PREVENTING AND REVERSING TYPE 2 DIABETES NATURALLY

Dr. **Michael T. Murray N.D.**

Dear Health Enthusiast,

In this collection of articles you will find valuable information on natural approaches to preventing and reversing type 2 diabetes. What the medical literature clearly demonstrates is that there is a lot that can be done with diet and supplementation to prevent and possibly reverse this dreaded disease. But, this information is only valuable if it is actually put into practice. So, please do your best and take action!

Sincerely,
Michael T. Murray, N.D.

WHAT IS DIABETES?

Diabetes mellitus is a chronic disorder of carbohydrate, fat, and protein metabolism characterized by fasting elevations of blood sugar (glucose) levels and a greatly increased risk of heart disease, stroke, kidney disease, retinopathy, and loss of nerve function. Diabetes can occur when the pancreas does not secrete enough insulin or if the cells of the body become resistant to insulin. Hence, the blood sugar cannot get into the cells, which then leads to serious complications.

Diabetes is divided into two major categories: **Type 1** and **Type 2**. About 10% of all diabetics are Type 1, and about 90% are Type 2. Type 1 is associated with complete destruction of the beta-cells of the pancreas, which manufacture the hormone insulin. Type 1 patients require lifelong insulin for the control of blood sugar levels. Type 1 results from injury to the insulin-producing beta-cells, coupled with some defect in tissue regeneration capacity. In Type 1, the body's immune system begins to attack the pancreas. Antibodies for beta-cells are present in 75% of all cases of Type 1, compared to 0.5-2% of non-diabetics. It is probable that the antibodies to the beta-cells develop in response to cell damage due to other mechanisms (chemical, free-radical, viral, food allergy, etc.). It appears that normal individuals either do not develop as severe an antibody reaction, or are better able to repair the damage once it occurs.

Type 2 historically has had an onset after 40 years of age in overweight individuals but is today even seen in children due to the obesity epidemic present in all age groups in America as well as those exposed to high levels of POPs (persistent organic pollutants). Initially, insulin levels are typically elevated in Type 2, indicating a loss of sensitivity to insulin by the cells of the body. Obesity is a major contributing factor to this loss of insulin sensitivity. Approximately 90% of individuals categorized as having Type 2 are obese. Achieving ideal body weight in these patients is associated with restoration of normal blood glucose levels in many cases. Even if Type 2 has progressed to the point where insulin deficiency is present, weight loss nearly always results in significant improvements in blood glucose control and dramatic reductions in other health risks such as cardiovascular disease.

There are other types of diabetes such as gestational diabetes which affects about 4% of all pregnant women. About 135,000 cases of gestational diabetes occur each year in the United States. Gestational diabetes occurs more frequently among African Americans, Hispanic/Latino Americans, and American Indians. It is also more common among obese women and women with a family history of diabetes. After pregnancy, 5% to 10% of women with gestational diabetes develop Type 2 and that number increases to 20% to 50% chance of developing diabetes in the 5 to 10 years after pregnancy.

Prediabetes and metabolic syndrome

Prediabetes (formerly called "impaired glucose tolerance") is categorized by fasting glucose being 100-125 mg/dL and/or postprandial glucose of 140-199 mg/dL. It is the first step in insulin resistance and estimated to affect 57 million Americans. Many people with prediabetes will go on to develop full-blown Type 2 despite the fact that prediabetes is usually reversible and, in most cases, diabetes can be completely avoided through dietary and lifestyle changes. Factors implicated in contributing to prediabetes, insulin resistance, and the progression to Type 2 include: a diet high in refined carbohydrates, particularly high fructose corn syrup; elevated saturated fat intake; over-eating due to increased portion sizes of food; increase in inflammatory markers; lack of exercise; industrial pollution; abdominal weight gain; hormonal imbalances; inadequate sleep; and nutrient deficiencies.

