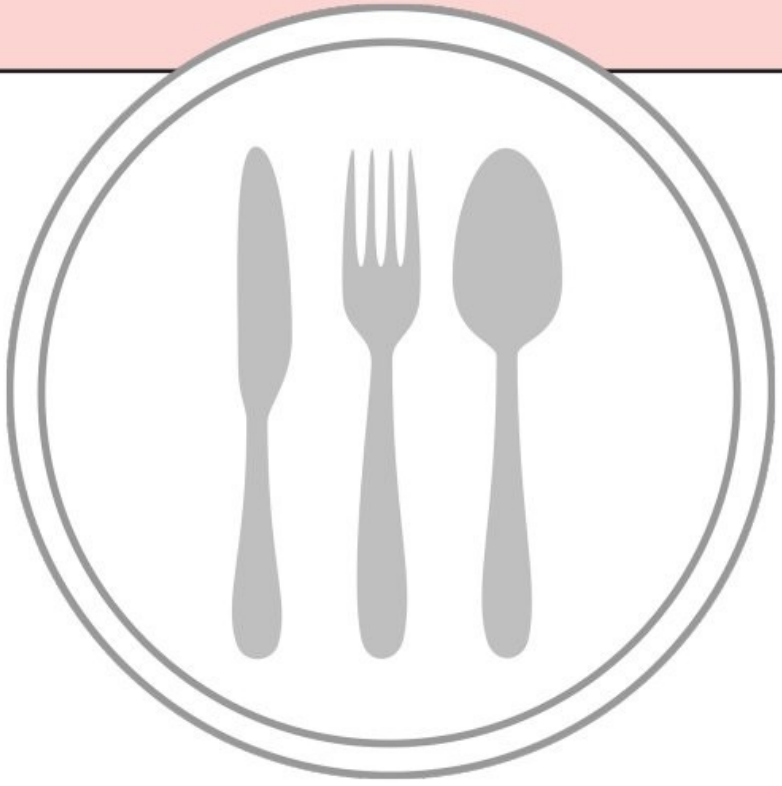
Can Nutrition Reverse Diabetes & its Causation of Eye Diseases?



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Can Nutrition Reverse Diabetes & its Causation of Eye Diseases?

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Course Description: (2 hours)

This course will look at Diabetes and its role in Eye Disease. This is meant to reveal the latest research about the possibilities of how to help those with pre-diabetes and type 2 diabetes to heal or at least improve. Science/Research has even stated there may be some help with these methods for type 1 diabetes. I also want to provide the ECP *(Eyecare Professional)* a review and discussion to understand how and therefore why diabetes affects the eye so severely to even cause blindness.

In the second part of this course, I will show how the diabetic can reverse the disease and thereby avoid most of the issues discussed in part I. An emphasis will be made on how to help the patient understand the meaning of the medical terms the Doctor used to tell them about their diabetes and their eyecare. Sometimes these medical terms do not mean enough to the Patient because they are not explained in layman's terms and the patient can end up in harm's way because they did not understand what they were to look for or to do.

I also explain how the ECP needs a great understanding of the proven lifestyle changes that will help reverse the effects of diabetes on the eye and the possibility of even curing the diabetes and therefore the eye diseases associated with it. We as Opticians can direct and refer to those who have more credentials if we understand the issues ourselves. This is something we can suggest to the patient to read and understand their case better and be able to know what might help them. We of course will not step outside the boundaries of our practice of Opticianry, but at all times work with the Doctor. If we do the research and show this to others, we are not practicing as Doctors, only showing the professional opinions and proven results with research of those with the proper credentials.

Instructional Objectives

Upon conclusion of this course, the student will be able to:

- Define what Diabetes is.

- Explain the 3 different types of Diabetes and how the newest type can develop into Glaucoma.
- Define Insulin sensitivity vs resistance
- Define Leptin sensitivity vs resistance
- Discuss the Columbia University findings on how human gut cells can be converted into cells that produce insulin in response to dietary sugar.
- List the Statistics of how many people in the USA have Diabetes or pre-diabetes, and what the future holds for more.
- List and explain the four Eye diseases associated with diabetes.
- Discuss the types of food for a healing diet, how much fat, protein and carbohydrates to eat.
- Discuss the role that exercise has in reversing diabetes
- Describe the brain connection to type 3 diabetes and how it can induce Glaucoma
- Explain the Leptin connection and how weight loss will improve conditions.
- Explain how the Optician can help in the referral process by understanding the nutritional needs to help heal the patient.
- Discuss the foods and supplements that help slow or stop Diabetes
- List the three herbs that researchers/science has accepted to help diabetics

Now, before we start this course lets address the elephant in the room…

FDA disclaimer

The information provided in this course has not been evaluated by the United States Food and Drug Administration and is not approved to diagnose, treat, cure or prevent disease. It is for informational purposes only and is not intended as a substitute for advice from your physician or other health care

professional. You should not use this information for diagnosis or treatment of any health problem or for prescription of any medication or other treatment.

You should consult with a healthcare professional before taking any medication or supplements, especially if you are pregnant or if you have or suspect you might have a health problem.

Introduction…

I think most everyone has heard the old adage of "you are what you eat"? This came about around 1930 when American nutritionist Victor Lindlahr, who was a strong believer in the idea that food controls health, developed the Catabolic Diet. I know of three others of the 1920s-1930s who were also advocates of nutrition, namely Norman Walker, Paul Bragg and Jack Lalanne who lived to 102, 95, and 96 respectively. We were already about 30 years into this newer medical discovery of pharmaceuticals. And yes, these nutrition advocates were advocating for people to go back to regenerative farming and nutritional diets of yesteryear. This was in direct contrast to the processed/fast food diets that were already being pushed on us at the grocery stores and the foods grown with the new chemical fertilizers and chemical herbicides and pesticides. (and this was 1920s-1930s!)

Jack Lalanne even said *"People thought I was a charlatan and a nut. The doctors were against me—they said that working out with weights would give people heart attacks and they would lose their sex drive."* So we see this same attitude among some doctors today when we talk diet and nutrition. Trivia: When Jack Lalanne was 54 years young, he was in a competition that he won against a 21 year old Arnold Schwarzenegger.

This course is a presentation of how we may be able to heal the root causes of disease (in this case diabetes), and not just mask the symptoms or "control" the symptoms with pharmaceuticals.

This course will present the parts of the "Alternative" medical systems that science has proven to work, including regulation of certain diets, exercise and vitamins and supplements that are food based and herbal based. Remember as you read this that most of the doctors in the US are not trained in medical school for nutrition and there is little to no training in herbal. Yet many other countries rely on the ancient medicine and actually some of those communities are living longer and in better health than the US population.

We in the US have depleted our soil so badly with chemical fertilizers and chemical herbicides and pesticides that poison the ground and as the end result, poison humans. Therefore the nutrition is not as great in our vegetables and fruits, nor are we eating healthy meats raised in

the old way of regenerative farming. (Europe calls it Biodynamic Farming) With this concept in mind I intend to show you a way we may be able to prevent blindness through these methods.

I have mentioned regenerative farming twice now, and for those that would like to know what it is, please go to the reference section under “regenerative farming” and see the YouTube video movie clip of a new movement for this type of farming.

Before the new age of processed and fast foods came out around 1900, the US had very few cases each year of diabetes and other diseases like macular degeneration only had a couple of cases from 1851 to 1920. So let’s see why these cases are now into the millions.

