

LEARNING MADE EASY



Diabetes & Carb Counting

for
dummies[®]
A Wiley Brand



Accurately count carbs
and manage diabetes

Decipher food labels and
improve glucose control

Sample menu plans for
meals and snacks

Sherri Shafer, RD, CDE

Diabetes educator

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dummies[®]
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by Sherri Shafer, RD, CDE
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Introduction

Once upon a time, the diet advice for people with diabetes was fairly concise, and it went something like this — “Don’t eat sugar!” Well, guess what? That strategy didn’t seem to cure anybody. Strike one. Next up was an attempt at the one-size-fits-all, handy-dandy, pre-printed tear-off diet sheet that directed you to follow your 1,800-calorie diabetes diet plan (or whatever calorie level you were assigned to). Not that many people were thrilled with being told to eat the exact same tedious diet pattern day after day for the rest of their lives. Strike two. Most recently, health experts have come to the conclusion that dietary interventions for people with diabetes should be individualized. That’s a home run, finally!

From here on out, when I use the word “diet” I’m referring to your overall food choices and pattern of eating. I don’t mean diet in terms of a temporary fix or in the sense of dieting for weight loss (although that can be built into the plan). When I say “diet,” I’m referring to the way you eat or aim to eat most of the time.

The management of diabetes has a dietary component. What you eat, how much, and when you eat it directly affects your blood glucose and overall health. Diabetes and diet principles are inseparable. Now throw in a few more variables such as exercise, stress, body weight, concurrent health problems, and medications. It isn’t uncommon to feel like you’re a juggler trying to keep six balls in the air without ever slipping up. If you can relax and focus on one variable at a time, diabetes self-management becomes doable. Instead of thinking about juggling, imagine that each aspect of diabetes management is a piece of a larger puzzle. *Diabetes & Carb Counting For Dummies* is designed to help you put those pieces together.

The current diabetes trend lines are alarming. It’s impossible to keep up with the statistics because they change so fast, but the 2016 tally has the count at 29 million Americans with diabetes and 86 million more with prediabetes. That’s one out of every three American adults on the path to diabetes — unless action is taken. Studies conclusively show that diet and exercise are the most effective strategies for slowing or reversing that trend. I’m writing this book to reach as many people with diabetes and prediabetes as possible. This book provides an overview on diabetes and looks at dietary strategies and diabetes self-management principles. The nutrition information is geared for overall health; in other words, even people without diabetes will find worthwhile content.

About This Book

It's impossible to approach diabetes management without focusing on food. Finding out more about diet, especially carbohydrates, gets to the very core of diabetes treatment. Sure, medications are important, but you can't just slap on a medication and ignore diet because you can out-eat any medication. Managing your diet doesn't have to mean giving up all of your favorite foods. On the contrary, you should be able to eat most foods. It's a matter of balancing carbohydrate intake with exercise and medications (if you take them). While there is room for individual preference, the diet you choose to follow should support overall health, provide a variety of nutrient-dense foods in appropriate portions to promote a healthy body weight, and assist in reaching treatment targets for blood glucose, lipids, and blood pressure.

This book has a focus on understanding and managing carbohydrate, but it addresses all aspects of diet with diabetes. As each topic is covered:

- » You're provided with clear, understandable information that thoroughly explains each concept.
- » You know why the recommendations are being made and what the payoffs are.
- » You're made aware of potential consequences should you opt out of the advice.

Diabetes self-management takes some effort, but you're worth it. Taking care of your diabetes improves health and reduces risks. The rewards may be a little less tangible than saving up for a flat-screen TV, but health and quality of life are far more important than material things. Remember: *The best things in life aren't "things" at all.*

A few more comments and clarifications about this book:

- » I've chosen to use the term *blood glucose* because glucose is the type of sugar streaming through your blood vessels, but it is equally acceptable to call it *blood sugar*. In the United States, blood glucose is measured in milligrams per deciliter (mg/dl). If you're accustomed to millimoles per liter (mmol/L), simply divide mg/dl by 18.
- » Occasionally, I include sidebars, shown in shaded boxes. Some, but not all, of the sidebars provide personal stories that uncover solutions to common diabetes management issues. Feel free to skip sidebars or anything with the Technical Stuff icon, which highlights information that's interesting but not essential to understanding carb counting and diabetes.

