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Understanding Diabetes

Diabetes is a two-way street. For too many people it has presented serious health challenges, but we know that it can improve and, in some cases, even disappear with the right diet and lifestyle changes. This book will give you the information you need to prevent, manage, or even reverse diabetes.

In the early 1980s, evidence began to emerge showing that Type 2 (sometimes called adult-onset) diabetes could be dramatically improved by diets that stepped beyond the usual regimens doctors often prescribed. And new research also has shown striking links between diet and Type 1 (or childhood-onset) diabetes. Fortunately, the most effective diet for people with diabetes isn't really a diet at all. It requires simple substitutions that are a breeze to make—once you know what to look for.

If you or someone you care about is facing diabetes, you will soon have powerful new tools at your disposal—many of which are as close as your supermarket—to make your life simpler. This book will provide you with a comprehensive, user-friendly guide to nutrition and fitness for people with diabetes, including the impact of diet on Type 1, Type 2, and gestational diabetes. We will see how to

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use a low-fat, high-fiber diet for controlling, improving, and even reversing the disease. We will explore carbohydrate-counting, analyze the nutritional content of easy recipes, and learn about diabetic exchanges. Powerful methods for weight management; controlling blood glucose levels, blood cholesterol levels, and blood pressure; and preventing diabetes are all tucked into these pages. And, if you are a health professional working in this area, you will find cutting-edge, proven techniques for changing its course.

Diabetes Basics

Diabetes mellitus has been recognized since ancient times. In 1552 B.C., the Egyptian journal *Ebers Papyrus* described this painless disease that caused body wasting and loss of large amounts of urine. Aretaeus, a Greek physician in the first century A.D., gave the condition its name. Noting that it caused increased urination, he called it “diabetes” from the Greek word for *siphon*. In the seventeenth century it was renamed “diabetes *mellitus*.” The word *mellitus*, which means “honey” in Latin, referred to the sweetness of the urine.

In the nineteenth century, scientists learned that the pancreas, an organ located behind the stomach, produces hormones and enzymes that are important in the digestion and uptake of nutrients in the body. German pathologist Paul Langerhans discovered clusters of cells (now called the islets of Langerhans) in the pancreas that produce insulin, a hormone that helps sugars and the building blocks of protein enter the cells of the body.

People with diabetes are either not able to make or not able to properly use insulin. Because insulin is affected by every meal we eat, healthy nutrition is key to improving diabetes. A range of dietary recommendations from fasting and very-low-calorie diets to high-carbohydrate diets and high-protein diets have all been tested in the treatment of this disease. Through scientific study and trial and error, we have learned about the special advantage of complex carbohydrates and the detrimental effects of dietary fat for people with diabetes. But only in the past few years have we come to understand what is the optimal diet for managing diabetes.

Hormones and Sugar

The starchy part of many foods—breads, potatoes, and beans, for example—is made up of many molecules of a natural sugar called “glucose,” bonded together. When food enters the digestive tract, these sugar molecules come apart, and glucose passes from the small intestine into the bloodstream. In response to this influx of sugar, the pancreas releases insulin into the blood so it can carry the glucose into the cells of the body. Normal, healthy blood sugar levels are important for keeping your body working properly. When this system is not functioning as it should and blood sugar levels are generally too high, then diabetes results.

Insulin plays many important roles in the body in addition to helping glucose get into cells. Because insulin is released when you have recently eaten, insulin also discourages the breakdown of fat from your fat stores. This makes perfect sense. You don’t need to pull energy out of your storage sites when you have new energy coming in from food. And insulin helps your muscles take up new amino acids—the building blocks of protein—for use in muscle repair and growth.

