DIABETES: THE BUTTER WITH THE SWEET

By John Clark M.D. NorthernLightsHealthEducation.com

March 1, 1954. The United States tested the largest nuclear device ever tested, and they tested it in the Marshall Islands of the South Pacific. It was 1,000 times larger than the atomic bomb dropped on Hiroshima. It sent a cloud of fire 100,000 feet into the air. The heat created gale force winds that blew vegetation from surrounding islands. The Marshallese were not amused. Enraged, they raced to court and sued the United States government. The United States conceded, and money started rolling into these remote South Sea Islands.

But what does an islander do with money on an isolated island? Soon products had to be imported to spend cash on. People who once subsisted on tropical fruits, vegetables, and fish, now became enamored with Spam and frozen turkey tails, (as well as other convenience foods high in fat, salt, and sugar, and low in nutrition.) The health results of such lifestyle changes quickly became apparent. Type II diabetes, almost unheard of in the Pacific islands prior to these dietary changes, now rendered 30% of the people over age 15 diabetic, with resultant high rates of hypertension, cardiovascular disease, kidney failure, eye disease, and amputations.[1]

"But I thought diabetes was inherited." someone may be thinking.

Inherited from the grocer, I might caution.

WORLDWIDE EPIDEMIC

Sadly, diabetes proliferation is not limited to the Marshall Islands. Worldwide, diabetes is expected to increase by 46% in the next 10 years. The largest increases will be in the developing countries of Africa, China, India and South America[2]—countries that can ill afford the increased medical complications and costs associated with such a disease.

Nor is the United States immune to such increases in the number of diabetics. According to the CDC, the U.S. had 5.8 million diabetics in 1980. By 2005 this number had jumped to an all-time high of 20.8 million[3], and we know the population has not tripled during that same time. If diabetes were inherited we would have to conclude that diabetics are having far more babies than the rest of society! This is not actually possible because diabetics have difficult pregnancies.

"What are my chances of getting diabetes?" someone may be wondering.

Lifetime risk of getting diabetes in the United States for Caucasians is 39% for women and 33% for men. Hispanics suffer a little higher incidence at 53% for females and 45% males.[4]

Diabetes is one of the greatest causes of amputations in the United States. A diabetic has ten times the risk of amputation. There are over 80,000 amputations per year in diabetics alone.

The American Diabetes Association estimates the 2002 total cost for diabetes in the United States at $132 Billion. With the rise in diabetes, they calculate that by 2020 we will be spending nearly $200 Billion on diabetes.[5]

COMPLICATIONS OF DIABETES

Diabetes causes multiple complications, if blood sugar is not controlled. Complications can take many forms, and can occur in various places throughout the body.

Heart disease[6] and stroke[7] kill 80% of diabetics.

Three out of four diabetics have high blood pressure.[8]

Diabetes is the number one cause of blindness accounting for 24,000 new cases each year.[9]

In 2005 there were 46,000 new cases of kidney failure resulting from diabetes, and an ongoing total of 179,000 cases.[10]

Thirty to 50% of diabetics suffer nerve damage that results in carpal tunnel syndrome,[11] pain or numbness in the feet or hands (peripheral neuropathy),[12] and slowed digestion of food.[13]

Diabetes is one of the greatest causes of amputations in the United States. A diabetic has ten times the risk of amputation. There are over 80,000 amputations per year in diabetics alone.[14] Diabetics who experience amputations on both legs never get back to walking like they once did.

Diabetics are 10 to 34% more likely to become depressed.[15] They experience more mood and memory changes, and studies show that their brains actually shrink.[16]

Infections occur more frequently in diabetics making them more likely to die from pneumonia or influenza. Life expectancy of diabetics is reduced by 12-14 years.[17] Not only does diabetes shorten one's life, but it more than triples the risk of ending up in a nursing home in middle age.[18]

HISTORY OF DIABETES

The earliest recorded history of diabetes comes from Egypt in 1552 B.C.[19] It is interesting to note that this would have been around the time that the Israelites were enslaved in that country. Upon emancipation, scripture records that God told them, "If thou wilt diligently hearken to the voice of the LORD thy God, and wilt do that which is right in his sight, and wilt give ear to his commandments, and keep all his statutes, I will put none of these diseases upon thee, which I have brought upon the Egyptians: for I am the LORD that healeth thee."[20] Apparently, if the Israelites followed God's instructions they would be spared the metabolic syndrome embarrassment.

