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## ASK THE DOCTOR

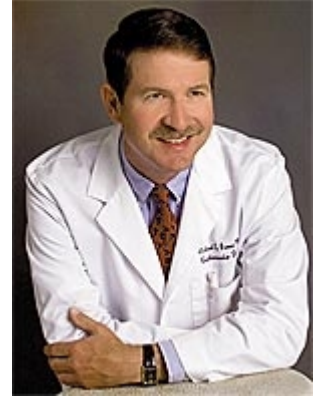
### Preventing Diabetes

#### With the Miami Mediterranean Diet

By Michael Ozner, MD

*Q: I have been following the Miami Mediterranean diet to reduce my risk of heart disease. I read somewhere that this diet may be helpful for those with high blood sugar and diabetes. Can you tell me more about this?*

A: I'm glad to hear that you're following the healthy Miami Mediterranean diet. In my practice, I've found that patients who adopt the diet, along with lifestyle changes such as exercise and stress reduction, are healthier and happier. Studies have long proven that a Mediterranean-type diet reduces the risk of cardiovascular disease, and it also has been linked to protection against some cancers. But now there's more good news: a new study published in the *British Medical Journal* shows that eating a traditional Mediterranean diet regularly may reduce the risk of developing type 2 diabetes by as much as 83%!<sup>1</sup>



The results of this study are astonishing. Previous research has shown the benefits of a Mediterranean-type diet for reducing insulin resistance. But earlier studies were not as large as this new one which, for four-and-a-half years, followed 13,380 Spanish university graduates who had no history of diabetes. At the study's conclusion, it was found that the participants who most strictly adhered to the diet had a lower risk of developing type 2 diabetes. And from that large population, only 33 cases of type 2 diabetes were documented.

How well one adheres to a Mediterranean-type diet appears to be the real key to successfully lowering the risk of developing type 2 diabetes, and even preventing it. In addition to closely monitoring the types of foods that study participants ate, researchers rated each person on how well they adhered to the diet. Those with the highest adherence to the diet reduced their risk of developing type 2 diabetes by 83% over those with the lowest adherence. And, according to the scale of 1 to 10 used to measure adherence, researchers found that a mere two-point increase on the adherence scale correlated to a 35% reduction in diabetes risk.

Here's an interesting fact: Among those with better adherence to the diet were people with the greatest number of risk factors for developing type 2 diabetes. These were people who were expected to have a higher incidence of the disease, yet they, too, showed lower risk. This suggests that a Mediterranean-type diet has substantial potential for type 2 diabetes prevention.

The study's findings are truly good news because diabetes is a major problem in the United States and worldwide. Type 2 diabetes has significantly increased in industrialized countries due to the toxic Western diet and lifestyle and the population's expanding girth. According to the American Diabetes Association, nearly 24 million adults and children in the US have diabetes. The disease contributed to approximately 224,000 deaths in 2002—and that number could be low, as studies have shown that diabetes is generally under-reported on death certificates.<sup>2</sup> Regularly consuming a Mediterranean-type diet can be a big step toward bringing this epidemic under control.

Diabetes is also a major drain on the health care system in both dollars and resources. The costs of treating the disease itself and what it leads to—heart attacks, strokes, hospitalization—are staggering and can financially cripple or bankrupt families. We have a health care crisis in America and the diabetes epidemic is definitely a major contributor to it.

I'm sure you're wondering how the Mediterranean diet helps prevent and control diabetes. I'll explain, but first I'll discuss what diabetes is, what causes it, and why reducing the risk of developing the disease is so important.

### UNDERSTANDING DIABETES

Diabetes is a chronic, progressive disease in which insulin—a hormone that converts sugar, starches, and other foods into energy—is not properly produced or utilized in the body. Medically, it is defined as fasting blood sugar in excess of 125 mg/dL. There are several types of diabetes. Type 1, in which the body fails to produce insulin, is found mainly in childhood. The causes are theorized to be autoimmune or viral. Type 2 diabetes is the most common and is largely the result of lifestyle choices, primarily obesity, lack of exercise, and the consumption of unhealthy foods. It used to be called adult-onset diabetes, but now it is called type 2 diabetes, because unfortunately, adolescents are also getting the disease in increasing numbers. The third type is known as gestational diabetes, which women sometimes develop during pregnancy. Usually this type goes away after pregnancy; however, roughly 50% of women with gestational diabetes will develop type 2 diabetes within five years of giving birth.