- » Diabetes doesn't define you, so you will never hear me call you a diabetic. You are a person who has been dealt the diabetes card, but the deck is not stacked against you. Play your cards wisely and chances are you'll have a winning hand.
- » 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

When planning the content for this book, I thought critically about who my potential readers would be. I assumed there would be diversity because, for starters, there's more than one kind of diabetes. Additionally, many people with diabetes are simultaneously trying to manage weight, cholesterol, or blood pressure.

I've made the following assumptions about who you might be:

- » You have diabetes: type 1 diabetes, type 2 diabetes, or any other form of glucose dysregulation. You may have been recently diagnosed or you may have had diabetes for years (or decades) and are looking for up-to-date, accurate, and tangible information.
- » You've heard that diet, weight control, and exercise are foundational strategies for managing diabetes or preventing prediabetes from progressing to type 2.
- » You may have developed gestational diabetes or be a woman with pre-existing type 1 or type 2 diabetes who is committed to having a safe pregnancy and a healthy baby.
- » You may be a parent of a child with diabetes or have a family member or other loved one with diabetes, and you want to know how you can help.

Icons Used in This Book

The four icons used throughout this book identify different kinds of information.



TIP

A tip may save you time, simplify a concept, improve health, or present you with your “aha” moment of the day.



REMEMBER

This icon identifies essential information, a take-home message worth sharing with family and friends. This symbol also identifies concepts that you should discuss further with your healthcare provider, such as medication dosing adjustments.



WARNING

Don't skim over or ignore any warnings. This icon is there to protect you from harm.



TECHNICAL
STUFF

Text marked with this icon provides details that are not essential to the book's main theme — for example, an interesting scientific explanation, background details on a study, or information pertaining to a subset of readers who use medical devices.

Beyond the Book

In addition to the content in this book, you can access free companion materials online. Simply navigate to www.dummies.com and search for “Diabetes & Carb Counting For Dummies Cheat Sheet.” From there you'll be able to read or print several useful articles about choosing carbs wisely, making better food choices, and more.

Where to Go from Here

Please feel free to read this book's chapters in any order. *For Dummies* books are not linear, meaning content doesn't build sequentially. Each chapter develops a core concept and provides usable information that stands alone yet ultimately dovetails with other pieces of the diabetes puzzle. Review the table of contents and see whether any particular chapter is calling your name.

If you aren't sure where to begin, Chapter 1 provides a glimpse of the key content in the book and directs you to the appropriate chapters where you can find more details on each topic. Chapter 2 is a great place to get an overview on diabetes.

Be sure to read Chapter 4 sooner rather than later. Chapter 4 has concepts and illustrations that are integral to much of the rest of this book. It explains what happens to food after you eat it — how the body processes carbohydrates and then uses, stores, and even creates glucose. It also explains what happens when glucose levels rise too high or fall too low.

1

Getting Started with Carb Counting and Diabetes Management

IN THIS PART . . .

Understand how diet and diabetes are intimately connected.

Explore why glucose is essential to fuel the brain and body.

Find out how much carb you really need and discover how to balance carb intake with medication doses.

Get a handle on how your food choices affect blood-glucose response.

Take note of the nutrients in carbohydrate foods.

Build your diabetes team and embrace your role in self-care.

IN THIS CHAPTER

- » Understanding how carb choices, portions, and timing affect your health
- » Getting started with carb control and advancing your carb-counting skills
- » Living well with diabetes through self-management education

Chapter 1

Delving into Diabetes and Carb Counting

Diabetes is a disorder that is largely *self-managed*. You are the one making the daily decisions that affect your health outcomes. That's a significant responsibility! The thought of taking on diabetes may seem overwhelming, but you can do it.

There's a learning curve, of course. Being successful at any skill, sport, task, or job takes effort, training, patience, and support. Think about a preschool child who picks up his parent's paperback novel and stares blankly at the foreign squiggles on the page, wondering how anyone could possibly read it. We've each been that child and faced that same challenge. We still encounter words that we don't recognize from time to time, but we can look them up.

Learning about diabetes is similar. First you tackle the basics, and then you build on that foundation. Learning to manage your own diabetes requires diabetes self-management education. This book is designed to be your companion text in the learning process. The goal is to build knowledge (especially about counting carbs) and foster the skills needed for successful self-management. This chapter introduces you to the world of diabetes and carb counting.

Getting Up to Speed on Diabetes Basics

Diabetes is a condition of abnormal blood-glucose regulation. Lack of insulin (type 1 diabetes) or ineffective insulin (type 2 diabetes) both lead to elevated blood-glucose levels and a diagnosis of diabetes.