Types of Diabetes

Diabetes generally occurs when the body does not produce insulin (or not enough to be effective) and glucose builds up in the blood. Alternatively, sometimes diabetes results even when the pancreas is making enough insulin, but your body cells are resistant to its effects. Insulin is there, glucose is available, but the cells don’t open up and let it in the way they should. In either case, some of the built-up glucose in the blood ends up passing through the kidneys, carrying water along with it, resulting in the increased urination that is often the first tip-off that something is amiss. When this happens, dehydration, increased thirst, blurred vision, and fatigue can occur. Prolonged, elevated blood glucose levels wreak havoc over the long term, so it is important to take the simple steps outlined in this book to keep it under control.

The three most common types of diabetes—Type 1, Type 2, and gestational diabetes—are described below.

Type 1 Diabetes

Type 1 diabetes, sometimes called insulin-dependent, childhood-onset, or juvenile-onset diabetes, accounts for 5 to 10 percent of diagnosed cases. It can occur at any age, but is diagnosed more frequently in younger people and is more common in Caucasian than in non-Caucasian populations. At onset, Type 1 diabetics are usually lean and often have recently experienced weight loss.

In Type 1 diabetes, the cells in the pancreas that produce insulin can no longer do their job. The most common cause of Type 1 diabetes is an autoimmune response in which the insulin-producing cells of the pancreas have been destroyed by the body's own immune system. Scientists are investigating why some people's immune systems attack their own pancreatic cells. It appears that a combination of genetic and environmental factors conspire to trigger this disease. Some of the culprits under investigation are cow's milk proteins and viruses in genetically susceptible individuals.

If you have Type 1 diabetes, you'll need insulin injections to keep your blood sugar under control. Injected insulin acts the same way as it does in a person without diabetes, by bringing blood glucose to the cells of the body. However, medication alone is not enough to successfully manage Type 1 diabetes. Diet and exercise make all the difference in whether you stay healthy and vibrant throughout life or succumb to the problems diabetes can cause.

Type 2 Diabetes

The vast majority of people with diabetes—90 to 95 percent—have the Type 2 form, also known as non-insulin-dependent or adult-onset diabetes. The pancreas is able to produce insulin, but the cells of the body are resistant to it. The problem appears to be that the insulin receptors on the cells don't recognize insulin and won't allow the glucose to enter. This "insulin resistance," as it is called, is often a consequence of carrying excess body fat. Over time, some people with Type 2 diabetes also make too little insulin to get their resistant cells to respond. If this occurs, they may also be given insulin.

Unfortunately, diabetes is on the rise, a serious consequence of the growing numbers of overweight and obese people in many

countries. Although most people with Type 2 diabetes develop it as adults, children are not entirely immune. As more kids lead sedentary lifestyles and put on extra weight, the number developing Type 2 diabetes continues to rise.

If you have Type 2 diabetes, you are not likely to have any symptoms for the first several years of its development. In fact, only about 50 percent of the people with Type 2 diabetes are aware they have it. However, there are some clues that indicate who is at increased risk for the disease. People who develop Type 2 diabetes tend to be:

- adults
- overweight
- from a family with a history of diabetes
- mothers with a history of gestational diabetes
- inactive
- diagnosed with impaired glucose tolerance
- on diets high in meat, dairy products, and other fatty foods

Gestational Diabetes

Gestational diabetes mellitus occurs during pregnancy, affecting about 4 percent of all pregnant women. The problem develops when a pregnant woman is not able to use insulin properly, possibly because pregnancy hormones counteract its actions. The condition usually goes away at the end of the pregnancy, but it is often a sign that Type 2 diabetes is around the corner unless you take steps to prevent it. Normally, more than 50 percent of women with gestational diabetes go on to develop Type 2 diabetes, but this is often because they did not receive proper information about *prevention*. See chapter 11 for more information.

Symptoms and Diagnosis

But how do I know if I have it? And, if so, is it the kind that will go away? Diagnosing this disease is a straightforward matter. The rest of this book will show you the powerful steps you can take to tackle the problem.

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Diabetes develops gradually, and sometimes these warning signs can go unnoticed for years. But there are several symptoms you can look for:

- increased urination
- excess hunger or fatigue
- weight loss
- dry, itchy skin
- blurred vision
- tingling or lost feeling in the feet
- sores that heal slowly

If you experience any of these symptoms, be sure to discuss them with your doctor. These symptoms alone are not enough to tell whether you have diabetes or, if you do have it, what kind of diabetes you have. Your doctor can do several tests to determine if you have this disease, and, if so, what to do about it.

