Defeating Diabetes

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Diabetes is a chronic disorder characterized by high blood sugar levels resulting from either insufficient insulin production by the pancreas or the body's inability to effectively use insulin. Insulin is a hormone produced by the pancreas that helps regulate blood sugar levels by facilitating the uptake of glucose from the bloodstream into cells, where it is used for energy. There are two distinct diabetes disorders.

Type 1 Diabetes

- Autoimmune destruction of insulin-producing beta cells in the pancreas
- Rapid onset with symptoms developing quickly over a few weeks or months
- Usually develops in childhood or adolescence, but can occur at any age.
- There is little to no insulin production in these individuals.
- This is an irreversible disease and patients require lifelong insulin therapy for survival

Type 2 Diabetes is the most common and we will be addressing this for the remainder of this editorial.

- It is strongly associated with lifestyle factors such as obesity, poor diet, and lack of physical activity.
- Gradual onset, with symptoms developing slowly over several years.
- Typically develops in adults over the age of 45, but increasingly seen in younger individuals, including children and adolescents.
- The body produces insulin, but cells are resistant to its effects. Over time, the pancreas may not produce enough insulin to maintain normal blood sugar levels.
- Most of the time, and especially in the earlier stages of type 2 diabetes, lifestyle modifications are very successful at defeating diabetes

Risk Factors for Type 2 Diabetes

- Unhealthy Diet
- Physical Inactivity
- Overweight/ Obesity
- Genetics & Ethnicity
- Age
- Gestational Diabetes
- Polycystic Ovary Syndrome
- High Blood Pressure
- Sleep Disorders

Type 2 diabetes often develops gradually over time, and some people may not experience any noticeable symptoms initially. However, as the condition progresses, symptoms may become more and more apparent**.**

Symptoms may include:

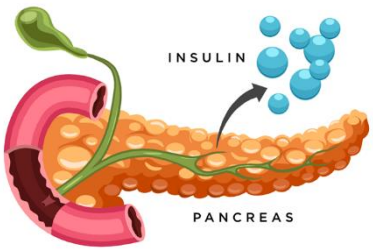
- Polydipsia = drink more
- Polyuria = pee more
- Polyphagia = eat more
- Fatigue and weakness
- Blurred vision
- Tingling/numbness in hands and feet
- Poor wound healing
- Recurrent infections

Untreated, type 2 diabetes can lead to a range of serious consequences, affecting various organs and systems in the body. These complications can develop gradually over time and significantly impact a person's health and quality of life. Some of the consequences include:

- Cardiovascular: heart attacks, strokes, limb circulation issues
- Nerves: tingling, numbness, burning, pain in legs, feet, hands
- Kidneys: chronic kidney disease, kidney failure
- Eyes: retina disease, blindness
- Feet: ulcers, infections, amputation
- Gut: bloating, constipation, diarrhoea, abdominal pain
- Skin: dryness, itching, infections, poor wound healing
- Premature death

Biochemistry of Sugar Metabolism

When you eat your food, all the proteins, fats and carbohydrates are broken down into their components to be absorbed. The carbohydrate is broken down into the glucose which is the main energy source for all the cells in our body. As the glucose is absorbed from the gut and into the blood stream, this rise in blood glucose signals the pancreas to release insulin from special cells in the pancreas, called beta cells. Insulin acts like a key, fitting into special locks called receptors on all the cell membranes. This unlocks these receptors and allows the glucose molecules to pass into the cell. Inside the cells, most of the glucose is used up as energy relatively quickly and efficiently



In the liver and muscle cells, the sugar can also be stored away in the form of glycogen. In Type 1 Diabetes, there is no insulin produced. The beta cells in the pancreas are destroyed by an autoimmune process where the body attacks and destroys these insulin producing cells. As there is no insulin key, the glucose is not able to get into the cells

Without a regular dose of insulin treatment, the cells and tissues would be destroyed and the individual would die. Insulin resistance is a key problem of type 2 diabetes. This is where the cells throughout the body become less responsive to the effects of insulin. The insulin can't fully unlock the cells and this means that glucose uptake into cells is impaired, leading to elevated blood sugar levels. There are many causes of insulin resistance including poor diet, sedentary lifestyle, obesity and the aging process. Initially the pancreas can compensate for insulin resistance by producing more insulin to overcome the reduced responsiveness of cells. However, over time, pancreatic beta cells may become dysfunctional and fail to secrete adequate amounts of insulin. These individuals, without early intervention, will also eventually require insulin for survival.