WHAT IS DIABETES?

Diabetes is too much sugar in the blood and urine. Blood sugar is tested on a fasting blood test. Normal blood sugar should be between 70-99 mg/dl. A blood sugar after fasting of between 100-125 mg/dl is defined as pre-diabetes. Any fasting blood sugar above 125 mg/dl confirms the diagnosis of diabetes.[21]

WHAT CAUSES DIABETES?

In an effort to answer this question, Dr. James Anderson, renowned diabetologist, decided to feed healthy young men two pounds of sugar a day and check for signs of diabetes. Thirteen weeks into the study there were still no signs of diabetes.[22]

"I thought diabetes was too much sugar in the blood and urine," you may be thinking.

Recent research has confirmed the real culprit—fat. People on a low-fat diet, (10-15% fat calories), where the fat comes from vegetable sources, have a relatively low risk of getting diabetes. On the other hand, people eating 46% of their calories as fat have a 40% higher risk of diabetes. Certain fats are especially dangerous. Just 3% of calories coming from trans-fat will raise the risk of diabetes by 44%, and 270 mg of cholesterol, little more than that found in one egg, will increase the risk by 60%. If the majority of fat in the diet, (36% of calories), comes from saturated fat (usually animal sources) the risk of diabetes goes up to 64%.[23] Animal studies have shown that increasing the fat intake to 65% of calories increases the incidence of diabetes by 350%.[24] Fat makes a difference!

Various fats have different physiological effects on the body. Saturated and trans-fats tend to increase cholesterol, raise blood pressure, and diminish the good HDL cholesterol levels. They also increase the risk for heart disease, stroke, certain cancers, and diabetes.[25,26] Unsaturated fats, taken in their moderate amounts, (10%-15% of calories), tend to lower cholesterol, help maintain healthy HDL levels, provide essential fatty acids, and lower the risk for heart disease, stroke and diabetes.[27,28]

Some of the healthiest fats comes from natural plant sources. Five servings of nuts a week have been shown to decrease the incidence of diabetes by 30%.[29] Unhealthy fats tend to come from fast foods, which are high in fat and low in nutrition. Two or more fast food meals per week will not only increase obesity but also can double the risk of diabetes.[30]

Fat is not the only culprit in fast foods; one sugar-sweetened soft drink per day can increase the risk of diabetes by 83%.[31] These drinks are sweetened with a sugar once thought to be of no harm to diabetics because it did not increase the sugar measured in blood tests. The problem with this theory is that fructose is not the sugar being mearusred in tests for total blood sugar. As it turns out, refined fructose is more dangerous for you than other available sugars.[32] Some sources of refined fructose include corn syrup, high fructose corn syrup, and agave syrup. Now this is not to say that the small quantities of naturally occurring fructose found

in fresh fruit, well balanced with all the other nutrients, is a problem, it is not.[33]

There are other causes of diabetes. Remember the old "four food group" posters that hung on grade school classroom walls – dairy, meat, grains, and plant foods? These posters were not an initiative of the National Institute of Health or National Academy of Sciences, they were an advertisement. Studies show that milk and red meat consumption increases insulin resistance leading to the development of obesity, cardiovascular disease, and diabetes.[34] Meat is not friend to the diabetic. Just 4-ounces per day of beef, lamb, pork, or hamburger, increases the risk of diabetes by 20%. Process that meat, e.g. bacon, hot dogs, sausage, salami, bologna, etc., and just 2 ounces per day will increase your risk of diabetes by a whopping 50%![35]

Stimulants can also increase diabetes. Smoking increases the risk of diabetes by 60%.[36] Caffeine increases diabetic blood sugars by 28%[37] and decreases the effectiveness of exercise in lowering blood sugar.[38] Alcohol increases obesity and destroys the pancreas' ability to produce insulin.[39] Narcotics increase insulin resistance within the cells.[40] Even excess salt increases your risk for diabetes.[41]