As you read this course I believe most of you will know somebody who has diabetes or at least pre-diabetes. In fact you may have been diagnosed with this yourself! We have all heard the term “diabetes” for years, yet some will not know the root cause of diabetes. I intend to explain the root cause so you will see the possibility of a reversal or cure by the time we wrap up this course. Some of the discussion about what causes diabetes has changed dramatically over the last 5 or 6 decades. I for one experienced a diagnosis with diabetes in the mid 1970s and at that time was told there is no cure and that the only control for diabetes was insulin. I didn’t believe that, so I hypothesized that diet and exercise would help and the science proves me right after many years. (We did not have the research then to prove what we know now.)

Today, you will find some doctors trying to help control at least pre-diabetes with a lifestyle change. These are the same doctors not trained in nutrition that have surged ahead to learn more on their own about how to help their patients with diabetes. I want to show proof of this lifestyle change and how most anybody with the will power and self discipline can take an honest look at themselves and move ahead to stop the damage to their eyes and even prevent blindness. I will only report the proven science as you will see in my references. So let’s get started! (You will see links in my references for further study for those so energetic.)

What is diabetes?

Before we get into the nitty-gritty of causes, prevention, and possibly reversal of diabetes, let's clarify and define some terms that you may or may not be so familiar with. For example… the difference between type 1 and type 2, and the emergence of what some are now referring to as "type 3" diabetes. The terms "pre-diabetes" and "metabolic syndrome", and “sensitivity” vs “resistant” also need to be explained.

Understanding how Insulin operates…

Insulin attaches to a receptor on the surface of muscle tissue and drives a complex change within the interior compartment of the tissues which allows glucose to enter.

Insulin Sensitivity

Tissue responsiveness to insulin, meaning how successfully the receptor operates to permit glucose clearance, is termed insulin sensitivity. In the case of optimal insulin sensitivity, after a high sugar meal, insulin rises sharply, pushing glucose into the tissues rapidly, then dissipates. In the case of poor insulin sensitivity, however, insulin's elevation is sustained due to an inability to force glucose into muscle tissues. The consequences are poor receptor sensitivity which indicates a failure in the communication between insulin and the internal cellular machinery. Locked out of the muscles, glucose remains elevated in circulation. Because glucose remains high, the pancreas must generate additional insulin or insulin will need to be injected to complete circulatory glucose disposal.

Insulin Resistance

Abnormally low insulin sensitivity is called insulin resistance. In this case, tissues resist the activity of insulin on a regular basis, disabling efforts to remove glucose from circulation and eventually requiring medical intervention.

Disease Risk

Insulin resistance also occurs at the liver and adipose tissues. When these tissues do not properly respond to insulin, glucose and fat are released into circulation. Sustained elevation of circulatory glucose and triglycerides cause cardiovascular diseases and obesity.

• **Pre-diabetes**, also known as impaired glucose tolerance, describes an earlier state of progressing insulin resistance. It is conventionally diagnosed by having a fasting blood sugar between 100 and 125 mg/dl.

• **Metabolic syndrome**. As your insulin resistance progresses, your liver makes too much sugar and fat, and your skeletal muscles are less able to burn them and make glycogen, which is how glucose is stored in your muscles and liver. In turn, there is an increase in sugar and fats in your bloodstream which leads to high triglyceride levels and increased body fat--especially abdominal fat, and higher blood pressure.

Having 3 or more of a group of symptoms caused by insulin (and now we also know leptin) resistance -- high triglycerides, low HDL, higher blood glucose and blood pressure, and increased belly fat—is referred to as metabolic syndrome (in the past it was called Syndrome X).

• **Type 1: insulin-dependent diabetes**. Traditionally, type 1 diabetes develops before the age of 20. It used to be relatively uncommon, but its incidence is rapidly rising.

Type 1 diabetes is classically an autoimmune disease in which your immune system destroys the insulin-producing cells of your pancreas, resulting in an inability to produce any significant insulin which that, if left untreated, will cause death in days to weeks from a hyperglycemic coma.

This deficiency of insulin is why type 1 is called "insulin-dependent" diabetes. There is currently no known way to completely reverse this, only how to help it.

However recent research suggests glimmers of hope. For example, Columbia University scientists claim that by turning off a particular gene, human gut cells can be converted into cells that produce insulin in response to dietary sugar.

• **Type 2: non-insulin-dependent diabetes**. In type 2 diabetes, the pancreas is producing some insulin, in fact usually too much, but is unable to recognize the insulin and use it properly. This is an advanced stage of insulin resistance, which is typically caused by a diet that is too high in sugars and sugar-forming foods.

When you have inadequate insulin signaling, sugar cannot get into your cells and instead builds up in your blood. While anyone can get type 2 diabetes, you are typically considered at highest risk if you are overweight, sedentary, you are a woman who had gestational diabetes, have family members with type 2 diabetes, or have metabolic syndrome. However, all of these really have the same underlying root of insulin and leptin resistance as I will show you.

Type 2 diabetes represents the vast majority of all diabetics, and contrary to conventional medical and media teaching, it's nearly 100 percent reversible, through lifestyle changes alone, providing these are instituted before the progression of the disease kills the cells in the pancreas that makes insulin, causing type 1 diabetes too; see second part of this discussion.

• **Type 3: non-insulin-dependent diabetes.** A growing body of research suggests there's a powerful connection between your diet and your risk of both Alzheimer's disease and glaucoma, via similar pathways that cause type 2 diabetes. Alzheimer's disease was tentatively dubbed "type 3 diabetes" in early 2005 when researchers learned that the pancreas is not the

only organ that produces insulin. Your brain also produces insulin, and this brain insulin is necessary for the survival of your brain cells.

A drop in insulin production in your brain may contribute to the degeneration of your brain cells, and studies have found that people with lower levels of insulin and insulin receptors in their brain often have Alzheimer's disease. Researchers have now discovered that insulin does far more than simply regulating blood sugar. Your brain does not require glucose, and actually functions better burning alternative fuels, especially ketones. In fact, Dr. Rosedale believes that it is the constant burning by the brain of glucose that is primarily to blame for Alzheimer's and other brain disorders.

Insulin is actually a "master multitasker" that helps with neuron glucose-uptake, and the regulation of neurotransmitters, like acetylcholine, which are crucial for memory and learning. This is why reducing the level of insulin in your brain impairs your cognition. Other research shows that type 2 diabetics lose more brain volume with age than expected—particularly gray matter. This kind of brain atrophy is yet another contributing factor for dementia. "Brain diabetes" may also be responsible for glaucoma, according to recent research. As reported by Medical News Today:

> "Researchers [in India]... have proposed a new mechanism of glaucoma which suggests that diabetes can occur in the brain and may be the cause of many neurodegenerative disorders including glaucoma... an irreversibly blinding disorder with almost 65 million sufferers worldwide. There is no cure..."
>
> The recent paper titled 'Glaucoma: Diabetes of the brain - a radical hypothesis about its nature and pathogenesis', also published in Medical Hypotheses... explores glaucoma and related neurodegenerative diseases from many perspectives and come up with a multifaceted and internally coherent concept of glaucoma being 'the diabetes of the brain."

It's becoming increasingly clear that the same pathological process that leads to insulin resistance and type 2 diabetes may also hold true for your brain. As you over-indulge on sugar and grains, your brain becomes overwhelmed by the consistently high levels of glucose and insulin that blunts its insulin signaling, leading to impairments in your thinking and memory abilities, eventually causing permanent brain damage.

