

LEARNING MADE EASY



Managing Type 2 Diabetes

for
dummies[®]
A Wiley Brand



Lead a healthy life
with type 2 diabetes

Prevent and manage
diabetes complications

Combat diabetes-related
anxiety and depression

 **American
Diabetes
Association**[®]

Managing Type 2 Diabetes

for
dummies[®]
A Wiley Brand



Managing Type 2 Diabetes

by American Diabetes Association®

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Managing Type 2 Diabetes For Dummies®

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Introduction

Diabetes touches everyone. You may have diabetes, or you may take care of a loved one like a parent, spouse, or teen with this chronic condition. It's incredibly personal, and yet it's global. According to the World Health Organization, 422 million people around the world had diabetes in 2014. That's a whopping 8.5 percent of the earth's population.

Largely, diabetes is a condition that you manage on your own. In other words, you're the top dog. You're the person in charge of your care. There's even a name for it: self-care. You're responsible for learning about diabetes, assembling a healthcare team, taking steps to exercise and eat healthy, and discovering how to manage and treat your blood glucose. Yet, you may have been diagnosed with diabetes for reasons out of your control, such as a family history or because your race and ethnicity put you at higher risk for type 2 diabetes. The factors that contribute to each person's diagnosis of diabetes aren't always obvious.

Put in this context, diabetes is quite a journey for most of us. And it's almost always an opportunity to take better care of yourself because you're at the center of your healthcare. It can be empowering to realize that you're responsible for making choices that will impact your health today and for decades in the future.

About This Book

You're about to find out a lot about diabetes — at least enough to get started on this journey. You'll discover how to become a better healthcare consumer and take actionable steps to manage your diabetes and prevent complications. Of course, there are many books out there dedicated to diabetes, and we're thankful for all of them.

This book is focused solely on type 2 diabetes. We hope opening this book is like turning to a trusted friend or your favorite nurse to get answers to questions that you never had the time (or opportunity) to ask. There are no dumb questions in a *For Dummies* book.

This book was written by the American Diabetes Association, an organization dedicated to fighting diabetes and its deadly consequences through cutting-edge medical research, public health information, advocacy for people's rights with diabetes in the workplace and school, and more. This is a group of volunteers, members, healthcare professionals, and staff with the sole motivation to prevent and cure diabetes. We're on the front lines, right there with you.

This book is organized in easy-to-read parts that focus on specific topics such as how to get started, eating healthy, and staying active. Unlike the last novel you read, don't expect to read this book from front to back. Instead, think of this book as a reference. You can dip in and out of topics as they relate to your diagnosis, care, and questions or concerns. You won't find a pop quiz at the end, and frankly, remembering every detail isn't the point. Use this book as reference when taking care of your type 2 diabetes or someone you love with diabetes.

You can skip the Technical Stuff icons and sidebars if you don't need the nitty-gritty details on a particular topic. You're going to see reasonable recommendations that the American Diabetes Association makes for most people with diabetes. These are just guidelines. It's up to you and your healthcare provider to set your own goals for managing diabetes and preventing complications. Your goals should be based on your individual needs.

Within this book, you may note that some web addresses break across two lines of text. If you're reading this book in print and want to visit one of these web pages, simply key in the web address exactly as it's noted in the text, pretending as though the line break doesn't exist. If you're reading this as an e-book, you've got it easy — just click the web address to be taken directly to the web page.

Foolish Assumptions

If you're reading this book, you probably have diabetes or someone very close to you has diabetes. However, you may know almost nothing about diabetes because you've never had to deal with it before. Don't worry — this book is for you.

You may not have ever set eyes on a blood glucose meter or pricked your skin for a blood sample. Or perhaps you have a family of people who have type 2 diabetes — and now you find yourself with the same diagnosis. You may have thought that you knew certain things about diabetes, but now wonder if those assumptions are really true. It's time to find out.