DRUGS AND DIABETES

There are certain prescription drugs that increase the risk of diabetes. Blood sugars tend to be harder to control with the use of some blood pressure medications (thiazide diuretics and beta-blockers, etc.), atypical antipsychotic drugs (Clozapine, Zyprexa, Seroquel, etc.), steroids such as prednisone,[42] and oral contraceptive pills.[43] The risk of diabetes goes up by 48% to 71% with use of cholesterol lowering statin drugs.[44,45] And, what about diabetes medications themselves. In a 4 year study, aggressive blood sugar control with typical diabetes medications and/or insulin increased the risk of dying by 20%.[46] Drugs do not cure disease.

EMF AND DIABETES

Do you love your smart phone, wifi, smart meter and wireless devices? Think again. Electromagnetic fields (EMF) generated by these devices are known causes of blood sugar elevations. Living within 600ft of a cell pone tower can significantly raise your risk of diabetes.[47]

LATE DINNER AND LATE BEDTIME

Eating a late dinner, as most Americans are accustomed too, influences the bodies ability to process sugar negatively, giving rise to glucose intolerance, which over time results in diabetes.[48] The best practice is to maintain a healthy two meal a day schedule--breakfast and lunch.[49] The more regular you can keep your schedule the lower your risk of diabetes.[50,51] A regular bedtime, before 10:00pm, decreases not only the risk of diabetes, but stroke, hypertension, cardiovascular diseases, and obesity.[52] In fact, going to bed between 6:00pm and 10:00pm cuts the risk of diabetes in half!

"DIABESITY"

Obesity is one of the most powerful risk factors for type 2 diabetes.[53] While people that are considered underweight have a 7% lifetime risk of acquiring diabetes, those who meet the criteria for "very obese" have a 57% lifetime diabetes risk.[54] In fact, just 2 pounds weight gain can increase the risk of diabetes by 4%.[55] As more and more Americans become obese, the number of diabetics goes up proportionately. The most dangerous fat is that which accumulates inside the abdomen, around the belly, by the organs—what we call central fat, or visceral fat. An increase in this fat increases resistance to the action of insulin and increases the risk of heart disease[56] and other complications.

STRESS: DIABETES AND OBESITY

People with type A personality tend to have more stress. Type A personalities have more than twice the risk of diabetes.[57,58] Psychosocial stress unbalances the body's hormones promoting central obesity, diabetes, and cardiovascular disease.[59]

WHY IS DIABETES A PROBLEM?

When fat cells are too full, as in obesity, they lose the ability to respond to insulin. The fatigued pancreas eventually loses its capacity to produce enough insulin, and blood sugar rises even higher.

Each fat cell has insulin receptors. When these receptors are stimulated by insulin they facilitate the passage of sugar into the cell. Think of insulin receptors as doorknobs and insulin as the doorkeeper who opens the doors. The way the cells regulate how much sugar they take in is by increasing or decreasing the number of insulin receptors (doorknobs) available for insulin to activate (open the door to sugar). For example, a normal cell puts some of its insulin receptors (doorknobs) out into the blood stream where insulin can activate them (open sugar doors). Sugar then moves out of the blood stream into the cells lowering the blood sugar. Overfed fat cells pull all of their insulin receptors into the cell (leaving no doorknobs to open). As a consequence, the sugar accumulates in the blood stream increasing blood sugar to dangerous levels. When the diabetic starts to exercise, the cells get hungry and start putting more receptors into the blood stream, thus making way for more sugar to enter the cells, lowering the blood sugar.[60]

GLYCEMIC INDEX AND GLYCEMIC LOAD

Glycemic index indicates the effect specific carbohydrates have on blood sugar levels in comparison to the effect of pure sugar. High glycemic index foods raise blood sugar and insulin levels much higher and more rapidly than low glycemic index foods.[61] For example 50 gm of glucose has a glycemic index of 100, it enters the blood stream 100% as fast as pure sugar. A bowl of corn flakes and milk has a glycemic index of 92, meaning that the sugar in a bowl of corn flakes and milk enters the blood 92% as fast as pure sugar. Broccoli has a glycemic index of around 15, meaning that the carbohydrate in broccoli has 15% the effect of pure sugar on blood sugar.

