Living with diabetes

If you’ve been recently diagnosed with diabetes, you’re not alone. Over 25.8 million Americans—8.3% of the population—have been diagnosed with the disease, and this number continues to grow. Many others have it but are completely unaware of their condition.

Properly managing diabetes will most likely require some changes in your lifestyle. With the help of modern treatments and medications, and careful monitoring, most people with diabetes are able to participate in the same activities they enjoyed before the diagnosis.

You may be familiar with some of the people who have continued to excel at the things they love, even after being diagnosed with diabetes: actress Halle Berry, Supreme Court Justice Sonia Sotomayor and even the football quarterback Jay Cutler. Throughout this book, you’ll learn how to keep your diabetes under control so that you, too, can continue to lead a healthy and fulfilling life.

Individuals with diabetes experience the disease differently. Because of this, not everyone follows the same course of treatment. For example, while some may require an insulin supplement to help relieve symptoms every day, others may never need it. With time, and with the help of your doctor, you’ll learn what methods work best to help keep your blood sugar levels under control.

Bring this book along to your next doctor visit and review the questions on page 37 together. Before long, you will be on the road to successfully managing your diabetes.
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Diabetes, sometimes referred to as diabetes mellitus or sugar diabetes, is a family of disorders that affects the body’s ability to process and use glucose—a simple sugar released from many foods during digestion—properly. Glucose normally provides the energy needed for a wide range of things within the body’s blood cells. Too much glucose in the bloodstream is a root cause of diabetes. This can be caused by a shortness of insulin, a hormone usually created by the body to process glucose.

Approximately 2 million new cases of diabetes are diagnosed in adults (people 20 years of age and older) each year in the United States.

Among people 65 years of age and older, 26.9% have diabetes.

Those who develop diabetes during their middle age are often overweight.
To put it another way, good health depends on the cells’ ability to do their work. How well the cells perform depends on the answers to the following questions:

Is there a normal level of glucose in the bloodstream?

Are the cells able to absorb glucose so it can be used for energy?

For those with diabetes, the answer to one or both questions is “No.”

**The pancreas is in charge**

The pancreas is very important for controlling glucose levels naturally. An organ about the size of your hand, it’s located between the stomach and the backbone and makes two hormones needed to control the levels. The part of the pancreas that makes the hormones is made up of scattered clusters of specialized beta and alpha cells.

Beta cells constantly monitor blood glucose levels. As they rise, usually after you digest your food, the beta cells respond by releasing insulin into the bloodstream. This allows the glucose to be taken into the cells to provide energy. Blood glucose levels then fall.

Alpha cells do the opposite: If blood glucose levels fall a lot between meals, the alpha cells release a second hormone called glucagon, which signals the liver to release glucose. This raises the blood glucose to a more normal level.

**Insulin is the key**

Sugars, fruits and vegetables, also called carbohydrates, are the body’s main source of glucose. After these are digested, they are stored until needed. Insulin helps determine how much glucose is stored and how much is released into the bloodstream. Any saved is sent to the liver and muscles for storage.
But even when there is a balanced level of glucose, the body’s cells can’t make use it without the help of insulin. Insulin attaches to the surface of cells, and just as a key opens a lock, insulin “unlocks” the cells’ surface, allowing glucose to enter.

In people who have diabetes, either the pancreas stops producing insulin or the insulin that is produced is less effective than normal because of “insulin resistance.” Without insulin, cells begin to “starve” because glucose can’t reach its intended destination. Each of these problems is linked to a specific type of diabetes.

**Types of diabetes**

Not including pre-diabetes, there are three major types of the disease: Type 1, Type 2 and gestational:

**Pre-diabetes** is a condition marked by blood glucose levels that are higher than normal but not high enough for a diagnosis of diabetes. More than 79 million Americans of all ages are estimated to have pre-diabetes.

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### Types of diabetes

<table>
<thead>
<tr>
<th>Type</th>
<th>Key points</th>
</tr>
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| **Type 1** | • Usually diagnosed in children or young adults  
| | • Symptoms may include unusual thirst, big appetite, frequent urination, blurred vision, tiredness, weight loss, non-healing infection  
| | • Diagnosis frequently based on high blood glucose and presenting symptoms  
| | • Must be treated with insulin |
| **Type 2** | • Usually diagnosed in people over age 40; increasingly found in teens and youth  
| | • Often associated with overweight and sedentary lifestyle  
| | • May cause no symptoms at all or milder forms of the symptoms seen in individuals with type 1 diabetes  
| | • May be suspected when a routine blood test shows a high glucose level  
| | • Diagnosis often based on blood glucose test or an oral glucose tolerance test  
| | • Treatment includes diet, exercise, oral medication, and/or insulin |
| **Gestational** | • Occurs during pregnancy, usually during the 24th to 28th weeks  
| | • Often causes no symptoms or just tiredness  
| | • Diagnosis usually based on an oral glucose tolerance test  
| | • The diabetes disappears after the pregnancy is completed  
| | • Signals a risk for developing type 2 diabetes within 10 years |
This number continues to increase with rising obesity. People with pre-diabetes who don't improve their diet and exercise habits are at a higher risk of developing full-blown diabetes within 10 years. However, those who take steps to improve their risk factors may be able to prevent this development. Unfortunately, symptoms are often so mild that individuals who don't get regular check-ups can be pre-diabetic for years and not know it.

**Type 1 diabetes**, which used to be known as insulin-dependent diabetes mellitus (IDDM) or juvenile diabetes (JD), affects as many as three million Americans. About half of these are children. Almost 15,000 new cases are diagnosed each year. Type 1 occurs when the pancreas makes little or no insulin because the immune system is attacking and destroying the pancreas’ beta cells. This can happen very quickly, leading to blood sugar levels tripling as the sugar builds up in the bloodstream. People with Type 1 diabetes need daily insulin shots. Type 1 diabetes is about twice as common among Caucasians than African-Americans.

**Type 2 diabetes**, which used to be called adult-onset diabetes or non-insulin dependent diabetes mellitus (NIDDM), is the most common form of diabetes. Approximately 90-95% of cases are Type 2. It can develop at any age, even during childhood, though it’s most likely to show up slowly in people over the age of 40, especially for people seriously overweight. In Type 2, the liver, muscle and fat cells slowly lose their ability to use insulin efficiently. Because of this, the body needs more and more insulin to keep cell energy normal. At first, the pancreas tries to meet the added demand by making more insulin. In time, however, the pancreas loses its ability to make enough. Blood glucose levels usually rise above the normal range, especially after meals. Although some people with Type 2 diabetes need extra insulin, most can be treated with diet and non-insulin-type oral medications. The number of new cases of Type 2 diabetes in people aged 20 and older is estimated at 1.9 million annually. At all ages, the likelihood of Type 2 diabetes is higher in African-Americans, Hispanics, Asians and Native Americans than in Caucasians.

**Gestational diabetes mellitus (GDM)** can develop in some pregnancies between weeks 24 and 28. Unlike Type 1 and Type 2 diabetes, GDM is not a permanent condition, lasting only until the pregnancy is completed. However, women with GDM are more likely than others to develop Type 2 diabetes within the following 10 years. Health problems of untreated GDM can be serious and include the risk of high blood pressure (preeclampsia) in the mother and some developmental problems in the fetus. Every year, about 135,000 pregnant women in the United States experience GDM.
Symptoms and diagnosis

What are the key symptoms of the most common types of diabetes?

Each type of diabetes has its own set of symptoms:

There aren’t any early warning signs for pre-diabetes. And the high blood glucose levels aren’t high enough to be called diabetes. Instead, the condition is usually discovered during a regular physical exam. People with pre-diabetes are, however, at a higher risk for developing diabetes in the future and are also at a higher risk of blood vessel damage and heart disease. To keep this from happening, it’s important to reach and maintain an ideal body weight, develop an exercise program, practice healthy eating habits and stop smoking. It’s also important to follow other recommendations from your doctor.