Whatever your background, you'll discover the basics of diabetes and its impact on your body in this book. You don't even have to remember anything from your high school biology class to get started. You can use this information to understand why it's important to take care of your diabetes so you can feel good each day and live a long and healthy life free of complications. You'll find out how to build a healthcare team and ask the right questions during checkups. You'll discover the latest medications and technology for taking care of your type 2 diabetes. You'll learn the basic steps to take toward eating wholesome, nutritious foods and exercising more regularly. You may use this knowledge for yourself or use it to take care of someone you care about deeply.

Icons Used in This Book

Icons throughout the book alert you to helpful information, facts to remember, and technical information that may help if you're looking for a more advanced understanding of the topic.



TIP

This icon marks important information that can save you time or make your life easier.



REMEMBER

This icon flags important information. Commit it to your memory or mark it so you find it again for easy reference.



WARNING

This icon warns about potential problems — health related and other.



TECHNICAL
STUFF

This icon gives you information that may be helpful, but it's not necessary to your understanding of the topic at hand.

Beyond the Book

In addition to the book you're reading right now, be sure to check out the free online Cheat Sheet for details on diabetes checkups, checking your blood glucose, treating low blood glucose, and reading food labels for carbohydrate. To get this Cheat Sheet, simply go to www.dummies.com and type **Type 2 Diabetes For Dummies** in the Search box.

Where to Go from Here

Turning this page to get started is a great next step in discovering what you need to know about diabetes. You're about to uncover the basics of type 2 diabetes, including the role of the pancreas, insulin, and blood glucose. **Remember:** This is the part where you *don't* need to remember anything about high school biology to jump right in. Perhaps more important, in Chapter 2 you find out why it's critical to take care of your diabetes. That knowledge and confidence can give you a foundation for taking many of the action steps described in the rest of the book.

What if you already know a lot about type 2 diabetes? What if you're already inspired to take charge of your health? Then feel free to skip to the chapter that most intrigues you. Perhaps it's a chapter on women's health or taking care of your mental health. Maybe you're eager to get more information about checking blood glucose or bariatric surgery. Take a look at the topic of each chapter and start with the one that's most important to your diabetes care.

Remember: Diabetes is a journey. You'll learn to live with it every day, and some days will be better than others. This book can help you on those days when you need a reference to troubleshoot a problem or make meaningful changes to your health.

1

Getting Started with Diabetes

IN THIS PART . . .

Find out the basics of diabetes, including how it affects your entire body, understand how diabetes is diagnosed, and discover the risk factors.

Uncover why it's important to take care of yourself — today and for the future — and take the first steps toward managing your diabetes by making healthy choices in your everyday life.

IN THIS CHAPTER

- » Defining diabetes
- » Looking at the different types of diabetes
- » Understanding how diabetes is diagnosed
- » Knowing the risk factors
- » Seeing who else has diabetes

Chapter 1

Type 2 Diabetes: The Basics

Taking care of your diabetes means taking care of your whole body: from positive thinking in your brain to checking the bottoms of your feet for scrapes and cuts. It's a whole-body endeavor, and we're here to take you on that journey as you discover what diabetes is, how to manage and treat it, and how to prevent complications down the road.

This chapter starts off with the basics of diabetes: what it is and how it affects your body. These are the Biology 101 facts that you can reference down the line. It's fascinating stuff (and you don't need a medical degree to understand it). Then we tell you who else has diabetes and what the contributing risk factors are. After all, you're not the only one with diabetes. As of 2015, more than 30 million people in the United States had it, too.

What Exactly Is Diabetes?

You have diabetes, or perhaps someone you love has diabetes. That's not an easy diagnosis to hear. But it doesn't have to be a scary unknown either. In fact, scientists know more about diabetes and have more tools at their disposal than ever before.

The following sections explain how diabetes affects your body. It's good to know what's happening before you dive into how to manage and treat diabetes.

Getting the lowdown on blood glucose

Diabetes is a disorder in which the amount of glucose, also called sugar, is too high in the blood. When you were diagnosed with type 2 diabetes, you were probably told that your blood glucose was sky high. But why would your blood glucose be high?

