action, and adipokine production. – NCBI](#)
- [Ethnic Differences in the Relationship Between Insulin Sensitivity and Insulin Response – American Diabetes Association](#)
- [Effect of alpha-lipoic acid on blood glucose, insulin resistance and glutathione peroxidase of type 2 diabetic patients. – NCBI](#)
- [Oral magnesium supplementation improves insulin sensitivity and metabolic control in type 2 diabetic subjects: a randomized double-blind controlled trial. – NCBI](#)
- [Chromium – WebMD](#)
- [Effects of resveratrol on glucose control and insulin sensitivity in subjects with type 2 diabetes: systematic review and meta-analysis – NCBI](#)
- [The impact of soluble dietary fibre on gastric emptying, postprandial blood glucose and insulin in patients with type 2 diabetes. – NCBI](#)
- [Mechanisms of Glucocorticoid-Induced Insulin Resistance – NCBI](#)
- [Effects of intensity and volume on insulin sensitivity during acute bouts of resistance training. – NCBI](#)

- [Aerobic training improves insulin sensitivity 72-120 h after the last exercise session in younger but not in older women. – NCBI](#)
 - [Effects of short-term, medium-term and long-term resistance exercise training on cardiometabolic health outcomes in adults: systematic review with meta-analysis. – NCBI](#)
 - [Exercise and insulin sensitivity: a review. – NCBI](#)
 - [In obese patients, 5 percent weight loss has significant health benefits – ScienceDaily](#)
 - [Effect of a low-carbohydrate diet on appetite, blood glucose levels, and insulin resistance in obese patients with type 2 diabetes. – NCBI](#)
 - [Effects of intermittent fasting on health markers in those with type 2 diabetes: A pilot study – NCBI](#)
 - [Insulin Resistance Isn't All About Carbs and Insulin – Chris Masterjohn, PhD](#)
 - [The Biochemistry of Why Insulin Doesn't Make You Fat – Chris Masterjohn, PhD](#)
-

BPA Linked to Insulin Resistance, Diabetes in Humans

A new study now links “safe” levels of Bisphenol-A (BPA) and the development of type-2 diabetes, insulin resistance, and other metabolic disorders. The Food and Drug Administration considers BPA safe at oral exposure levels of 50 micrograms per every kilogram of body weight every day. Published in the *Journal of the Endocrine Society*, researchers based at the University of Missouri wanted to determine if humans exposed

to BPA exhibited the same symptoms as mice. Frederick vom Saal, an endocrinologist at the MU College of Arts and Science and co-author on the study, thinks this study provides a compelling argument that they might.

This exploratory study needs to be replicated because it suggests that BPA exposure at a dose considered safe by U.S. regulators could alter glucose-stimulated insulin responses in humans...Our study is an initial step toward investigating whether exposure to endocrine disrupting chemicals, such as BPA, contributes to insulin resistance and eventually Type 2 diabetes."

Methods

For this study, researchers gave non-diabetic men and postmenopausal women oral doses of the FDA's safe level of BPA. They also administered a placebo. Those who were given the BPA had altered insulin responses. Those results occurred both when scientists used an oral glucose tolerance test and a hyperglycemic clamp.

[Related: How to Detox From Plastics and Other Endocrine Disruptors](#)

Bad News BPA

Most people know BPA is bad, even if they don't know why it's bad. In addition to insulin resistance, the chemical has been associated with inflammatory bowel disease, obesity, cancer, and a whole host of hormonal issues. It's been banned in the majority of children's products, but the alternatives to BPA aren't much better. A recently released Washington State University study found that BPA alternatives like bisphenol-S caused genetic abnormalities similar to those caused by the product they're replacing.

Related: [How to Heal the Gut](#)

Even something as simple as a cash register receipt can be a big deal. The BPA found in register receipts is unbounded, meaning it is loose and more readily absorbed through the skin. The Minnesota Pollution Control Agency conducted receipts tests in 2014 and found that the thermal paper used in 18 hospitality business had from 54–79 micrograms of BPA per square centimeter of paper. That's more than the accepted safe oral dose of BPA.