Testing for Diabetes

The doctor will use one or more of three blood glucose tests to make a diagnosis. If the test suggests diabetes, the doctor will confirm the result on another day.

The first test checks the amount of glucose in your bloodstream at any time during the day without consideration of the time of the last meal eaten. A glucose value of 200 mg/dl (11.1 mmol/l in the international units used in most countries other than the United States) or more, plus symptoms such as increased urination, increased thirst, and unexplained weight loss (the most common symptoms), are good indicators of diabetes.

The second blood test is a fasting blood glucose. The test is done after you have fasted for at least eight hours, meaning that you cannot eat or drink anything except water for eight hours prior to the blood test. Normally, fasting glucose should be in the range of 70 to 110 mg/dl. A fasting plasma glucose level of 126 mg/dl (7.0 mmol/l) or higher indicates diabetes.

The third test, an oral glucose tolerance test, measures how well your body deals with a dose of sugar. Normally, blood sugar rises

after eating and then comes back down to near or within the normal range (70 to 120 mg/dl) in one to two hours. Higher values mean your body is having trouble moving glucose out of the blood and into your cells. In the oral glucose tolerance test, you drink a syrupy solution of glucose mixed with water. During the next two to three hours, a series of blood tests is taken. A plasma glucose at two hours of more than 140 mg/dl (11.1 mmol/l) or of more than 200 mg/dl at any time during the testing period indicates diabetes. As with the other tests, the findings should be reconfirmed on a separate day.

Once your doctor determines whether you have diabetes, it is important to speak with him or her about the vital role of nutrition and to make the most of your treatment. The importance of diet is discussed throughout this book, helping you to better understand the important role it plays in the management of diabetes.

Impaired Fasting Glucose

Some people may have blood glucose levels that aren't high enough for a diagnosis of diabetes, but they are still too high to be considered healthy. Impaired fasting glucose or impaired glucose tolerance—sometimes called “prediabetes”—affects about 13.4 million Americans, and more and more people in other countries. To diagnose it, your doctor will look for a fasting blood glucose value of 110 to 125 mg/dl or a two-hour, postmeal blood sugar level of 140 to 200 mg/dl. These levels are higher than normal, but lower than the levels seen in diabetes.

Currently 25 to 30 percent of individuals with impaired fasting glucose or impaired glucose tolerance eventually end up with Type 2 diabetes. Researchers are trying to work out which people in this category will actually develop diabetes and how they can stop it from happening. If you have impaired fasting glucose, it is essential to work with your doctor, to adjust your diet as outlined in chapter 2 and discussed in more detail in chapter 3, and to begin regular exercise to head off the problem.

Understanding Your Blood Sugar Test

When looking at your blood sugar numbers, be sure to ask or notice which type of test was done. Fasting blood sugar for people without diabetes should be less than 110 mg/dl, while a two-hour, postglucose load value should be less than 140 mg/dl. Before eating, or approximately four to five hours after your last meal, a good blood sugar range for a person with diabetes is 70 to 150 mg/dl. When people with diabetes have good glucose control, their blood sugar levels return to these values within two to three hours after the glucose load.

Who Should Be Tested?

Because diabetes can sometimes go unnoticed for years, it's a good idea for anyone forty-five years of age or older to be tested for diabetes by a medical doctor. If you have no symptoms, you should be retested once every three years. Younger adults should be tested if they weigh more than 120 percent of their desirable body weight or have a close family member with diabetes, as they are at a higher risk of developing diabetes. African Americans, Hispanic Americans, Native Americans, Asian Americans, and Pacific Islanders also are at a greater risk than Caucasians. A woman delivering a baby weighing more than nine pounds and who has been diagnosed with gestational diabetes (i.e., diabetes during pregnancy) also is at risk for Type 2 diabetes. Additional risk factors include high blood pressure, a blood test showing a low level of high-density lipoprotein cholesterol (the "good cholesterol"), or a high triglyceride level. Previous testing showing impaired glucose tolerance or high fasting glucose also is a warning sign of increased risk.