Research increasingly indicates that prediabetes is accompanied by serious health risks especially an increased risk for cardiovascular disease (CVD). Prediabetics often meet the criteria of the metabolic syndrome. The **metabolic syndrome** (MetS) is a cluster of factors that together carry a significantly greater risk for CVD and developing Type 2 that include:

- Greater waist to hip ratio
- Two of the following:
  - Triglycerides > 150 mg/dL
  - HDL-C < 40 mg/dL for men, < 50 mg/dL for women
  - Blood pressure ≥ 130/85 mmHg
  - Fasting plasma glucose (FPG) ≥ 100 mg/dL

Other types of diabetes include:

- Secondary diabetes (a form of diabetes that is secondary to certain conditions and
- Syndromes, such as pancreatic disease, hormone disturbances, drugs, and malnutrition)
- Gestational diabetes (glucose intolerance that occurs during pregnancy)
- Impaired glucose tolerance (a condition that includes prediabetic or borderline diabetes); individuals with impaired glucose tolerance have blood glucose levels and glucose-tolerance test (GTT) results that are intermediate between normal and clearly abnormal

The following criteria are used for diagnosing diabetes:

- Fasting (overnight): serum glucose (blood sugar) concentration greater than or equal to 126 mg/dl on at least two separate occasions
- Following ingestion of 75 g of glucose: serum glucose concentration greater than or equal to 200 mg/dl at two hours post-ingestion and at least one other sample during the two-hour test

What causes diabetes mellitus?

Although the exact cause of Type 1 diabetes is unknown, current theory suggests an autoimmune process leads to destruction of the insulin-producing beta-cells in the pancreas.

Antibodies for beta-cells are present in 75% of all cases of Type 1 diabetes, compared to 0.5-2% of non-diabetics. The antibodies to the beta-cells appear to develop in response to cell destruction due to other mechanisms (chemical, free-radical, viral, food allergy, etc.).

Approximately 90% of individuals with Type II diabetes are obese. Obesity is a major contributing factor to this loss of insulin sensitivity. In most cases, achieving ideal body weight is associated with restoration of normal blood sugar levels in these patients. In other words, achieving ideal body weight is often a "cure" for type 2 diabetes.

What dietary factors are important in diabetes?

Diabetes, perhaps more than any other disease, is strongly associated with Western culture and diet as it is uncommon in cultures consuming a more "primitive" diet. However, as cultures switch from their native diets to the "foods of commerce," their rate of diabetes increases, eventually reaching the same proportions seen in Western societies.

Dietary modification and treatment is fundamental to the successful treatment of both Type I and Type II diabetes. All simple, processed, and concentrated carbohydrates must be avoided. Low glycemic load foods should be stressed and saturated fats should be kept to a minimum. Since diabetics have a higher incidence of death from cardiovascular disease (60-70%, versus 20-25% in people without diabetes), the dietary recommendations given in atherosclerosis are equally appropriate here.

Weight loss, in particular a significant decrease in body-fat percentage, is a prime objective in treating the majority of Type 2 diabetics; it improves all aspects of diabetes and may result in cure.

"Dr. Murray, the simple words—Thank You!—cannot begin to encompass the gratitude I feel, the hope you have restored to me, and the reality of significantly improved health that I thought may never happen.

I have been morbidly obese and continually gained weight for the last twenty years. I have tried various diets during this time only to experience failure and even more weight gain. In March 2004, within a few days of starting the WellBetXT products, the hypoglycemic episodes I would experience even before I got hungry started to level out, which allowed me to more comfortably make better food choices. Within three weeks my blood sugar swings completely normalized. What was even more impressive was the PGXT and how it controlled my appetite. For the first time in years I found myself not hungry. I also started using the WellBetXT with PGXT meal replacement shakes for breakfast.

Three months later on a follow up visit to my physician, he came in the room with a smile on his face and showed me my blood test results. WOW! In 90 days, my fasting insulin level had dropped from 35.1 to 19.0. It was now well within the normal range along with my fasting glucose levels ... and that was not all—I had also lost 22 pounds and 23-1/2 inches. I had never had that kind of weight loss before, and yet I was still rarely hungry and I was feeling much better.