Death By a Thousand Cuts

At this point, it's plastics. There are several different types of plastic, and not all of them have inspired a cause for concern. Part of that can be attributed to a desire from good enough by plastics manufacturers and government officials. But good enough has so far led to a steady increase in mystery illnesses that linger and seriously impact a person's quality of life.

Sources:

- [*BPA exposure in U.S.-approved levels may alter insulin response in non-diabetic adults – MU News Bureau*](#)
 - [*Experimental BPA Exposure and Glucose-Stimulated Insulin Response in Adult Men and Women – Oxford Academic*](#)
 - [*How to Detox From Plastics and Other Endocrine Disruptors – Organic Lifestyle Magazine*](#)
 - [*BPA in thermal paper – Minnesota Pollution Control Agency*](#)
-

Radical Diet Can Reverse Type 2 Diabetes – Groundbreaking New Study

The number of people with type 2 diabetes has been on the rise for some time now, and it's believed that this rise is directly related to the obesity epidemic. Fat accumulated in the abdomen impedes pancreatic function, which makes sense when you consider how glands work, and what happens when a gland does not have enough space to function properly. If you squeeze a gland it will secrete hormones, so consider how excessive fat accumulation plays a role when putting pressure on glands.

These findings are very exciting. They could revolutionise the way type 2 diabetes is treated. This builds on the work into the underlying cause of the condition, so that we can target management effectively. Substantial weight loss results in reduced fat inside the liver and pancreas, allowing these organs to return to normal function. What we're seeing ... is that losing weight isn't just linked to better management of type 2 diabetes: significant weight loss could actually result in lasting remission." – [Prof Roy Taylor, Newcastle University, lead researcher](#)

This is huge! We now have the scientific community recognizing that diabetes can be reversed by diet. Nine out of 10 people in the trial who lost 15kg (33 lbs) or more put their type 2 diabetes into remission – no more insulin!

<https://www.youtube.com/watch?v=-EFsVsFsYCE>

Restricted vs. Healthy

One thing to consider though is that reducing calories is not enough. It may be enough to reverse the worst aspects of a disease, but for those wanting to enjoy a body in complete homeostasis, toxins need to be eliminated and nutrition needs to be assimilated. We would bet anything that the one person out of the ten people who did not go into remission would have healed with the right diet. You are what you eat, and science is starting to see this, to an extent. New studies are regularly coming out about gut microbes, how diet effect them, and how toxins affect us. Scientists are not yet connecting the dots with how food can heal very well, so there is a lot more about what's wrong with our diet than how to fix it. Scientists still may be a long way from realizing how powerful food can be for healing. If you want to reverse diabetes (or almost any chronic illness), check out [*Holistic Guide to Healing the Endocrine System and Balancing Our Hormones.*](#) It's a journey, and it's not easy to heal holistically. It's a lifestyle change, a journey, a process involving more than just diet. But many have done it, and more and more people are waking up to the reality that we are in fact in control of our health.

Related Reading:

- [*Detox Cheap and Easy Without Fasting – Recipes Included*](#)
- [*Start Eating Like That and Start Eating Like This – Your Guide to Homeostasis Through Diet*](#)
- [*How to Make the Healthiest Smoothies – 4 Recipes*](#)
- [*Diabetes, Endocrine Functions of the Pancreas, and Natural Healing*](#)
- [*Natural Diabetes Cure*](#)
- [*Foods That Contribute to Diabetes*](#)

Turmeric and Diabetes

Every now and then we hear about a common food that contains amazing healing properties. Turmeric is a fine example. Although it is a spice that has been used in Asian medicine for thousands of years, its potential to cure disease has been largely ignored in the West. Now we are told it can be used to treat a whole list of ailments from diarrhea to diabetes, and scientific tests are beginning to back up these claims.

What is Turmeric?

The turmeric plant, a member of the Zingiberaceae or ginger family, is native to Southeast Asia. Like ginger, the rhizome, or root, is the source of the spice. The turmeric root looks much like ginger root except for its color. While ginger is white, turmeric is orange, so orange, it was used as a dye before it was used for medicinal purposes.

