Many people with diabetes are surprised to find that, after receiving their diagnosis, they start to feel better than ever. You are likely to notice the same after you start eating a healthy diet; losing excess weight and becoming more active helps to improve your physical and mental wellbeing.

This chapter gives you the latest information about what diabetes means, how doctors diagnose it, and all the other things you need to know in order to thrive following a diagnosis of diabetes. Don’t waste another minute. Get stuck in right away so that you can feel as healthy as possible, as soon as possible.

**Recognising Diabetes**

With so much diabetes around these days, you may think that recognising it is easy. The truth is, however, that spotting diabetes is actually quite difficult, because its diagnosis depends on blood tests. You can’t just look at someone and know the level of glucose in his or her blood. In addition, symptoms are often quite general, and so the diagnosis of diabetes doesn’t just jump out and grab you (or your doctor).

*Glucose* is the name of the type of sugar found in your body that provides most of the energy that your cells and organs need to carry on all the chemical reactions that let you live, think, breathe, and move around.
Diabetes by the numbers

The level of glucose that means you have diabetes is as follows:

- A random blood glucose test result (one not taken first thing in the morning after fasting) that is greater than, or equal to, 11.1 millimoles per litre (mmol/l), along with symptoms such as fatigue, frequent urination and thirst, slow healing of skin, urinary infections, and vaginal itching in women. A normal random blood glucose level is between 4 and 8 mmol/l.

- A fasting blood glucose level (taken after consuming nothing but water for at least eight hours) that is greater than, or equal to, 7 mmol/l. A normal fasting blood glucose level is less than 5.6 mmol/l.

- A blood glucose level that is greater than, or equal to, 11.1 mmol/l two hours after consuming 75 grams of glucose during an oral glucose tolerance test.

Although an oral glucose tolerance test is the gold standard for diabetes, this test isn’t always practical, and is expensive. Diabetes UK, the leading charity for people with diabetes, recommends using a fasting glucose level, which is more convenient. Taking a random blood glucose test isn’t as sensitive for diagnosing diabetes.

The United Kingdom and most of the rest of the world uses the International System (SI) of units – millimole per litre (mmol/l) – to measure the concentration of something in a liquid, such as glucose in blood. For some reason, the United States is different and uses milligrams/decilitre (mg/dl) as the unit of measurement. You may come across mg/dl values on some Web sites or in American books. To convert mg/dl to mmol/l, simply divide the value of mg/dl by 18. For example, 126 mg/dl becomes 7 mmol/l.

Some people have blood glucose levels that are not (yet) high enough to diagnose diabetes, but aren’t as low as normal. Such people have impaired glucose tolerance, or pre-diabetes. Pre-diabetes is diagnosed when a fasting blood glucose level is between 5.6 and 7 mmol/l and a blood level taken two hours after drinking a sugar solution in an oral glucose tolerance test is between 7.8 and 11 mmol/l. Without changing their diet and lifestyle, between 29 and 55 per cent of people with pre-diabetes develop type 2 diabetes over the course of three years, and most people with pre-diabetes go on to develop diabetes within ten years. Although people with pre-diabetes don’t usually develop small blood vessel complications of diabetes like blindness, kidney failure, and nerve damage, they’re more prone to large vessel disease like heart attacks and strokes. Therefore, you want to get that glucose level down. An estimated 388 million people are currently living with pre-diabetes worldwide, although most are unaware that they are affected.
Types of diabetes

Three main types of diabetes exist:

- **Type 1 diabetes**: Previously known as juvenile diabetes or insulin-dependent diabetes, this type mostly begins in childhood and results from the body's self-destruction of its own pancreas cells. The pancreas is an organ of the body that sits behind the stomach and makes insulin, the chemical or hormone that is needed to get glucose into cells for use as a fuel. You can’t live without insulin, and so people with type 1 diabetes take insulin shots (injected or, most recently, inhaled). Of the known 2.2 million people in the United Kingdom with diabetes, about 10 per cent have type 1.

- **Type 2 diabetes**: Once called adult-onset diabetes, type 2 tends to come on around the age of 40, but is now occurring younger and younger – even in children – due to rising levels of obesity and lack of exercise. The problem in type 2 diabetes is not a total lack of insulin, as occurs in type 1, but a resistance to insulin, so that cells no longer respond to it properly; as a result, glucose isn’t let into cells and builds up in the blood so levels rise.