Thank you."
—LA

For both Type 1 and Type 2 diabetics, there are some specific foods that have been shown to produce positive effects on blood sugar control. These foods include olives, soybeans and other legumes, nuts, artichokes, bitter melon, garlic, Jerusalem artichokes, mangoes and onions. These foods all have a low glycemic index and glycemic load and are high in fiber.

Cinnamon may also be helpful in controlling blood sugar levels. According to research, cinnamon might be acting as an insulin substitute in type 2 diabetes. A double-blind study of 60 people with type 2 diabetes revealed a significant decrease in fasting serum glucose (18-29%), triglyceride (23-30%), LDL cholesterol (7-27%), and total cholesterol (12-26%) levels after taking cinnamon for 40 days. The effective dosage was as little as 1 gram per day of cinnamon (roughly ¼ teaspoon).

What nutritional supplements should I take for diabetes mellitus?

Along with Dr. Lyon and Natural Factors, I have created the ***WellBetX***—a family of nutritional and herbal products designed to address special nutritional needs of people with diabetes. The *WellBetX* products are designed to be used in conjunction with proper dietary, lifestyle, and medical treatment of diabetes. *WellBetX* is not designed to "treat" diabetes, instead it is designed to support the proper utilization of blood glucose and insulin as well as deal with some of the nutritional challenges and deficiencies that many diabetics suffer from. The various *WellBetX* products are designed to impact one or all of the following goals:

1. Reduce after meal elevations in blood sugar levels.
2. Provide optimal nutrient status.
3. Improve insulin function and sensitivity.
4. Prevent nutritional and oxidative stress.

The *WellBetX* product line consists of the following formulas:

- **PGX with Mulberry** – A proprietary fiber blend with remarkable properties in supporting blood sugar control along with a special extract of mulberry leaves.
- **WellBetX Meal Replacement Drink Mix with PGX** – A delicious way to improve blood sugar levels and promoting satiety.
- **WellBetX Complete Multi for Glucose Balance** – a high potency formula that provides optimal levels of nutrients to support people with diabetes.
- **Herbal Glucose Balance** – A unique formula of herbal extracts with scientific support for their role in promoting human health.
- **Berberine** – An alkaloid from goldenseal, barberry bark, and Oregon grape root has shown impressive results in supporting blood sugar control, blood pressure, and blood lipid levels.
- **RxOmega-3 Factors with Borage Oil** – A pharmaceutical grade fish oil with the added benefits of GLA from borage oil.

How do I know if the recommendations are working?

If you have diabetes and utilize nutritional and herbal support, you must monitor blood sugar levels, especially if you are on insulin or have relatively uncontrolled diabetes. Typically insulin and drug dosages will have to be altered after employing natural medicines. Under no circumstances should a person suddenly stop taking insulin or oral diabetic drugs without consulting their physician.

It is important to monitor blood sugar levels because poor blood sugar control dramatically risk of developing the complications of diabetes. The availability of home glucose monitoring kits makes it easier now than in the past to monitor blood sugar levels, resulting in a major improvement in the care of diabetes. Another major improvement is the measurement of the level of glycosylated hemoglobin (HgbA1c), which allows monitoring of blood sugar levels over a long period of time. I recommend periodic measurement-every three months in poorly controlled diabetes, and every year in well-controlled cases. If a diabetic can keep their HgbA1c between 6-7%, the risk for developing any complication of diabetes is dramatically reduced.

WHY A NATURAL APPROACH TO TREATING TYPE 2 DIABETES BEATS MEDICINE

When I recently read the American Diabetes Association's 2013 Standards of Medical Care for Type 2 Diabetes, I found many extremely alarming guidelines. Foremost is the complete over-reliance on the pharmaceutical management of diabetes and its complications, along with a complete absence of recommendations for use of critical nutritional support. The major shortcoming of pharmaceutical interventions in Type 2 diabetes is that they don't impact the progression of the disease, and in many cases actually **accelerate** the underlying disease process and increase mortality. Yet this approach is the only one offered by conventional medicine.