The amount of food consumed is a major determinant of blood sugar. Glycemic load takes into account the amount of a certain glycemic indexed food eaten.[62] High glycemic load foods include calorie dense foods such as snack foods, fast foods, pastry, cookies, sweets, soda pop, white bread and white rice, refined carbohydrates, and white potatoes. Low glycemic load foods include whole-grain breads and cereals, including oatmeal and brown rice, legumes, peas, beans, garbanzos, soy, tofu, fresh fruit and vegetables, nuts, protein rich foods and healthy fats.

We were not made to eat high glycemic load meals. Rats fed a high glycemic diet develop marked obesity in 32 weeks.[63] Fat rats are generally not seen out in nature. Humans fed high glycemic meals eat a larger volume of food, feel less satisfied, and get hungry sooner.[64,65] This sounds like the prescription for an addiction, and it is!

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CONSEQUENCES OF HIGH BLOOD SUGAR

High blood sugar causes triglycerides to go up.

"Why would triglycerides go up?" Someone may be wondering, "I thought triglycerides were fats!"

The body has no little box in which to store sugar cubes. That's right. In order to store excess sugar, the body needs to convert it to something it can store, like fat. So, up go the triglycerides.

High blood sugar causes proteins to be glycated.

"Glycated! What's glycated?" you may be wondering.

Glycated is when sugar sticks to, or coats the proteins in the body, like blood cells and blood vessels. Sugar clogs the system.

High blood sugar provokes insulin to rise.

Insulin is not just for chasing excess blood sugar into cells; it's also a growth factor.[66] As a growth factor it needs building blocks for growth. Cholesterol is one of these building blocks. Elevated insulin results in elevated cholesterol, heart disease and also increases blood pressure.[67] Insulin not only makes the abdomen grow (in central obesity) but it also can make tumors grow increasing the chance of cancer.[68,69]

Sugar weakens the body's white blood cell's ability to destroy bacteria. Studies show that on a good day, one white blood cell can kill 14 dangerous disease-causing bacteria. With the intake of just 12 teaspoons of sugar, the amount contained in most soft drinks, each white cell can only destroy 5-1/2 bacteria. Double the soft drink intake and the number of bacteria a white cell can destroy drops to just one![70] Most

Americans consume more than 52 teaspoons of sugar a day![71]

BLOOD SUGAR RESPONSE TO WHOLE FOODS

The more carbohydrates are refined, the higher their glycemic index. For example, orange juice is the refined product of oranges. Not only is the fiber removed, but also in the process of preservation the juice is "pasteurized", meaning that it has been heat treated in an effort to reduce the number spoilage causing microbes. This process of heat-treating has a further refining influence on the carbohydrate in oranges, breaking it down into shorter chain starches and simpler sugars. Commercial orange juice is little different than soda pop in its effect on the body.[72] As a consequence drinking commercial orange juice elevates blood sugar very rapidly and to an excessive degree. What's more, once the body responds with insulin, the blood sugar drops precipitously leaving the individual faint and craving more refined carbohydrate. By comparison, eating a whole orange has a very different effect. The whole orange has not only sugar, but fiber, vitamins, phytochemicals, and minerals which help slow the passage of sugar into the blood stream and help the body use the sugar more efficiently. Because the sugar enters the blood more slowly, and over a longer period of time, a precipitous fall in blood sugar, that triggers hunger and faintness, does not occur.[73] The consumption of one serving of fruit as juice, instead of as whole fruit, increases the risk of diabetes by 36%.[74]

Diabetics tend to eat foods of higher glycemic index.[75] The effect is that their blood sugar goes up quite quickly. The body responds with a surge of insulin to take care of the emergency. Insulin can rise rapidly but it cannot drop as rapidly as blood sugar. Consequently, before long the sugar runs out and the person becomes hypoglycemic—low on blood sugar—faint and hungry. They then look for food, probably long before the next *scheduled* meal. The foods they choose to fulfill their low blood sugar needs are usually junk foods that compound the process and the problem.