- **Gestational diabetes**: This type of diabetes is like type 2 but occurs in women during pregnancy, when a lot of chemicals in the mother’s blood oppose the action of insulin. About 4 per cent of all pregnant women develop gestational diabetes. If the mother isn’t treated to lower her blood glucose, the glucose gets into the baby’s bloodstream. The baby doesn’t have diabetes, and so produces plenty of insulin. As a result, the baby begins to store the excess glucose as fat and becomes much larger than usual, so that delivery is often difficult. When born, the baby is cut off from the large sugar supply but is still making lots of insulin, and so the blood glucose can drop severely after birth. The mother is at risk of gestational diabetes in later pregnancies and is likely to develop type 2 diabetes as she gets older, especially if she puts on weight and doesn’t exercise.

Consequences of diabetes

If your blood glucose isn’t well controlled, it can damage your body cells temporarily or even permanently, depending on how high your blood glucose becomes, and for how long it stays that high. The damage is divided into three categories: irritations, short-term complications, and long-term complications.
Irritations

Irritations are mild and reversible, but still unpleasant, results of high blood glucose levels. The levels aren’t so high that the person is in immediate life-threatening danger. The most important of these irritations are the following:

- Blurred vision
- Fatigue
- Frequent urination and thirst
- Genital itching, especially in females
- Gum and urinary tract infections
- Obesity
- Slow healing of the skin

Short-term complications

These complications are potentially very serious and can even lead to death if not treated. They’re associated with very high levels of blood glucose – in the 20 mmol/l range and above. The three main short-term complications are:

- **Ketoacidosis**: This complication is found mostly in type 1 diabetes. Without insulin, glucose levels rise very high, and the body starts to use fat for energy. As fat breaks down, it produces chemicals called ketones that make the blood very acid. The acid condition makes the patient nauseated and unable to eat or drink. He or she becomes very dehydrated but continues to lose fluids due to excessive urination or vomiting. The increased urine takes important body constituents with it, such as potassium. The patient becomes very sick and dies if not treated with large volumes of fluids and large amounts of insulin. After the situation is reversed, however, the patient is fine.

- **Hyperosmolar syndrome**: This condition is often seen in neglected older people. Their blood glucose rises due to severe dehydration and the fact that the kidneys of older people often can’t get rid of glucose as well as younger kidneys. The blood becomes like thick syrup. The person can die if large amounts of fluids aren’t restored, but replenishing fluids is tricky in older people, who often have heart failure as well. When heart failure is present, the heart can’t handle too much fluid at one time. The excess fluid can get into the lungs and also cause swelling of the legs. People with hyperosmolar syndrome don’t need that much insulin to recover. After the condition is treated, the person returns to a normal state.
Hypoglycaemia or low blood glucose: This complication happens when someone is on a drug like insulin, or a pill that drives down glucose levels, at a time when they aren’t getting enough food or are getting too much exercise. If glucose levels fall much below 3 mmol/l, the patient starts to feel bad because not enough glucose reaches the brain. Typical symptoms include sweating, rapid heartbeat, hunger, nervousness, confusion, and even coma if the low glucose level is prolonged. The usual treatment is to take glucose by mouth or, if the person is unconscious, to inject a glucose solution directly into a vein. This complication usually causes no permanent damage.

Long-term complications

The long-term complications of diabetes have a substantial impact on quality of life and are divided into two groups: microvascular, which are due at least in part to small blood vessel damage, and macrovascular, associated with damage to large blood vessels.

These problems occur after ten or more years of poorly controlled diabetes or, in the case of macrovascular complications, after years of pre-diabetes or diabetes. After these complications are established, reversing them is hard, but treatment is available early in their course, and so your doctor screens you for them on a regular basis after your initial diagnosis of diabetes. See Diabetes For Dummies, 2nd Edition, by Dr Sarah Jarvis and Dr Alan Rubin (Wiley) for information on screening for these complications.