Type 1 diabetes tends to cause its first symptoms quickly and with little warning. Unusual thirst, increased appetite, frequent urination, blurred vision and tiredness are all signs of Type 1 diabetes. More dangerous signs are extreme thirst, fruity-smelling breath, dehydration, nausea, vomiting, dry or flushed skin, rapid breathing, mental confusion and even coma. These are signs of a medical emergency. Symptoms must be reversed quickly with aggressive use of insulin and fluids—usually in a hospital emergency room.

Type 2 diabetes usually evolves more slowly than Type 1—over months or sometimes years. It tends to be more common among people over the age of 40 who are overweight. Some people with Type 2 diabetes have milder forms of the symptoms listed for Type 1 diabetes, but most people have no overt symptoms at all. Instead, their disease is discovered during a regular blood test or medical exam.

Gestational diabetes is only rarely accompanied by symptoms. Because of this, periodic blood glucose testing is very important beginning around the 24th week of pregnancy.

Weight carried mostly around the middle of the body rather than being evenly distributed, also known as metabolic syndrome or abdominal obesity, is an important risk factor for diabetes. It is often accompanied by insulin resistance, higher blood glucose levels, high blood pressure and high fats (cholesterol) in the bloodstream. Metabolic syndrome is also a known risk factor for heart disease and stroke.
How is the diagnosis made?

**Type 1 diabetes** is diagnosed by measuring your blood glucose level. A high blood glucose reading, combined with the symptoms listed above, is usually all that’s needed to be sure of the diagnosis.

**Type 2 diabetes** may not be suspected until a regular blood test finds an unusually high glucose level. If Type 2 diabetes seems a possibility, your doctor may order a “fasting” blood glucose test. This means the blood sample is taken in the morning or at least 8 to 10 hours after you last ate a meal to get a baseline reading. An oral glucose tolerance test is another choice. For this test, a blood sample is taken after an overnight fast to get the baseline. You then drink a special high-glucose beverage. After 30 minutes, your blood glucose level is then measured. This is repeated after 60 minutes and 120 minutes to see how well the body uses sugar over time compared to set normal readings.

**Gestational diabetes (GDM)** is usually identified by oral glucose tolerance testing during pregnancy. (This Self-help Guide does not provide further details about GDM. If you need additional information, please call your doctor or visit the American Diabetes Association website at www.diabetes.org.)
2. Managing your diabetes

While there's no cure for diabetes, a lot is now known about how to keep it under control. Maintaining good control lets the body use glucose efficiently. Studies show that controlling your blood glucose also helps prevent serious long-term health problems that can affect your eyes, kidneys, nerves, heart and circulatory system.

Keeping your blood glucose level in control is the best way to avoid diabetes-related health problems.

What you eat, when and how much you eat, your level of physical activity, and physical and emotional stress all influence your blood glucose level.

Even light exercise, when done regularly, reduces the risk of heart disease, lowers blood pressure and helps maintain good body weight.
While it's very important to team with your doctor, you must always be the main day-to-day manager of your disease. The first step is to wear identification at all times that clearly states you have diabetes. The ID can be worn on a chain around your neck under your clothing, or on a bracelet. And mention your diabetes if you are seeing a new doctor for the first time on some other health matter. This information is critical because those who are providing your care, like doctors, nurses, first responders, or others, must consider your diabetes when providing treatment.

Over time, you and your healthcare team will get to know your body's responses to different dietary changes, exercise, other illnesses and, if necessary, medications. You will also learn which exams are important to schedule regularly to help you manage your disease.

**Monitoring your blood glucose**

You and your doctor must work together in tracking your blood glucose. Check your blood glucose level at home regularly with a small, portable blood glucose-monitoring device and jot down the readings in a pocket diary. The readings display the amount of glucose in milligrams per deciliter (mg/dl) found in your blood. Your daily goal will be to keep your blood glucose below 160 mg/dl within two hours after eating and between 80 and 120 mg/dl after fasting.

Self-monitoring finger stick devices allow you to obtain a small blood sample and read-out at the touch of a button. They usually come with a tiny needle that you can use to prick the tip of your finger or some other part of your skin almost painlessly to draw a drop of blood. Depending on the testing device used, you simply place the blood sample onto a test strip or a meter test pad. You may also read results in the window of a personal digital glucose meter (glucometer), which analyzes the blood for glucose. Needle tips of self-monitors can be thrown away and replaced easily after each use so that a fresh sterile tip is available with each test.

Numbers that fall far outside your daily goals should be reported to your doctor so that he or she can adjust medications or recommend other treatments promptly. Even if all goes according to plan, it's important to see your doctor in person every so often and discuss how well you are doing.
How often do I have to self-monitor my blood glucose?

How often you should test daily blood glucose varies. There may be times, such as when you are first diagnosed or if your blood glucose control gets worse, when you will benefit from testing three or more times per day. You may also need to test more often if you:

• Take insulin or are starting a new medication.

• Have problems with low blood glucose (hypoglycemia or below 50 mg/dl).

• Have problems with high blood glucose (hyperglycemia or 250 mg/dl).

• Are sick with a bad cold or some other unrelated condition.

• Are unable to eat as usual, including at the same times each day.

• Are pregnant.

• Use an insulin pump (a small, computerized device that delivers insulin continuously throughout the day).

If your diabetes is well controlled, you may test less often. Be sure to ask your doctor to work with you to determine the right amount and frequency of testing for you.

Blood glucose testing

When you have diabetes, frequent blood testing is extremely important. There are several test kits and devices available for getting reliable readings, and they are easy to use. You and your doctor can decide which one is best for you.

Changes in blood glucose readings

One of the reasons for frequent blood glucose testing is that test results are influenced by many things. An answer of “Yes” to any of the following questions may account for unexpected test results:

• Did you eat within the last 90 minutes, or has it been several hours since you’ve eaten? If you have eaten recently, what did you eat?

• Has your eating been “off schedule” in the last 24 hours?

• Have you exercised today?

• Have you been under stress?

• Has your blood glucose been somewhat unstable?

• Other than your diabetes, are you ill?

• Do you have symptoms of possible hypoglycemia, hyperglycemia or ketoacidosis?

• Are you taking medication for your diabetes? If you are taking insulin, what type are you taking, when was your last dose and what injection site did you use? If you are taking an oral hypoglycemic agent, which one is it, what is the dose and when did you take it last?

If you have questions about your blood glucose, call your doctor.
Physician monitoring

To get an ongoing average of your blood glucose levels, your doctor will perform an HbA1c test every three to six months. This involves taking a blood sample—usually from the inside of the elbow or back of the hand—and running a lab test to measure how much glucose is attached to the red pigment in your red blood cells (also called glycated hemoglobin). Over time, this gives a very accurate picture of your blood glucose levels. For people who don’t have diabetes, HbA1c levels are typically between 5 and 6%. As an individual with diabetes, your goal will be to get an HbA1c of 7% or the level recommended by your physician.

Short-term complications of diabetes

Ketoacidosis

Ketones in the urine are a sign that your body has turned to other fuel sources for its energy and is using fat, the most available substitute. Ketones build up in the blood and become toxic. Ketones are the acidic waste products of the breakdown of fats. They can be found in the urine for diagnosis. If the build-up of ketones goes untreated for long, it can result in diabetic ketoacidosis. This is a very serious complication that can lead to coma—even death if not addressed quickly.

Ketoacidosis occurs more commonly in Type 1 diabetes but can occur in Type 2 if blood sugars are poorly controlled. Some of the common signs of ketoacidosis include extreme thirst, nausea, vomiting, excessive urination, deep and rapid breathing, chest pain, a sweet or fruity-smelling breath, and mental confusion. The risk of ketoacidosis becomes greater if you stop following your usual meal plan, become sick, or experience unusual stress. The best way to prevent it is to follow your basic daily plan for blood glucose testing, diet and exercise. If you think you are experiencing ketoacidosis, call for emergency help. An ambulance will bring you directly to the nearest hospital emergency room for treatment.