Additionally, when your liver is busy processing fructose (which your liver turns into fat), it severely hampers its ability to make cholesterol, an essential building block of your brain that is crucial for optimal brain function. Indeed, mounting evidence supports the notion that significantly reducing fructose consumption is a very important step you can take to prevent Alzheimer's disease.

Statistics: Why are the numbers rising so fast?

Great Britain, like the United States, has seen a remarkably rapid rise in pre-diabetes and type 2 diabetes over the last decade. According to a recent BBC News report, more than one-third of British adults are now pre-diabetic.

In 2003, 11.6 percent of Britons had pre-diabetes. By 2011, that figure had more than tripled, reaching 35.3 percent. Researchers warn that this will lead to a massive avalanche of type 2 diabetics in upcoming years, which will have serious consequences for health care and life expectancy.

In the United States, nearly 80 million people, or one in four has some form of diabetes or pre-diabetes (2014), now that was 6 years ago, so what would the percentage be today? What's worse, both type 1 and type 2 diabetes among children and teens has also skyrocketed.

The most recent data, reveals that, between 2001 and 2009, incidence of type 1 diabetes among children under the age of 19 rose by 21 percent. Incidence of type 2 diabetes among children aged 10-19 rose by 30 percent during that same time frame!

What is diabetic eye disease?

Diabetic eye disease is a group of eye problems that can affect people with diabetes, and even starts during the pre-diabetes stage. These conditions include diabetic retinopathy, diabetic macular edema, cataracts, and glaucoma.

Over time, diabetes can cause damage to your eyes that can lead to poor vision or even blindness. But you can take steps to prevent diabetic eye disease, or keep it from getting worse, by taking care of your diabetes. We will cover that in the second half of this course in greater detail.

Your eyes may seem fine, but having a full, dilated eye exam is the only way to know for sure if you have eye damage from diabetes and its progression.

Often, there are no warning signs of diabetic eye disease or vision loss when damage first develops. A full, dilated eye exam helps to find and treat eye problems early—often before much vision loss can occur.

Diabetes affects your eyes when your blood glucose, also called blood sugar, is too high.

In the short term, you are not likely to have vision loss from high blood glucose. People sometimes have blurry vision for a few days or weeks when they're changing their diabetes care plan or medicines. High glucose can change fluid levels or cause swelling in the tissues of the eyes that help the eye to focus, causing blurred vision. This type of blurry vision is temporary and goes away when the glucose level gets closer to normal.

If your blood glucose stays high over time, it can damage the tiny blood vessels in the back of your eyes. This damage can begin during pre-diabetes, when blood glucose is higher than normal, but not high enough for you to be diagnosed with diabetes. Damaged blood vessels may leak fluid and cause swelling. New, weak blood vessels may also begin to grow. These blood vessels can bleed into the middle part of the eye, lead to scarring, or cause dangerously high pressure inside your eye.

Most serious diabetic eye diseases begin with blood vessel problems. Remember this statement as we cover the four eye diseases that can threaten eyesight and are caused by diabetes.

Diabetic Retinopathy

The retina is the inner lining at the back of each eye. The retina senses light and turns it into signals that your brain decodes, so you can see the world around you. Damaged blood vessels can harm the retina, causing a disease called diabetic retinopathy.

In early diabetic retinopathy, blood vessels can weaken, bulge, or leak into the retina. This stage is called nonproliferative diabetic retinopathy.

If the disease gets worse, some blood vessels close off, which causes new blood vessels to grow, or proliferate, on the surface of the retina. This stage is called proliferative diabetic retinopathy. These abnormal new blood vessels can lead to serious vision problems.
Here is an example of how advanced Diabetic Retinopathy could look to the patient:

Normal vision of two boys playing

This photo shows how retinopathy might affect vision. Dark spots hang over a view of two boys with rubber balls. The spots block their faces. Photo courtesy of the National Eye Institute

About one in three people with diabetes who are older than age 40 already have some signs of diabetic retinopathy. Diabetic retinopathy is the most common cause of vision loss in people with diabetes. Each person's outlook for the future, however, depends in large part on regular care. Finding and treating diabetic retinopathy early can reduce the risk of blindness by 95 percent.

Diabetic Macular Edema

The part of the retina that we need for reading, driving, and seeing faces is called the macula. Diabetes can lead to swelling in the macula, which is called diabetic macular edema. Over time, this disease can destroy the sharp vision in this part of the eye, leading to partial vision loss or blindness. Macular edema usually develops in people who already have other signs of diabetic retinopathy.

Glaucoma

Glaucoma is a group of eye diseases that can damage the optic nerve—the bundle of nerves that connects the eye to the brain. Diabetes doubles the chances of having glaucoma, which can lead to vision loss and blindness if not treated early.

Symptoms depend on which type of glaucoma has been diagnosed.

This photo shows how glaucoma affects vision. Shadows darken all sides of a view of two boys. Only the center is bright enough to see clearly. Photo courtesy of the National Eye Institute

People with glaucoma slowly lose side vision.

Cataracts

The lenses within the eyes are clear structures that help provide sharp vision—but they tend to become cloudy as we age. People with diabetes are more likely to develop cloudy lenses, called cataracts. People with diabetes can develop cataracts at an earlier age than people without diabetes. Researchers think that high glucose levels cause deposits to build up in the lenses of your eyes.

A blurry photo shows two boys with rubber balls. The photo shows how cataracts, affect vision. Photo courtesy of the National Eye Institute

Cloudy vision and faded colors are symptoms of cataracts.

A diabetic's chances of developing glaucoma or cataracts are about twice that of someone without diabetes.

Anyone with diabetes can develop diabetic eye disease. Your risk is greater with:

- high blood glucose that is not treated
- high blood pressure that is not treated

High blood cholesterol and smoking may also raise your risk for diabetic eye disease.

Some groups are affected more than others. African Americans, American Indians and Alaska Natives, Hispanics/Latinos, Pacific Islanders, and older adults are at greater risk of losing vision or going blind from diabetes.

Duty to warn and Communicate

We need to remind the patient to call the doctor right away if they notice sudden changes to vision, including flashes of light or many more spots (floaters) than usual. (also if it looks like a

curtain is pulled over their eyes). These changes in eye sight can be symptoms of a detached retina which is a medical emergency.

As an Optician for almost 50 years, I feel It is our duty as Opticians to communicate this to patients, but doubly so to diabetic patients. Remember the patient is usually quite uninformed on this subject and so often the Doctor doesn't have time to talk about this in much detail and can generalize in some very confusing medical terms that the patient does not have a clue about. Trust me when I say this, the patient will love you for giving this communication to them as to what to look for and possibly save their eye sight down the road. For one example, I have had many a patient that did not know what or how dangerous the "lightning flashes" could be until it was too late, yet they had been to an Ophthalmologist every year for at least 15 years before this happened. And just to clarify, this patient was new to me and had been going to an Ophthalmologist and buying their glasses at a rushed atmosphere in a "big box" store. It seems as though nobody informed them of the hazards of this issue even though I found evidence of vitreous detachment in previous exams.