The diet is front and centre in prevention, management and even potentially reversing type 2 diabetes. First and foremost – diabetes is not primarily caused by a diet high in carbohydrates. Large population studies around the world have shown that diabetes is rare in many countries on the Asian and African continents where they have diets very high in carbohydrates – such as starchy vegetables, beans, noodles, rice and other grains. Albeit, the diets from these nations were healthy, generally high fibre forms of carbohydrate. If carbohydrate is not the villain, what is? The insulin resistance villain the fat in the diet. In particular, saturated animal fats. This type of fat causes a lot if oxidative stress and inflammation which impairs the ability of the insulin to bind to the cell receptors and also the transport of the sugar into the cells. Whilst saturated fats found in meat, dairy, and eggs, cause insulin resistance, but fats found mostly in plants such as nuts, olives, and avocados actually improve insulin sensitivity.

On the topic of villains, there is one universal villain – Satan – who is literally hell-bent on destroying the character of God to prevent as many people as possible from having an opportunity of an amazing eternity. It is through the terrible Hell Deception. This is a theory that states that when the wicked people die, they will go to an eternal BBQ where God sustains their lives in flames to torture them for all eternity. This makes God's character worse than any despot that has walked this earth's history. It is not consistent with how the Bible describes God, nor is it the correct understanding of what hell actually is from the Bible narrative.

God is:

- **Love -** Jeremiah 31: 3 *The Lord appeared to us in the past, saying: "I have loved you with an everlasting love; I have drawn you with unfailing kindness."* This is a God that is not willing that anyone should chose death and perish, over an eternal life with One whom loves them the most.
- **A consuming fire** – Hebrews 12: 29 *For our God is a consuming fire…*this fire consumes sin, but for the repentant sinner who has accepted the gift of Jesus's life for their sin, being in His presence will be an experience of total joy and pleasure forever.

Hell is:

- **An event:** Malachi 4: 1-3 *Surely the day is coming, burning like an oven; all the proud, yes, all evildoers will be stubble. The day that is coming will burn them up, says the Lord of Hosts, so that it will leave them neither root nor branch. But for you who fear My name, the sun of righteousness will rise with healing in its wings. You will go out and grow up like calves from the stall. And you will tread down the wicked, for they will be ashes under the soles of your feet, on the day when I do this, says the Lord of Hosts.* They will be ashes, not being tortured for all eternity. Psalm 37 says that the wicked will perish and not be found. They will no longer exist.
- **Eternal in its consequences, not in its timeline:** Matthew 25:46 "*And they* (the wicked) *will go away into eternal punishment, but the righteous into eternal life."* The punishment is eternal – not an eternal punishing. It is a single punishment with eternal consequences – death. Heaven would be a place of torture for those who have no love for God.

If the lost people of the ages are destroyed for all eternity, who dwells in the eternal fire? Isaiah 33: 14-17 *Who of us*

can dwell with the consuming fire? Who of us can dwell with everlasting burning?" Those who walk righteously and speak what is right, who reject gain from extortion and keep their hands from accepting bribes, who stop their ears against plots of murder and shut their eyes against contemplating evil — they are the ones who will dwell on the heights, whose refuge will be the mountain fortress. Their bread will be supplied, and water will not fail them. Your eyes will see the king in his beauty and view a land that stretches afar. It is the saved that will dwell in the eternal burning fire of God.