In order to ameliorate this problem, diabetics are told just to eat many little meals all day long.[76,77] Does this work? Sort of, for two reasons, first, if little meals are eaten all day long, eventually all the blood sugar spikes will coalesce into one big long sugar rise with less variability, and there will be no more dangerous peaks and troughs. This method does not stop the diabetic complication. Frequent meals, like this, more than doubled the risk of cancer![78,79]

The problems with eating more often are not limited to increased cancer risk. The stomach is a bit like the common household washing machine. A load of clothes is started washing. Halfway through the cycle some unruly person comes with more dirty clothes and adds them to the load. If the clothes are to be cleaned the whole cycle must be started over and perhaps more soap added. This is just the way the stomach works. If more food is added before it finishes its work, it has to start over and add more digestive juice.[80] Thus the machinery is jammed, sugar digestion impeded, and the diabetic controls this blood sugar at the cost of the delicate digestive organs.

What is the real solution? If the diabetic eats an unrefined whole food breakfast—high in fiber (low glycemic index)—the blood sugar rises slowly, the sugar supply will be steady, and there will be no precipitous fall in blood sugar at the end of digestion. By lunch time the diabetic is just starting to feel hungry. Lunch is a meal of whole vegetables and legumes, and the sugar is held at a manageable level all day long.

SUGAR CLOGS THE SYSTEM

Glucose (blood sugar) is the preferred fuel of the cell. But too much glucose in the blood clogs blood vessels and coats the blood cells with sugar. As blood sugar rises, excess sugar begins to stick to proteins—blood cell and blood vessel walls. These sugar-coated blood cells are called hemoglobin A1c or HbA1c. HbA1c predicts increased risk of heart disease and overall mortality even for people without diabetes. HbA1c indicates the average blood sugar concentration over the past three months. A HbA1c of 7.0 or higher may indicate diabetes. An increase of just 1% in HbA1c is associated with roughly a 30% increase in mortality from all causes and a 40% increase in mortality from coronary heart disease. In one study 70% of non-diabetics over 45 had a hemoglobin HbA1c of 5% or greater. Thus 82% of excess mortality due to blood sugar elevations is in non-diabetes.[81] And here we were all patting ourselves on the back because we are not diabetic. Living the lifestyle of a diabetic may not make everyone diabetic, but it may still provide

us with all the same complications as the diabetic.

Medications reduced the incidence of diabetes by 31% and lifestyle modification by 58%! This demonstrates that lifestyle change is a much stronger medical intervention than medications.

When HbA1c goes up, so does glycation of the vessel walls. Thus, not only do the blood cells have trouble functioning, due to the sugar coating, but the sugar-coated blood vessels pose an additional barrier to nutrients reaching body tissues. When this happens, body tissues starve for oxygen and nutrients making them more susceptible to fatigue, damage, and infection. This explains some of the complications listed earlier, such as the elevated risk of amputation.

On the other hand, a 1% reduction in HbA1c lowers the risk of stroke by 17%, fatal heart attack by 18%, diabetic deaths by 25%,[82] amputation,[83] kidney failure, and diabetic retinopathy that leads to blindness each by 30%.[84]

SIGNS OF DIABETES

What are the signs of diabetes?
The signs of diabetes include:

- Low energy.
- Fatigue.
- Extreme thirst.
- Frequent urination.
- Blurred vision.
- Irritability and mood changes.
- Weight changes.
- Tingling and numbness in hands or feet.
- Frequent infections.
- Extreme hunger.
- Cuts and bruises that are slow to heal.
- Nausea and vomiting.
- Dehydration.
- Reduced conscious level.

Reduced consciousness! I was in the emergency room one day. In the stall next to where I was working an ER doctor was trying to awaken someone.

"Wake up! Wake up! Can you hear me?"

"What, who me? Where am I?"