If you've never bought turmeric, you may not realize you've eaten it. Chances are, you have. It is the main spice in curries, the spice that gives curry powders an orange color.

Related: [*Foods, Vitamins, and Herbs That Kill Cancer*](#)

What Does Turmeric Contain That Aids in Healing?

Curcumin has been identified as turmeric's source of healing properties. Curcumin is both an anti-inflammatory and a strong anti-oxidant. It prevents inflammation and reduces chronic inflammation. It has also been found to induce apoptosis (cell death) in cancer and pre-cancer cells.

What is Turmeric Used to Treat?

According to Web M.D., turmeric is used internally to treat the following:

- Arthritis
- Heartburn (dyspepsia)
- Joint pain
- Stomach pain
- Crohn's disease and ulcerative colitis
- Bypass surgery
- Hemorrhage
- Diarrhea
- Intestinal gas
- Stomach bloating
- Loss of appetite
- Jaundice
- Liver problems
- Helicobacter pylori (H. pylori) infection
- Stomach ulcers
- Irritable bowel syndrome (IBS)
- Gallbladder disorders
- High cholesterol
- Lichen planus
- Skin inflammation from radiation treatment,
- Fatigue
- Headaches
- Bronchitis
- Colds
- Lung infections
- Fibromyalgia
- Leprosy
- Fever
- Menstrual problems
- Itchy skin
- Recovery after surgery
- Cancers

- Depression
- Alzheimer's disease
- Swelling in the middle layer of the eye (anterior uveitis)
- Water retention
- Worms
- Lupus
- Urinary bladder inflammation
- Kidney problems
- Soreness inside of the mouth and gum disease.
- Inflammatory bowel disease (used as an enema)
- Diabetes

And is used topically to treat:

- Pain
- Ringworm
- Sprains and swellings
- Bruising
- Leech bites
- Eye infections
- Acne
- Inflammatory skin conditions and skin sores
- Infected wounds

Related: [*What Causes Chronic Inflammation, and How To Stop It For Good*](#)

Turmeric and Diabetes

If you google turmeric or curcumin, you will find statements denouncing its benefits. It is common to find every alternative healthcare claim to be summarily dismissed. On the other hand, it doesn't take much effort to find scholarly articles that show turmeric's health benefits, such as the studies regarding turmeric and diabetes.

Studies have shown turmeric lowers blood sugar levels, repairs

pancreas cells (even benefitting type I diabetics), reverses prediabetes, lowers cholesterol levels, reduces heart risks, protects kidneys, and reduces inflammation and oxidative stress caused by the disease.

Related: [*Holistic Guide to Healing the Endocrine System and Balancing Our Hormones*](#)

What is Diabetes?

When we eat, carbohydrates and sugars are broken down into glucose. The pancreas produces the hormone insulin, which allows glucose in the bloodstream to enter the cells. When this process is disrupted because the body cannot make enough insulin or can't utilize the insulin it does make, high levels of glucose remain in the blood and the cells do not receive the glucose they need.

High blood sugar results in damage to blood vessels, to the kidneys, eyes, nerves, and other parts of the body. Healing and circulation may become impaired. Diabetes is also associated with high blood pressure and an increased risk of heart disease and stroke.

According to the American Diabetes Association, 30.3 million Americans or 9.4% of the population have diabetes; 1.25 million (4%) have type 1 diabetes. In 2015, diabetes was rated the 7th leading cause of death in the United States.

Type 1 Diabetes

Type 1 diabetes is an autoimmune disease that is usually diagnosed in childhood or young adulthood. The body attacks and destroys the pancreatic cells that make insulin, leaving the pancreas unable to produce sufficient amounts of insulin, if any at all. The treatment for type 1 diabetes is lifelong insulin therapy – injected insulin – along with diet and exercise management.

Gestational Diabetes

Gestational diabetes occurs during pregnancy. It is believed that hormones from the placenta create insulin resistance, causing the mother to need as much as 3 times the usual amount of insulin. The CDC estimates gestation diabetes occurs in about 9.2% of pregnancies.