I'll focus my discussion on type 2 diabetes, since it is the subject of this new study. What is the mechanism of type 2 diabetes? Digestion converts sugars in food into glucose, a form of sugar that is the body's primary fuel. Insulin, which is a hormone produced and released by the beta cells of the pancreas, enables glucose to pass from the bloodstream into the body's cells to be used for the body's energy requirements. Unused glucose is stored in liver and muscle cells as glycogen. As glucose levels in the body decrease, glycogen converts back to glucose to be used as fuel when necessary. However, if insulin resistance develops, normal amounts of insulin no longer produce a normal insulin response. Glucose won't be absorbed as well by the cells that need it, and it won't be stored properly in the liver and muscles. The level of glucose in the blood remains high. The pancreas responds by trying to produce more insulin, but this can eventually overtax the beta cells, which can't keep up with the process of producing more insulin to handle the excess glucose. The beta cells themselves can become dysfunctional, producing less insulin (insulin deficiency) while blood glucose levels continue to rise. This can eventually lead to beta cell apoptosis, or programmed cell death.



Studies have shown that obesity and the highly processed American diet leads to a state of chronic low-grade inflammation. Inflammatory proteins interfere with insulin receptors, leading to insulin resistance. Obesity or lifestyle choices that increase inflammation in the body help create the conditions that favor the development of type 2 diabetes.

Diabetes can cause serious, long-term complications such as kidney disease, neuropathy, and blindness. It also significantly increases the risk of death from cardiovascular disease, heart attack, and stroke. A major study published in 1998, the Finnish East West Trial, showed that if you have type 2 diabetes, you actually have the same risk of heart attack as someone who has already had a heart attack.<sup>3</sup> That's why diabetes is considered a coronary heart disease risk equivalent. Even worse, the risk of cardiovascular disease can even be raised by a pre-diabetes condition associated with insulin resistance called impaired fasting glucose.<sup>4</sup> This is signaled by a blood sugar measurement greater than 100 mg/dL—generally 100-125 mg/dL—and it is a warning sign of the impending development of diabetes.

Treatment for type 2 diabetes typically involves medication to lower blood sugar. There are many drugs available, including insulin and drugs that are costly and have side effects. One particular antidiabetic drug called rosiglitazone (Avandia®) has been in the news recently for increasing the risk of heart attack.<sup>5</sup> Considering the complications and dangers of diabetes and the risks of some of the drug treatments, it truly is great news to learn that you can lower your risk of developing the disease by 83% in a completely natural way, without taking medication.<sup>1</sup> I want to stress, however, that I'm not saying medications should not be used, as there are situations where medication is appropriate. But medication shouldn't be used as a substitute for lifestyle changes. People can be their own worst enemy and want to use medication just so they can abuse lifestyle. They often reason that if they take insulin or pills, it's a license to continue eating the wrong foods or to overeat. This is never the way to treat type 2 diabetes. The best use of medication is to take it in addition to making the proper lifestyle changes. The hope is that lifestyle changes will improve the condition enough so that one is no longer labeled as diabetic, so that it is possible to stop taking the medication.

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## Preventing Diabetes

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### HOW DOES THE MIAMI MEDITERRANEAN DIET FIGHT DIABETES?

Adherence to a Mediterranean-type diet, along with exercise, is a proven approach to lowering your risk of developing type 2 diabetes. All you need is healthy food, a knife and fork, and a good pair of walking shoes. In my book, *The Miami Mediterranean Diet*, you can read all the specifics of a Mediterranean diet that consists of fresh fruits and vegetables, whole grains, olive oil, cold water fish, red wine, nuts, and beans. If you've been regularly following the diet, I'm sure you've made use of the book's hundreds of delicious recipes and suggested meal plans that can decrease your risk of developing type 2 diabetes, as well as hypertension and cardiovascular disease.