The kidneys will attempt to remove excess ketones from your blood. Because of this, testing your urine for ketones is a good way to monitor how well you are doing. Urine tests are simple, but to get accurate results you have to follow test kit manufacturer’s directions carefully. Collect a urine sample in a clean container and dip a chemically treated ketone test strip in the sample. You could also pass the test strip through a urine stream. Then wait for the strip to change color and compare the resulting color to the color chart on the test kit. Where the colors match, find the matching percentages of ketones in your urine.
A small amount of ketones may mean ketone build-up is just starting. Be sure to test again in a few hours. If you see a visible rise in a few hours or your test shows moderate to large amounts of ketones, your diabetes is not well controlled. Report these findings at once to your doctor. And do not do any physical exercise until ketone levels return to normal as it can only make matters worse. Blood ketone testing kits are also available for self-monitoring.

**Hypoglycemia and hyperglycemia**

When your blood glucose levels are low (under 50 mg/dl), this is called hypoglycemia. Its symptoms are anxiety, pale moist skin, sweating, hunger and dizziness or lightheadedness. As hypoglycemia advances, often very quickly and sometimes to the dangerous state of insulin shock, its symptoms can look somewhat like a stroke, with one-sided weakness of the body. Seizures, fainting or coma are also possible. If you have just a few of these symptoms, test your blood level immediately. If it is below the 50-mg/dl-threshold, eat or drink something sugary (not a sugar substitute) at once to give your blood glucose a “quick” boost.

Whenever you go out, be sure to carry a source of “quick” sugar in your pocket or purse. Aside from glucose tablets prescribed by your doctor, other quick fixes include:

- Four or five sugar cubes.
- A small box of raisins or five or six pieces of dried fruit.
- A piece of fresh fruit.
- A small amount (half cup) of fruit juice.
- A small bottle (at least a half cup) of sugared soda.
- Six small hard candies.
- A half tube of sugar-based cake frosting.

If you still have symptoms after 15 minutes, check your blood glucose level again. If it is still low, eat or drink another item from the list. If the second boost of sugar doesn’t ease your symptoms, call your doctor. If this seems to be happening often, be sure to let your doctor know. Even if the episodes are brought under control fairly easily, they may suggest that you need an adjustment in diet, exercise or medication.
When your blood glucose levels are too high (at least 250 mg/dl), this is called hyperglycemia. Its symptoms include increased thirst, frequent urination, blurred vision, fatigue and headaches. Besides the immediate serious risk of ketoacidosis, described earlier, unchecked hyperglycemia can lead to diabetic coma, a state of unconsciousness. Again, if you have hyperglycemia, it is very important to call your doctor and work out a more effective diabetes management program.

Maintaining a normal blood glucose level is the best insurance against developing either hypo- or hyperglycemia. People with diabetes can experience many changes in their blood glucose because there are so many variable factors that affect it. Overeating, lack of exercise, drug therapy, other illnesses and infections, and emotional stress are among the many influences that can challenge blood glucose control and stress the importance of doing regular checks according to the schedule recommended by your doctor.

**Diet and meal planning**

**Consistent eating habits**

Keeping the same eating habits—both in the timing and in the quantities and nutritional value of the foods you eat—is extremely important when you have diabetes. Going without food for too long or skipping a meal can throw off your blood sugar control. It’s also helpful to have different choices in your food selection. You will probably have to give up some foods that are particularly not good for your diabetes, so make an extra effort to find some new items you like and that will make meals more interesting.

Consistency is the key to maintaining a normal blood glucose level throughout the day. Remember, you are in control. Your doctor may recommend that you meet with a registered dietitian who will organize your diet, educate you about caloric intake and suggest adjustments that need to be made in the first weeks. You’ll also learn about food labeling and which prepared foods to avoid, as well as which questions to ask when dining out.
Matching weight, calories and exercise

Food preferences, your daily meal and snack schedule, exercise level, weight, and age all help find out how much you should eat each day. Since keeping your weight within a normal range is very helpful for diabetes control, weight loss is a common objective for people with Type 2 diabetes who are overweight. If you want to lose weight, your doctor will help you get started.

You’ll also learn how your food choices affect your blood glucose levels. For instance, some people get better blood glucose control and feel better with six small meals during the day rather than the traditional small breakfast, medium-sized lunch and larger dinner.

Your diet doesn’t have to be boring

There are many cookbooks for people with diabetes. You can check your local library and bookstores to see what’s available. The American Diabetes Association also provides tips on how to prepare healthy meals at www.diabetes.org. Reading food labels to determine the protein, fat and carbohydrate (sugars and starches) content will also help you make good selections among the prepared foods you buy. Many markets and restaurants have healthy selections, and as part of their promise to please customers who have healthy lifestyles, their employees are trained to offer helpful suggestions.

Feeling good: exercise for fun and fitness

Diabetes raises the risk of heart and circulatory (blood flow) disease. Working to maintain normal blood pressure helps lower the risk of some of these long-term complications of diabetes. Regular exercise that requires even moderate levels of effort is known to reduce the risk of heart disease, lower blood pressure and help with proper weight maintenance. No matter what type of diabetes you have, a thorough physical exam is recommended before you start any exercise program.

Exercise affects your blood glucose level

The benefits of exercise far outweigh the risks, but keep in mind that hypoglycemia (low blood glucose levels) can occur because of working out. Your doctor can provide specific guidelines for exercising safely. For people with Type 1 diabetes, regular exercise can lower the amount of additional insulin needed. However, controlling your use of insulin when exercise is a normal part of your lifestyle may take some practice and experience. Measuring your blood glucose level is important to make sure the effects of exercise on the blood glucose are in balance with your food intake and insulin regimen.
These overall guidelines can be helpful:

If your blood glucose is under 100 mg/dl before exercise, you may need a snack before you start to work out. Some good choices include a piece of fruit, a slice of bread, a small box of raisins, or a half cup of juice.

When checking your blood glucose after exercise, your doctor may suggest that you have a snack if the reading is below a certain level; in general, a snack is advised if the blood glucose is under 100 mg/dl.

Exercise should be avoided if, after not eating or drinking, glucose is over 250 mg/dl and ketoacidosis is present. Also use caution if glucose is over 300 mg/dl.

If possible, do not inject insulin into a part of the body, such as an arm or leg, that will be exercised soon. Exercising increases blood flow, which causes insulin to be absorbed at a faster rate than needed.

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**For Weight Loss: Exercise Burns Calories**

The number of calories burned during exercise depends on which exercise you choose and your current weight. In the chart below, 250 calories is used as the example. The columns show how many minutes of each exercise would be needed to burn 250 calories if you weigh 129 lbs., 150 lbs. or 220 lbs.

<table>
<thead>
<tr>
<th>Minutes needed to burn 250 calories if you weigh:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of exercise</strong></td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Aerobic dancing</td>
</tr>
<tr>
<td>Bicycling (6 mph)</td>
</tr>
<tr>
<td>Bicycling (12 mph)</td>
</tr>
<tr>
<td>Bowling</td>
</tr>
<tr>
<td>Calisthenics</td>
</tr>
<tr>
<td>Golf (walking with bag)</td>
</tr>
<tr>
<td>Running or jogging (12-min. mile)</td>
</tr>
<tr>
<td>Running or jogging (8-min. mile)</td>
</tr>
<tr>
<td>Running or jogging (6-min. mile)</td>
</tr>
<tr>
<td>Skiing (cross-country)</td>
</tr>
<tr>
<td>Racquetball</td>
</tr>
<tr>
<td>Swimming (fast, freestyle)</td>
</tr>
<tr>
<td>Tennis (singles)</td>
</tr>
<tr>
<td>Tennis (doubles)</td>
</tr>
<tr>
<td>Walking (3 mph)</td>
</tr>
<tr>
<td>Walking (4 mph)</td>
</tr>
<tr>
<td>Walking (up stairs)</td>
</tr>
</tbody>
</table>

Getting started

You’ll probably find that regular exercise gives you increased energy. In fact, most experts suggest exercise as an energy booster on “tired” days. Here are some tips for getting started:

Choose a type of exercise you enjoy or think would be fun. Discuss the options with your doctor to make sure that your initial plan matches your state of fitness. You’ll probably want to increase the difficulty and add minutes to your routine over time as you become more fit.