Type 2 Diabetes

Type 2 diabetes is also caused by insulin resistance. Since the cells don't respond correctly to insulin, the pancreas overproduces insulin to compensate. Over time, the pancreas is unable to provide enough insulin.

Prediabetes

Prediabetes is diagnosed when blood sugar is abnormally high but not yet high enough to be considered diabetes. These elevated levels of blood sugar can still cause damage to the body.

Curcumin, Prediabetes, and Type 2 Diabetes

In a [study](#) conducted in 2012, 240 pre-diabetic patients were randomly chosen to receive either curcumin or placebo capsules. By the end of the 9-month study, 16.4% of the control group developed type 2 diabetes, while the subjects who received curcumin showed better overall function of the pancreatic cells, and not one patient developed diabetes.

A 2014 [study](#) that reviewed articles published from 1998 to 2013 in PubMed concluded that curcumin can reduce blood glucose levels, stimulate glucose uptake, stimulate insulin secretion, improve pancreatic cell function, and reduce insulin resistance.

Although most of the positive reports involve prediabetes and type 2 diabetes, some studies are also showing improvements in the pancreas tissue of patients with type I diabetes.

Related: [*How to Optimize Curcumin Absorption – With Golden Milk Tea Recipe*](#)

Warnings

There are a few warnings about regular or daily use of turmeric for medicinal purposes. Extreme amounts taken on a daily basis may cause problems with the liver. Keep in mind that turmeric really does work to reduce blood sugar levels. Do not use it medicinally along with medication to reduce blood sugar. The result may be hypoglycemia – low blood sugar.

For excellent detail regarding dosage and interactions, check out [*Turmeric Dosage for Diabetics*](#). The entire site, [*Turmeric for Health*](#), is filled with useful information, including recipes.

To learn more about healthy absorption of turmeric and a delicious way to consume it, read [*How To Optimize Curcumin Absorption – With Golden Milk Tea Recipe*](#). To increase absorption of curcumin, always add a pinch of black pepper. There is evidence that garlic also increases absorption.

Conclusion

There is abundant evidence proving turmeric can prevent type 2 diabetes and aid in managing or reversing the disease. Remember, the smart way to manage or prevent late onset diabetes is through diet and exercise, not by simply adding supplements or medications to your daily routine. But turmeric can certainly be a healthy part of your diet plan as well as a supplemental aid, without the side effects of pharmaceuticals.

Recommended Reading:

- [*Holistic Guide to Healing the Endocrine System and Balancing Our Hormones*](#)
- [*Cinnamon – Ceylon Vs Cassia, Health Benefits, and Other Interesting Facts*](#)
- [*The Amazing Herbal Power of Ginger*](#)
- [*Gluten, Candida, Leaky Gut Syndrome, and Autoimmune Diseases*](#)
- [*Hypothyroidism – Natural Remedies, Causes, and How To Heal the Thyroid*](#)
- [*Total Nutrition – Make your own Homemade Multivitamin and Mineral Formula*](#)

Sources:

- [*Turmeric – Web M.D.*](#)
 - [*Statistics About Diabetes – American Diabetes Association*](#)
 - [*Curcumin Extract for Prevention of Type 2 Diabetes – Diabetes Care*](#)
 - [*Anti-hyperglycemic and insulin sensitizer effects of turmeric and its principle constituent curcumin. – Int J Endocrinol Metab. 2014 Oct 1;12\(4\)*](#)
 - [*Why All Diabetics Should Know About Turmeric – The Food Revolution Network*](#)
 - [*12 Benefits Of Turmeric In Diabetes – Turmeric for Health*](#)
 - [*Turmeric Dosage For Diabetes – Turmeric for Health*](#)
-

How to Improve Blood Sugar

Levels and Reverse Diabetes For Good

Every 23 seconds another person is diagnosed with diabetes – one the leading causes of death in the United States.

But these people don't have to suffer. Diabetes is preventable, manageable, and reversible.