The Miami Mediterranean diet works in two ways to lower the risk of diabetes by: 1) including healthy foods that fight the causes of diabetes, and 2) eliminating toxic foods that increase the risks of the disease. The diet limits refined sugar, which clearly increases the risk of high blood glucose and diabetes. The worst player that is completely absent from the diet is high-fructose corn syrup, which increases inflammation in the body. Unfortunately, high-fructose corn syrup is now pervasive in the standard American diet. It is used as a preservative and to sweeten foods and drinks like sodas. The food industry has had a love affair with high-fructose corn syrup for decades because it is cheap and it allows foods to be preserved on the shelf. But we've paid a price for that, as high-fructose corn syrup increases inflammation in the body, as well as the amount of the lipoprotein called very low-density lipoprotein (VLDL), which is a major transporter of triglycerides.<sup>6</sup> When high-fructose corn syrup is consumed, blood sugar goes directly to the liver instead of to muscle and fat cells. The liver utilizes the sugar to produce triglycerides. There simply aren't any health benefits to be gained from high-fructose corn syrup like there would be if you ate a piece of fresh fruit such as an apple. Many physicians, myself included, believe that the significant increase in high-fructose corn syrup in the American diet has greatly contributed to the epidemic of insulin resistance and type 2 diabetes.<sup>7,8</sup>

Red meat and trans fats are two more unhealthy culprits that you will not find in the Miami Mediterranean diet. Both can increase inflammation in the body. The Harvard Nurses' Health Study showed that even a slight increase in the amount of dietary trans fat translated into a significant increase in the development of type 2 diabetes.<sup>9</sup> Trans fats are the biggest food processing disaster in history. They've been banned in some countries for years, and only now are we waking up in this country to the point where trans fats are being banned in some areas.

Foods included in the Miami Mediterranean diet fight inflammation and thus reduce the risk of developing type 2 diabetes.<sup>10</sup> Olive oil, particularly extra-virgin, cold-pressed olive oil, has anti-inflammatory and antioxidant properties and has been shown in several trials to protect against insulin resistance and the metabolic syndrome. Indices of insulin resistance were significantly improved in people following a Mediterranean-type diet that included moderate consumption of olive oil and cold water fish. Cold water fish like salmon, sardines, and trout bring omega-3 fatty acids to the table, which exert anti-inflammatory effects. I regularly recommend moderate consumption of cold water fish or fish oil supplements for my patients who are at increased risk of cardiovascular disease. Red wine, consumed in moderation, and other components of the diet such as whole grains and fresh fruits and vegetables have all been shown in various studies to lower blood sugar and decrease insulin resistance.



Weight management is an important component of a diabetes prevention program, because obesity contributes to the development of type 2 diabetes. Fat cells secrete inflammatory proteins that interfere with insulin receptors, leading to insulin resistance and pancreatic beta-cell dysfunction.<sup>11</sup> A Mediterranean-type diet, coupled with a program of regular exercise, supports healthy weight loss and weight management. When you consider the lifestyle of people in the Mediterranean region, you see that they eat healthy foods, avoiding highly processed foods that pack on the pounds and are found too often in the American diet. They are active during the day, walking as a matter of routine, and doing other activities like working in the garden. So along with the diet, be sure to incorporate activity into your daily life. Walking is the easiest way to do this. And a good walk after a delicious Mediterranean-style meal is a perfect way to reduce the stresses in your life.

Diabetes can be prevented and even reversed by following a Mediterranean-type diet and incorporating exercise into your lifestyle. I saw in my own practice that patients who followed these recommendations had less chance of developing type 2 diabetes. In fact, I have had patients with type 2 diabetes who went on the Miami Mediterranean diet and began a walking program see their blood sugar return to normal. Hippocrates said, "Let food be your medicine." He was right all those years ago. By following the Miami Mediterranean diet, you are right on track for reducing your risk of both cardiovascular disease and type 2 diabetes.

Michael Ozner, MD is the author of *The Great American Heart Hoax* (Benbella Books, 2008) and *The Miami Mediterranean Diet* (Benbella Books, 2008).

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