Diabetes and diet are intimately intertwined. It's impossible to talk about managing diabetes without discussing food in great detail. Blood-glucose levels are influenced by what you eat, how much you eat, and when you eat. The goal is to eat healthy foods, properly portioned, at appropriate times. The following sections introduce the basics of managing diabetes.

Checking out concerning trends in the diabetes epidemic

Nearly 30 million Americans are living with diabetes. Type 2 diabetes accounts for roughly 95 percent of cases. Over 86 million American adults have *prediabetes*, a condition where blood-glucose levels are above normal but not yet high enough to be classified as diabetes.

The best way to turn that trend around is to improve dietary choices, lose weight if you are overweight, and exercise regularly. Prediabetes can progress to type 2 diabetes, but lifestyle changes cut the risk by up to 58 percent. If you already have diabetes, eating right and exercising comprise the foundation of treatment.

Improving outcomes and preventing complications

I don't plan to list scary statistics on how many people with diabetes have developed complications. Fear isn't a good motivator. Hope is. In this book, I focus on how to better manage diabetes to help prevent complications. Keep in mind that when people developed diabetes many years ago, they simply did not have the resources, knowledge, tools, medications, and technologies needed to adequately manage their disease. Those tools are available now: blood-glucose monitors, insulin and other medications, insulin-delivery options, and knowledge. The roles of diet and exercise in managing diabetes are understood. Multiple studies from around the globe provide a hopeful message, which is taking care of your diabetes has a big payoff: your improved health.



WARNING

While the onset of type 1 diabetes is more obvious, type 2 diabetes can go undiagnosed for many years. Screening is critically important and may alert you to your risk long before diabetes develops. Chapter 2 sorts through the types of diabetes, delineates risk factors, and explains diagnostic criteria.

You should take diabetes seriously. Uncontrolled diabetes may lead to complications. For example, elevated blood-glucose levels over time can damage blood vessels and tissues. People with diabetes are twice as likely to suffer a heart attack or stroke. Your eyes, kidneys, feet, and nerves are all vulnerable to the damages inflicted by persistently elevated glucose levels.



REMEMBER

If you currently have complications, talk to your diabetes specialist for appropriate treatment. Request a referral to a registered dietitian if treating your complication has a dietary component. Two examples: Kidney disease may impose restrictions on dietary sodium, potassium, phosphorus, fluid, and possibly protein. Treating *gastroparesis* (nerve damage that alters the digestive system) involves dietary modifications to improve digestion and absorption of food. When diet becomes part of the treatment for a disease, it's referred to as *medical nutrition therapy*. A registered dietitian is a trained medical professional who can help you learn to make dietary changes that support the treatment of diabetes, heart disease, lipid problems, hypertension, and more.



TECHNICAL
STUFF

A landmark study called the Diabetes Control and Complication Trial (DCCT 1983–1993) followed 1,441 people with type 1 diabetes for ten years. Results showed definitively that *improving blood-glucose control reduces the risks of developing complications*. The results were astounding: 76 percent reduction in eye disease, 50 percent reduction in kidney disease, and 60 percent reduction in nerve disease. The United Kingdom Prospective Diabetes Study (UKPDS 1977–1997) focused on people with type 2 diabetes. With 5,102 study participants, it was shown conclusively that both *blood-glucose control* and *blood-pressure control* are important in reducing complications.

Building your diabetes team

Your diabetes team starts with you. You are the team captain, and you get to pick who will be there to assist you on your diabetes management journey:

- » Your primary care provider manages your overall healthcare needs. Look for one who has experience with diabetes.
- » If you have type 1 diabetes or your type 2 diabetes is not under adequate control, your general practitioner may refer you to an endocrinologist, a doctor who specializes in diabetes.

- » You may also benefit from the expertise of a diabetes nurse educator (RN or NP), who can teach you how to monitor your glucose levels, keep and review blood-glucose records, properly administer insulin, handle travel and sick days, and more. In addition, a registered dietitian (RD or RDN) can help you plan balanced meals, teach you to read Nutrition Facts labels and count carbs, and provide dietary advice to help you achieve weight goals, manage blood pressure, improve cardiovascular health, understand the impact of alcohol, treat hypoglycemia, and more.
- » A certified diabetes educator (CDE) is a healthcare provider who has advanced training in diabetes management and has passed a comprehensive national exam. To maintain the CDE status, the healthcare professional must complete 75 hours of continuing education in the field of diabetes every five years.
- » Also on the roster to join your team are an eye doctor (either an ophthalmologist or an optometrist), a dentist, and a pharmacist.
- » At times you may choose to see a mental-health specialist: a counselor, social worker, psychologist, or psychiatrist.
- » Should you need them, a podiatrist is available for foot care and an exercise physiologist or physical therapist can guide your physical fitness plan.
- » Don't forget your loved ones, family, and friends. Enlist the support and help of the important people in your life. People want to help; just let them know how best to assist you.