What is Diabetes? – A Quick Overview

There are two types of diabetes – type 1 and type 2.

| | Type I Diabetes | Type II Diabetes |
|--------------|----------------------|-----------------------------|
| Age of Onset | Juvenile | Adult |
| Cause | No insulin | Insulin resistance, obesity |
| Prevalence | 5% | 95% |
| Symptoms | Severe | Less severe, obesity |
| Progression | Abrupt | Gradual |
| Consequences | Kidney, eyes, cardio | Kidney, eyes, cardio |

This is an over-simplified chart, but it gives you a good visual of the differences and similarities between the two. Now, let's dig a little deeper into each type of diabetes.

Type 2 diabetes is characterized by high blood sugar levels

and insulin resistance. Insulin resistance happens when blood sugar levels are so consistently high that the cells don't respond to insulin (a hormone that helps lower blood sugar) like they used to. When the cells aren't as sensitive to insulin, blood sugar levels raise even more. As a result, insulin levels raise and the cells become more insulin resistant. This vicious cycle is commonly caused by eating too much sugar, not moving enough, and stressing too much.

Conversely, type 1 diabetes is when the body lacks the ability to produce insulin. In some cases, this happens because the immune system attacks the cells in the pancreas that make insulin. Despite the lack of insulin, type 1 diabetics can still manage their blood sugar levels by taking exogenous insulin.

Although type 1 and type 2 diabetes are caused in completely different ways, they both lead to higher blood sugar levels that will destroy cells throughout the body and cause chronic inflammation. If we can improve blood sugar levels then we can manage and reverse diabetes – regardless of which type of diabetes it is.

The Best Treatment for Diabetes – Diet



Studies continuously show that eating less sugar and more whole foods is an effective way to manage blood sugar levels. For example, ketogenic diets – the lowest of low carbohydrate diets – were found in one study to help type 2 diabetics get off their medications completely.

The right diet may even transfer over to type 1 diabetics as well. One case study that put a type 1 diabetic on a paleolithic ketogenic diet found that it was effective in managing blood sugar levels and may even halt or reverse the disease process.

Even specific vegetables, fruits, herbs, and spices can help reverse type 1 and type 2 diabetes. For example, consuming curcumin (from turmeric) and fenugreek seeds together can be an effective way to lower blood sugar levels and improve the health of the cells in the pancreas that produce insulin.

Must Read: [Top Ten Blood Sugar Lowering Foods](#)

Related: [How to Optimize Curcumin Absorption](#)

There is one important caveat. Food isn't the only thing that impacts blood sugar levels. Even if you eat a plant-based, low-carbohydrate diet, your blood sugar levels can still be an issue.

Stress and Blood Sugar – The Missing Link

Right before we wake up in the morning, a stress hormone called cortisol is released. Cortisol raises blood sugar levels to provide you with the energy you need to wake up and get your morning started. To keep insulin from decreasing your blood sugar levels, cortisol also tells the cells to resist the seduction of insulin.

This brief period of insulin resistance is necessary for your body to maintain its blood sugar levels until you have your first meal. This is a great idea. Good job, body!

However, this same process occurs whenever you are stressed as well. Whether you are being chased by a lion or you are mad at a family member, cortisol is released so that you have enough energy to deal with that situation. The only problem is that most modern day stressors don't require extra energy. They require logical thinking and empathy – two processes in the brain that cortisol shuts down.

When every day is filled with stress, your cortisol levels will be consistently high. And you know what leads to – higher blood sugar levels, insulin resistance, and poor decision making.

This can happen regardless if you eat the healthiest food or not (although healthy food will help a lot). Reversing diabetes does not rely only on what you eat, it relies on what you do as well.

Related: [Natural Remedies for Chronic Stress](#)

The Cheapest & Most Natural Ways to Reverse Diabetes

Whether you start with food or with stress, it is still important to address both. However, if you are struggling to make ends meet, you don't have to wait to improve your health. You can help yourself right now – for free.

Drink More Water

Hydration is important. Although there are no studies that examine the direct effect that water consumption has on blood sugar levels, one observational study found that people with the highest blood sugar levels tended to drink the least amount of water.