"Did you know your blood sugar was 300? Are you a diabetic?"

"What? Who me? A diabetic?"

Sad to say this is the way all too many people discover they are diabetics. Their blood sugar goes too high, they pass out, and someone finds them and sends them to the hospital emergency room. This is not the way to discover you are diabetic. By this time the complications of diabetes are well on their way.

CAN PEOPLE REVERSE THEIR DIABETES?

Kit Carson was taking 85 units of insulin daily. He was a big guy - 6'8" and 440 lbs. He relied on his vehicle to go even short distances. Two days into a "Reversing Diabetes" lifestyle program his blood sugar, which had been as high as 500, returned to normal. In two years, he lost 135 lbs. He never used insulin again. He says, "This program has changed my life."[85]

Can lifestyle changes really have that great of an effect on diabetes? The New England Journal of Medicine answered this question. They reported on an intervention trial to prevent diabetes in pre-diabetics that compared the effects of placebo (doing nothing), pharmacological medications, or lifestyle interventions. The results? Medications reduced the incidence of diabetes by 31% and lifestyle modification by 58%![86] This demonstrates that lifestyle change is a much stronger medical intervention than medications. Well, it makes sense; lifestyle caused the diabetes in the first place, not pills. And what were the lifestyle interventions? Lifestyle intervention included weight loss with a goal of 7% weight reduction; daily exercise with a goal of 150 minutes per week; improved eating including higher fiber intake, lower saturated fat, and lower glycemic load. After 3 years, the incidence of diabetes was 58% lower in the lifestyle intervention group.

LIFESTYLE INTERVENTIONS

What lifestyle changes was Kit Carson asked to make?

Change the diet to the "whole plant food whole" diet. Okay, so aren't there too many "wholes" in that sentence? The point to be made is, eat plant foods and eat them in their entirety—don't let anyone "refine" them.[87] So, what are some examples of "whole plant foods whole"? –brown rice, whole wheat flour

products, fresh carrots, broccoli, spinach, and granola, etc. What are some examples of foods that are not whole plant foods whole; cow's milk, eggs, pancake mixes, crackers that have refined flour, fast foods, most foods that come in crinkly packages, sugar and oil, fish, anything with oil as an added ingredient, etc.

One reason refined foods are dangerous is their lack of fiber. Only about 5% of Americans get as much fiber as is recommended. Fiber plays an important role in diabetes prevention and management. Fiber protects against constipation, high cholesterol, heart disease, high blood sugar, diabetes, certain cancers, and obesity.[88]

In Harvard's Woman's Health Study, eating low fiber, high glycemic index foods more than doubled the risk of getting diabetes.[89]

In another study oat bran bread reduced blood sugar response by 46% and insulin response by 19% compared to refined white bread in the diet.[90]

A patient came in with gestational diabetes (diabetes resulting from the changes that pregnancy does to the body) who did not want to take drugs or insulin for fear of what they might do to her unborn child. She was adamant—no pills, no shots. She was advised to eat ½ cup of oat bran three times a day.[91] This she oat bran cookies, oat bran cereal, oat bran bread, oat bran in drinks. Her blood sugar was totally controlled; she delivered a normal healthy baby, and her diabetes was gone.

Fiber slows the rate at which sugar enters the blood stream. Even more fiber than is recommended for the average American is recommended for diabetics; 50 gm or more of daily fiber.[92]

One reason refined foods are dangerous is their lack of fiber. Only about 5% of Americans get as much fiber as is recommended. Fiber plays an important role in diabetes prevention and management.

Another great benefit of the whole plant food diet is whole grains. Replacing refined grains in the diet with whole grains can reduce the risk of diabetes by 70%.[93] Increasing whole grains to 3 servings per day can decrease the risk of diabetes by 50%.[94]

Another benefit of eating whole plant foods is that they actually require chewing. Thorough chewing increases the early insulin response to eating, decreases blood sugar,[95] and helps reduce food intake.[96] Reduced food intake helps with weight control and increases insulin sensitivity.[97,98]

A healthy breakfast plays a major role in diabetes reduction. People who eat breakfast tend to eat fewer total calories for the entire day; have lower cholesterol levels; and end up with less diabetes.[99] One study shows a 37%-55% reduction in risk of diabetes in people who eat a regular breakfast compared to those who don't.[100]

Speaking of a healthy breakfast, a lot of people do not even know if they are eating breakfast, brunch or lunch—they have no real set schedule. Irregularity of meal times, between meals snacking[101,102,103] and late bedtimes[104] increases insulin resistance, obesity and diabetes.