It all comes down to eating — that amazing topic that everyone likes to obsess about. When you eat food, your body breaks that food down into glucose, and then the glucose travels in your bloodstream to waiting cells. That glucose really wants to get out of your blood and into your cells because that's how you get energy. That's the goal!

Insulin is a hormone that helps move glucose from your blood to inside your cells. However, people with type 2 diabetes don't make enough insulin or aren't as sensitive to that hormone. Therefore, the glucose gets trapped in the blood and can't get inside your cells. Then high blood glucose — diabetes — happens.



Glucose is just a simple form of carbohydrate. The simplest carbohydrates are sugars, and the simplest sugar is glucose. It's your body's main source of energy, used to power everything from getting up in the morning to taking your dog for a walk. Is it blood glucose or blood sugar? Actually they're the same thing. Blood glucose is simple sugar. So, you may hear people say their "sugars" are too high or their blood glucose is too high. Blood glucose is the more technical term; sugar is the more colloquial term. We use *blood glucose*, or simply *glucose*, in this book.

The mighty hormone insulin

You've probably heard of insulin, and you may associate it with injections or an insulin pump. We usually think of that as the synthetic or man-made medication. But the hormone in your body is also insulin. And it's one of the most important hormones for helping you metabolize your food and get energy.

Specialized beta cells in the pancreas make insulin. The pancreas, which is totally essential and underappreciated (until it stops working), is little, about 6 inches long, and sits right behind your stomach (see Figure 1-1).

The pancreas has islet cells that include both beta cells, which make insulin, and alpha cells, which make another hormone called glucagon. Both insulin and glucagon are important for metabolizing food.

FIGURE 1-1:
The pancreas
and its
specialized cells.

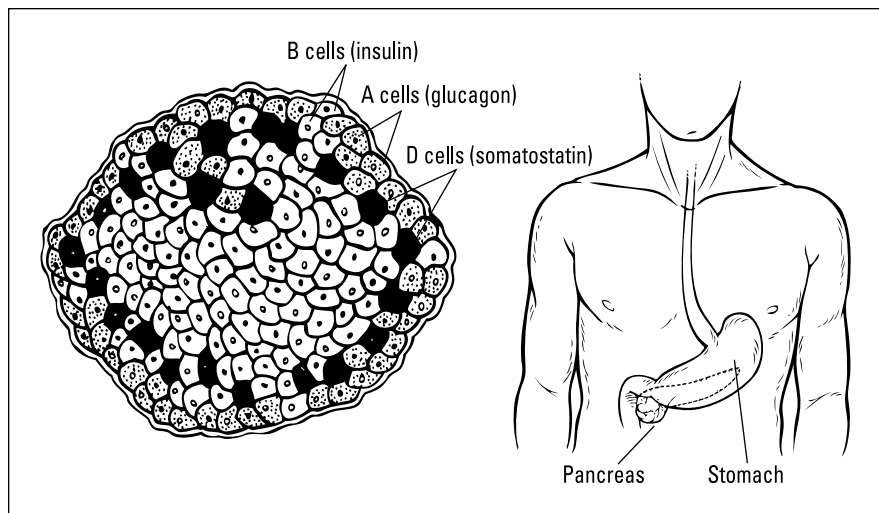


Illustration by Kathryn Born, MA

Beta cells are the only cells that make insulin. In type 2 diabetes, several things are happening with those beta cells:

- » **The beta cells don't work well.** They don't make as much insulin as they're supposed to.
- » **There may be fewer beta cells than usual.**
- » **The beta cells that are making all the insulin get burned out (super tired) and eventually make less insulin.** It's a cycle in which insulin production can get worse over time.

At the same time that beta cells are struggling in the pancreas, another crazy thing happens: Cells in your body become less sensitive to insulin. So, even though the insulin may be sitting right next to the glucose by a cell, saying, "Hey, let us in!" your cell doesn't let them in. Instead, your cells need more insulin than ever before to let those glucose molecules inside. This is called *insulin resistance* or *decreased insulin sensitivity*.