In our duty to warn, let's also review the protocol recommended by Optometrist and Ophthalmologist for Eye exam guidelines for diabetes:

Type 1: Yearly eye exams should start within 5 years of diagnosis.
Type 2: Yearly eye exams should start right after diagnosis.
Pregnancy: Women with type 1 and type 2 diabetes need an eye exam before pregnancy or within the first 3 months.
Most people with diabetes should see an eye care professional once a year for a complete eye exam.

And now we are running into a new issue in our field of Opticianry that I mentioned above, one that involves the "fast" eye exam. When a diabetic patient needs more time to diagnose these issues, we see some doctors doing just a refraction rather than a full eye exam. It should not just be about the money, but how we can help these patients attain better treatment and health. And remember not to overstep your boundaries as an Optician, we cannot prescribe, so be careful how you help them. You can get around some of those issues if you work closely with an understanding Doctor during the treatment. Sometimes you can put a thought in the patient's head to do their due diligence in research on the issue and learn what they need to try for each individual case. After all, if the patient pays attention to their own body and assesses what their personal needs are , the results can be astonishing with self-discipline.

The sooner we can work to manage the patient with diabetes and other health conditions, the better. We may be able to prevent blindness by communicating the next section on helping the patient help themselves with diet, nutrition, exercise and lifestyle changes. So here we go!
It's time to outline a program to reverse this condition. Remember what I said earlier, type 2 may be reversible, and in the vast majority of cases does not require any form of medication (if

it is caught early enough). I did not go into detail concerning the medication and treatment we currently use in the US for diabetes. As most of us know the most common way is pills and insulin. But lets look at this for just a moment.

New Warning:
Insulin Can Rapidly Produce Type 1 Diabetes in Type 2 Diabetics!

Please understand that medications and supplements are not the answer for type 2 diabetes. I am sure you have seen the ads on TV that tout the use of some drug and then give you a myriad of side effects that could even be death. Like most you see on TV, Diabetes drugs fail to address the underlying problem, and many, like Avandia or Metformin, can have dangerous side effects. Avandia is linked to 43 percent increased risk of heart attack and 64 percent higher risk of cardiovascular death, compared with other treatments. Metformin can cause lactic acidosis, diarrhea, nausea and vomiting. The risk of lactic acidosis increases with renal or hepatic impairment. Instead of these drugs, most people can control their type 2 diabetes by restoring their insulin and leptin sensitivities. This is done by eliminating grains (carbohydrates that turn into sugar) and sugars—especially fructose—from your diet, getting plenty of healthy fats, exercising, and sleeping well. Further details on this will be provided below, in the treatment section.

Important Note! Recent research published in the Journal of Clinical Endocrinology & Metabolism confirms what Dr. Ron Rosedale has stated for the last two decades, which is that insulin treatment can provoke otherwise reversible type 2 diabetes to progress into type 1 insulin deficient and therefore insulin-dependent diabetes. The study found that giving genetically engineered recombinant insulin to type 2 diabetics with certain genetic susceptibility can trigger their bodies to produce antibodies that destroy their insulin producing cells (pancreatic islet cells). You may not realize that all human insulin, the type typically used, is GMO or genetically modified which might be responsible for this autoimmune reaction.

Basically, it triggers an autoimmune disease response, producing a condition in which you have both type 1 and type 2 diabetes simultaneously. The average time of type 1 diabetes onset was 7.7 months. One study participant developed type 1 diabetes in just over one month! According to the authors, acute deterioration of blood glucose control after administering insulin is a warning sign of this problematic side effect. According to this study, the genes predisposing you to this autoimmune-type response to insulin are:

Type 1 diabetes high risk HLA class II (IDDM1), thought to play a role in about half of all type 1 diabetes cases

VNTR genotype (IDDM2), which is believed to predispose you to type 2 diabetes

This is yet another way conventional diabetic treatment pushes diabetics into premature death... Research published last year revealed that treating type 2 diabetes with insulin more than doubled patients' risk of all-cause mortality. It also leads to:

Twice as many myocardial infarctions	**1.4 time more strokes**	**2.1 time more neuropathy**	**1.4 times more cancer**
1.7 time more major adverse cardiac events	**3.5 times more renal complications**	**1.2 times more eye complications**	**2.2 times more deaths**

How to Prevent and Treat Insulin/Leptin resistance and Type 2 diabetes

Here I want to take a look at the most advanced research on preventing or reversing type 2 diabetes.

This section will also show you how overweight and obesity is caused by this resistance and therefore is the main cause of diabetes and other health issue. Remember, 75% of the population in the US is overweight or obese. So they are predicting a huge surge in pre diabetes and diabetes in the most of these people, so does this mean the 25% with this condition now, will become 50% over the next few years?

Newest evidence in research since 2014- Leptin—An Oft-Ignored KEY Player in Type 2 Diabetes Development

What in the world, you may ask is Leptin? While much conventional advice centers around insulin, Leptin is another hormone that plays an integral role in the development of type 2 diabetes. Leptin is produced in your fat and other cells, and one of its primary roles is regulating your appetite and body weight. Leptin tells your brain when to eat, how much to eat, and most importantly, when to stop eating. Leptin also instructs your brain as to what to do with the available energy.

Now remember, when your blood sugar becomes elevated, insulin is released to direct the extra energy into storage—the majority of which is stored as fat, and Leptin is produced in these fat cells. The more fat you have, the more leptin is produced. Furthermore, as the sugar gets metabolized in your fat cells, the fat releases further surges in leptin. This is why typically the research has talked about insulin and Leptin resistance, as they work in tandem. Moreover,

Leptin is largely responsible for the accuracy of insulin signaling and whether or not you become insulin-resistant. If you're insulin resistant, you're more than likely leptin resistant as well, especially if you're overweight or obese.

Why?

Because when you develop leptin resistance, your brain can no longer hear leptin's signals, resulting in chronic hunger, overeating, inability to properly burn fat and, typically, obesity. Insulin resistance, and ultimately type 2 diabetes, follow suit. Just as with insulin, the only known way to reestablish proper Leptin signaling is through proper diet. High consumption of carbohydrates, especially fructose, are again the prime culprit and the root cause of Leptin resistance. Lack of exercise and abnormal gut flora (Probiotics) also contribute and/or exacerbate insulin and Leptin resistance. Leptin's importance in blood glucose control and diabetes is powerfully illustrated by recent studies that show its ability, even in low doses, to lower blood glucose in both type 1 and 2 diabetics, and this is an exciting new potential treatment.

Honest reflection, a strong will and self discipline…

The following nutrition and lifestyle modifications should be the foundation of your diabetes prevention and treatment plan. Also, make sure to monitor your FASTING insulin level. This is every bit as important as monitoring your fasting blood sugar. You'll want your fasting insulin level to be between 2 and 4. The higher your level, the greater your insulin resistance and the more aggressive you need to be in your treatment plan, especially when it comes to altering your diet.

• Swap out processed foods, all forms of sugar—particularly fructose—as well as all or most grains, for whole, fresh food. A primary reason for the failure of conventional diabetes treatment over the last 50 years has to do with seriously flawed dietary recommendations. Fructose, grains, and other sugar forming starchy carbohydrates are largely responsible for your body's adverse insulin reactions, and all sugars and grains—even "healthful" grains such as whole, organic ones—need to be drastically reduced.

If you're insulin/Leptin resistant, have diabetes, high blood pressure, heart disease, or are overweight, you'd be wise to limit your total fructose intake to 15 grams per day until your insulin/Leptin resistance has resolved. This includes about 80 percent of Americans. For all others, according to this research, it is recommended to limit your daily fructose consumption to 25 grams or less, to maintain optimal health.