REMEMBER

Staying up to date with advances in diabetes care

Diabetes specialists (like those listed in the preceding section) stay up to date on the latest advancements in the field of diabetes. Capitalize on their knowledge; stay up to date with your medical appointments and healthcare screenings. Having a few reputable diabetes management books (like this one!) on your home bookshelf is also helpful. Read and reread the sections most pertinent to you.



TIP

Keep in mind that not everything you read online is factual. Chapter 25 links you to reputable websites for gathering sound information.

Examining the Carb-Glucose Connection

This book offers in-depth info about the nutrients in food and how nutrients are used in the body. Carbohydrates, proteins, and fats are *macronutrients*. We need them in relatively large amounts as compared to *micronutrients*, such as vitamins and minerals, which are required in smaller amounts. Here's what they do:

- » Carbohydrates provide glucose, the body's primary fuel.
- » Proteins contribute amino acids for building and repairing tissues and cells.
- » Fats provide fatty acids, assist in the absorption of fat-soluble vitamins and, along with glucose, are used for energy.
- » Vitamins and minerals are essential nutrients required for hundreds of jobs throughout the body. To obtain the full complement of vitamins and minerals needed for health, choose a wide variety of wholesome foods.

Chapter 4 focuses on carbohydrates because carbs have the most profound effect on blood glucose, also known as blood sugar. There, you get a behind-the-scenes tour of carbs' journey through the body. You find out how carbohydrate foods are digested, turn into glucose, and are absorbed into the bloodstream. You also track the glucose through the system and discover why insulin, "the key to the cell," is required for proper fuel usage.

Glucose is so critical for human function that the body stockpiles glucose in the muscles and the liver. The storage form of glucose is *glycogen*. Glycogen reserves can be tapped into when the body is running low on glucose. If glycogen reserves become depleted, the liver will make glucose from scratch (but it may cost you a little muscle tissue . . . because you can't make something from nothing).

Diabetes interrupts the delicate balance of glucose regulation. Managing dietary carbohydrate intake is one of the most important lessons when learning to self-manage your diabetes. It's not only the amount and timing of the carbohydrate (see Chapters 6 and 8); it's also the quality of the carbohydrate and what it's mixed with (see Chapters 10, 11, and 12). In the bigger picture, carbs must be balanced with medications and exercise. Table 1-1 lists the most significant variables affecting blood-glucose levels for people with diabetes.

TABLE 1-1 **Variables Affecting Blood-Glucose Regulation**

Hyperglycemia (High Glucose Levels)	Hypoglycemia (Low Glucose Levels)
Too much carbohydrate	Not enough carbohydrate
Concentrated sweets, soda, juice	Alcohol
Mismatched timing of meds and meals	Mismatched timing of meds and meals
Illness, stress, hormonal surges	Skipping a meal
Lack of insulin or insulin resistance	Too much insulin or too many diabetes pills
Medication dosing errors	Medication dosing errors
Lack of physical activity	Strenuous or unplanned activity
Certain medications, steroids	Certain medications



REMEMBER

Diabetes imposes the need to understand how to juggle carbs, exercise, and medications, but it can be done, as you find out in Chapters 6 and 14. No one has perfect blood-glucose control, so set realistic expectations. Use a blood-glucose monitor (see Chapter 23) and have A1C levels checked regularly. You and your healthcare team can use glucose data to make adjustments to your self-care regimen. If your medications put you at risk for low blood glucose, find out more about preventing, recognizing, and treating hypoglycemia in Chapter 15.

Nutritional needs and diabetes management strategies change and evolve through all ages and stages of life. Chapter 17 provides specific tips for managing diabetes in childhood, during pregnancy, and into the golden years.

Getting Acquainted with Carbs

Carbs have been getting a bad rap lately. Many people are swept up in the notion that carbs are fattening or carbs are bad. Perhaps the pendulum has swung too far, causing some diets to be too low in carbs and excessive in protein or fat. The human body has basic needs, and glucose is one of them. Carbohydrates provide glucose, which is the preferred fuel source for the brain, nervous system, and muscles. For the sake of your health, it's important to find a happy medium . . . a little carb equilibrium.