You also can use the American Diabetes Association's diabetes risk test to see if you are at risk. Just answer the following questions.

Am I at Risk?

- | | | |
|---|-----|----------|
| 1. I am a woman who has had a baby weighing more than nine pounds at birth. | Yes | 1 point |
| 2. I have a sister or a brother with diabetes. | Yes | 1 point |
| 3. I have a parent with diabetes. | Yes | 1 point |
| 4. My weight is equal to or above that listed in the chart below. | Yes | 5 points |
| 5. I am under 65 years of age and I get little or no exercise. | Yes | 5 points |
| 6. I am between 45 and 64 years of age. | Yes | 5 points |
| 7. I am 65 years old or older. | Yes | 9 points |

Scoring 10 or more points: You are at risk for developing diabetes. This doesn't mean you have it; it means that you are at risk for developing it in the not-too-distant future. Only your healthcare provider can check to see if you have diabetes. See yours soon and find out for sure.

Scoring 3 to 9 points: You are probably at low risk for having diabetes right now. But don't just forget about it. Keep your risk low by losing excess weight; by getting some exercise most days of the week; and by eating low-fat meals that are high in fruits, vegetables, and whole grain foods.

Scoring less than 3 points: You are at low risk for diabetes.

The Importance of Overcoming Diabetes

Uncontrolled high blood sugar levels can have serious consequences. For example, people with diabetes have a higher risk of heart attacks and stroke. Chronically high blood sugar levels also cause trouble for the eyes, the kidneys, and the nerves. Diabetes is the leading cause of new blindness in adults. A third of all people with Type 1 diabetes and 5 to 20 percent of people with Type 2 diabetes end up with renal disease, where their kidneys need the assistance of a dialysis machine to filter waste out of the body.

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WEIGHT TABLE

If you weigh more than the amount listed for your height, you may be at risk for diabetes.

WEIGHT (IN POUNDS WITHOUT SHOES)	HEIGHT (IN FEET AND INCHES)
129	4' 10"
133	4' 11"
138	5' 0"
143	5' 1"
147	5' 2"
152	5' 3"
157	5' 4"
162	5' 5"
167	5' 6"
172	5' 7"
177	5' 8"
182	5' 9"
188	5' 10"
193	5' 11"
199	6' 0"
204	6' 1"
210	6' 2"
216	6' 3"
221	6' 4"

When nerves are damaged by excessively high blood sugar levels, a variety of symptoms can result, including a loss of sensation in the hands and feet, digestive problems, and impotence.

Can Diabetes Be Reversed?

The right food choices can make a world of difference. In fact, several clinical studies have shown that people with Type 2 diabetes can often decrease or discontinue their medication and even reverse their condition with the right eating plan. Controlling blood glucose and cholesterol levels decreases the risk of serious complications

that might otherwise occur. In study after study, the diet with the most profound and lasting effects is one made up exclusively of whole grain foods, such as hearty breads, pastas, and cereals, along with fresh fruit; a rich array of vegetables; and low-fat, protein-rich beans, peas, and lentils.

While Type 1 diabetes is not reversible, these same dietary practices, along with a carefully managed insulin regimen and moderate exercise, have a remarkable ability to keep complications at bay. Gestational diabetes, the kind that can occur during pregnancy, most often goes away after your baby is born, and healthy eating habits can keep it from leading to Type 2 diabetes.

The ever-increasing rates of diabetes can be rapidly turned around to the extent that we take advantage of the diet change whose power is proven by modern research studies. For an individual, this means regaining a new level of health and vitality you may have thought impossible. Please read this book carefully, take advantage of what it has to offer, and share this good news with anyone you know who is shouldering the same challenge.