The easiest way to accomplish this is by swapping processed foods for whole, ideally organic foods. This means cooking from scratch with fresh ingredients. Processed foods are the main source of all the primary culprits, including high fructose corn syrup and other sugars, processed grains, Trans fats, artificial sweeteners, and other synthetic additives that may aggravate metabolic dysfunction.

Besides fructose, Trans fat (NOT saturated fat) increases your risk for diabetes by interfering with your insulin receptors. Healthy saturated fats do not do this. Since you're cutting out a lot of energy (carbs) from your diet when you reduce sugars and grains, you need to replace them with something. The ideal replacement is a combination of:

- Low-to-moderate amount of high-quality protein. Substantial amounts of protein can be found in meat, fish, eggs, dairy products, legumes, and nuts. When selecting animal-based protein, be sure to opt for organically raised, grass-fed or pastured meats, eggs, and dairy, to avoid potential health complications caused by genetically engineered animal feed and pesticides.

Dr Joseph Mercola believes most Americans eat far too much protein, so be mindful of the amount! He believes it is the rare person who really needs more than one-half gram of protein per pound of lean body mass. Those that are aggressively exercising or competing and pregnant women should have about 25 percent more, but most people rarely need more than 40-70 grams of protein a day. The current per capita annual consumption of meat is 222 lbs. That means the average America is eating over 9.7 oz of meat each day along with protein from other sources. Considering that Vegans/Vegetarians make up about 9% of the USA population and 46% of Americans eat Vegan/Vegetarian at least 1-2 days per week, then that average of 9.7 oz becomes more like 14-16 oz a day for at least 25% of the population. If we go by the science of eating less meat we should only have maybe 3-4 oz of meat per day, (68-88 lbs of meat per capita vs 222-250 lbs per capita) Also some of your protein should be coming from beans, vegetables, eggs, seeds and nuts.

To determine your lean body mass, find out your percent body fat and subtract from 100. This means that if you have 20 percent body fat, you have 80 percent lean body mass. Just multiply that by your current weight to get your lean body mass in pounds or kilos. To determine whether you're getting too much protein, simply calculate your lean body mass as described above, then write down everything you're eating for a few days, and calculate the amount of daily protein from all sources.

Again, you're aiming for one-half gram of protein per pound of lean body mass, which would place most people in the range of 40 to 70 grams of protein per day. If you're currently averaging a lot more than that, adjust downward accordingly.

You can get a good idea of protein content in your food from the following chart below or simply do a web search for the food you want to know and you will quickly find the grams of protein in the food.

Red meat, pork, poultry and seafood average 6-9 grams of protein per ounce. An ideal amount for most people would be a 3 ounce serving of meat or seafood (not 9 or 12 ounce steaks!), which will provide about 18-27 grams of protein	Eggs contain about 6-8 grams of protein per egg. So an omelet made from two eggs would give you about 12-16 grams of protein. If you add cheese, you need to calculate that protein in as well (check the label of your cheese)
Seeds and nuts contain on average 4-8 grams of protein per quarter cup	Cooked beans average about 7-8 grams per half cup
Cooked grains average 5-7 grams per cup	Most vegetables contain about 1-2 grams of protein per ounce

- As much high-quality healthy fat as you want (saturated and monounsaturated). For optimal health, most people need upwards of 50-85 percent of their daily calories in the form of healthy fats. Good sources include coconut and coconut oil, avocados, butter, nuts, and high quality animal fats. (Remember, fat is high in calories while being small in terms of volume. So when you look at your plate, the largest portion would be vegetables.)

- As many non-starchy vegetables as you want

- Exercise regularly and intensely. Studies have shown that exercise, even without weight loss, increases insulin sensitivity. High intensity interval training (HIIT), which should be a part of anybody's fitness program, has been shown to improve insulin sensitivity by as much as 24 percent in just four weeks. (check with your doctor before starting such an intense exercise program.)

- Improve your omega-3 to omega-6 ratio. Today's Western diet has far too many processed and damaged omega-6 fats, and has far too few omega-3 fats. The main sources of omega-6 fats are corn, soy, canola, safflower, peanut, and sunflower oil (the first two of which are typically genetically engineered as well, which further complicates matters). Our bodies evolved for an optimal 1:1 ratio of omega-6 to omega-3. However, our ratio has deteriorated to between 20:1 and 50:1 in favor of omega-6. This lopsided ratio has seriously adverse health consequences.

To remedy this, reduce your consumption of vegetable oils (this means not cooking with them, and avoiding processed foods), and increase your intake of animal-based omega-3, such as krill oil. Vegetable-based omega-3 is also found in flaxseed oil and walnut oil, and it's good to include these in your diet as well. Just know they cannot take the place of animal-based omega-3s. (hence the well known issues with Vegan diets more so than vegetarian diets)

• Maintain optimal vitamin D levels year-round. New evidence strongly supports the notion that vitamin D is highly beneficial not only for type 1 diabetes (before the pancreas islet dies off), but also in type 2 diabetes. The ideal way to optimize your vitamin D level is by getting regular sun exposure. As a last resort, consider oral supplementation with regular vitamin D monitoring, to confirm that you are taking enough vitamin D to get your blood levels into the therapeutic range of 50-70 ng/ml. Also please note that if you take supplemental vitamin D, you create an increased demand for vitamin K2.

• Get adequate high-quality sleep every night. Insufficient sleep appears to raise stress and blood sugar, encouraging insulin and leptin resistance and weight gain. In one 10-year long study of 70,000 diabetes-free women, researchers found that women who slept less than five hours or more than nine hours each night were 34 percent more likely to develop diabetes symptoms than women who slept seven to eight hours each night. If you are having problems with your sleep there are many ways of improving this, but that is a whole other course!

• Maintain a healthy body weight. If you incorporate the diet and lifestyle changes suggested above you will greatly improve your insulin and Leptin sensitivity, and a healthy body weight will follow in time. Determining your ideal body weight depends on a variety of factors, including frame size, age, general activity level, and genetics. As a general guideline, you might find a hip-to-waist size index chart helpful. This is far better than BMI for evaluating whether or not you may have a weight problem. BMI fails to factor in both how muscular you are, and your intra-abdominal fat mass (the dangerous visceral fat that accumulates around your inner organs), which is a potent indicator of Leptin sensitivity and associated health problems.

• Incorporate intermittent fasting. If you have carefully followed the diet and exercise guidelines and still aren't making sufficient progress with your weight or overall health, Dr Mercola strongly recommends incorporating intermittent fasting. This effectively mimics the eating habits of our ancestors, who did not have access to grocery stores or food around the clock. They would cycle through periods of feast and famine, and modern research shows this cycling produces a number of biochemical benefits, including improved insulin/Leptin sensitivity, lowered triglycerides and other biomarkers for health, and weight loss. I have found the book written by Jason Fung MD, “The Complete Guide to Fasting” to be quite an eye opener.