The key issue that's not addressed by the ADA or other conventional medical groups dealing with diabetes is that drugs are only biochemical band-aids. There is one fundamental truth that is rarely explained to the patient: **Type 2 diabetes in almost every case is a disease caused by diet and lifestyle.** Findings from the U.S. government's Third National Health and Nutrition Examination Survey (NHANES III) clearly support this statement. Of individuals with type 2 diabetes, 69% did not exercise at all or did not engage in regular exercise; 62% ate fewer than five servings of fruits and vegetables per day; and 82% were either overweight or obese.

Among patients with pre-diabetes, a minimum of 150 minutes a week of physical activity similar in intensity to brisk walking was associated with a 58% reduced risk of developing diabetes. This study, the Diabetes Prevention Program, also looked at early drug therapy with metformin as a possible prevention strategy. The metformin reduced the risk by 31%. In other words, walking was nearly twice as effective!

Natural approaches to treating type 2 diabetes

Diet alone can often be effective as the sole factor in treating and reversing Type 2. Other lifestyle factors and supplements are important, but treatment of Type 2 begins with diet. There is considerable evidence from clinical trials that a diet low in refined carbo-

hydrates is emerging as the most scientifically proven approach, especially when considering not only its effect on blood glucose levels, but also the effects it exerts in reducing the sequelae of diabetes, such as high cholesterol levels, cardiovascular disease, hypertension, and other complications.

The treatment of diabetes with natural medicine also involves trying to achieve ideal blood glucose control and metabolic targets, as well as reducing the risk of the complications of diabetes by focusing on the following four areas:

1. Providing optimal nutrient status.
2. Reducing after-meal elevations in blood glucose levels.
3. Improving insulin function and sensitivity.
4. Preventing nutritional and oxidative stress.

"Dr. Murray, I know that you are very busy and may not remember talking to me when you came to Houston and talked about your book and research on preventing and treating diabetes. You saved my life that night.

I was very ill with Type II diabetes and the medication did not work and I could feel my life was slipping away. I was helpless to do anything until I met you. You gave me hope and helped me to believe that my life could continue and indeed it has.

I went immediately and bought the Welbetx and began using it as you told me to that night. On the second day, I came back from my illness! I began to feel well again and I had energy and my sugar began to drop. Today I am 52 pounds lighter, I no longer have diabetes and am off medications and just doing your program, eating correctly and exercising three times a week. I have gone from a size 3XXX to a size Large. My pants have gone from a 48 to size 40. I weighed 268 and now weigh 216. I am well and fit and owe it to you and to the products that you developed.

I wish I could do more to thank you for you saved my life. My wife and children are grateful to you too. You make a difference in peoples lives and I know that you saved my life. God bless you and your work and Natural Factors."

—JG

One of the centerpiece supplements for Type 2 diabetes is highly viscous dietary fiber products. A good high-potency multiple vitamin and mineral formula is also a must and should provide 200 to 400 mcg of chromium—a key mineral in the proper utilization of insulin. Other considerations include:

- **Alpha lipoic acid** (400 to 600 mg), which not only helps improve insulin action, but also helps prevent and reverse diabetic nerve disease.
- **Flavonoid-rich extracts like bilberry, grape seed, or pine bark**, which are extremely important in protecting against the long-term complications of diabetes.
- **Onions and garlic**, which have demonstrated blood-sugar-lowering action in several studies and help reduce the risk of cardiovascular disease.
- The oral administration of **mulberry extract, cinnamon extract, or extracts of *Gymnema sylvestre***, which have all been shown to produce very good results in improving blood sugar control.

Before you swallow everything the American Diabetes Association recommends in terms of medications for your Type 2 diabetes, do yourself a favor and learn more about natural approaches that include a healthy diet, superfoods for diabetes, exercise, and nutritional supplements.