This correlation can be explained by the fact that the systems that control both blood sugar and body fluid levels are linked. In other words, drinking more water can indirectly improve your blood sugar levels.

Related: [What's the Best Water for Detoxifying and For Drinking?](#)

Exercise

The fastest way to lower your blood sugar levels is by exercising. But before you lace up your running shoes, it is important to consider the type of exercise.

Low-intensity exercises like walking and cycling have a minimal effect on blood sugar levels unless they last for longer than an hour. Studies suggest that the optimal exercise strategy is high-intensity interval training.

Many different variations of high-intensity interval training

can lower blood sugar levels and improve insulin sensitivity (the opposite of insulin resistance).

One of the high-intensity workouts used in many studies went like this – thirty seconds of maximal cycling efforts 4 to 6 times separated by 4 minutes of rest. That's all you need to do to lower your blood sugar levels. And if you don't have access to a bicycle or stationary bike, all you have to do is sprint.

Here is an example sprinting workout from one of the studies:

5-10 near-maximal sprints for 30 seconds each with 3-minute rest between.

By doing this, you can lower your blood sugar in less than 20 minutes (for free).

Meditate

One of the best ways to mitigate stress and reduce cortisol levels is with meditation. In one study, researchers decided to see if meditation helped lower blood sugar levels in diabetics. After one month of meditation, the eleven patients that completed the intervention had lower blood pressure and A1C levels (more about this later in the article) and less anxiety and depression.

Sleep

Sleep for at least 7 hours a night, and you can maintain healthy blood sugar levels. But if you sleep for only 4 to 5 hours a night, your fasting blood sugar levels will increase significantly.

Continue to sleep like this, and your cells become resistant to insulin. As this vicious cycle continues, your blood sugar levels continue to rise regardless of how little sugar you eat. This sounds eerily familiar to what stress does to the

body because it is.

Sleeping less is a form of stress that leads to more cortisol release than normal. The cortisol raises blood sugar levels and tells the cells to become more resistant to insulin. Keep this from happening by making sleep a priority.

Putting it all Together – The Anti-Diabetes Lifestyle

Here's is a simple weekly checklist you can follow to improve your health dramatically:

1. Drink a gallon of purified water a day.

We suggest drinking a gallon of cranberry lemonade every day to provide you with a [healthy and tasty detox drink while you hydrate yourself.](#)

2. Eat only whole foods.

Make sure you get all of your food from high-quality sources as well. Look for bio-dynamic, organic. and non-GMO produce, and source all of your animal products from animals that lived a healthy life.

3. Do 3 to 4 high-intensity exercise sessions a week.

Here's a simple workout you can try:

5-10 near-maximal sprints for 30 seconds each with 3-minute rest between.

Combining high-intensity training and resistance training is an even better idea.

4. Meditate for 15 to 30 minutes a day.

You can use an app like Headspace to guide you or check out Sam Harris's guided meditation:

5. Sleep for at least 7 hours a night.

To improve your sleep quality, turn off all electronics and lights at least 30 minutes before you want to fall asleep and meditate laying down.

Related: [*Is Diabetes Caused by Sugar or Bad Genetics?*](#)

How to Know if You Are Really Reversing Diabetes

To know if your blood sugar levels are chronically high, many doctors will check your A1C levels. A1C stands for glycated hemoglobin, which is formed when blood sugar attaches to hemoglobin (the oxygen-carrying protein in red blood cells).

A1C tests measure the percentage of your hemoglobin that has blood sugar attached to it. If blood sugar levels have been high for the past 3 months, then more hemoglobin will be glycated. Thus, A1C testing provides an accurate measurement of how high your blood sugar has been over the past two to three months.

An A1C level of 6.5 percent or higher on two separate tests indicates that you have diabetes. An A1C between 5.7 and 6.4 percent indicates pre-diabetes. Below 5.7 is considered normal.

But Dr. Chris Masterjohn suggests that you shouldn't only look at A1C levels. This is because high A1C levels do not directly cause diabetes, and people with diabetes can have low A1C levels (if they have faster blood cell turnover than the

average person). In other words, A1C testing provides an indirect measurement of blood sugar levels so it isn't always a reliable indicator for diabetes.