Microvascular complications include the following:

- **Diabetic retinopathy:** Eye damage that leads to blindness if untreated.
- **Diabetic nephropathy:** Kidney damage that can lead to kidney failure.
- **Diabetic neuropathy:** Nerve damage that results in many clinical symptoms, the most common of which are tingling and numbness in the feet. Lack of sensation in the feet can result in severe injury without awareness unless you carefully check your feet regularly. Such injury can result in infection and may even lead to amputation.

Macrovascular complications also occur in pre-diabetes and consist of the following:

- **Coronary heart disease:** Furring up of the arteries supplying the heart. Blockage of the coronary arteries can lead to a heart attack, which is the most common cause of death in people with diabetes.
- **Cerebrovascular disease:** Furring up and blockage of arteries supplying the brain, resulting in a stroke.
Peripheral vascular disease involving the blood vessels of the legs:
These vessels can become clogged and lack of blood can lead to ulceration and gangrene, which may eventually require amputation of the feet or legs.

If you control your blood glucose well, none of these complications need ever occur. Controlling your blood pressure and your cholesterol also helps prevent these complications.

Treating diabetes

Treatment of diabetes involves three essential elements:

- **Diet**: If you follow the recommendations in this book, you can significantly lower your average blood glucose level, and reduce your risk of developing diabetes-related complications.

- **Exercise**: Exercise lowers blood glucose levels, because it improves insulin resistance and allows more glucose into muscle cells for use as a fuel. This chapter and Chapter 3 touch on exercise, and *Diabetes For Dummies, 2nd Edition* (Wiley) discusses it more fully.

- **Medication**: Diabetes medications abound – far too many are available to discuss here, in a recipe book, but you can find out about them in *Diabetes For Dummies, 2nd Edition* (Wiley).

Controlling Kilocalories

Just as the three most important factors in the value of a house are location, location, location, the three most important factors in diet for people with diabetes are moderation, moderation, moderation. If you’re overweight or obese, which is true of most people with type 2 diabetes and a lot of people with type 1 diabetes who are on intensive insulin treatment (four shots of insulin daily), weight loss makes a huge difference to your blood glucose levels. If you maintain the weight loss, you can avoid the complications of diabetes and may even find that your blood glucose levels return to normal.

Successful weight loss means controlling the amount of kilocalories you consume (see the ‘Kilocalories versus calories’ sidebar for an explanation of kilocalories), and increasing the amount of exercise you take. If you don’t burn the same amount of kilocalories as you eat, you gain weight. Conversely, losing weight involves burning up more kilocalories than you eat. Sounds simple, eh!
As you reduce your portions of food, also make sure that you reduce your intake of added sugars, fats, and alcohol. These items contain few nutrients such as vitamins and minerals and are simply sources of empty kilocalories.

If you are predisposed to develop diabetes because, for example, both your parents have diabetes, you can help to prevent it by maintaining a healthy weight. If you already have diabetes, you can minimise its impact by losing weight and keeping it off.

Do you need a highly complicated formula to figure out how to moderate your food intake? No! The process is as simple as looking at the portions you currently eat and cutting them in half. This approach is relatively easy in your own home, but in restaurants that serve super-sized portions, the rule of eating half isn’t always strong enough. In these fast-food emporiums, the advice is often to eat only a third of their usual portions! You may also need to apply the same portion control when you eat at someone else’s home. And NEVER go back for seconds! Figure 1-1 shows you the difference between reasonably sized portions and ones that are too big.

**Figure 1-1:** Eating in moderation means choosing the portion sizes on the left, rather than those on the right.

**Kilocalories versus calories**

A kilocalorie is 1,000 times greater than a calorie. This book uses the term *kilocalories* (or *kcals*) because it’s more accurate — experts in health and medicine always use kilocalories as the unit of measurement when working out the energy provided in a diet plan or in different foods. Unfortunately, however, the term *calories* is in common use on food labels and in diet books, and health officials don’t want to confuse the public by attempting to correct this error.