Intermittent fasting is by far the most effective way I know of to shed unwanted fat and eliminate your sugar cravings. Intermittent fasting has also been identified as a potent ally for

the prevention and perhaps even treatment of dementia. Ketones are released as a byproduct of burning fat, and ketones (not glucose) are actually the preferred fuel for your brain. Keep up your intermittent fasting schedule until your insulin/Leptin resistance improves (or your weight, blood pressure, cholesterol ratios, or diabetes normalizes). After that, you only need to do it "as needed" to maintain your healthy state. A good percentage of people have bought into the concept of eating 6 meals a day and think they get dizzy if they do not eat that many times during the day. Yes, at first you may need to work up the intermittent fasting times. I personally find 16-21 hours very doable. But at first I started no late night eating. Also we should not eat within 3 hours of going to bed, as digestion interferes with sleep repair or the circadian rhythm of the body organ repair schedule at night. (Circadian rhythm, something else for you to websearch!) So I first adapted my body to stop eating 3-4 hours before bed, then after that was working very well, I started adding 30 minutes at a time the next morning to work up to the 16 or more hours of fasting. You will be surprised how fast the body adapts and no dizzy spells. Again you should check with your doctor to understand any complications you may have that would interfere with this. Most can adapt.

• Optimize your gut health. Your gut is a living ecosystem, full of both good bacteria and bad. Multiple studies have shown that obese people have different intestinal bacteria than lean people. The more good bacteria you have, the stronger your immune system will be and the better your body will function overall. And taking a probiotic as a supplement will only work temporarily as your gut needs much more healing before the probiotics re-colonize your gut versus a pass through of pills. Fortunately, optimizing your gut flora is relatively easy. You can re-seed your body with good bacteria by regularly eating fermented foods (like natto, sauerkraut, raw organic cheese, miso, and cultured vegetables). The latest research on the gut has shown that it is connected to the brain for communications and helps the whole body perform better, including the eyes!

The good news? You CAN Prevent and reverse Type 2 Diabetes

You don't have to be a part of the diabetes epidemic that is taking place before your eyes; you merely need to make some lifestyle changes and be mindful about your habits. The changes, detailed above, will prevent you from heading down the diabetes path, and can be the U-turn you've been looking for if you're already insulin resistant or diabetic. None of these strategies are expensive or overly time-consuming. However, they do require a measure of honest reflection and discipline. Plus if you share this information to your friends and patients, you may be saving somebody’s vision!

Now that you have an understanding of what diabetes really is and how it develops, you can steer clear of behavior patterns that harm your health, and incorporate those that will enhance

your quality of life. Again, type 2 diabetes involves loss of insulin and Leptin sensitivity, which is easily preventable, and nearly 100 percent reversible without drugs, by addressing your diet and other lifestyle habits, such as exercise, sleep, and intermittent fasting. I suggest taking a lifestyle inventory to see where you might have room for improvement.

For example:

- Review your eating patterns. How much sugar and sugar-forming carbohydrates are you eating daily? Is corn syrup a primary staple of your diet, hidden in the processed foods you buy on a regular basis? Are you spending your time in the middle of the grocery store, or around the periphery? (Most processed foods come from the middle aisles.)

- Are you an "emotional eater"? Do you tend to overindulge in comfort foods when you are feeling sad or angry? If so you have emotional issues to resolve first.

- Evaluate your activity level. Are you getting enough exercise each week?
- Are you getting enough sunlight? Have you measured your vitamin D levels lately? Unless you are deeply tanned, that is the only way to know your level. Do you need to consider a vitamin D supplement?

- Are you getting enough magnesium in your diet? Early signs of magnesium deficiency include loss of appetite, headache, nausea, fatigue, and weakness. An ongoing magnesium deficiency can lead to more serious symptoms, including muscle spasms and abnormal heart rhythms.

What patterns are you inadvertently passing along to your children? What example are you setting for your kids, in terms of nutrition and exercise? Are they getting the message that health is a priority? Getting healthy can and should be a family activity! When everyone is involved, you can support each other and give kudos for positive strides, making it more fun for everyone. The payoffs to your health will be great, and you will be passing along good lifestyle habits to your children, which will serve them for years to come.

And all of this may seem overwhelming for many, but a bit of perseverance will make this a healthy lifestyle change and it will become an easy routine once learned. Remember, the health pyramid given us in school since the early 1960s that was purported to us to be a way of a healthy life has been proven wrong! I remember my grandparents trying to eat fewer eggs, no fat from butter, (the pyramid recommended Margarine, omega 6s), more grains and less meat. We were taught that all saturated fat was bad, yet today the experts on nutrition are reversing all of what was taught in school those years!

Herbal supplements and how they may help Diabetes

This is a very interesting part of the control of pre-diabetes and even type 2 diabetes because there is so much controversy over herbs vs pharmaceuticals. So I will only bring up a couple of the herbs that have extensive research proving their worth.

Berberine-coptis chinensis (Huanglian)

First lets review the most useful of all supplements/herbs, Berberine. What is that you may ask?

Berberine is a compound originally extracted from the Chinese herb – coptis chinensis (Huanglian). But according to Dr. Morstein, it can be found in many different botanicals: Barberry, Oregon Grape, Goldenseal, Chinese goldthread, California poppy, and others.

Dr. Ralph Esposito and Dr. Mona Morstein

Even though berberine may be new to you, it has been around for a long time – being used in folk medicine, along with traditional Chinese, Indian and Middle-Eastern medicine for over 400 years.
So, not surprisingly, this yellow-colored, alkaloid compound is now being studied by avid scientists for its numerous health benefits, which include:

lowering blood glucose
improving metabolism
assisting with weight loss
boosting heart health
cutting inflammation-(the main culprit leading to diabetes!)

And of course, the most interesting benefit to our discussion here is how it can improve type 2 diabetes or pre-diabetes, and berberine's ability to help improve blood glucose control.

Let's look at the research closely here.

Berberine for Better Blood Glucose Control

Quite amazingly, berberine has been shown to help control blood sugar levels as effectively as Metformin – (I talked about this and other pharmaceuticals earlier in the course and gave you the side effects of them, and why they can be as dangerous as helpful). Whereas Berberine does not have any known side effects other than a possible slight digestive issue with only a few people and if you lower the dose a bit, you may be able to eliminate it.

Researchers compared the glucose-lowering effects of berberine and Metformin in newly diagnosed adults with type 2 diabetes, over the course of 13 weeks.

The randomized groups were given either 500 mg of berberine per day, 3 times per day, or 500 mg Metformin, 3 times per day after meals. If people experienced any gastrointestinal side effects from the berberine, their dosage was reduced to 300 mg, 3 times per day.

The results at the conclusion of the study showed that the glucose-lowering effect of berberine was highly similar to that of Metformin. And in fact, outperforming it for A1c reduction!

Metformin

A1c reduced by 1.43%
Postprandial (after meal) blood glucose levels reduced by 138.1 mg/dL (7.67 mmol/l)
Fasting blood glucose reduced by 50.4 mg/dL (2.8 mmol/l)

Berberine

A1c reduced by 1.99%
Postprandial (after meal) blood glucose levels reduced by 158 mg/dL (8.78 mmol/l)
Fasting blood glucose reduced by 68 mg/dL (3.78 mmol/l)

“This study of berberine against Metformin at equal doses was very impressive, with berberine lowering A1c by 2%, which is higher than any conventional oral hypoglycemics have been shown to lower A1c in the same time,” says Dr. Morstein.

The same study also set a secondary study with combination therapy, adding 500 mg of berberine alongside Metformin for an additional 5 weeks. Fasting blood glucose showed a dramatic reduction and A1c reduced by 0.8%.