You can try different activities or just do one type of exercise for a period of time. Think about whether you would be more committed if you were exercising with a companion or in a class, or whether you’d rather exercise on your own. If extra weight or an inactive lifestyle makes you self-conscious, exercising at home may be more comfortable at first. Try walking on a treadmill or exercising to a fitness program.

If you haven’t been exercising regularly, start slowly. Try exercising for 10 minutes three times a week. You can increase the time by 5-minute increments every 10 to 14 days until you are exercising for 30-minute periods. After that, slowly increase your level of effort. Set regular exercise times that suit your lifestyle and do not interfere with other time commitments.

The goal is to exercise at moderate intensity for a minimum of 30 minutes at least three or four times a week. (When you’re at the right level of effort, you should be just below the point at which you must breathe too hard to carry on a conversation.)

Stop smoking

Smoking is a major health hazard for everyone. It’s particularly dangerous for people with diabetes because it increases your risk for heart and circulatory diseases. If you’re a smoker, ask your doctor about local programs that can help you quit.
Take good care of your feet

People with diabetes can develop serious foot problems due to blood flow (circulatory) and nerve changes in the feet and legs. Not only do the blood vessels there suffer damage from circulating high levels of blood glucose but they also lose the ability to sense extreme heat, cold or injury. The best way to protect yourself from developing serious foot infections and permanent foot damage is to take daily care of your feet. Here are some recommended practices:

- Wash your feet every day.
- Carefully dry your feet. Examine them for anything unusual using a hand-held mirror if necessary—a hard corn or callus, flaking between the toes, a blister, a wart, a broken toe nail, swelling, discolored areas, dry or cracked skin. Remember that any opening is a place where bacteria can enter and cause infection. Tell your doctor as soon as you see any skin breaks, calluses or ulcers, or if a wound isn’t healing, as these can worsen quickly.
- Keep your toenails clipped straight across. If you need help with this, consult your doctor.
- Use a mild lotion on your feet to reverse and prevent excessive dryness.
- Don’t go barefoot—ever—except when you’re in the bathtub.
• Don’t wear tight stockings, socks or poorly fitting shoes. They can cause sores and reduce the circulation to your feet.

• Wear clean stockings or socks every day.

• Have your feet examined every time you go to your doctor.

• Report any changes in how your feet feel—tingling sensations, numbness, excessive coldness, or pain—to your doctor.

• Keep your feet comfortably warm in cold weather, as you may not be able to sense extreme cold.

• Do not use your feet to test the temperature of bath water. Instead, use a bathing thermometer or your hands as your feet may not feel extreme heat. Do not use a heating pad on your feet for the same reason.

• Wear special orthotic shoes to provide critical support to your feet. These are available by prescription from your doctor if you experience frequent sores due to pressure injuries.

Infections and wound care

Poorly controlled diabetes can affect wound healing. In extreme cases, it can lead to gangrene—a condition in which an area of tissue dies—and eventually to amputation. Proper control of blood sugar combined with careful attention, as well as good skin and foot care, will go a long way to reducing the risk of these kinds of infections and wounds. Several factors contribute to diabetes-related infections and poor wound healing:

• The immune system helps your body fight infection but in people with diabetes, this system is not as efficient. Because of this, even small scrapes and cuts can develop into open, infected sores.

• Lack of feeling, caused by nerve damage, can lead to various minor injuries going unnoticed and untreated until they develop into larger wounds.

• Clogged or hardened arteries tend to develop earlier in people with diabetes. This leaves blood flow to the more distant parts of the body, such as the arms and legs, greatly reduced. As blood flow is critical to wound healing, the process can be slower and more difficult.
Gum care

People with diabetes have a greater risk of developing gum disease (also known as periodontal disease), including gingivitis, or reddening of the gums. Research suggests the relationship between periodontal disease and diabetes goes both ways: periodontal disease may make it more difficult for people who have diabetes to control their blood sugar and severe periodontal disease can increase blood sugar, increasing the number of times the body functions with a high blood sugar level. Careful brushing and flossing in the morning and before going to bed at night are important parts of self-care. Call your dentist if you develop mouth, gum, or jaw soreness, bleeding or swollen gums, or a toothache.

Periodic exams to schedule

Testing your blood glucose regularly as directed by your doctor and keeping your blood glucose level within a good range are the best ways to avoid health problems. You can take several other steps to prevent them:

**Check your HbA\(_1c\) level every three months.** In addition to your daily blood glucose testing, the HbA\(_1c\) test, performed by your doctor, is a very accurate way to check your blood glucose level over time.

**Have your blood pressure and weight checked every three or four months.** High blood pressure and weight increase the risk of heart and blood vessel disease. Your doctor will help you get these problems under control.

**See your dentist for a regular dental exam every six months.** Make sure your dentist knows you have diabetes and that you get checked not only for cavities but also for any signs of gum disease. If you develop gum soreness, bleeding or swollen gums, a toothache, or pain in your jaw, call your dentist and schedule a checkup immediately.
Have your urine tested once a year. The presence of protein (proteinuria) in your urine is a sign of improper kidney function.

Schedule a yearly eye exam. A careful exam by an eye doctor is a must to guard against vision loss. For those with diabetes, the loss can be due to several reasons, including diabetic retinopathy (damage to the blood vessels), cataracts (clouding of the eye’s lens), or glaucoma (pressure in the eye that can lead to nerve damage). Both cataracts and glaucoma occur with greater frequency in people who have diabetes. During the exam, the eye doctor dilates (temporarily enlarges) your eyes with drops. Then your eye can be checked for any changes in the blood vessels of the retina, the light-sensitive tissue at the back of the eye needed for good vision. Since early damage may not be visible to a person with diabetes, a professional eye exam is the only means of detection and follow-up treatment.

Have your blood cholesterol and lipid profile checked once a year. This is a good precaution against having high levels go unnoticed. People with diabetes are at risk for heart and blood vessel disease. There is also risk of high serum cholesterol levels, which tend to build up on artery walls and increase that risk even further. If necessary, your doctor will help you get high levels under control.

Tips for changes in your daily routine

Unexpected mealtime changes

Issue: Even when you know how important consistent mealtimes are, you are not always in control of a day’s events. Personal and job-related events, even bad weather and unexpected travel problems can sometimes get in the way.

Solution: If you are taking insulin and your normal mealtime will be delayed up to an hour, you can delay your insulin shot for an hour. If the delay is more than an hour, have a snack at the usual mealtime, take your insulin shot according to your normal schedule and eat your meal later.
**Issue:** You don't want to ignore your diabetes during holidays and on special occasions, but you do want to enjoy yourself.

**Solution:** Careful planning will help. It’s best to divide your meal and snack amounts according to the holiday or special occasion eating schedule set by your doctor. But be sure to keep the total day’s food consumption—total calories and total carbohydrates—close to normal.

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**When you are sick**

**Issue:** Any infection or illness, even a minor one, can cause blood glucose to rise.

**Solution:** To avoid this, you need to take illness seriously and carefully follow these guidelines:

- Rest and take your temperature. Contact your doctor if your temperature passes 102°F (39°C) or if any fever lasts longer than two or three days.

- Increase your blood glucose monitoring to every three or four hours, or at least four times a day. Check for ketones if your blood glucose level is greater than 240 mg/dl. Be sure to keep a careful record so you can report back to your doctor.

- Drink plenty of fluids to prevent dehydration. This means about six to eight ounces every hour while you are awake.

- If you're able to eat, drink sugar-free fluids like water or broth with your meals.

- If you can't keep any solid food down, try to rotate between drinking sugar-free drinks and sugary drinks like sweetened soda, apple juice or Jell-O® at the rate of one cup every hour.

- If you can't eat anything, contact your doctor for medication instructions and “sick day” rules.

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**When you are under stress**

Both emotional and physical stress have an impact on your blood glucose level. But stress can't, and shouldn't, always be avoided. The first step is to learn to recognize and, when possible, anticipate stress. If you can’t schedule 20 minutes for a stress-reducing exercise or quiet relaxation, close your eyes and breathe deeply for 5-minutes a few times during the day. Think of a place that calms you or play music while you breathe. If you feel that you're almost always under stress, you may want to talk with a professional counselor about ways to manage your feelings.
Planning for travel

Diabetes shouldn’t stop you from traveling. But careful planning is the key to having a safe and comfortable trip. Use the following guidelines to make sure your diabetes is properly taken care of without badly affecting your trip:

• Discuss with your doctor any questions you might have several weeks in advance of the date you leave.