For example, if you are obese and your fasting blood sugar is consistently above 100 mg/dl (pre-diabetic), but your A1C levels are low, then you should still be considered as a pre-diabetic that needs to implement dietary and lifestyle changes to lower your blood sugar.

This is why it is important to consider fasting blood glucose levels, blood sugar levels after a meal, and other measurements like weight and waist circumference to develop a clearer picture of what is going on inside of the body.

While you are implementing the steps to the anti-diabetes lifestyle, it is important to pay attention to multiple measurements. Fat loss, lower blood sugar levels, lower A1C levels, and decreased waist size are all indicators that you are on the right track.

Recommend Reading:

- [*Healthy Alternative Sugars and More*](#)
- [*Holistic Guide to Healing the Endocrine System and Balancing Our*](#)
- [*The Way We Used To Eat – The Real Paleo Diet*](#)
- [*Are Low-Carbohydrate Diets Healthy?*](#)
- [*Detox Cheap and Easy Without Fasting – Recipes Included*](#)

Sources:

- [*Diabetes – CDC*](#)
- [*The impact of brief high-intensity exercise on blood glucose levels – NCBI*](#)
- [*Influence of physical training on the fuel-hormone response to prolonged low intensity exercise – Science Direct*](#)
- [*MINDFULNESS-BASED STRESS REDUCTION IS ASSOCIATED WITH*](#)

[IMPROVED GLYCEMIC CONTROL IN TYPE 2 DIABETES MELLITUS: A PILOT STUDY – ProQuest](#)

- [Recent Developments in Delivery, Bioavailability, Absorption and Metabolism of Curcumin: the Golden Pigment from Golden Spice – NCBI](#)
- [Effect of fenugreek seeds on blood glucose and serum lipids in Type 1 diabetes – Indian Council of Medical Research](#)
- [Effect of ginger \(Zingiber officinale Rosc.\) and fenugreek \(Trigonella foenumgraecum L.\) on blood lipids, blood sugar and platelet aggregation in patients with coronary artery disease – Science Direct](#)
- [Curcumin and Diabetes: A Systematic Review – Hindawi](#)
- [Low-Glycemic Index Diets in the Management of Diabetes – American Diabetes Association](#)
- [Systematic review and meta-analysis of dietary carbohydrate restriction in patients with type 2 diabetes – BMJ](#)
- [The effect of a low-carbohydrate, ketogenic diet versus a low-glycemic index diet on glycemic control in type 2 diabetes mellitus – Nutrition & Metabolism](#)
- [Type 1 diabetes mellitus successfully managed with the paleolithic ketogenic diet – Edorium Journals](#)
- [Beneficial effects of ketogenic diet in obese diabetic subjects – Springer Link](#)
- [A low-carbohydrate, ketogenic diet to treat type 2 diabetes – Nutrition & Metabolism](#)
- [The effect of a low-carbohydrate, ketogenic diet versus a low-glycemic index diet on glycemic control in type 2 diabetes mellitus – Nutrition & Metabolism](#)
- [Role of Sleep Duration and Quality in the Risk and Severity of Type 2 Diabetes Mellitus – The JAMA Network](#)
- [Cortisol-Induced Insulin Resistance in Man: Impaired Suppression of Glucose Production and Stimulation of Glucose Utilization due to a Postreceptor Defect of Insulin Action – Oxford Academic](#)
- [Systematic review and meta-analysis of dietary](#)

[carbohydrate restriction in patients with type 2 diabetes – BMJ](#)

- [American Diabetes Association Releases 2016 Standards of Medical Care in Diabetes – Diabetes](#)
- [Low water intake and risk for new-onset hyperglycemia. – NCBI](#)
- [Plasma copeptin and the risk of diabetes mellitus. – NCBI](#)
- [Mastering Nutrition Episode 012: What Is Measuring Our Hba1c REALLY Telling Us About Our Blood Glucose and Diabetes Risk? – Chris Masterjohn PhD](#)