What all carbs have in common is their chemical make-up. Simple carbohydrates and complex carbohydrates are made out of the same basic building blocks: sugar molecules. Chapter 3 boils it down into super simple chemistry concepts; a

preview is just ahead. In this section I also talk about the nutrients in carbs and other food groups.



REMEMBER

Carbohydrate foods do more than just contribute simple or complex carbs; they provide vitamins, minerals, and good taste too!

Introducing the so-called simple carbs

Imagine a pile of Legos. Lego blocks can exist separately or be snapped together in pairs. Those would represent the “simple” carbohydrates, which are single or double sugar molecules. The sugars in fruit are single sugars, while lactose, the sugar in milk, is a double sugar molecule. White sugar, brown sugar, honey, and syrups are simple carbohydrates too, but they don’t offer the same health benefits as fruit, milk, and yogurt. Spoon for spoon, most sugars and syrups have similar amounts of carb. Agave nectar is a natural carb-containing sweetener that has less impact on blood-glucose levels if used in moderation.

Desserts that contain sugar alcohol can claim to be “sugar free,” but they typically have as many carbs and calories as their sugar-containing counterparts. Chapter 12 sorts through the many sugars and alternative sweetening agents, and separates fact from fiction when it comes to carb-free sugar substitutes.

Catching up on complex carbs

Consider again the Lego analogy introduced in the preceding section. If you connect many Lego pieces together, you can build complicated structures. The same thing is true of starches; starches are complex carbs that are made out of many sugar molecules. Fiber is also considered a complex carb, but it doesn’t digest. Chapters 3 and 16 fill you in further on fiber facts.

Noting the nutrition in carb food groups

Carbohydrates are found in many healthy, nutrient-packed foods, including grains, legumes, whole-grain breads, starches, milk, yogurt, fruits, and vegetables. Beware of sweets and desserts, though. They are usually high in sugar (and oftentimes fat) and don’t offer much in terms of nutrition. Desserts and processed snack foods can contribute to weight gain and health problems if eaten in excess. Chapter 13 shows best-bet options in all food groups and even helps you figure out how to have a little dessert when you have diabetes; the key is moderation.



REMEMBER

The term “carb” encompasses many foods, and not all carb foods are alike. Healthy carbs shouldn’t be condemned like junk-food carbs. Guilt by association isn’t fair. Give carbs a break and enjoy wholesome carb-containing foods in appropriate portions. Chapter 5 reviews carb-intake targets and reflects on established dietary guidelines.

Fruit is packed with nutrition, but you can’t ignore that it’s a simple sugar and that too much of a good thing isn’t good anymore. Fruits should be enjoyed in smaller serving sizes and one portion at a time. Chapter 11 specifically addresses fruit juice and sugary soft drinks and makes a convincing case against consuming your carbs in liquid form.

A balanced diet includes an appropriate amount of carbohydrate, protein, and fat and adequate intakes of all key vitamins and minerals. Some vitamins and minerals are found across a wide array of food choices, while other nutrients are unique to specific foods. Cutting out entire food groups cuts the nutrition in those groups. For example, vegetarians need to focus on getting adequate intakes of protein and iron. In addition, vegans must seek out vitamin B12 and calcium. When people try to avoid carbs, all kinds of nutrition red flags go up.



REMEMBER

While focusing on carbohydrate is important, don’t lose track of the overall quality of your diet. Learn to make choices that are good for your heart, weight, and health. Check out Chapter 13 for more information about eating for health and happiness.

Acknowledging that staying healthy isn’t just about carbs

Diabetes requires that you control carbohydrates, but that isn’t the whole story. Keeping healthy means eating smart for your weight and heart (see Chapter 16); learning to identify the perfect proteins and the heart-healthiest fats and oils (see Chapter 13); and putting together balanced meals (see Chapter 8 and Part 5). A balanced diet not only assures nutritional needs are met, but blood glucose is also easier to control when meals have appropriate amounts of carbohydrate, protein, and fat.



REMEMBER

Physical fitness plays an essential role in overall health. While exercise is encouraged for everyone, there are diabetes-related considerations and safety tips to be aware of (check out Chapter 14).

Making the Case for Carb Counting: To Count or Not to Count?