Calorie counts in the text of this book and in the nutritional analyses of the recipes are given in kilocalories.
Controlling kilocalories isn’t easy when TV commercials often imply that eating certain foods helps make you sexier and more beautiful. Another challenge is eating in a restaurant where the menu makes everything sound perfectly delectable. And when the portions arrive at your table, they’re twice the size that you normally eat. Use these tips to help you visualise portion sizes:

- A serving of meat is around the size of a deck of cards.
- A medium fruit is the size of a tennis ball.
- A medium potato is the size of a computer mouse.
- A serving of cheese is the size of a domino.
- A serving of vegetables such as broccoli is the size of a light bulb.

An average woman needs around 2,000 kilocalories per day to maintain her weight, and an average man needs around 2,500 kilocalories per day. You don’t need to take in many more kilocalories than you need, over time, to gain weight. Just 100 extra kilocalories on a daily basis results in a weight gain of 5.5 kilograms (12 pounds) in a year. An extra glass of wine is that many kilocalories. On the other hand, if you reduce your daily intake by 100 kilocalories, you can lose those 5.5 kilograms (12 pounds) over a year. Just cut out that glass of wine!

Look at a few examples of today’s typical portion sizes and compare them to a serving offered 20 years ago. Table 1-1 shows the kilocalories in the portions of 20 years ago and today and how much exercise you need to burn up the extra kilocalories in order not to gain weight.

<table>
<thead>
<tr>
<th>Table 1-1</th>
<th>Consequences of Today’s Larger Portions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food</strong></td>
<td><strong>Kilocalories 20 Years Ago</strong></td>
</tr>
<tr>
<td>Bagel</td>
<td>140</td>
</tr>
<tr>
<td>Cheeseburger</td>
<td>333</td>
</tr>
<tr>
<td>Chicken Caesar salad</td>
<td>390</td>
</tr>
<tr>
<td>Chips</td>
<td>210</td>
</tr>
<tr>
<td>Chocolate chip cookie</td>
<td>55</td>
</tr>
<tr>
<td>Coffee</td>
<td>45</td>
</tr>
<tr>
<td>Popcorn</td>
<td>270</td>
</tr>
<tr>
<td>Turkey sandwich</td>
<td>320</td>
</tr>
</tbody>
</table>
Including Exercise (and Rest)

Exercise is just as important as diet in controlling your blood glucose. When people at risk of developing diabetes (because both their parents have diabetes) walk for just 30 minutes a day, 80 per cent of them don’t develop the disease. These people don’t necessarily lose weight, but they do exercise.

Exercise isn’t only for someone with diabetes. Anyone who wants a healthy lifestyle needs to exercise, but for people with diabetes, exercise is especially important as it protects against both the microvascular and the macrovascular complications of diabetes.

And you don’t have to spend hours exercising. About 30 minutes a day of moderate exercise, such as walking, gives you all that you need. If walking doesn’t interest you, you can cycle, swim, jog, play a sport, or do just about anything that gets your heart pumping faster and your muscles moving.

Too many people complain that they just can’t find time to exercise. This excuse isn’t really acceptable, is it? Especially when you realise how much difference exercise makes in your life and to your diabetes control. Here are some ways that different amounts of exercise can help you:

- Thirty minutes of exercise a day gets you in excellent physical shape and reduces your blood glucose substantially.
- Sixty minutes of exercise a day helps you maintain a weight loss and gets you in even better physical shape; it can even help you to discontinue medications for diabetes, unless you have type 1 diabetes.
- Ninety minutes of exercise a day helps you lose weight.

If you say that you can’t find 90 extra minutes in your day, that’s probably not an unreasonable assessment of your schedule, but do consider the benefits before ruling out the possibility! How about walking the kids to school, or walking to the shops rather than taking the car?

An exercise partner helps ensure that you get out and do your thing. Having someone waiting for you so that you can exercise together is extremely helpful.

Here are some more facts about exercise to keep in mind:

- You don’t have to get all your minutes of exercise in one session. Two 30-minute workouts are just as good as, and possibly better than, one 60-minute workout.
- Although walking is excellent exercise, especially for older people, the benefits of more vigorous exercise for a longer time are greater still.
Your decision to take the stairs instead of the lift may not seem like much, but if you do so day after day, it makes a profound difference. Another suggestion that helps over time is to park your car farther from your office or the shops. A pedometer (a small gadget worn on your belt that counts your steps) may help you achieve your exercise goals. The objective is to increase your step count every week and get up to 10,000 steps a day.