Refined food products generally have had many nutrients removed from them that are necessary for life and for the processing of carbohydrates. If a person eats a food that is totally devoid of a nutrient that is necessary for life, the body has to take from its own stores just to survive, thus depleting its own reserves of that necessary nutrient.

Chromium is an example. Diabetics generally have no tissue chromium.[105] Consumption of refined carbohydrates, such as refined sugar, tends to deplete chromium stores. In diabetics, increasing chromium has been shown to decrease fasting glucose levels, improve glucose tolerance, lower insulin levels, decrease total cholesterol and triglycerides, increase HDL-cholesterol levels, and ameliorate the symptoms of hypoglycemia.[106] Whole wheat has eight times the chromium of white flour. Brown rice has four times the chromium of white rice.

Diabetes,[107,108] coronary heart disease,[109] hypertension, and high triglycerides[110] are all associated with low dietary zinc. Whole wheat flour has four times the zinc as white flour. Pumpkin seeds and lentils are also good sources of zinc.

Magnesium levels are significantly lower in diabetics[111]—especially diabetics with

complications such as poor glycemic control, retinopathy, obesity, and hypertension.[112] The major dietary sources of magnesium include whole grains, legumes, nuts, and green leafy vegetables.[113]

Speaking of vegetables, cabbage consumption reduces blood sugar levels and whole-body inflammation. People who eat cabbage regularly are more likely to get off of their insulin.[114] What about picking up a head of cabbage next time you are in the grocery store?

A word of caution; the longer a person has been a diabetic, the longer it may take to respond to dietary changes.[115]

HERBS FOR DIABETES

Herbal teas take an important role in disease treatment for the person desiring to recover without the use of drugs. Beneficial herbs for the diabetic are as follows. Astragalus helps reduce Beta cell inflammation in the pancreas where insulin is made.[116,117] Red ginseng[118,119] and Jiaogulan (Gynostemma pentaphyllum) tea[120] stimulate beta cell production of insulin. Rosemary and Lemon balm inhibit carbohydrate metabolism.[121] Citrus leaves[122] helps reduce insulin resistance. Bladderwrack[123,124,125] inhibits carbohydrate metabolism, stimulates insulin production, and protects the pancreas, it also has a protective effect against diabetic nephropathy, and it is a good iodine source. Goldenseal root is antioxidant, anti-inflammatory and has hypoglycemic activities, which contribute to its efficacy in diabetes.[126] Fenugreek protects and rejuvenates pancreatic β-cells.[127] Tarragon (Artemisia dracunculus L.) enhances insulin release from primary β cells.[128] Moringa oleifera leaf possesses potent hypoglycemic effects.[129] Select a few readily available representative herbs, use one teaspoon of the combined herbal mixture per one cup of water and drink one or two cups of the preparation a half hour before each meal.

EXERCISE BENEFITS

Remember earlier we said that exercise makes the cells hungry again, reducing insulin resistance? Exercise lowers blood sugar and insulin, but it also helps to control weight. More than that, a good walk out in the fresh air and beautiful sunshine improves mental outlook, helping to deal with stress that can cuase diabetes.[130] Compared to those who live a sedentary lifestyle, those who are highly active have a 46% lower incidence of diabetes.[131] Of all the times to exercise, diabetics benefit most from exercise, such as walking, right after eating.[132,133,134] Another beneficial time to be exercising, for blood sugar control, is in the morning before breakfast![135] Maybe you have heard it said, “The early bird gets the worm.” Exercise, together with good water intake, are amonge the few lifestyle changes that have been shown to improve prepheral neuropathy, the pain or numbness in the hands or feet, of diabetics.[136] It has been said, if you can’t find time for exercise, you will have to find time to be sick. And, more people die for want of exercise than through over-fatigue.