• Ask for a letter from your doctor confirming that you have diabetes.

• Get a list of your medications (including generic names and their dosages) from your pharmacist—especially oral medications for diabetes and insulin. Make copies of the list and carry one copy at all times.

• Carry a set of new written prescriptions in case you need to refill.

• Pack all the medications you’ll need and some precautionary ones as well. Include medicines for headaches, nausea and diarrhea. Be sure you have enough of everything to allow for a few extra days in case of a last-minute change in travel plans.

• Pack snack foods and glucose tablets that will last for a few days beyond the duration of the trip, particularly if you’re going to a new place where such items may be hard to find.

• Include enough glucose- and ketone-testing equipment for several extra days.

• Be sure to wear your diabetes identification tag on a chain around your neck or on a bracelet.

• Write down what you need to know about changing your medication times if you’re going to another time zone.

• Call your flight carrier and ask about their policy about packing diabetic supplies (especially sharp objects like your self-monitoring finger stick).

• If you’re traveling by plane, train or bus, take all of the items listed above with you in a clear zippered case inside your carry-on bag. Don’t check them for shipping in a baggage compartment because they might be lost or delayed in arriving.
3. Medication

Proper diet, regular exercise and not smoking may help to control your diabetes. Taking medication is sometimes needed as well. Insulin is the primary medication used in the treatment of Type 1 diabetes because insulin is no longer being made by the pancreas. Type 2 diabetes, by contrast, can be controlled with lifestyle changes like diet and exercise. Medications taken by mouth (oral medications) may be needed to treat Type 2 diabetes as well. However, some individuals with Type 2 diabetes may need insulin and other diabetes medications to manage their disease.

Since prescription and nonprescription medications often interact with insulin and other diabetes medications, discuss all medications you are taking with your doctor or pharmacist.
Types of insulin

Most insulin used in the United States today is produced in a lab but works just like insulin made in the body. Insulins are grouped according to how fast they start working: rapid-acting, short-acting, intermediate and long-acting. Each type of insulin has its advantages. Your doctor will work with you to determine which insulin or combination of insulins is right for you. It’s important to check package instructions for proper storage of insulin. Insulin is usually stored in the refrigerator. However, insulin can be stored at room temperature for up to 28 days. Typically, insulin vials and cartridges should be disposed of properly 28 days after opening. If you don’t know the expiration date for your type or brand of insulin, consult your pharmacist.

Injecting insulin

Insulin is given as a shot into the fatty tissue just beneath the skin. Insulin works fastest when given at room temperature and is shot into the stomach area. Insulin can also be shot into the back of the arms, the top and outside of the thighs, and the buttocks. It’s recommended that you rotate the site of your insulin shot. Using only one site daily can cause hard lumps or fatty deposits in the skin. These can make the insulin not work as well. You and your doctor will discuss how often and when you should use your insulin. You will be taught how to draw-up the insulin from a vial with a syringe and needle and how to inject it. You may also be taught how to inject insulin with a prefilled pen device. Your doctor or pharmacist will also inform you of the best way to dispose of used syringes and needles.

Your doctor may want you to mix different types of insulin, like short and long-acting insulins. When mixing them, draw up the clear, short-acting insulin first and then the cloudy, longer-acting insulin after. Insulin is also available in vials and prefilled pens that have the short-acting insulin and the long-acting insulin mixed in the same container. You and your doctor will determine what insulin is best for you.
Alternative insulin delivery systems

Some people have trouble using a needle and syringe to inject insulin into the skin. If you're having trouble, an insulin injector jet dispenser is another choice: it releases insulin through the skin at high velocity without a needle. But, it can cause bruising because of the pressure exerted. Insulin inhaled through the mouth is another treatment currently being tested. Insulin patches and other over the skin (transdermal) devices are also being tested.

One device that has relatively wide use now, especially among people who have trouble keeping good control on their own, is the insulin pump. This small, electronic device is typically worn on a belt or carried in a pocket and is connected to the body via a plastic tube. It delivers insulin continuously throughout the day, with larger doses at mealtimes and when the blood glucose level rises too high. The device doesn't keep users from self-management. You must check blood glucose levels at least four times a day, watch your carbohydrate eating and adjust the insulin dose based on these factors. Only certain individuals with diabetes will benefit from insulin pumps. Check with your doctor to see if it's an option for you.
### Insulins commonly used in the United States

<table>
<thead>
<tr>
<th>Generic name</th>
<th>Brand name</th>
<th>Form</th>
<th>Onset of action (h)</th>
<th>Time to peak of action (h)</th>
<th>Duration of action</th>
</tr>
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<tbody>
<tr>
<td><strong>Rapid-acting</strong>*</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>insulin glulisine</td>
<td>Apidra**</td>
<td>analog</td>
<td>&lt;15 minutes</td>
<td>1–2 hours</td>
<td>3–4 hours</td>
</tr>
<tr>
<td>insulin lispro</td>
<td>Humalog®*</td>
<td>analog</td>
<td>&lt;15 minutes</td>
<td>1–2 hours</td>
<td>3–4 hours</td>
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<tr>
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<td>analog</td>
<td>&lt;15 minutes</td>
<td>1–2 hours</td>
<td>3–4 hours</td>
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<tr>
<td>regular</td>
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<td>2–3 hours</td>
<td>3–6 hours</td>
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<tr>
<td>regular</td>
<td>Novolin® R*, ReliOn® (Wal-Mart)</td>
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<td>0.5–1 hour</td>
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<tr>
<td>NPH</td>
<td>Humulin® N*</td>
<td>human</td>
<td>2–4 hours</td>
<td>4–10 hours</td>
<td>10–16 hours</td>
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<tr>
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<td>Novolin® N*, ReliOn® (Wal-Mart)</td>
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<td>2–4 hours</td>
<td>4–10 hours</td>
<td>10–16 hours</td>
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<tr>
<td>insulin detemir</td>
<td>Levemir®*</td>
<td>analog</td>
<td>0.8–2 hours</td>
<td>relatively flat</td>
<td>up to 24 hours</td>
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<td>insulin glargine</td>
<td>Lantus®*</td>
<td>analog</td>
<td>2–4 hours</td>
<td>peakless</td>
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<td><strong>Mixtures</strong></td>
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<td>50% lispro protamine, 50% insulin lispro</td>
<td>Humalog® Mix 50/50**</td>
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</tr>
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<td>Humulin® 70/30*</td>
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<tr>
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</tr>
<tr>
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<td>Humalog® Mix 75/25***</td>
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<td>70% aspart protamine/ 30% aspart</td>
<td>NovoLog® Mix 70/30**</td>
<td>analog</td>
<td></td>
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</tbody>
</table>

* Available in prefilled, disposable pens or cartridges for reusable pens. Apidra® is available in pens, pumps or infusion sets. (Insulin pens are listed on pages RG28 and RG29)

† Note difference between Novolin® 70/30 (70% NPH/30% regular) and NovoLog® Mix 70/30 (70% aspartprotamine/30% aspart). The time of action for these mixtures is a combination of the intermediate and short-or rapid-acting components, with one peak of action. Please ask your doctor for the specific time of action for your medication.
**Oral medications**

When Type 2 diabetes can't be controlled with diet and exercise, medications are used to control blood glucose levels. In addition to insulin, there are quite a few classes of oral and injectable medicines that work to lower blood glucose levels. Some boost the production of insulin by activating the cells of the pancreas. Others help the body's cells take up glucose more easily.

Your doctor may prescribe more than one medication to achieve the best results. Your doctor will also want to discuss other medications you might be taking, including over-the-counter medications. Some diabetes medications don't react well with alcohol. Talk to your doctor about the best treatment for your diabetes. Be sure to take prescribed medications exactly as instructed.