Whether you loosely manage your carbs or strictly count them depends on your situation. Carb counting is the gold standard if you have type 1 diabetes, but people with type 2 diabetes also stand to benefit from knowing how to count carbs. Establishing carb budgets and adhering to those budgets is one method of managing blood-glucose levels while simultaneously controlling calories and managing weight.

Counting carbs with type 1 diabetes: An essential tool

When you count carbs accurately, you know exactly how much glucose is going to end up in your bloodstream. Insulin doses can be adjusted to cover that amount of carb. People with type 1 diabetes don't make any of their own insulin. If insulin doses are based on carbohydrate intakes, counting carbs as precisely as possible is really important. It takes a little extra time initially, but with experience it gets easier and quicker. Label reading and carb-counting fundamentals are covered in Chapters 7 and 8. See Chapter 9 to add Internet tools to your carb-counting tool chest. For a deeper understanding of the dietary variables that affect blood-glucose readings, check out Chapter 10, and to find out how to line up insulin timing with digestion timing, see Chapter 6.

Gaining tighter control over blood-glucose levels with type 2 diabetes

Type 2 diabetes is characterized by insulin resistance. The body has insulin, but the insulin doesn't work as well as it should. For better blood-glucose control, strive to spread carbohydrate intake between three meals and perhaps one or two small snacks per day. Chapter 22 offers snack ideas.



TIP

People who skip breakfast or lunch often end up eating too much in the evening. Big meals with lots of carbohydrate can derail glucose control. There are several ways to set portion limits. The plate model puts perspective on portioning and is a simple visual tool. The carb portioning and counting fundamentals covered in Chapter 8 aren't reserved for people on insulin. Carb counting is an option for anyone who wants to accurately control carb portions.

THE EFFECTS OF CARB COUNTING WITH TYPE 1 DIABETES

Coral took one unit of rapid-acting insulin for every 15 grams of carbohydrate. She hadn't been completely satisfied with the results. Sometimes her blood-glucose levels were higher or lower than expected. Upon close inspection we identified several issues:

- She was putting in effort but had gaps in her accuracy. She never counted the carbs in nonstarchy vegetables, such as green beans and broccoli. Coral was diagnosed at age 9, and at that time she didn't really eat many vegetables, so her diabetes team told her family that vegetables were “free.”
- Another issue: No one had ever told her to subtract the fiber from the total carbohydrate when reading food labels. She's now 28 years old and eating lots of vegetables and whole grains. After nearly 20 years of diabetes, she felt a measuring cup wasn't needed. What she had been calling “one cup” of rice had gradually grown in size. She was easily having 1½ to 1¾ cups, thinking it was just a cup. Inaccuracies in carb counting meant she wasn't getting the right doses of insulin.

After our visit she went home, implemented the tips, and returned for follow-up three months later. Her blood-glucose levels had improved and were more predictable, so she felt safer and more confident. We explored how to further hone accuracy with a food scale, and we identified apps and online resources to count the carbs in mixed dishes and ethnic foods.

Sticking with consistent carb counts when you're on set insulin doses

Do you check your blood-glucose level at mealtime and then refer to an insulin chart to determine what your dose should be? That insulin dosing method is called *sliding-scale insulin*. The dose goes up incrementally for higher blood-glucose readings. Some individuals are on *set insulin doses* at mealtimes. In other words, the dose of insulin is the same from one day to the next regardless of blood-glucose levels.



WARNING

The problem with sliding-scale insulin dosing and set insulin dosing is that they don't take into consideration what you are planning to eat. The carbs in the pending meal will determine how much more glucose enters the bloodstream. Consider a low-carb salad for lunch one day and a burrito the next day. The two meals contain very different amounts of carbohydrate, but sliding-scale or set insulin dosing doesn't take that carb variability into consideration. These insulin dosing plans require mealtime carb intakes to be consistent from one day to the next.

EXPLORING THE GLYCEMIC INDEX

The glycemic index (GI) is a tool to measure how individual foods are expected to impact blood-glucose levels. The basic concept may be used in addition to carb counting and other carb management strategies. It's true that not all carb foods affect blood glucose in the same manner, which is why pizza isn't used to treat hypoglycemia. Liquids move through the stomach quickly, so the sugars in juice and soda show up in the bloodstream in a matter of minutes. That's just what you need if you're trying to treat hypoglycemia. Juice isn't what you need if blood-glucose levels are already running high.