Back to the best diet for preventing and managing type 2 diabetes. The absolute gold standard diet is the whole-food plant-based diet. This eating pattern emphasizes whole, minimally processed plant foods, including fruits, vegetables, whole grains, legumes, nuts, and seeds, while minimizing or avoiding animal products and processed foods. The whole - food plant-based diet is well known for its ability to prevent diabetes. The Diabetes Prevention Program trial showed that a lacto-ovo vegetarian diet, that is vegetarians that still eat eggs and dairy, reduced their risk of developing diabetes by 60%. However, going to a completely plant-based diet with no animal products lead to a huge 80% drop in the risk of developing diabetes. The whole-food plant-based diet not only prevents diabetes, but has also been shown to reverse

diabetes, independent of an individual's weight. Scientifically it has been shown to reduce the HbA1c by 1.2 %. HbA1c is blood test that we use to measure your diabetes control over a three-month period. This diet is three time more effective than the standard diabetic diet, and as effective as medication. Dr Neal Barnard, a physician and researcher from the US, showed that on this sort of diet, two-thirds of the participants on diabetes medications where able to decrease or even discontinue them during the study intervention. This is in the setting of no calorie counting, no portion control, no restriction on carbohydrates and no exercise. There was just no animal fat and very limited free plant oils as well.

The well-known benefits of the whole-food plant-based diet includes:

- Improving insulin resistance
- Stabilising blood sugars
- Enhancing beta-cell function
- Promoting weight loss
- Preventing & treating heart & kidney disease
- Reducing inflammation
- Enhancing gut health
- Being as effective as leading diabetic medication

Drinking water plays an important role in Type 2 Diabetes. Here are some of the benefits of staying hydrated with water:

- Regulates blood sugar
- Improves insulin sensitivity
- Enhances kidney function
- Supports weight management

On the other hand, a beverage that needs to be avoided is alcohol. Alcohol consumption can have complex effects on diabetes, making it worse, the more you drink. Negative aspects of alcohol include:

- Being high in calories
- Empty, nutrient poor calories
- Interfering with sugar metabolism
- Fatty liver and insulin resistance

Exercise plays an important role in the prevention and reversal of type 2 diabetes. It has been shown to:

- Improve insulin sensitivity
- Regulate blood sugars
- Enhance muscle function
- Aid weight management
- Reduce abdominal fat

There are three types of exercises that can be very helpful in diabetes – to help increase the insulin sensitivity and reduce the toxic visceral fat:

1. Aerobic (Huff & Puff): Brisk walking, cycling, swimming, hiking, aerobics classes - 150 minutes each week.
2. Interval Training (High Intensity): Incorporate into your aerobic exercises.
3. Resistance (Strength training): Using weights, resistance bands, bodyweight exercises - 2-3 sessions each week.

Sleep has and influence of type 2 diabetes. Here's how sleep influences type 2 diabetes:

- Stabilises blood sugars
- Improves insulin sensitivity
- Regulates hormones involved in blood sugar metabolism
- Reduces oxidative stress and inflammation

To get all the benefits of sleep for both prevention and management of diabetes, aim for 7-9 hours of quality sleep each night, and try to maintain a consistent sleep schedule.

Smoking is a well-established independent risk factor for the development of type 2 diabetes. Nicotine and other compounds in tobacco smoke can increase insulin resistance and impair insulin sensitivity, making it more challenging to manage blood sugar levels effectively. Smoking is associated with an increased risk of diabetes-related complications, including heart attack, stroke, nerve, kidney and eye damage. It does this by exacerbating the negative effects of diabetes on blood vessels and organs, leading to accelerating the damage.

Sunlight exposure stimulates the skin to produce vitamin D, a fat-soluble vitamin that plays a crucial role in various physiological processes, including sugar metabolism. Vitamin D has been shown to enhance insulin sensitivity, allowing cells to more effectively respond to insulin and regulate glucose metabolism. Vitamin D may also have a protective effect on pancreatic beta-cell function, the cells responsible for producing insulin - preventing the decline in insulin secretion that is associated with type 2 diabetes progression.

As with many chronic diseases, stress plays a significant role in the development and progression of type 2 diabetes. Stress can, increase blood sugars, impair insulin sensitivity, lead to poor eating behaviours, and disrupt sleep. It is always important to manage the stress in your life to enhance your health outcomes.

There are a number of herbs that can assist in the management of diabetes:

- Bitter Melon: 0.5-2g daily
- Fenugreek seed: 5g daily
- Ceylon Cinnamon: 1-3g daily
- Goats Rue: 3g daily
- Garlic: 2-4g dried powder daily