**When to Consult Your Doctor about Your Medications**

Ask your doctor for recommendations about when you should call him or her, or follow the guidelines below. Though it is important to keep in steady contact with your doctor, call him or her if:

- Your blood glucose test results are 240 mg/dl or more for two consecutive tests.
- A urine test reveals moderate (30-40mg/dl) to large (>80mg/dl) levels of ketones.
- You have become hypoglycemic, have consumed a “fast-acting” source of glucose, waited 10 minutes to recover, and do not feel better. After repeating the process, you still have symptoms.
- You are too nauseated to eat or drink or you have chest pain or continual bloating.
- You seem to be losing weight and are just not feeling “right.”
- You have vomited more than once or had repeat episodes of diarrhea for several hours.
- You are experiencing mental confusion or dizziness, have double vision or are breathing rapidly.
- You want to make a major change (increase or decrease) in your level of physical activity.
- You are regularly depressed, worried or angry about having diabetes.

**Complementary therapies**

Besides diet, exercise and lifestyle choices, there is ongoing research on the use of vitamins, minerals, herbs and trace metals for keeping control of blood glucose and increasing insulin resistance. Talk with your doctor or pharmacist to determine if supplements would be helpful for you.
4. Preventing long-term complications

Over time, high blood sugar levels damage blood vessels, nerves, kidneys and other internal structures. The key to preventing these long-term health problems is keeping blood glucose steady within the right range. How well your diabetes is controlled depends on making good habits and finding a good balance between diet, exercise and, if needed, drug therapy. Tests can be done every so often to recognize these health problems in their early stages—before they cause symptoms in some cases. These conditions are most easily managed when they are recognized early.

Uncontrolled diabetes increases your risk of getting heart and blood vessel diseases, visual problems (diabetic retinopathy) and nerve problems (diabetic neuropathy).

An annual eye exam is the best way to protect against developing serious visual problems, such as blurriness or loss of vision.

Kidney malfunctions (diabetic nephropathy), or kidney disease, is another long-term risk of poorly controlled diabetes.
Vision problems

The eye is a complex organ that serves as our window to the world. Each part of the eye has a special function. Our ability to see is based on these functions working together, much as the parts of a camera work together to take good quality pictures. People with diabetes may face many eye problems, the most common of which is diabetic retinopathy.

A rich web of small blood vessels called capillaries feed the eye’s retina, the light-sensitive tissue at the back of the eye. Diabetic retinopathy occurs when the capillaries swell and leak fluid or when abnormal new blood vessels grow on the surface of the retina. Over time, either development can cause vision loss that gets worse with time. This will usually occur in both eyes.

Pregnancy increases the risk of retinopathy. If you have diabetes and become pregnant, a careful eye exam is recommended during the first trimester. You should also have follow-up exams every three months until delivery and then six weeks after delivery. However, anyone with Type 1 or Type 2 diabetes should get yearly dilated eye exams of the deeper parts of the eyes because there are often no symptoms at first and the condition is most treatable when it starts.

Eye doctors are trained to identify diabetic retinopathy as well as two other eye diseases linked with diabetes:

- Cataracts, which cloud over the eye’s lens, tend to build up at a younger age in people with diabetes.
- Glaucoma—an increase in fluid pressure inside the eye that leads to nerve damage and loss of vision—happens nearly twice as often in people with diabetes compared to the general population.

If you see any early signs of these eye problems, call your doctor. Your doctor will review your blood glucose readings, exercise habits and other things to decide if some changes are needed.

Kidney problems

The kidneys’ main job is to remove, or filter out, waste from the blood. If the small blood vessels that do the filtering become weak or damaged, either from high blood pressure or from diabetes, wastes build up and start destroying kidney tissue. This condition is called diabetic nephropathy.

Diabetic nephropathy usually doesn’t begin to develop, if ever, until 15 or 20 years after the start of diabetes. The best way to prevent it is to keep steady control of your blood glucose level and blood pressure. Controlling your weight and exercising regularly are two proven ways to keep your blood pressure controlled. If your blood pressure is high, your doctor may prescribe pressure-lowering medicines.
Your doctor may also test the level of a protein called albumin in your urine from time to time. Finding small amounts of albumin in the urine is a sign of early stage nephropathy. If early stage nephropathy is suspected, there are steps you can take to keep it from getting worse:

• Keep your weight at a good level or lose weight if needed to reach a healthier range for your age and height.

• Stay on your program of regular exercise.

• Watch your blood glucose levels as advised by your doctor.

• Keep your blood pressure within a normal range, with medicine if needed.

• Limit daily salt, fluid and protein in your diet as advised by your doctor.

**Nerve problems**

The nervous system is the main messenger for sending information from one part of the body to another. It makes the body’s many jobs work together and alerts us to conditions outside the body. For example, the nervous system sends a signal to speed up our heartbeat and breathe faster when we exercise, to put on warmer clothing when we feel cold, or to let us know that our foot hurts when we stub a toe.
Diabetes can damage the nervous system. This is called diabetic neuropathy. Symptoms include double vision, nausea, feeling like you have a full stomach, and tingling, burning, or loss of feeling, especially in the feet. The loss of feeling can lower your sensitivity to cold, heat, or pain. This can cause injury and infection.

Maintaining good blood glucose control can help avoid these nerve problems. Your doctor will ask you questions from time to time to see if neuropathy has started. If you develop any loss of feeling that doesn’t go away, call your doctor.

**Blood vessel problems**

People with diabetes are at twice the risk for hardening of the arteries, or atherosclerosis. This condition happens when too much fat (cholesterol) clogs the arteries, slowing blood flow. Over time, not only do the large and small vessels suffer, but the hardening also raises the risk of stroke and heart attack. To make the risk of this family of blood vessel problems lower, keep blood glucose levels controlled, keep good weight control, follow a low-fat diet and exercise regularly. If you smoke, this is the time to quit, because the chemicals in cigarettes also hurt blood flow. Also have your blood pressure checked every 3-4 months and your blood cholesterol and lipids measured once a year.

**Skin problems**

Nearly a third of people with diabetes will have a skin problem caused by or changed by diabetes at some time in their lives. Among the general skin conditions that anyone can get but that turn up more often in connection with diabetes are bacterial and fungal infections, and itching, most often in the legs. Good skin care may take care of the problems but call your doctor if you think there’s an infection. Some of the diabetes-related skin problems that can also happen include:

- Light brown, scaly patches, similar to age spots are called diabetic dermopathy (DD). The skin problem is caused by changes in the small blood vessels. It is harmless and needs no treatment.
- Spots that look like DD but are larger and deeper are called necrobiosis lipoidica diabeticorum (NLD).
There are less NLD spots than DD but they are also easier to detect. They start with a dull, red, raised area and turn into a shiny scar with a purple border. Sometimes NLD is itchy and painful and the spots break open, making them painful and sometimes infected. NLD should be treated only if you have open sores.

- Diabetes that is out of control can also cause both eruptive xanthoma, which looks like small, yellowish-orange or reddish-brown dot on your skin, and diabetic blisters. Both go away when blood sugar is brought back to suggested levels.

- About a third of people with Type 1 diabetes can get tight, thick waxy skin, usually on the backs and palms of hands, and stiff finger joints. This is called digital sclerosis. Blood sugar control is the only treatment.

**Depression and diabetes**

Studies show that diabetes may also increase the risk for depression. It's not clear what exactly causes this connection, but feeling overwhelmed by the daily tasks of diabetes care and diet can result in feelings of sadness. Feeling down once in a while is normal. But feeling this way most of the day for two weeks or more is a sign of clinical depression. Not only can depression decrease your ability to function well but it can also make it harder to control your diabetes. It can even have an effect on blood sugar levels. It’s important that you tell your doctor and get the right treatment if you:

- Feel sad, guilty or hopeless for long periods.
- No longer take interest in doing things you used to enjoy.
- Have trouble sleeping, or sleep too much.
- Experience a change in appetite or a major weight change.
- Have problems staying focused or making decisions.
5. Taking care of your child with diabetes

Making a relationship with your child that promotes open communication is a top priority. You can look together for ways to build habits that will keep the diabetes in control. These should be habits that don’t prevent your child from being part of normal activities. Over time, you’ll learn what your child wants to do independently and when he or she prefers your help.