It's a double whammy: Your pancreas makes less insulin, and yet you need more insulin than ever before. It's not a good combination.

If your body doesn't make enough insulin or if you have insulin resistance, your glucose can't get inside your cells and builds up in your blood. This is called *high blood glucose*. It's the key factor that defines diabetes.

Scientists are still trying to figure out why beta cells fail or die — and also why the body becomes less sensitive to insulin. If they can get to the bottom of those questions, we're on our way toward a cure for type 2 diabetes.



TIP

In the meantime, scientists know that insulin sensitivity can be improved by exercise. Just a short bout of exercise can improve insulin sensitivity for up to 24 hours. It's another amazing effect of breaking a sweat besides burning calories.



REMEMBER

Insulin is a hormone that helps your cells use glucose for energy. It's made by beta cells in the pancreas. People with type 2 diabetes may not make enough insulin or may not be as sensitive to insulin — or both.

Don't forget glucagon

Your pancreas makes another hormone, glucagon, which works together with insulin to turn food into energy (refer to Figure 1-1). Glucagon works very closely with the liver by stimulating glucose stored inside it. This is an essential step when you need extra energy and you're not eating. For example, you might release glucagon when you exercise or if you need energy between meals. As you can see, it's a delicate balance to get energy from the foods you eat, but also have access to energy whenever you need it.

High blood glucose is not good

The bottom line is that people with type 2 diabetes have too much glucose in their blood.

High blood glucose can create problems in the short term and long term. It's so important because it can make you feel crummy from time to time, but it can also cause dangerous complications down the road.

As blood glucose levels rise, your body tries to flush out extra glucose in your blood by filtering it through your kidneys and out through your urine. That's why people with undiagnosed or out-of-control diabetes pee a lot. So much peeing causes people to feel thirsty, dehydrated, and tired. Dehydration can also blur vision.

However, high blood glucose may not cause these symptoms in everyone. Or sometimes the symptoms just aren't that noticeable. People can walk around for years without any symptoms or knowledge that they have high blood glucose and diabetes.

In the long term, high blood glucose damages blood vessels and nerves. The damage can lessen blood flow throughout your body, from your heart to your head to your feet. This, in turn, can lead to complications like eye disease, heart disease, stroke, and kidney failure. You find out more about complications in Chapter 8.

The great news is that you can take active steps to lower your blood glucose by eating wholesome foods, exercising, losing weight, and taking prescribed medications. You don't have to experience problems in the short or long term. The most important thing to remember is that you can take control of your blood glucose and diabetes.

Paying attention to blood pressure

Two out of every three people with diabetes have high blood pressure or take medications to lower it. That's a big number. Blood glucose and blood pressure go hand in hand. Why? Because they're both related to your blood vessels.

High blood glucose can damage blood vessels, causing them to narrow and inhibit the flow of blood. This in turn can cause high blood pressure, which can lead to further damage such as a heart attack, stroke, or kidney failure.

Also, diabetes and high blood pressure share similar risk factors, including smoking, obesity, and eating foods high in saturated fats. For example, if you're overweight and smoke cigarettes, it's a double whammy on your body.



WARNING

High blood pressure doesn't have any symptoms. You won't know you have high blood pressure until you have your blood pressure checked by your healthcare provider. Make sure you have it tested every time you visit your doctor or nurse.

Most people with diabetes will have a goal of less than 140 mmHg for systolic blood pressure (the top number) and less than 90 mmHg for diastolic blood pressure (the bottom number) to reduce the risk of cardiovascular disease and other complications.

Different Types of Diabetes

So far, you've heard all about type 2 diabetes, but there are actually many different types of diabetes. The most common type by far is type 2 diabetes. It accounts for 90–95 percent of all people with diabetes.