BLOOD SUGAR BLUES

Too many type 2 diabetics are taking drugs when simple diet and lifestyle changes may be just as effective

The statistics on the growing epidemic of type 2 diabetes are staggering—it is now estimated that one-half of all American adults will develop the disease by 2020. Currently, one out of every five United States federal health care dollars is spent treating people with diabetes. The average yearly health care costs for a person without diabetes is $2,560; for a person with diabetes, that figure soars to $11,744. Much of that increase is related to the costs of drugs.

Conflict of interest?

Recently, the journal *Diabetes Care* published the American Diabetes Association's (ADA) Standards of Medical Care for type 2 diabetes, which are quite disturbing for their **over-reliance on the pharmaceutical management of diabetes** while all-but-ignoring nutritional support. The problem is that pharmaceutical interventions don't impact the progression of type 2 diabetes, and in many cases, they can accelerate the disease process. Yet this approach is the only one offered by conventional medicine, perhaps for dubious reasons.

In an article published in the September/October 2012 issue of the *Annals of Family Medicine*, researchers from Michigan State University recommended that doctors with financial conflicts be excluded from developing medical guidelines for diabetics, regardless of disclosure. They also suggested that physicians should be discouraged from meeting with drug company representatives. After analyzing how physicians treated patients with type 2 diabetes and high blood pressure in 44 primary care centers, the authors described "a common scenario: patients began medications after having moderately elevated test results (often at levels considered normal just a few years ago), developed additional symptoms, were found to have values falling outside reference ranges on other tests, and were prescribed more drugs. They were expected to continue these medications permanently: their target laboratory levels could be achieved only through continued use of these drugs."

The consultations the researchers observed "focused heavily on" medications with little or no discussion of other treatment paths, including diet and exercise. The authors also noted that clinicians are exposed to heavy marketing efforts by pharmaceutical companies, and that this may be contributing to the emphasis on prescriptions. Of the 53 clinicians willing to discuss pharmaceutical marketing, 38 (72%) reported having regular contacts with pharmaceutical representatives.

The patient interviews were also enlightening, as almost 70% said they had experienced significant symptoms of adverse drug reactions from diabetes or hypertension medications, a much higher percentage than is expressed by the drug companies.

The real type 2 diabetes cure

The key issue being ignored by the ADA is that diabetes drugs are only biochemical band-aids. One fundamental truth is rarely explained to the patient: type 2 diabetes, in almost every case, is caused by poor diet and lifestyle choices. Findings from the U.S. government's Third National Health and Nutrition Examination Survey clearly support this statement: of individuals with type 2 diabetes, 69% did not exercise at all or did not engage in regular exercise; 62% ate fewer than five servings of fruits and vegetables per day; and 82% were either overweight or obese.

Among patients with pre-diabetes, a minimum of 150 minutes per week of physical activity was associated with a 58%–reduced risk of developing diabetes. In the same study (known as The Diabetes Prevention Program), the drug metformin was found to reduce diabetes risk by only 31%.

Although lifestyle changes are important, diet alone can be effective in treating and reversing type 2 diabetes. The most scientifically proven approach is a diet low in refined carbohydrates. Not only does such a regimen lower blood glucose levels, but it also helps with conditions such as high cholesterol, cardiovascular disease, and hypertension.

Supplements for diabetes

Here are key supplements to consider adding to your daily regimen if you have type 2 diabetes or want to prevent it:

- **PGX** (2.5–5 grams at meals) is one of the centerpiece supplements for treating type 2 diabetes. PGX is a highly purified fiber that lowers the glycemic index of foods and helps promote satiety.
- **A high-potency multivitamin and mineral formula** is a must and should provide 200–400 mcg of chromium, a trace mineral that plays a key role in the proper utilization of insulin.
- **Alpha-lipoic acid** (400–600 mg) not only helps improve insulin action, but also helps prevent and reverse diabetic nerve disease.
- **Flavonoid-rich extracts such as bilberry, grape seed, or pine bark** are extremely important in protecting against the long-term complications of diabetes.
- **Onions and garlic** have demonstrated blood-sugar-lowering action in several studies and help reduce the risk of cardiovascular disease.
- **Mulberry extract, cinnamon extract, or extracts of Gymnema sylvestre** have all been shown to produce results in improving blood sugar control.