Instead of deferring to a chart to choose from low, medium, or high GI foods, it pays to get to the bottom of why foods behave the way they do (check out Chapter 10). With a solid grasp of the concepts, you can make food choices work in your favor. For example, whole grains and legumes have fiber and a lower glycemic index than white refined grains and breads. Meals that contain fiber and balanced amounts of carbohydrate, protein, and fat produce a blunter blood-glucose rise and more stability in blood-glucose levels.

Establish mealtime carb targets (with the help of Chapters 5 and 6). You can vary your food choices daily but keep the carb amounts consistent. Sample menus for breakfast, lunch, and dinner with set carb amounts are found in Chapters 19, 20, and 21.



REMEMBER

Set insulin dosing and sliding-scale insulin dosing aren't ideal for type 1 diabetes but may suffice for some people with type 2 diabetes. Talk to your healthcare providers to determine a safe and effective insulin dosing plan for you.

Managing weight with carb counting and portion precision

Counting carbs and eating appropriate amounts at meals and snacks helps with weight control. When you adhere to budgeted amounts of carbs at mealtimes and snacks, you are automatically putting a cap on portion sizes for fruit, bread, grains, starches, cereals, milk, yogurt, sweets, and many other items. Controlling carb portions helps with blood-glucose control and weight management. Here are some pointers:

- » Use the Exchange Lists in Appendix A to choose lean proteins and limit mealtime protein portions to the size of the palm of your hand.

- » Choose lower-fat cooking methods and limit added fats.
- » Eat plenty of vegetables and salads.



REMEMBER

The benefits are cumulative. Controlling portions helps with weight loss; losing weight improves insulin action; better-working insulin improves blood-glucose control; and controlling diabetes and weight lowers your risk of heart disease! For more tips on eating smart for your weight and heart, see Chapter 16.

Regulating Carb Intakes

The human body relies on glucose to fuel many functions. The biggest user of this essential fuel is the brain. The minimum recommended intake for carbohydrate is 130 grams of carb per day, whether you are 1, 10, or 100 years old. Who says and why? The National Institutes of Health establish nutrient intake guidelines. The guidelines on carbohydrate intake assure adequacy for vital functions and baseline needs. Actual intake should be assessed individually, as discussed in the following sections.

Figuring out how much carb you need

Glucose is an important fuel for the human body. You can't live without it. The brain requires a steady supply of glucose around the clock and lifelong. Glucose is the preferred fuel source for muscles and other tissues. Foods supply glucose and other nutrients.



REMEMBER

Carbohydrate requirements depend on age, gender, height, weight, and level of physical activity. Use Chapter 5 to assess your body mass index (BMI) and weight status. Estimate your daily caloric needs. Choose a daily carbohydrate budget based on calorie goals and personal preference.

Timing your carb intake

There's something to be said about proper meal spacing. If meals are too close together, blood-glucose levels can climb. If meals are too far apart, appetite can overtake willpower and make portion control difficult. Going to bed on a full stomach can lead to elevated glucose levels overnight and into the next day. Try having dinner at least three hours before going to bed. Eat three main meals four to six hours apart. Tuck in a snack if needed to curb appetite or to supply energy for exercise. Determine how to divvy up the carbs among meals and snacks to regulate appetite and blood-glucose levels in Chapter 6.

Matching insulin timing to digestion timing takes a bit more finesse. It's critical to understand onset, peak, and duration profiles for the insulins you use. Chapter 6 reviews insulin action times. Chapter 10 looks at the variables that affect digestion timing. Some foods digest quickly (liquids, simple sugars, and refined grains), while others digest more slowly (whole grains, foods with fiber, and meals higher in protein and fat).

Counting Carbs Successfully

Make use of the many carb-counting resources available to you. The following sections introduce food labels, food lists, menus, brochures, apps, websites, and more.

Looking at the label lingo

Nutrition details are clearly marked on packaged foods. Look for the Nutrition Facts food label. First, identify the serving size. The calories, total carbohydrate, fiber, and everything else on the label refers to “one serving,” not necessarily the whole package. Did you know that fiber isn't digestible so you can subtract it from the total carbohydrates to get a more accurate carb count?

Tune in to Chapter 7 to sharpen your supermarket savvy and find out all about food labels. You can even take a sneak peek at the new look; the food label is undergoing a makeover.