You also need to strengthen your muscles. Stronger (larger) muscles take in more glucose, providing another way of keeping your diabetes under control. A programme of light weight training is often all you need. You may want to book a personal trainer to show you a routine at the start, and then take over on your own (or keep up with weekly trainer sessions to maintain your motivation). You can buy hand-held weights inexpensively from most sport shops. You don’t need to weight train every day, as is advisable for walking – three or four times a week is enough. You may be surprised at how much your stamina increases and how much your blood glucose falls when you keep this routine up.

Place a daily limit on activities that are completely sedentary, such as watching television or surfing the Web. Use the time you may have once spent on these activities to exercise. This advice is especially helpful for overweight children.
You want to keep active, but don’t do it at the cost of getting plenty of rest each day. People who sleep eight hours a night tend to get less hungry and are leaner than people who sleep less. Strange but true!

**Controlling Your Blood Pressure**

Keeping your blood pressure in check is particularly important in preventing the macrovascular (large blood vessel) complications of diabetes. But elevated blood pressure also plays a role in bringing on eye disease, kidney disease, and neuropathy. Have your blood pressure checked every time you see your doctor. The goal is to keep your blood pressure under 130/80 mmHg – even lower if you have kidney problems. You may want to get your own blood pressure monitor so that you can check your blood pressure at home yourself.

The statistics about diabetes and high blood pressure are daunting. Over 70 per cent of people with diabetes have high blood pressure, but almost a third are unaware of it. And almost half of them aren’t receiving proper treatment for high blood pressure. Among those treated, more than half still have a blood pressure greater than 130/80.

You can do plenty of things to lower your blood pressure, including losing weight, avoiding salt, eating more fruit and vegetables, and, of course, exercising. But if all else fails, your doctor prescribes medication. Many blood pressure medicines are available, and one or two are exactly right for you. See *High Blood Pressure For Dummies, 2nd edition*, by Alan L. Rubin (Wiley) for an extensive discussion of the large number of blood pressure medications at your doctor’s fingertips.

One class of drugs in particular is very useful for people with diabetes who have high blood pressure: *angiotensin converting enzyme inhibitors* (ACE inhibitors), which protect your kidneys. If kidney damage is detected early, ACE inhibitors can reverse the damage. Some experts believe that all people with diabetes benefit from taking ACE inhibitors, but as long as no evidence exists of kidney damage and the diabetes is well controlled, most doctors prefer to keep these drugs in reserve.

**Considering the Rest of Your Lifestyle**

Diabetes is just one part of your life. It can affect the rest of your lifestyle, however, and your lifestyle certainly affects your diabetes. This section explores the other parts of your lifestyle that you can alter to benefit both your overall health and your diabetes.
Try making changes one at a time, and when you think that you have one aspect under control, move on to the next. If you try to tackle too much at once, you soon give up as we’re all creatures of habit and changing more than one aspect of our behaviour at the same time isn’t easy.

Drinking alcohol safely

A glass of wine is a pleasant addition to dinner, and studies show that alcohol in moderation can lower the risk of a heart attack (see the sidebar ‘How alcohol helps prevent heart disease’, later in this chapter). For someone with diabetes, however, ensuring that food accompanies the wine is especially important because alcohol reduces blood glucose levels; a complication called hypoglycaemia may occur if you drink too much alcohol and eat too little food (see the section ‘Short-term complications’, earlier in this chapter).

Never drink alcohol without food, especially when you’re taking glucose-lowering medication.

The following people shouldn’t drink alcohol at all:

- Children and adolescents
- People with medical conditions that are worsened by alcohol, such as liver disease and certain diseases of the pancreas
- People who take medications that interact with alcohol
- Pregnant women
- Women who are breastfeeding

Don’t drink more than two 100-millilitre glasses (two small glasses) of medium-strength, dry wine daily if you’re a man, or one 100-millilitre glass if you’re a woman. Men metabolise alcohol more rapidly than women, which means that they’re able to drink more. But don’t drink more than a maximum of five days out of every seven overall, so you have two alcohol-free days per week. In terms of alcohol content, 100 millilitres of wine (a small glass) is equivalent to 300 millilitres (½ pint) of beer or 25 millilitres (a single measure) of spirits.