STATINS INCREASE THE RISK OF DIABETES EVEN GREATER THAN EXPECTED!

A new study again highlights the fact that using statin drugs to lower cholesterol levels are not at all risk free. Researchers found that **statin use increased the risk of developing type 2 diabetes** by 46% in men. These results are a little better than the 72% increase in type 2 diabetes noted in postmenopausal women taking statins. The results from these studies and others call into question the false hope that physicians and consumers place in statin drugs to promote a longer, healthier life.

While statins have been shown to reduce heart attack risk and extend life in patients with confirmed cardiovascular disease such as a history of a heart attack, stroke, or clinical evidence of blockage of the arteries such as angina, about 80% of the prescriptions for statins are written for people with no clinical evidence of cardiovascular disease (CVD). In many cases, physicians are prescribing statins to people with the only risk factor being high LDL cholesterol levels. Statins have not been shown to increase life expectancy in these patients or in others not suffering from clinical evidence of CVD.

The list of statin drugs include:

- Altoprev (lovastatin extended-release)
- Crestor (rosuvastatin)
- Lescol (fluvastatin)
- Lipitor (atorvastatin)
- Livalo (pitavastatin)
- Mevacor (lovastatin)
- Pravachol (pravastatin)
- Zocor (simvastatin)

The easy conclusion is that the majority of people on statin drugs are achieving no real benefit from them, and may in fact be exposing themselves to considerable harm including the risk of developing type 2 diabetes.

Background data

While drug companies and many doctors state that statins are so safe and effective they should be added to drinking water, the reality is that they are very expensive medicines, provide very limited benefit, and carry with

them considerable risks for side effects. In addition to the increased risk of developing type 2 diabetes, some of the side effects noted with statins include the following:

- Liver problems and decreased liver function.
- Interference with the manufacture of coenzyme Q10 (CoQ10), a key substance responsible for energy production within the body.
- Rhabdomyolysis, the breaking down of muscle tissue, which can be fatal.
- Nerve damage – the chances of nerve damage are 26 times higher in statin users than in the general population.
- Cognitive (brain-related) impairment, such as memory loss, forgetfulness and confusion, has been seen in some statin users.
- Possible increased risk of cancer and heart failure with long-term use.
- Increased muscle damage caused by exercise and reduced exercise capacity.
- Worsening energy levels and fatigue after exertion in about 20% of cases
- Increased risk for obesity and insulin resistance.

New data

To further explore the risk for type 2 diabetes with statin drug use, researchers investigated the effects of statin treatment on blood glucose control and the risk for type 2 diabetes in 8,749 non-diabetic men age 45-73 years in a 6-year follow-up of the population-based Metabolic Syndrome in Men (METSIM) trial, based in Kuopio, Finland.

Results clearly showed that statin use was associated with a 46% increased risk for type 2 diabetes after adjusting for all confounding factors. Patients taking statins also had a 24% decrease in insulin sensitivity and a 12% reduction in insulin secretion compared with those not receiving the drugs.

Commentary

It is interesting to note that despite the clear risks of taking statins, physicians are largely brainwashed into believing that the benefits outweigh the risks. The data just does not support this line of thinking. Again, while statins do produce some benefits in reducing deaths due to a heart attack in people with a history of a heart attack, stroke, or current signs and symptoms of existing CVD; large studies in people without a history of heart attack or stroke who took statin drugs and lowered their cholesterol have shown they do not live any longer than the people in the placebo group. That is especially true for women. In fact, there is no real solid evidence that statins increase life expectancy even in women with cardiovascular disease.

This recent study is just one more that further strengthens my consistent message on statins. They are **NOT addressing the major causes of CVD** and may be creating serious health issues of their own.

In order to provide you the best guidelines to reduce your risk for CVD, I am offering a free PFD download on my book, *Cholesterol and Heart Health – What the Drug Companies Won't Tell You and Your Doctor Doesn't Know*. Feel free to forward it to any friend or family member that can benefit from it. Also, if you know someone taking a statin and you can't get them to read my book, have them at least watch my recorded webinar, *An Honest Appraisal of Statins and Their Alternatives*.