Results from a review of clinical trials also demonstrate that berberine stands up against diabetic medications:

Berberine vs Metformin – 500 mg per day, 3 times per day berberine vs 0.75 g metformin – no difference in fasting blood glucose and A1c – meaning they performed the same.

Berberine vs rosiglitazone (Avandia) – Two clinical trials demonstrated that berberine performs better than the medication rosiglitazone for lowering fasting blood glucose, with no difference between the two for A1c reductions.

Berberine vs glipizide – no significant difference in the fasting blood glucose outcomes for groups.

What about when berberine is taken in conjunction with other medications? Well, let's take a closer look…

Berberine + Metformin vs Metformin(by itself) – 5 trials have demonstrated combination therapy improves fasting blood glucose and A1c more than using Metformin alone.

Berberine + glipizide vs glipizide – one trial has shown that combo therapy may be more beneficial for lowering postprandial blood glucose.

How Does Berberine Work?

We have already learned about insulin resistance earlier in this discussion, so lets apply what we learned above to Berberine.

Insulin is the hormone produced by your pancreas that is needed to help glucose (sugar) move out of your bloodstream and into the cells (such as muscle and liver cells). On the outside of cells lies ‘insulin receptors' and under normal circumstances, insulin acts as the key to unlock the cells so that clearing of the bloodstream can occur.

If you have insulin resistance, then the door is not unlocked

Another important thing to recognize is it's not just the pancreas and insulin involved here. Your liver plays a critical role in insulin resistance, along with energy metabolism as well.

Now that you have those concepts in mind, let's move on to how berberine works…

Dr. Morstein explains that berberine influences the AMPK pathway (adenosine monophosphase-activated protein kinase). "The AMPK is a cellular enzyme that is a regulator for how energy is produced and used in body cells," she explains. "It induces numerous events in the cells involved in helping the body maintain its energy needs. If a cell is low in energy the AMPK signals the production of more energy. And it also regulates activities such as lipid and glucose production."

"When insulin resistance is occurring the AMPK regulated pathways are shut off, triggering the development of hyperglycemia, increased cholesterol and triglycerides, and of course, diabetes," Dr. Morstein continues. "If the AMPK is once again activated, as it can be with the addition of berberine, those pathways can be corrected and therefore, initiate weight loss, energy burning and reduced glucose and lipids."

"In Western botanical medicine, berberine is considered an "alterative," that is, an herb that helps support the functioning and health of the liver, and the production and secretion of bile. The liver is a key organ for insulin resistance, and most obese patients have fatty liver. Therefore, supporting liver health and functioning is an added bonus to using berberine," adds Dr. Morstein.

Indeed, research on liver cells shows that berberine increases the expression of insulin receptors by as much as 40%, making them more sensitive to insulin so they can unlock those cell doors.

Similarly, berberine also improves insulin sensitivity in muscle cells, increasing the activity of glucose transporters, and therefore improving overall glucose metabolism.

Additionally, berberine alters glucose metabolism by stimulating glycolysis – a pathway of nutrient metabolism that can become disrupted in diabetes and pre-diabetes. Glycolysis is the pathway that assists with utilizing and storing glucose in the body.

Another function of berberine is it suppresses gluconeogenesis, the production of glucose in the liver. If you have high morning blood sugar levels, this is often the result of gluconeogenesis – your liver producing glucose, along with your body's lack of ability to hormonally counteract/control these effects.

Other potential mechanisms of berberine include:

- Influencing intricate cellular transcription factors
- Improving pancreatic function and stimulating insulin secretion
- Increasing glucose uptake and decreasing glucose absorption
- Reducing inflammation (can also be useful for inflammation diseases such as arthritis & cataracts) Diabetes is an inflammation disease!

In any case, the results of studies clearly show that berberine could be a beneficial inclusion to your diabetes or pre-diabetes treatment plan, either in solo or as a combo therapy alongside the medications you already take.

Yes, that's right. You can even take it alongside medications you already take, as the studies above showed. And these effects are being seen in real life scenarios.

"Oftentimes my diabetic patients are already taking prescription medications for their diabetes," says Dr. Esposito. "I have seen berberine work exceptionally well alone, and I often begin first with berberine capsules and nutritional therapy. If those are not providing benefit, I find berberine to work well with Metformin as well. Generally berberine is safe and effective with other diabetic drugs," he says.

But once again, the patient should talk to their doctor about using it before starting..

There are several other herbs/supplements that show a promise to help pre-diabetes and diabetes.

Fenugreek

Fenugreek is a seed that may help lower blood sugar levels.

The seeds contain fibers and chemicals that help to slow down the digestion of carbohydrates and sugar.

There is also some evidence that the seeds may help delay or prevent the onset of type 2 diabetes.

Findings of a 3-year investigation published in 2015 noted that people with pre-diabetes were less likely to receive a diagnosis of type 2 diabetes while taking powdered fenugreek seed.

The researchers concluded that taking the seed led to:

increased levels of insulin in the body, leading to a reduction in blood sugar
lower cholesterol levels

The study involved 66 people with diabetes who took 5 grams (g) of the seed preparation twice a day before meals, and 74 controls, who did not take it.

A person can:

include fenugreek as a herb in certain dishes
add it to warm water
grind into a powder
take it as a supplement in capsule form

Gymnema

Gymnema sylvestre is a herb that comes from India. Its name means “sugar destroyer.”

A 2013 review noted that people with both type 1 and type 2 diabetes who took gymnema showed signs of improvement.

In people with type 1 diabetes who took the leaf extract for 18 months, fasting blood sugar levels fell significantly, compared with a group who received only insulin.

Other tests using gymnema found that people with type 2 diabetes responded well to both the leaf and its extract over various periods.
Some people experienced:
lower blood sugar levels
higher insulin levels
Using either the ground leaf or leaf extract may be beneficial. But once again, the patient should talk to their doctor about using it before starting.

Vitamins

We cannot leave out vitamins and how they may help diabetics. A very important and little known dietary phenomena is that diabetes is a nutritional wasting disease – when blood glucose (sugar) levels are high, they act as a diuretic. This causes excessive urination, which

washes out loads of nutrients including antioxidants, vitamins and minerals such as magnesium and zinc.

The second reason is glycation, a process in which glucose molecules react with proteins in the body – this damages the protein turning them into nonfunctional structures called advanced glycation end products (AGEs). Unfortunately, although glycation is a key-feature of diabetes-related complications such as blindness, heart attack and nerve damage, it does not figure in conventional treatment for diabetes. You've probably heard of glycated hemoglobin (HbA1c), a well known AGE among diabetics. Well, HbA1c is formed when glucose molecules in the blood attach to hemoglobin – measuring your HbA1c will give you a picture of the extent to which your hemoglobin is exposed to glucose (that is, how controlled your blood glucose levels are.)

The third reason is that diabetes causes a lot of oxidative stress – elevated blood glucose levels and glycation produce free radicals that further damage proteins in your body while reducing levels of nitric oxide. Since the arteries are kept relaxed and wide open by nitric oxide, high levels of free radicals adversely affect arteries throughout the body. This can pave the way for numerous complications and is the reason why individuals suffering from diabetes face higher risks of atherosclerosis (the hardening of arteries), heart disease and heart attacks.

I will not go into the details of which vitamins for this study of diabetes, but you can find more detail about which ones in my references under Health Wholeness.

So, why won't strict blood glucose control solve this issue?