MAKE WEIGHT LOSS A HABIT

The most dangerous fat for the diabetic is the belly or central fat, or what is called visceral fat—that fat which settles in the abdomen around the organs. This fat is always at a higher temperature and releases toxins that increase diabetic complications. One thing the diabetic has in their favor is that loosing weight results in the simultaneously reduction of all fat deposits —any reduction includes reduction in abdominal fat.[137] The goal then is not only to lose a little weight but also to make weight loss a habit. As long as weight is not gained back, the visceral fat will continue to melt away. Continuous weight loss, approaching ideal body weight, can reduce the risk of diabetes by 30-50%.[138]

SUNSHINE, VITAMIN D AND DIABETES

Part of the program for reducing diabetes involves getting adequate sun exposure. This helps maintain vitamin D levels. Studies show that vitamin D deficiency increases the risk of diabetes[139] and that vitamin D supplementation can actually reduce diabetes risk.[140] Diabetics are at increased risk of osteoporosis. This risk is also reduced by sunshine and vitamin D.

WATER: ELIXIR OF LIFE

Which is sweeter, a raisin or a fresh grape? Usually, a raisin is sweeter. So is it with blood, drinking more water thins the blood and lowers blood sugar by sheer dilution,[141] protects against ketoacidosis (the condition that sends

diabetics to the emergency room with altered consciousness),[142,143] and decreases diabetic neuropathy.[144] Humans need between 8 and 12 eight-ounce glasses of water daily. Diabetics are no exception and benefit greatly from drinking water.[145,146]

REVERSING DIABETES SUMMARY

- Regular exercise in the open air and sunshine (a little is better than none).
- Eat an unrefined plant-based diet, low in fat, high in fiber.
- Make breakfast a healthy habit.
- Make weight control a habit.
- Drink plenty of water.
- Get adequate sleep.
- Avoid stimulants such as coffee, alcohol, and tobacco.
- Try a few medicinal herbs until recovery is certain.
- Turn stress over to God who alone can handle it.

HAS THIS PROGRAM WORKED?

It has. In the "Reversing Diabetes" program, diabetic patients were studied for 25 days on a special diet, exercise program with adequate sunshine, rest, and pure filtered water. Patients were fed an unrefined plant-based diet, low in fat (10%-15%), high in fiber with no cholesterol.

The average weight loss was 11 pounds. One fourth of diabetics no longer needed insulin or drugs to control blood sugar. Those who still needed insulin saw their requirements cut nearly in half. Blood pressures dropped from an average of 155/81 to 132/77, and 81% had complete relief of peripheral neuropathy.[147]

One example from the "Reversing Diabetes" program is John Rowe, R.N., E.R. nurse and a diabetic for eleven years, who was injecting up to 144 units of insulin a day. Within two days of adopting the "Reversing Diabetes" lifestyle, his blood sugar returned to normal without medication. He lost thirty-five pounds in four months. His blood pressure fell to normal, and his vision greatly improved.[148]

And exactly what dietary program are we really talking about? - The original Bible diet! Then God said, "I give you every seed-bearing plant on the face of the whole earth and every tree that has fruit with seed in it. They will be yours for food." "And you will eat the plants of the field."[149]

Recall that the earliest record of diabetes comes from the pyramids of Egypt during the time that the Israelites were liberated, and that God said, "If thou wilt diligently hearken to the voice of the LORD thy God, and wilt do that which is right in his sight, and wilt give ear to his commandments, and keep all his statutes, I will put none of these diseases upon thee, which I have brought upon the Egyptians: for I am the LORD that healeth thee."[150] If the Israelites would stick with the original diet from Eden, they could totally avoid the Egyptian's diabetes.

Why die of diabetes? Why not make it a point to exercise regularly and eat only a whole plant-based diet?

For further ideas on how to incorporate what you have just learned into your daily life, see the article entitled, "How Can I Apply Healthy Principles in My Daily Life", or Lifestyle Choices.

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