Reference
Mayor S. Statins associated with 46% rise in type 2 diabetes risk, study shows. BMJ. 2015 Mar 5;350:h1222. doi: 10.1136/bmj.h1222.

FRUIT CONSUMPTION REDUCES RISK FOR TYPE 2 DIABETES

While fruits are rich in fiber, antioxidants, and phytochemicals that provide considerable beneficial health effects, they also contain natural sugars that have the potential to stress blood sugar control. As a result, many people with diabetes strictly avoid fruit even though eating the right types of fruit has actually been shown to help improve blood sugar control.

While there is no question that fruits can have a high glycemic index and/or glycemic load, new data is showing that fruit consumption can positively influence blood sugar control regardless of their glycemic index and glycemic load values.

Background data

Previous studies examining the association between total fruit consumption, as well as the consumption of individual fruits or fruit groups, and the risk of type 2 diabetes have produced mixed results. The best results have been seen in studies focusing on:

- Anthocyanin rich fruits (e.g., blueberries, dark grapes, strawberries, and apples)
- Chlorogenic acid containing fruit (prunes, peaches, plums, apricots, and apples)
- Grapefruit (due to its high content of the flavonoid naringin)

What these positive studies indicate is that specific fruit exert benefits in helping to improve blood sugar control due to the various phytochemicals they possess.

New data

Researchers from the Harvard School of Public Health examined dietary data from 66,105 women from the Nurses' Health Study I; 85,104 women from the Nurses' Health Study II; and 36,173 men from the Health Professionals Follow-up Study. These subjects were free of major chronic diseases at baseline in these studies. The main outcome measure was the development of type 2 diabetes.

When the researchers looked at the risk of developing diabetes and the consumption of

three whole fruit servings per week of different fruit from pooled data from these very large studies they found the following risk levels:

- 26% reduced risk for blueberries
- 12% reduced risk for grapes and raisins
- 7% reduced risk for apples and pears
- 5% reduced risk for bananas
- 5% reduced risk for grapefruit
- 10% increased risk for cantaloupe

Diabetes risk was neutral for peaches, plums, apricots, prunes, oranges, and strawberries. These fruit neither increased or decreased the risk of type 2 diabetes. However, when the impact of eating three servings of these fruit was compared with the same amount of fruit juice per week, they were shown to be significantly protective. Simply switching out fruit juice for whole fruit significantly reduced the risk for diabetes (7% lower risk overall for any whole fruit and as much as 33% lower risk for blueberries).

The glycemic index/glycemic load values of fruits did not seem to be the factor that determined the fruit's association with type 2 diabetes risk. However, the increased risk of type 2 diabetes seen with fruit juice consumption was definitely thought to be the result of the increased glycemic index/load of fruit juice. In other words, the consumption of fruit juice lead to more rapid and larger changes in serum levels of glucose and insulin compared to whole fruits and carries with it an increased risk for type 2 diabetes.

Commentary

This study dispels a common misconception about fruit consumption. Yes, fruit contains natural sugars, but it also contains many compounds that promote health and reduce the risk of chronic diseases including type 2 diabetes. The key with fruit consumption is to focus on low glycemic choices like berries and to limit consumption to one serving for any three-hour period (to avoid stressing blood sugar control).

Another take away point from the above study is to avoid consumption of commercial fruit juices. Many of the beneficial compounds in fruit are destroyed during pasteurization. Fresh (preferably organic) fruit juices retain these beneficial compounds and provides considerable health benefits, but still need to be consumed in limited amounts to maintain proper blood sugar control (e.g., no more than 6-8 ounces per three-hour period and no more than two servings daily).

Reference
Muraki I, Imamura F, Manson JE, et al. Fruit consumption and risk of type 2 diabetes: results from three prospective longitudinal cohort studies. BMJ. 2013 Aug 28;347:f5001. doi: 10.1136/bmj.f5001.