Share food responsibility with your child. Make sure healthy food choices are available and let your child decide how much to eat.

As you and your child think of questions about diabetes, keep a written list. Plan on going through them together at your child’s next doctor visit.

Ask for a meeting at school with staff members who work with your child to talk about your child’s special diabetes.

Make a healthy lifestyle a family affair.
There are a number of books available for children with diabetes. Your library, local bookstores and doctor can help you find information for you and your children.

Children who have diabetes usually are diagnosed with Type 1. This is a condition that can appear any time after birth. More and more often, as children become seriously overweight, they can also develop Type 2 diabetes. This condition was once seen only in adults. In this section, we will focus on Type 1.

**Questions children often ask**

Listed below are a few common questions your child might ask. We have also listed some answers you can offer him or her. You can find additional information on talking with your child about diabetes in books, other brochures and on the Internet. You can also refer to page 39 for additional resources.

**Q** Did I do something that gave me diabetes?

**A** No, diabetes just happens. It’s not something you can bring on yourself and it isn’t catching.

**Q** What’s diabetes?

**A** When you have diabetes, part of your body called the pancreas that sits behind your stomach stops making something called insulin. Insulin is needed by your body to help make the energy you need for everyday you do. When insulin isn’t being made, you can feel tired because you don’t have much energy. You can also be thirsty when you shouldn’t be and need to go to the bathroom a lot.
Q How do doctors cure diabetes?

A There are many ways to control diabetes, but there's no cure for it. We're going to learn together how to control your diabetes to keep you feeling good and healthy.

Q What does “controlling diabetes” mean?

A First, it means we're going to learn how to give you extra insulin to replace what your body has stopped making. Second, we're going to find out when to give you this medicine to make sure your body has what it needs all day long. Third, we're going to talk about what you eat to see whether we need to make some changes to have less sugar and sweets. We're also going to learn how to test how much sugar is in your blood. This is also called your blood glucose level and it's important to make sure all the other things we're doing are working.

Q What happens when diabetes gets out of control?

A You might start to sweat even though you're not exercising. Or feel weak, shaky, or a little dizzy. You might get tired or angry too. These are signs of low blood glucose. Usually you can eat a snack that will give you a quick energy boost that will make you feel better in just a few minutes. A good snack might be a cup of juice or a small box of raisins. We'll make sure that you always have a snack like this with you when you go out to play or to school and we'll keep a supply at home, too.

Q I'm afraid of being sick a lot. Will I have to stop playing with my friends? What's going to happen to me?

A I can understand that you're afraid. This is all new for you and for me. But you don't need to be afraid because we're going to work it out together. You may even get angry about having diabetes. That's okay, too. I hope you'll be able to let me know if you have any questions or want to talk about what's on your mind and how you're feeling. You're not going to be sick a lot. You'll be able to play with your friends as you always have and do everything else you enjoy.
**Informing school personnel**

**Meeting with school officials**

Your child’s teachers, principal, school nurse, coach, head of cafeteria services and bus driver all need to know that your child has diabetes. Ask for a meeting to talk about the following:

- Your child’s usual routine for taking insulin and testing blood glucose.
- The importance of keeping insulin and testing materials available at the nurse’s office.
- Your child’s need for snacks to keep a stable blood glucose level.
- Whether the cafeteria food choices are okay for a child with diabetes.
- The symptoms of diabetic trouble in your child to be on the alert for.
- Where to reach you by phone during the day.
- Your child’s doctor’s phone number.

“Checking in” with the principal and your child’s teachers at least once a quarter will keep the lines of communication open. How your child is doing at school can be a good sign of his or her emotional and physical well-being.

**Reminders**

Maintain regular mealtimes, but don’t expect your child to eat as planned. Your child’s appetite may change with growth spurts and physical activity. Regular mealtimes are important, but your child may “rebel” against feeling closely controlled. If a gentle reminder doesn’t work, he or she may have to learn by experience that there are sometimes bad results of ignoring meal schedules.

Know that your child may sometimes go off his or her meal plan and not tell you. Your child is going to eat something extra, skip a needed snack, or even take an insulin shot a bit off schedule now and then. This behavior is normal. It’s a serious concern only if it happens a lot. If it does, it could become dangerous.

If your child asks about them, discuss the possible health problems of diabetes in a nice way. Tell your child that regular checks of blood glucose are the best way to keep blood glucose in a good range and that keeping the right range is the best way to stay healthy and avoid health problems.
6. Questions for your doctor

We hope that if you’re newly diagnosed with diabetes this book has answered many of your questions. But, because diabetes affects each person differently, successful management of the disease needs treatment and lifestyle choices unique to you or your child. It’s important to speak with your doctor if you have any questions about this disease and its management. Some suggested questions are listed here, but you may want to write down a list of any other questions you have before your next appointment.

Suggested questions for your next doctor visit:

Diet and exercise

• How can I learn more about healthy eating?

• How limited will my selection of foods be? How strict will my eating schedule be?

• Can I drink alcoholic beverages? If so, what are the limits?

• What happens if I change my regular eating schedule?

• What are some tips for making reasonable food choices when dining out or at someone else’s house?

• How much is enough exercise for me, how often and how should I get started?
Medication

- Do I have to take insulin? If so, how will I learn to inject myself?
- Will I need other medications for my diabetes? If so, what will I be taking?
- How does diabetes or medication for diabetes affect other medications I am taking?
- Do I have to stop some of the other medications? Do I have to be careful about starting other medications?

Follow-up

- How frequently will I see you for checkups?
- Who should I call to arrange for other periodic tests?
- Who is the best person in your office to call if I have questions?

Other concerns

- How will we know whether my diabetes is being adequately controlled? What are the little signs of being out of control?
- Do I need special information for times when I'm ill with something like the flu or an upset stomach?
- Is traveling safe? What precautions should I take?
- Does hot or cold weather affect my condition?
- Are there support groups for people with diabetes in this area?
7. Getting additional help

Want more information? There are many people, organizations and resources available to help you manage your diabetes. Here are a few suggestions:

**Medical Professionals**

**Your primary care physician (PCP)**

If you have questions about diabetes, diabetes medications or follow-up, contact your doctor, or primary care physician (PCP), first. Most doctors are well prepared to assist you in this area.

**Specialists**

If you are having difficulty controlling your diabetes, if your diabetes is severe, or if you are developing health problems of diabetes, your PCP may recommend that you see a specialist, such as an endocrinologist (a doctor who focuses on the organs like the pancreas) or a nutritionist (to help you with your diet and food choices). These healthcare professionals can help you to better manage different parts of your diabetes.

**Pharmacists**

Your local pharmacist can provide you with valuable information about the medications your doctor has prescribed. He or she can also help you avoid other medications that might interfere with successful treatment of your diabetes, as well as help you get the greatest benefit from your medications.
Organizations

The following organizations provide information and support services for adults and children with diabetes. While this list is a great starting point, there are many other resources available. Contact your doctor for more information.

American Association of Diabetes Educators
200 Madison Street, Chicago, IL 60606
(800) 338-3633
www.aadenet.org (To find diabetes educators in your area)

American Diabetes Association
Center for Information and Community Support,
1701 North Beauregard Street Alexandria, VA 22311
(800) 342-2383 (800-DIABETES)
www.diabetes.org

American Dietetic Association
120 South Riverside Plaza, Suite 2000 Chicago, IL 60606-6995
(800) 877-1600
www.eatright.org

American Heart Association
7272 Greenville Avenue, Dallas, TX 75231 (800) 242-8721
www.heart.org

Children with Diabetes Foundation
685 E. Wiggins Street, Superior, CO 80027
www.childrenwithdiabetes.org
Diabetes Exercise and Sports Association
310 West Liberty, Suite 604, Louisville, KY 40202
www.diabetes-exercise.org

Juvenile Diabetes Research Foundation International
26 Broadway, 14th Floor, New York, NY 10004
(800) 533-2873
www.jdrf.com

National Diabetes Information Clearinghouse
One Information Way Bethesda, MD 20892-3560
(800) 860-8747
www.diabetes.niddk.nih.gov

National Federation of the Blind
200 Wells Street, Baltimore, MD 21230
(410) 659-9314
www.nfb.org

National Kidney Foundation
30 East 33rd Street, New York, NY 10016
(800) 622-9010
www.kidney.org
The words and phrases listed are commonly used in speaking about diabetes:

**Albumin:** A protein that can be detected in microscopic amounts in urine by a special microalbuminuria test that your doctor can request. A positive finding allows your doctor to detect, treat and further prevent diabetic kidney damage at a very early stage.