Gathering carb-counting resources

Some of the most nutritious foods are harvested, not manufactured. Don't let the lack of a label keep you from reaching for wholesome foods. You can still closely estimate carbohydrate counts in fruits, vegetables, legumes, and grains with food composition lists (see Chapter 8 and Appendix A). The Exchange List concept groups foods by macronutrient composition; the items on a list have similar amounts of carbohydrate, protein, and fat. Every item on the fruit list, for example, identifies a portion size that equals 15 grams of carbohydrate: A small apple or orange, 17 grapes, 1 cup of cantaloupe or raspberries, or ½ banana all provide the same amount of carbohydrate. Variety isn't only the spice of life; it's also a great way to assure you get a wide array of important nutrients.

Measuring cups are essential for accuracy. Cooking from scratch? No problem! Chapter 8 also walks you through figuring out how to calculate carbs in your

homemade recipes. Add tools to your carb-counting tool chest by tapping into online resources (flip to Chapter 9).

Increasing carb-counting accuracy

With type 1 diabetes, insulin doses must be carefully matched to carbohydrate intakes. Once you've mastered carb counting 101 (food labels and carb-counting lists), you're ready for more advanced carb-counting strategies.

A food scale can verify exact carb counts on numerous foods, including fruits. By weighing foods occasionally, you'll hone your ability to accurately estimate carbs in the future. Chapter 8 provides a list identifying the number of grams of carb per ounce of fruit. Weighing nails the carb counts in baked potatoes or a chunk of French bread.

Apps and web-based food databases offer nutrition facts on ethnic foods and combination foods, including pizza and lasagna. Chapter 9 describes how to combine the technologies: your food scale and a food database or app. Weigh your food item — a tamale, for example — and then plug the weight of your tamale into the food database to get an exact carb count on the item you're about to eat. There is no need to do this for every food every time, but it sure helps to improve your ability to guesstimate more accurately in the future.

Living Well with Diabetes: The Seven Pillars of Diabetes Management

Eating for health and happiness and reaping the rewards of fitness should be a lifelong commitment through all ages and stages of life. The following sections cover these and the other pillars of diabetes management.



REMEMBER

We are all responsible for what we think, what we say, and what we do.

Eating a healthy diet

Food should be a positive part of creating and maintaining health, and it should be something to enjoy and savor too! Chapter 13 provides pointers for choosing the foods that promote health and wellness: colorful fruits and vegetables, whole grains, legumes, nuts, lean proteins, fish, vegetarian protein alternatives, heart-healthy fats, and dairy foods (or nondairy substitutes).

GIVING THOUGHT TO GOING GLUTEN-FREE

Gluten is a protein found in wheat, rye, and barley. Celiac disease inflicts intestinal damage if gluten-containing foods are consumed. The treatment is strict, lifelong avoidance of all sources of gluten, no matter how minute. Exposure to even a crumb can damage the linings of the intestine, impair nutrient absorption, and cause numerous diseases related to vitamin and mineral deficiencies.

People with type 1 diabetes have an increased risk of celiac disease because both diseases are autoimmune disorders. Whether you're avoiding gluten because of celiac disease, wheat allergy, gluten sensitivity, or preference, Chapter 18 provides the information you need to get started.



REMEMBER

If you eat wholesome foods in appropriate portions, you'll have the right recipe for health. This book provides you with a deeper understanding of how food choices affect your diabetes, weight, blood pressure, cholesterol, and cardiovascular health.

If you have celiac disease or gluten intolerance, it's time to go gluten-free all the way. Chapter 18 provides details.

Staying fit with exercise

Exercise has long been recognized as a foundation therapy in the treatment of type 2 diabetes. If you have prediabetes, exercise coupled with moderate weight loss has been shown to prevent or delay the onset of type 2 diabetes.

Everyone can cash in on multiple health benefits related to physical fitness. Exercise helps with weight control, improves blood pressure and cholesterol, strengthens bones and improves circulation, relieves stress, and improves sleep. No one comes back from an exercise session saying, "I wish I hadn't done that!" On the contrary, most people feel better and actually think, "I'm so glad I did that! I'll have to do that more often!"



TIP

If you aren't currently engaged in regular exercise, start by building more activity into your usual day. Don't sit for hours on end. Get up and move around. You can decide whether you move for one minute or for ten minutes. The first step is simply taking the first step. Walk while talking on your mobile phone. Do leg lifts and use hand weights while watching television. Put on some music and dance in your living room. Join an exercise class or a water aerobics group. Chapter 14 can help you get off on the right foot with fitness. The chapter also provides guidelines for building a safe exercise regimen.