Although maintaining optimal blood glucose levels will help reduce urinary losses of micronutrients and decrease the stress induced by diabetes, doing so does not eliminate these issues. You see, another complication of diabetes is that the individuals often face regular periods of high blood glucose levels even if their overall blood glucose control is good. Unfortunately, most conventional physicians miss that point.

A diet naturally rich in vitamins and minerals can help reduce glycation and oxidative stress while toning down inflammation. In fact, a large human trial showed that for each 1 percent reduction in HbA1c, there was:

- A 37% reduction in microvascular complications which affect small blood vessels in the eyes, nerves and kidneys. (*remember I told you in the introduction to watch for this information about blood vessels? Here it is again!)*
- A 21% decrease in risk for any complication of diabetes.
- A 21% decline in deaths linked to diabetes.
- A 14% reduction in heart attack.

So again we have shown where inflammation is a key part of the Diabetes and this causes the eye to stress and develop the 4 eye diseases we mentioned at the beginning of this. So see how it is coming together?

Conclusion

In summary, I described the process of Diabetes and how it contributes to 4 eye diseases. I have shown you that simply swapping processed foods for whole organic foods lower in sugar and sugar-forming carbohydrates combined with a few minutes of daily exercise will quickly put you on the road to reversing this condition. In fact I have seen many cases of people do this in 3-6 weeks for pre-diabetes. Of course Diabetes is a bit harder to reverse, but very possible. I realize that some of the information in this course is beyond what some of you have considered in your diet, but like I started the course with, I am a living example of what this type of diet can do for you. I "cured" my diabetes back in 1975 and have continued on this healing diet since. (Frankly, I have gotten even more advanced with this diet and more compliant.) It took about 10 months for my diabetes to heal, So the best take away for this course is in one word….Perseverance!

As Jack Lalanne would say: "If man made it, don't eat it"

And remember, a diabetic did not get the diabetes overnight, as it took possibly years of bad diet and sitting on the couch watching TV (lack of exercise) Let's not be impatient and work this lifestyle through our best efforts. There is no quick fix with a pill as most Americans tend to think.

The sooner we start, the better results, because the more advanced, the more damage and your only hope then is to 'control' the progression of diabetes and you may need medication at that point of advancement of the diabetes. But again, in the earlier stages of pre-diabetes and even early on for type 2 diabetes, these cases can be reversed, at least in Type 2 and maybe in a few years we will see some reversal of type 1. (According to the promising research going on.) The medication will seemingly "fix" the diabetes, but to change diet, exercise and supplementation will heal the body most of the time and could at least get better if you have been on medication too long to change up. Another consideration in all of this, is find a physician who will understand your concerns, as just like anything else, not everyone is on the same page as you are, and neither are all doctors! Let's try to stop as much blindness as we possibly can. And the best way is to stop eating sugar! (I know I ask a lot of you "sugarholics"!)

"I haven't had dessert since 1929" Jack Lalanne 1914-2011 (96)

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25 Test Questions for:
Can Nutrition Reverse Diabetes & its Causation of Eye Diseases?

1. If we are what we eat which of the following should we choose?:
    a. A highly processed, edible food-like substance comprised of 20+ chemicals
    b. An Organic Vegetable
    c. McDonald's Cheese burger
    d. All of the above

2. Type 1 refers to:
    a. Insulin dependent diabetes
    b. An autoimmune disease
    c. Usually develops before 20 years old
    d. All of the above

3. Type 2 refers to:
    a. Insulin dependent diabetes
    b. Non-Insulin dependent diabetes
    c. The newest model of a Tesla automobile
    d. None of the above

4. There is now a Type 3 diabetic condition:
    a. True
    b. False
    c. I have no clue

5. Which type of Diabetes is being studied for a cure using gene therapy?
    a. Type 1
    b. Type 2
    c. Type 3
6. Which country has proposed that Glaucoma may be a result of diabetes Type 3
    a. USA
    b. Great Briton
    c. Switzerland
    d. India
7. How many people in the USA by percentage, does pre-diabetes or diabetes affect?
    a. 33%
    b. 25%
    c. 40%
    d. 50%
8. In the early stages of this eye disease blood vessels can weaken, bulge or leak.
    a. Diabetic Retinopathy
    b. Diabetic macular edema
    c. Glaucoma
    d. Cataracts
9. In this eye disease there is swelling….
    a. Diabetic Retinopathy
    b. Diabetic macular edema
    c. Glaucoma
    d. Cataracts

10. In this eye disease the Optic Nerve is damaged
    a. Diabetic Retinopathy
    b. Diabetic macular edema
    c. Glaucoma
    d. Cataracts
11. In this eye disease the Patient will lose side vision
    a. Diabetic Retinopathy
    b. Diabetic macular edema
    c. Glaucoma
    d. Cataracts
12. In this eye disease glucose levels cause deposits to build up and colors fade
    a. Diabetic Retinopathy
    b. Diabetic macular edema
    c. Glaucoma
    d. Cataracts
13. How often should a person with diabetes get a full eye exam?
    a. Every year
    b. Every 2 years
    c. Every 3 years
    d. When they can no longer see clearly
14. Type 2 diabetes can rapidly produce Type 1 diabetes
    a. True
    b. False

15. Diabetics with Type 2, treated with insulin leads to how much more eye complications?

    a. 1.2
    b. 1.4
    c. 1.7
    d. 2.2

16. What hormone works with Insulin in our bodies according to the latest research?

    a. Adrenaline
    b. Cortisol
    c. Leptin
    d. Thyroxin

17. To improve health a pre-diabetic or Diabetic should restrict which of the following

    a. Grains-including whole grains
    b. Carbohydrates such as sugar and carbs that convert to sugar
    c. Trans fat and omega 6 vegetable oils
    d. None of the above
    e. All of the above

18. Protein consumption should be limited to .5 grams per pound of lean body mass

    a. True
    b. False

19. When you look at your dinner plate, the largest portion should be

    a. Fat
    b. Protein (meat)
    c. Vegetables
    d. French Fries

Pg 5 Test- Can Nutrition Reverse Diabetes & its Causation of Eye Diseases?

20. To help reverse Diabetic Eye Disease, we need this ration of Omega 3 to Omega 6
    a. 1:1
    b. 1:20
    c. 1:50
21. HIIT exercise has shown to improve this percentage in just the first 4 weeks
    a. 10%
    b. 20%
    c. 24%
22. Which Vitamin or Supplement below has been shown to improve Diabetic Eye Diseases
    a. Vitamin D
    b. Vitamin K2
    c. Magnesium
    d. All of the above
23. If everything else has failed to help lose weight and control insulin/Leptin sensitivity we should do which of the following?
    a. Intermittent fasting
    b. Cut our food down to half
    c. Take a friends advice on how they did it
24. The herb Berberine can be just as effective as Metformin for most Type 2 Diabetics
    a. True
    b. False
25. Inflammation is a key part of the Diabetes and this causes the eye to stress and develop the 4 eye diseases.
    a. True
    b. False

2020 Answer sheet (do not take a picture of this page with your smart phone!)

Can Nutrition Reverse Diabetes & its Causation of Eye Diseases?-2hr

Send this answer sheet only, do not enclose the entire printed material!

Please use a flat scanner to format in PDF, then email to: cedoinc@yahoo.com

Or: USPS Postal Mail it: CEDO INC PO BOX 46486 TAMPA, FL 33646

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