Type 1 diabetes

Type 1 diabetes is another common type of diabetes. It usually comes on much more severely than type 2 diabetes. In general, people with type 1 diabetes have to take insulin right away to survive because their bodies don't make any insulin. They have to take insulin for the rest of their lives. This is unlike type 2 diabetes, which has a more gradual progression.

Type 1 diabetes used to be called juvenile diabetes because it typically occurs in children. However, adults can also develop type 1 diabetes. Type 1 diabetes is an autoimmune disease in which the body destroys its own beta cells and, therefore, can no longer produce insulin. Of all the people with diabetes, about 5 percent have type 1 diabetes. (The “Type 1 or type 2?” sidebar explains how doctors determine whether you have type 1 or type 2 diabetes.)

Gestational diabetes

Gestational diabetes is a type of diabetes that occurs during pregnancy. It usually goes away after giving birth but gives moms and their babies a lifetime risk of developing type 2 diabetes. Women with gestational diabetes are more likely to someday have type 2 diabetes. Their children are also more likely to develop type 2 diabetes and be obese.

Women with gestational diabetes can take medications, eat healthy foods, and exercise to manage their blood glucose during pregnancy. Uncontrolled blood glucose during pregnancy can increase the risk of preeclampsia and injury during birth because babies are large. When you've had gestational diabetes, you have a two in three risk for it in subsequent pregnancies.

TYPE 1 OR TYPE 2?

Sometimes it's not obvious at first whether someone has type 1 or type 2 diabetes. A blood glucose test only tells you that you have diabetes, not whether it's type 1 or type 2 or some other form. For example, some adults may have type 1 diabetes, but still have some insulin production. This makes it appear more like type 2 diabetes at first. This is sometimes called *latent autoimmune diabetes* (LADA).

Your doctor can give you a separate test to help determine whether you have type 1 diabetes. People with type 1 diabetes have antibodies in their blood that signal an autoimmune disease. So, a physician can give you a blood test to detect autoantibodies and diagnose type 1 diabetes.

Gestational diabetes is different from already having type 2 diabetes and becoming pregnant. Women with preexisting type 2 diabetes should try to have their blood glucose on target before they become pregnant. They also need to exercise, eat healthy foods, and often take medications to manage their blood glucose during pregnancy.



TIP

All pregnant women should be tested for gestational diabetes during the 24th to 28th week using the oral glucose tolerance test (see Chapter 9 for more details on tests to diagnose gestational diabetes). Then women with gestational diabetes should get a test for type 2 diabetes 4–12 weeks after giving birth and every 3 years thereafter.

Other types of diabetes

Type 1, type 2, and gestational diabetes are the main types of diabetes. However, they're not the only ones. Other forms of diabetes occur because of mutations in single genes. You can inherit these gene mutations, or they can occur out of the blue. Maturity-onset diabetes of the young (MODY) and neonatal diabetes mellitus are two of the most common forms.

Cystic fibrosis-related diabetes is another type of diabetes common in people with cystic fibrosis, which occurs because of scarring of the pancreas. This also destroys beta cells and stops insulin production.

Prediabetes

Prediabetes is another term you've probably heard alongside type 2 diabetes. And it's exactly what it sounds like. *Prediabetes* is a higher than normal blood glucose level that isn't high enough to be diabetes. One out of three American adults has prediabetes, although many don't know they have it; nine out of ten Americans who have prediabetes are undiagnosed.

Why does prediabetes matter? Well, it turns out that making changes to the foods you eat or exercising more can reduce your risk for diabetes. This is especially true for people with prediabetes. Finding out you have prediabetes can be a wakeup call to make changes to your lifestyle and health.

In one study called the Diabetes Prevention Program, people with prediabetes who lost 5–7 percent of their body weight through changes to diet and exercise reduced their risk of developing diabetes by 58 percent during the 3-year course of the study. This was a landmark study that showed that people at risk for type 2 diabetes can make changes to prevent or delay the disease.

How Is Diabetes Diagnosed?