Alcohol adds kilocalories without providing any nutrition. Alcohol contains no vitamins or minerals, but you have to account for the kilocalories in your diet. If you stop drinking alcohol, you can lose a significant amount of weight. For example, a person who consumes three drinks a night and stops can lose nearly 12 kilograms (26 pounds) in a year.
Alcoholic drinks tend to contain sugar too. Avoid sweet drinks such as sherry or port, and select dry red or white wine instead.

Excess alcohol causes cirrhosis of the liver, raises blood pressure, and can cause abnormal heart rhythms that are linked with sudden death. Alcohol also worsens diabetic neuropathy. Do you need any more reasons not to drink too much alcohol?

### Avoiding tobacco

Whether you smoke, chew, or inhale it because someone else is smoking, tobacco shortens your life and makes you a prime candidate for many types of cancer. The connection between cancer and tobacco is a scientific fact. Just why tobacco isn’t a banned substance like heroin or crack cocaine is a mystery (although the tobacco companies know the solution to that one).

Everything about tobacco is negative. It stains your teeth and fingers, gives you bad breath, causes wrinkles, and ruins your heart, lungs, and many other organs. And people are dumb enough to pay for it! People with diabetes who smoke are much more prone to amputations of their feet and legs.

Numerous ways are available to stop if you already smoke. Unfortunately many smokers quit only after the first major event, such as a heart attack or a cancer they’re lucky enough to survive. Don’t find yourself in that group. Give it up, now! Your doctor and pharmacist can help.
Staying away from illicit drugs

Do you really want to screw up your life and make your diabetes almost impossible to control by adding illicit drugs to the mix? Some of them interact with your diabetes drugs, causing high or low blood glucose levels. If you use needles to inject these drugs, you may get infections, hepatitis, and even HIV sooner or later.

You can get high without illegal drugs. Try exercise instead. Climb those steps up to your office and enjoy the feeling that comes when you’re no longer carrying an extra 9 kilograms (20 pounds) of weight on your stomach. These highs benefit your diabetes at the same time.

Driving safely

Having diabetes means that you need to take special precautions before you drive. You need to test your blood glucose before driving and raise it to normal before you get behind the wheel. Always carry a source of glucose in your car to take if your glucose falls. When it falls much below 4 mmol/l while driving, your concentration is affected just as if you are drunk.

Wear a seat belt when you drive. Doing so prevents major injury if you get into an accident. Of course, you never drive faster than the speed limit, but you need to worry about the other driver. You never know what he or she is going to do.

Benefiting from relationships

People in loving relationships live longer than those who live alone. This fact is especially true for people with diabetes, many of whom depend to some extent on support from someone else. Perhaps your spouse or significant other buys or prepares the food that you eat. Or perhaps he or she is your invaluable exercise partner, cajoling you along. On the rare occasions when your blood glucose falls very low, he or she is also the one that calls for help and gets the glucose that restores you.

Belonging to a special-interest group is also helpful. For example, perhaps you’re a keen biker, stamp collector, or bridge player. Getting together with others who share your interest is a great stress reducer, which can benefit your diabetes.
People with diabetes also benefit from joining a diabetes support group. Here you discover that you’re not alone in your troubles. In addition, others often have helpful suggestions on managing their diabetes that you can use.

**Maintaining your sense of humour**

If you have diabetes, or any other chronic disease for that matter, keeping a sense of humour makes the inconveniences and associated complications much easier to bear. Some people, such as author Norman Cousins, even claim that you can reverse a disease that’s considered irreversible if you expose yourself to all kinds of funny experiences. He listens to audiotapes of the comedians he finds the most funny and reads humour books that keep him laughing. He also watches movies that make him roar with laughter.

Life is a human comedy. Surely you can laugh about some things in your life, even associated with your diabetes. If Woody Allen or the Marx Brothers don’t do it for you, maybe Monty Python, Jo Brand, Billy Connolly, or Graham Norton can get you going. Like beauty, humour is in the eyes of the beholder.

Find your favourites and get their performances in any media available. Watch or listen to them regularly. Rather than an apple, ‘a laugh a day keeps the doctor away’.