**Beta cells:** Beta cells are responsible for manufacturing insulin. Beta cells are found in the pancreas.

**Blood cholesterol and lipids:** A blood cholesterol test measures low density lipids (LDLs), high density lipids (HDLs) and triglycerides. High levels of some of these substances raise the risk of cardiovascular disease.

**Blood glucose testing:** Regular, frequent testing of the blood glucose level is the best way to monitor how well diabetes is being controlled. Sometimes blood glucose is measured in the fasting state, when the subject hasn't eaten in the last eight hours. At other times, blood glucose is tested in the postprandial state, which is about 90 minutes after a meal has been eaten. Your doctor will tell you when to test your blood glucose levels.
**Cardiovascular disease:** These are disorders of the heart and/or blood vessels, and people with diabetes are at higher than normal risk for developing these conditions. In addition, blood vessel changes and high blood pressure contribute to other long-term complications of diabetes.

**Circulatory system:** The system that moves blood throughout the body. The circulatory system is composed of the heart, arteries, capillaries, and veins.

**Diabetes:** Also referred to as diabetes mellitus and long ago as “sugar diabetes,” this condition develops when your cells are not able to make normal use of glucose as a source of energy. The inability is due either to the absence of insulin (Type 1) or to the presence of insufficient or ineffective insulin (Type 2). A third type, gestational diabetes, can occur during pregnancy. Though it stops after the pregnancy is completed, it can indicate the potential for developing Type 2 diabetes in the future.

**Diabetic dermopathy:** A skin condition associated with diabetes involving light brown or reddish scaly patches, most often on the shins or front of the thighs, less often on the scalp, forearm and trunk. The cause is thought to be a type of inflammation affecting small blood vessels in the skin. The patches are also called shin spots.

**Diabetic nephropathy:** Kidney malfunction (nephropathy) can be a long-term consequence of diabetes. Annual urine tests to search for the presence of protein (proteinuria) are advised as a means of identifying nephropathy. Keeping blood pressure within normal range, with the use of medications if necessary, is a precautionary step that helps prevent nephropathy.

**Diabetic neuropathy:** Nerve malfunction (neuropathy) can be a long-term complication of diabetes. Numbness, pain and tingling of the feet, stomach upsets and fullness and blurry or double vision may be signs of neuropathy.

**Diabetic retinopathy:** Visual impairment, even blindness, can be a long-term effect of diabetes. The smallest blood vessels in the eyes—the capillaries—become malformed or grow excessively to hamper the retina’s ability to see clearly. Vision is progressively lost, leading to blindness. Annual eye exams by an eye specialist can identify early signs of retinopathy when it is most treatable.

**Endocrinologist:** A physician who specializes in the diagnosis and management of hormonal conditions such as diabetes and metabolic disturbances.
Eruptive xanthoma: A skin condition characterized by the sudden eruption of small, yellow or yellowish orange papules encircled by an orange-reddish halo, especially on the buttocks, posterior thighs, and elbows, and caused by high concentrations of triglycerides in the blood, especially that associated with uncontrolled diabetes mellitus.

Gangrene: The death of tissue in any part of the body. It occurs when an area loses blood supply for a sustained period as the result of long-term infection, injury, circulatory problems or a condition such as diabetes.

Glycemic index: A ranking of carbohydrate-containing foods, based on the food’s effect on blood glucose.

Glucagon: This is a hormone produced by the pancreas that stimulates an increased level of glucose in the blood.

Glucose: The simple sugar that serves as the chief source of energy in the body. The body makes glucose from proteins, fats and, in largest part, carbohydrates. Glucose may also be consumed as part of foods. Absorbed directly into the blood from the intestine it results in a rapid increase in the blood glucose which is carried to each cell through the bloodstream. Cells, however, cannot use glucose without the help of insulin, so people with diabetes must keep track of their glucose and insulin levels as a means of avoiding unsafe highs or lows.

Glycosylated hemoglobin test: This is another term for the HbA1c test, which is considered a very accurate measure of the control of blood glucose levels over time; its findings also correlate with rates of diabetes complications. It is generally advised that the test be done by your doctor every three months.

Hormone: Any chemical substance such as insulin, estrogen and growth hormone produced by a gland whose purpose is to assist in the regulation of a specific bodily function.

Hyperglycemia: In this condition, the blood glucose level exceeds 250 mg/dl, well above the normal range.

Hypoglycemia: In this condition, the blood glucose level falls below 50 mg/dl, well below normal.
**Insulin:** This hormone is produced by the beta cells of the pancreas and has responsibility for the glucose level of the blood and the body cells’ ability to absorb glucose and use it as a major source of energy.

**Ketoacidosis:** This complication occurs when your body is unable to use your blood sugar for fuel and is a sign that your diabetes may be dangerously out of control. If ketoacidosis is not brought quickly under control, coma and death can result. A finding of ketones in the urine is a warning sign that must be reported right away to your doctor.

**Ketones:** These chemical compounds can be found in the urine and are a sign of uncontrolled diabetes. They are much more commonly found in people who have Type 1 than Type 2 diabetes and are a warning of possible ketoacidosis.

**Lipids:** Lipids are fats, including cholesterol, triglycerides, lipoproteins and fatty acids. Together with carbohydrates and proteins, lipids are the main building blocks of plant and animal cells. Easily stored in the body, they serve as a source of fuel.

**Metabolic syndrome:** The tendency of several conditions to occur together, including obesity, insulin resistance, diabetes or pre-diabetes, hypertension, and high lipid counts.

**Mg/dl:** Milligrams per deciliter, a unit of measure that shows the concentration of a substance such as blood sugar in a specific amount of fluid (blood).

**Microalbumin:** See Albumin.

**Necrobiosis lipoidica diabeticorum (NLD):** a rash composed of raised shiny red-brown patches that occur, usually in several locations on the lower legs. The centers of NLD rashes are often yellowish and may develop open sores that are slow to heal. Often a biopsy is needed to diagnose the condition, more frequently seen in women than men.

**Oral antidiabetic agents:** These are pill-form drugs most commonly given for Type 2 diabetes that does not respond adequately to a controlled diet and exercise plan. There are several types and their selection depends to a large degree on individual response.
Pancreas: This flat organ lies behind the stomach and has many functions. The hormones, insulin and glucagon are produced in the pancreas and function to regulate the level of glucose in the blood and to enable the body’s cells to absorb glucose. In some individuals the pancreas ceases to produce insulin at an early age; in others the insulin gradually becomes less and less effective even though its production may approach normal.

Pre-diabetes: A condition in which blood glucose levels are higher than normal but not high enough for a diagnosis of diabetes; often reversible with changes in lifestyle it is an indicator of developing Type 2 diabetes.

Proteinuria: This is the term used to describe a finding of protein in the urine. It is an indication of kidney malfunction.

Rapid-acting insulin: This is any insulin medication that begins working in 5-15 minutes, peaks in effectiveness in 2-3 hours, and lasts at most about four hours.

Regular insulin: This is insulin medication that begins working in 30-60 minutes, peaks in 2-3 hours, and lasts 3-6 hours.

Risk factor: Anything that raises the chance of developing diabetes, such as family history or obesity.

Type 1 diabetes: An autoimmune disease, formerly known as juvenile diabetes that destroys the ability of the pancreas to make insulin. It requires daily injections of insulin to stay alive.

Type 2 diabetes: The most common type of diabetes, this condition arises when the body develops a resistance to natural insulin and the pancreas cannot make sufficient amounts to overcome the resistance.