A healthcare provider can diagnose diabetes by measuring the amount of glucose in your blood using a simple blood test. There are four main tests:

» **A1C test:** The A1C test is also called the hemoglobin A1C, HbA1C, glycated hemoglobin, or glycosylated hemoglobin test. Whew, that's a lot of different names for one test. To keep things simple, we'll refer to it as the A1C test.

The A1C test measures your average blood glucose over 3 months. It's a picture of your blood glucose over time. It actually measures the percentage of hemoglobin (a protein) in your blood that has been *glycated* or attached to glucose over the past three months. You'll hear the number as a percentage such as 7 percent. A1C can be used both to diagnose diabetes and to measure how well you are managing your diabetes if you have it.

For diagnosis, an A1C of 6.5 percent or more means you have diabetes. Prediabetes can be diagnosed with an A1C of 5.7–6.4 percent.

You'll probably hear a lot more about your A1C because it's the test most commonly used to evaluate your diabetes. Your provider will give you an A1C test at every visit or at least three times a year. You can eat or drink what you want before you have an A1C test, so there's no need to fast.

» **Fasting plasma glucose test:** A fasting plasma glucose test can be used to diagnose diabetes. It's also a simple blood test, and it measures your blood glucose as a snapshot in that moment. So, it's different from the A1C, which measures your blood glucose over several months. You can't eat or drink anything besides water for 8 hours before a fasting plasma glucose test.

A reading of 126 mg/dL or above means you have diabetes. Prediabetes can be diagnosed with a fasting plasma glucose of 100–125 mg/dL.

» **Random plasma glucose test:** A random plasma glucose test is another test to diagnose diabetes. Just like it sounds, it can be done "randomly" as a snapshot of your blood glucose. Sometimes healthcare providers do this test if you have other clear signs of diabetes. A reading of 200 mg/dL or above means you have diabetes.

» **Oral glucose tolerance test:** An oral glucose tolerance test can also diagnose diabetes by measuring how well the body uses glucose. You don't eat or drink anything besides water for 8 hours before the test. Upon arrival at the doctor's office, you'll have your blood drawn for a baseline measure. Then you'll drink a liquid with 75 grams of glucose. You'll have your blood drawn 2 hours later. If your reading is 200 mg/dL 2 hours after drinking the liquid, you have diabetes.

Table 1-1 shows the different types of tests used to diagnose diabetes and lists the readings that indicate whether you have diabetes or prediabetes.

TABLE 1-1

Criteria to Diagnose Diabetes

Test	Reading	Diagnosis
A1C	5.7%–6.4%	Prediabetes
	6.5% or above	Diabetes
Fasting plasma glucose	100–125 mg/dL	Prediabetes
	126 mg/dL or above	Diabetes
Random plasma glucose	200 mg/dL or above	Diabetes
Oral glucose tolerance test	200 mg/dL or above two hours after	Diabetes

Understanding Risk Factors

No one knows exactly why some people get diabetes and other people don't get diabetes. There is not a single test that can predict whether you'll develop type 2 diabetes. Instead, type 2 diabetes develops because of a combination of genetic and environmental factors. There isn't just one trigger.

However, there are known risk factors for type 2 diabetes that include your family history, race, ethnicity, and lifestyle. Finding out your risk for diabetes may empower you to make changes such as exercising more or quitting smoking.

Age is a significant risk factor because more people 45 years and older have type 2 diabetes than younger people. Everyone 45 years or older should be tested for type 2 diabetes once they reach 45 years of age and then every 2 years after that.

Family history is another important risk factor. Having a mom or dad, brother, or sister with type 2 diabetes puts you at risk, too. The genes you've inherited are a risk factor, although no one has pinpointed a "diabetes gene."

Your race and ethnicity can also put you at risk for type 2 diabetes. Native Americans, African Americans, Hispanics, Asian Americans, and Pacific Island Americans all have a higher risk of diabetes than non-Hispanic whites. African Americans and Hispanics are over 50 percent more likely to develop diabetes than non-Hispanic whites.